Have political parties played a role in the Spanish housing bubble?

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Resumen: *(máximo 300 palabras)*
This paper aims at analyzing the role of local politicians in the development of the housing bubble in Spain. More precisely, it intends to determine whether different political ideologies matter and as a result municipalities run by political parties show housing bubbles of different intensity. The housing bubble has been characterised, as noted above, taking into account two main elements: the increase in house prices (and the subsequent fall when the bubble burst) and the stock of unsold houses that propel the subsequent house price falls. The main result is that municipalities governed with left-centre wing and left-wing mayors have lower number and percentage of empty houses than municipalities whose mayors belong to right wing parties. However, the drop in house prices seems to be independent of the political party to which the mayor of a municipality belongs.

Palabras Clave: *local power, housing bubble, house prices, vacant houses*

Clasificación JEL: R52; O18

1. - Introduction

The Spanish housing market has experienced a major downturn in recent years beginning in 2008 with the onset of the international financial crisis. Spain was Europe's largest user of capital markets to fund mortgages. Around 30% of the mortgages made use of residential mortgage-back securities and the rest covered 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 2.2 times in real terms between 1996 and 2006; house building rose to record heights with an annual average of 600,000 new houses 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 residential market remain amongst the worst in Europe. Two major factors characterise the bursting of the Spanish housing bubble: First, the fall of house prices from their peak in 2008. By the first term of 2014 house prices have decreased a 29.6%1 and it is still uncertain whether the market will start to level off in 2014 in some regions though there are signals that this might be the case. Obviously 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 highlights such differences strongly (Altuzarra and Esteban, 2010; García Montalvo, 2013; Ball, 2011). And second, the other major consequence of the bursting of the housing bubble in Spain 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 houses but many are potential house residences2. For some years, banks, when they foreclosed on developers, had the incentive to hold the unsold dwellings on their books rather than to discount 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 on to the market at significantly lower prices (Esteban and Altuzarra, 2014).

Research regarding housing bubbles and busts has been approached from different perspectives using various theoretical frameworks. Most related studies have examined the relationship between housing bubbles and macroeconomic fundamentals (Himmelberg, et al., 2005; Fraser et al., 2008). Other authors have addressed the relationship between bank lending and/or mortgage credit and the appearance of housing bubbles (Glaeser et al., 2010; Mayer, 2011). Furthermore, and especially since the onset of the global financial crisis, numerous research works have centred on the analysis of housing bubbles from the study of the behaviour of house prices (Sinai, 2012; Cohen et al. ,2012; Chang et al., 2013).

Most studies on housing bubbles and busts, including those cited above, used general indicators to measure and model housing bubbles. These indicators are mainly the evolution of house prices and the evolution of the housing stock. For instance, Sinai (2012) describes six stylized patterns among housing markets in the United States which could be used as potential explanations of the housing boom and bust. He uses house price to assess those cycles of booming and busting; Cohen et al. (2012) study changes in housing prices in metropolitan areas (using the Standard & Poor's/Case-

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

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

Shiller house price index) and a selected group of countries in order to analyze the U.S. boom and bust; Mayer (2011) produces a survey on housing bubbles highlighting the fact that existing research does not yet provide a crisp definition of a housing bubble nor does it allow researchers to predict where or when bubbles can occur. The author studies the evolution of the bubble by analyzing the behaviour of the house prices in relation to their fundamentals; Mikhed and Zemcik (2009) uses U.S. data for Metropolitan Statistical Areas and employs cross-sectionally panel data tests for unit roots and cointegration techniques to assess potential bubble occurrence in housing markets. They combine overlapping 10-year periods, price–rent ratios, and the panel data tests to construct a bubble indicator. Results show the presence of a housing bubble and also suggest that house price changes are helpful in predicting changes in rents and vice versa; Haughwout et al. (2012) studies the housing boom and bust by analyzing of the housing construction and house prices using a quarterly price index for metropolitan statistical areas with both elastic and inelastic housing supplies across the United States. Their conclusion points that changes in the structure and costs of the house building industry might explain the dynamics of the house construction and prices in the years previous to the bust; Glaeser, Gyourko and Saiz (2008) explore the role of housing supply elasticity in how possible housing bubbles would manifest themselves in different markets. Their model predictions are that places with more elastic housing supply have fewer and shorter bubbles, with smaller price increases. However, the welfare consequences of bubbles may actually be higher in more elastic places because those places will overbuild more in response to a bubble; Chang et al. (2013) applies Panel KSS Test with a Fourier function to test whether housing bubbles exist in South Africa using the ratio of housing price to income in 9 provinces.

Specific studies on the Spanish case have tried to identify the factors explaining the increase in house prices during the boom period: the reduction in the interest rates, the increase in disposable income, the relaxation of credit conditions for mortgages, the strong demographic growth, the increase in the unemployment rate and the increase in the rate of new construction (Esteban and Altuzarra, 2008; García Montalvo, 2006).

Many analysts (Leal Maldonado (2010); Fariña Tojo and Naredo (2010)) have pointed to the role of political parties, especially at the local level, in the making of the housing bubble in Spain. And these authors tend to ascribe the main political responsibility to the conservative party (Partido Popular) because it was a conservative government who approved in 1998 the Land Use Act3 that 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/builders' interests. Solé-Ollé and Viladecans-Marsal (2012, 2013b) show that a left-wing local government would allow approximately 65 percent less land to be developed than a right-wing government facing a similar competitive election.

Yet, 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. The variables cited above appear to be the explanatory factors. 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 to explain the bursting of the housing bubble: it is not only the rise in prices but also the amount of

[3] Law 6/1998 (13 April) on Land Regimen and Valuation

new houses put into the market that finally affect the scope of the correction needed in the market as Glaeser, Gyourko and Saiz (2008) state.

However, very few empirical studies have focused on the relationship between housing bubbles and the role of political parties at the local level. Solé-Ollé and Viladecans-Marsal, (2013a) study the effect of parties on housing prices in Spain during the boom period, and conclude that they grow higher in areas under left-wing parties. Yet, the study does not allow us to analyse the role played by other variables in these outcomes (such as demand variables) and more importantly this study does not cover the period of market correction during the bursting of the bubble.

Thus, the aim of this paper is to analyze the role of local politicians in the development of the housing bubble in Spain. More precisely, it intends to determine whether different political ideologies matter and as a result municipalities run by political parties show housing bubbles of different intensity4. The housing bubble in Spain has been characterised, as noted above, taking into account two main elements: the increase in house prices (and the subsequent fall when the bubble burst) and the stock of unsold houses that propel the subsequent house price falls.

The rest of the work is structured as follows. Section 2 looks at the role of local authorities in the housing market in Spain. Section 3 presents the database and the methodology used. Section 4 deals with the results. Section 5 deepens the interpretation of the results and Section 6 summarises the main conclusions.

2. The role of local authorities in the housing market in Spain

Spain is a Regionalised Unitary State with a Political Regionalisation process (Regional Autonomy) and, then, a multi-level government structure (Tosics, 2010; González Pérez, 2007). Since the 1978 Constitution, Spain tends to lean towards decentralization and distributing powers between regions (Autonomous Communities, AC) and municipalities. These AC5 have a very high degree of self-government, and own assemblies, whose members are directly elected by universal suffrage. Among others, these AC enjoy extensive legislative and executive competences in many fields (i.e., territorial planning, housing, environmental policy or economic development). However, the central administration reserves important legislative powers in the areas most concerned in this article. Thus, there is a Land Use Act that has to be observed for every Region and some housing guidelines (mainly those established by the State Housing Plans) that are generally followed by regional governments6 (Esteban and Altuzarra, 2014).

At the local level, there are 8,109 municipalities. In each local authority there is a municipal council (Pleno): the deliberative assembly of the municipality. It is composed of councillors (concejales) elected from party lists (generally using the brands of national or regional parties) by universal suffrage for a four-year term. This assembly approves the budgets, urban planning, by-laws and municipal rules. The local

[4] The massive amount of house building has raised serious concerns about the environmental degradation that has been produced, but this article will not deal with this issue.
[5] There are 17 Autonomous Communities and 2 Autonomous Cities in Spain.
[6] With the exception of the Autonomous Communities of the Basque Country and Navarre due to their special fiscal regime.

government council (Junta de gobierno local) is the main executive body. It is composed of elected councillors appointed by the mayor. The mayor (Alcalde) 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 interventions (Iglesias González, 2005). The most relevant one is the intervention in the land market mainly through urban land use planning regulations7. Urban development and spatial planning are within the remit of the regions and central government cannot legislate on them. But, 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 every moment. Thus, in fact, there are many common characteristics among them (Fariña Tojo and Naredo, 2010; González Pérez, 2007).

The urban planning process is a hierarchical one. At the regional level there are the Territorial Plans which cover the entire region but local governments have competence on the urban plans (General Urban Plans, GUP) concerning the municipalities, always following the general guidelines of the Territorial Plans. The GUP covers at least one municipality and its main objective was to provide integral urban development throughout municipal territory and to classify different zones of land use. Thus, building land was made available in the Spanish planning system via a zoning process that classified and periodically reclassified land into zones of urban, developable and protected uses. Besides, the GUP prefigures the uses, intensities of use, design of the communications systems and other structural elements. Developers had to implement infrastructure works themselves and it could take several years to win planning approval depending on the functioning of the municipality8.

Despite variations, since the late 1990s local governments 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 with favourable macroeconomic conditions helped to boost house building to such high levels (Ball, 2011, United Nations, 2008).

An important element in local government decision-making process over residential land availability 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 property value based local taxes.

Income was also substantial from sales of land appropriated during the zoning processes. In Spain developers must give between 5 and 15% of their land to the municipality to be used for public purposes (roads, schools, etc.) but it could also be sold in the free market if local governments wanted to. This was a powerful incentive to zone residential land for development because they gained revenue when they did9. Moreover, many municipalities sold land they already owned (vacant or otherwise) in

[7] Local authorities may also intervene in the production of public housing but these interventions have not been very relevant in the Spanish case.

[8] The 2007Land Use Act has introduced important changes in these processes, but will not be discussed here.

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

good locations to developers. One might say that local authorities speculated in the land market "in the public interest".

This increased expending capacity was used in different ways by different municipalities, and in many occasions led to significant additions to urban infrastructure facilities and local public services.

A second element that propelled land rezoning has to do with increasing the provision of social housing in the municipality. Land Use regulations specified that a percentage10 of all new houses of a certain development area should be subsidized ones. Thus, many local authorities actively supported free market new residential developments because this would increase, in turn, the stock of subsidized housing for the lower income inhabitants. In fact, in many occasions land obtained through the planning process was also used to the end.

Economic and employment concerns were also behind the support of many local authorities to 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 house sector, was seen as a driver to consolidate a tourist sector 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) conclude, "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 made by Fundación Alternativas (2007) concluded that corruption in urban development was a widespread practice in Spain11.

In conclusion, factors of very different nature made local authorities of different political colours to follow a similar strategy of actively supporting housing construction activities at an extraordinary pace.

3. - Data and methodology

3.1. Data

The empirical study has been performed using information provided by three sources of information: the Census of Population and Housing 2011, the Ministry of Public Works and the Ministry of Finance and Public Administration. Data refer mainly to different types of houses (primary, secondary and vacant houses), house prices and electoral lists to which mayors of the Spanish municipalities of over 25,000 inhabitants belong to. The total number of municipalities of this size 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 is not available at a higher level of territorial disaggregation.

a) Data on housing

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

[11] 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.

The Spanish Census of Population and Housing (CPH) are held every ten years. The CPH collects information on the characteristics of the population and housing for the whole of Spain and also disaggregated by autonomous regions, provinces and municipalities. We worked with the last census held in 2011.

Table 1 summarizes the characteristics of our sample. In the municipalities we studied there are 2,9169,632 people, 62.3 % of the total population. There are 11,317,371 primary houses, representing 62.6 % of total primary dwellings. The proportion of secondary houses in our sample is 35.8 % of the total of this type of houses. The percentage of empty houses contained in our sample is 52.4 % of the total number of empty houses in Spain.

Regarding secondary houses it is worth mentioning two issues. First, approximately one out of three secondary houses is located in municipalities with less than 5,000 inhabitants. This phenomenon is not only the result of a massive building in the last decade but obeys to cultural and family reasons. Less than 15% was built during the gestation period of the housing bubble (see Table 2). Secondary houses located in these 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.

Second, the ability of local governments to design development plans in these small municipalities is, in practice, very limited. Often, the implemented plans are the result of both the recommendations made by superior administrative authority as the council of the province or the government of the autonomous region and the indications received from party leaders to which mayors of the rural towns belong to.

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
Family houses	25,288,623	14,439,801	57.1
Primary houses	18,083,692	11,317,371	62.6
Secondary houses	3,681,565	1,317,750	35.8
Empty houses	3,443,365	1,804,680	52.4
Empty houses-Family houses ratio	13,6%	12,5%	

Source: Population and Housing Census 2011 and own calculations

Table 2. Secondary houses by municipality size and age

Municipalities size (inhabitants)	Number of secondary houses	%	% accumulated	% houses built between 1990-2011
Less than 5.000	1224955	33.3	33.3	15.9
From 5.001 to 20.000	874270	23.7	57.0	22.4
From 20.001 to 50.000	616425	16.7	73.8	23.8
From 50.001 to 100.000	425090	11.5	85.3	24.9
From 100.001 to 500.000	361270	9.8	95.1	31.4
More than 500.000	179560	4.9	100.0	32.8
Total	3681565			30.1

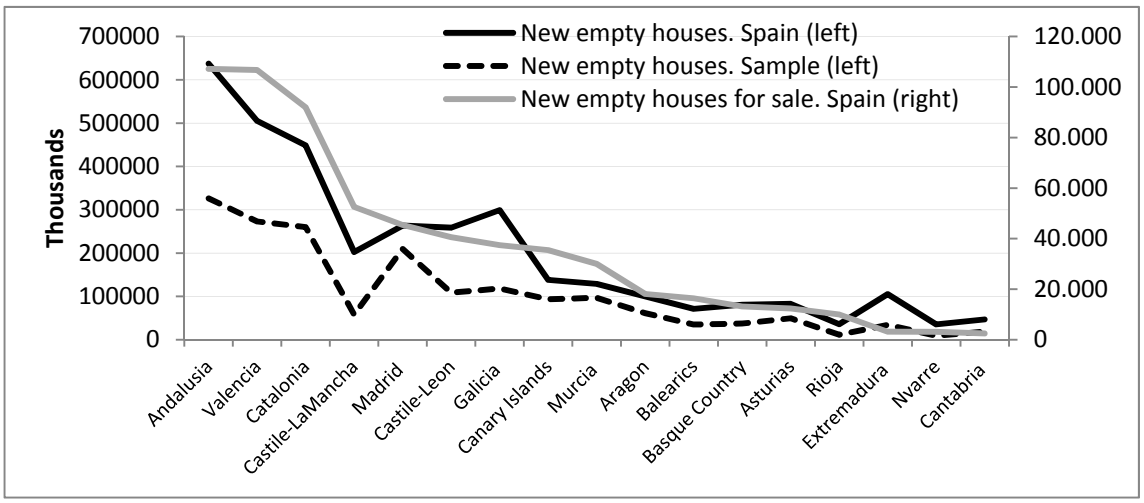
Source: Population and Housing Census 2011 and own calculations

The CPV-2011 registers information about the stock of vacant houses. However, it is not possible to distinguish existing empty houses from unsold new houses, with the latter being the more relevant to the objectives of this work. The Ministry of Economic

Development provides data on the stock of unsold empty houses at the level of autonomous region and provinces, but not at the level of municipalities.

In order to determine whether the stock of empty houses is a correct proxy for the stock of unsold new houses, we calculated the correlation between these two variables in the year of 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 CPV-2011 for municipalities with more than 25,000 inhabitants, used in this paper, is a suitable proxy. Figure 1 illustrates the behaviour of the total stock of empty houses in Spain and in our sample as well as of the stock of unsold houses in Spain.

Figure 1. Empty unsold new houses on the total housing by autonomous regions 2011



Source: Population and Housing Census 2011 and own calculations

b) Housing prices

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

Figures A1 and A2, in the Appendix, show the quarterly progress of house prices in levels and in growth rates respectively by autonomous region during the period 2005-2013. House prices rose until 2008 coinciding with the economic expansion and the strong momentum of the housing market. After the bursting of the housing bubble, a process of market adjustment starts. The dynamics of house prices present some interesting differences by regions. The highest house prices are observed in the regions of the Basque Country, Cantabria, Madrid and Catalonia while more moderate prices correspond to Extremadura and Galicia, among others. The biggest price increases were registered in Balearics, Murcia and Valencia.

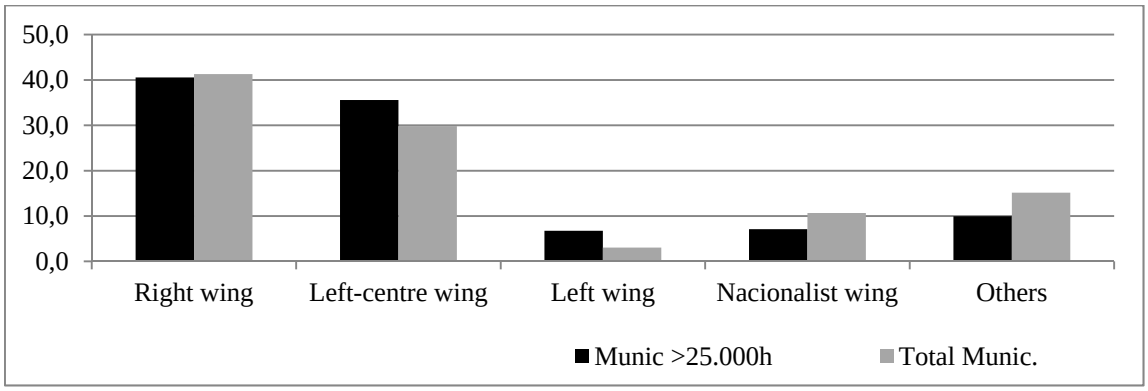
c) Political parties

The Ministry of Finance and Public Administration provides information on the political party to which belong 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 the term-of-offices run from 1995 to 1999, 1999-2003 and 2003-2007. These periods correspond to those years in which the political decisions about land zoning/rezoning and licensing of construction that led to the development of the housing bubble were adopted.

Political parties to which elected mayors belong to have been grouped into four categories: a) right wing which includes mayors belonging to the popular party; b) left-centre wing which groups mayors belonging to the Spanish socialist workers party; c) left wing which includes mayors of Izquierda Unida; d) nationalist parties which includes mayors of nationalist parties that govern primarily in the Basque Country, Catalonia and Navarre12; e) Regionalists and others.

Figure 2 shows the breakdown of the political parties in the whole of Spain and in the municipalities of over 25,000 inhabitants in the 1995 elections. It can be observed that the distributions are quite similar13 meaning that the conclusions drawn from this study may be extensive to the whole Spain.

Figure 2. Mayor's elections in 1995 according to our database and official results for all municipalities of Spain



Source: Ministry of Finance and Public Administration and own calculations

It is worth noting that during the term of office of 1995-1999, 40.6% of the municipalities had a right wing mayor. During the terms of offices 1995-1999 and 1999-2003, consecutively, this percentage was 25.3%, and 19.9% during the three terms of offices (1995-1999, 1999-2003. In the case of the left-centre wing municipalities, these percentages were 35.6%, 30.2% and 23.5, respectively.

3.2. Methodology

12 The following political parties are included: Basque County: Aralar-ARALAR, Eusko Alkartasuna-EA, Eusko Abertzale Ekintza-Basque Nationalist Action-EAE-ANV, Eusko Alberdi Jeltzalea-Basque Nationalist Party-EAJ-PNV; Catalonia: Convergence and Union-CIU, Republican Left of Catalonia-ERC; Galicia: Bloque Nacionalista Galego, BNG; Valencia Bloc Nacionalista Valenciá-BLOC, Republican Left Country Valenciá-ESQUERRA; and Aragon: Aragonese-CHA.

[13] Figures for the term of office 1999-2003 show similar results to the term of office 1995-1999

We have estimated, initially, three OLS with heteroskedasticity-robust standard errors models, with three dependent variables, one independent variable and a set of control variables.

$$\log vacantH_i = \alpha_0 + \alpha_1 PolParties_{1995-1999\,i} + \alpha_2 X_i + \varepsilon_i$$

$$\text{share}\, vacantH_i = \alpha_0 + \alpha_1 PolParties_{1995-1999\,i} + \alpha_2 X_i + \varepsilon_i$$

$$HPpeak - drop_i = \alpha_0 + \alpha_1 PolParties_{1995\&1999\,i} + +\alpha_2 X_i + \varepsilon_i$$

Where logvacantH_i is the log of the number of empty houses; sharevacantH_i is the percentage of empty houses over the total housing stock in each municipality; HPpeak-drop_i, the percentage fall in house prices since the peak; $\text{PolParties}^{14}_{1995\text{-}1999}$ represents the political party to which mayors belong to during the term of offices 1995-1999 and 1999-2003, and X_i is a vector of control variables.

a) Dependent variables

The first dependent variable is the log of the number of vacant houses in the year 2011 (logvacantH_i). This variable is intended to be a measure of the housing bubble in each municipality. This variable, as noted before, computes the number of empty houses which includes both existing empty houses and new unsold houses.

The second dependent variable is the share of vacant houses (sharevacantH_i). The information provided by this variable complements the one offered by the previous variable. While variable logvacantH_i captures the characteristics of municipalities in which the highest (lowest) number of empty houses is concentrated, variable sharevacantHi captures the characteristics of municipalities with highest (lowest) percentage of empty houses as percentage of their housing stock. Thus, we can analyze whether municipalities which concentrate more empty properties (i.e., municipalities with large housing stock) are those with the highest percentage of empty houses, or whether, on the contrary, this nexus does not occur.

The third dependent variable is the bursting of the *housing prices bubble* (HPpeak-drop_i). This variable is considered to be another measure for the housing bubble and is constructed as the difference between the highest house price per square meter reached from 2005 to 2013 and the lowest house price per square meter reached since the peak.

b) Independent variable

The independent variable is *political party to which belongs the mayor* of the municipality during two terms of office; that is, term of office 1995-1999 and term of office 1999-2003, when the relevant decisions were made.

This variable consists of five categories:

> Takes value 0 when the *political party to which belong the mayors* was right wing during the two terms of office consecutively.

[14] Years correspond to the first year of each term of office

Takes value 1 when the *political party to which belong the mayors* was left-centre wing during the two terms of office consecutively.

Takes value 2 when the *political party to which belong the mayors* was left wing during the two terms of office consecutively.

Takes value 3 when the *political party to which belong the mayors* was nationalist wing during the two terms of office consecutively.

Takes value 4 when there has been alternancy between political parties and/or the *political party of the major* was regionalist wing during the two terms of office.

To test whether the decisions taken in the next term-of-office 2003-2007 had an impact on the generation of the housing bubble, we have constructed a new variable. $PolParty_{1995\text{-}1999\text{-}2003}$. The construction of this variable is similar to the previous one but including the term of office of 2003-2007, that is, we take the terms of office 1995-1999, 1999-2003 and 2003-2007 together. Therefore, this variable consists of five categories:

Takes value 0 when the *political party to which mayors belong* was right wing during at least two terms of office.

Takes value 1 when the *political party to which mayors belongs* was left-centre wing during at least two terms of office.

Takes value 2 when the *political party to which mayors belongs* was left wing during at least two terms of office.

Takes value 3 when the *political party to which mayors belongs* was nationalist wing during at least two terms of office.

Takes value 4 when there has been alternancy between political parties and/or the *political party to which belongs the mayor* was regionalist wing during at least two terms of office[15].

c) Control variables

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

- 16 dummies for the autonomous regions ($Regions_i$)
- the maximum house price increase between 2005q1-2013q1 ($HPgrowth_i$), and
- the log of the population in the year 2001 ($logpopul_i$)

Table 3 and 4 display some descriptive statistics for the continuous and categorical variables respectively. And Table 5 presents the correlations of the variables.

[15] Only 2.5% of municipalities were regionalist wing during the three terms of office; 6.4% of municipalities were regionalist wing during the two terms of office; and the rest was alternancy between political parties.

Table 3. Statistics of continuous variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Empty houses 2011	279	6459	12171	329	153101
log empty houses 2011 (logvacantH_i)	279	8.2476	0.9172	5.7961	11.9389
Share of empty houses over total family houses 2011 (sharevacantH_i)	279	0.1322	0.0514	0.0193	0.3594
Minimum housing price	278	1349	479	579	3439
Maximum housing price	278	2291	697	1075	4337
Maximum housing price increase (HPgrowth$_i$)	278	0.3939	0.1684	0.0490	1.2574
Fall in house prices since the peak (HPpeak-drop$_i$)	278	0.4080	0.0790	0.1708	0.5996
log population 2001(logpopul$_i$)	276	10.8811	0.8464	9.8002	14.8997

Table 4. Statistics of categorical variables

Variable	Proportion	Std. Err.
Political Parties. 1995-1999		
Right wing	0.2545	0.0261
Left-centre wing	0.3047	0.0276
Left wing	0.0323	0.0106
Nationalist wing	0.0466	0.0126
Others	0.3620	0.0288
Political Parties. 1995-1999-2003		
Right wing	0.3297	0.0282
Left-centre wing	0.4337	0.0297
Left wing	0.0430	0.0122
Nationalist wing	0.0538	0.0135
Others	0.1398	0.0208
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 5. Correlations

		1	2	3	6	7	8	9	10
1	logvacantH_i	1							
2	logpopul$_i$	0.760	1						
3	HPgrowth$_i$	-0.000	-0.167	1					
6	HPpeak-dropi	0.094	-0.041	0.221	1				
7	sharevacantH_i	0.411	-0.178	0.376	0.149	1			
8	PolParty$_{1995\text{-}1999}$	-0.107	-0.102	0.001	0.052	0.005	1		
9	PolParty$_{1995\text{-}1999\text{-}2003}$	-0.183	-0.089	-0.117	-0.054	-0.139	0.567	1	
10	Regions	-0.148	-0.018	-0.109	-0.009	-0.113	-0.105	-0.091	1

4. - Results

We report two sets of three estimates each. The first set refers to the terms of offices 1995-1999 and 1999-2003, which will be named as Models A. The second set of estimates refer to the term of offices 1995-1999, 1999-2003 and 2003-2007 and will be name as Models B.

Table 6 presents the estimates of Models A. Model 1A presents the results when the dependent variable is the *Number of vacant houses in 2011* ($logvacantH_i$), Model 2A displays the results when the dependent variable is *Percentage of empty houses over the total housing stock* in each municipality ($sharevacantH_i$), and Model 3A, when the dependent variable is *Percentage fall in house prices since the peak* ($HPpeak\text{-}drop_i$).

Results in Model 1a show that municipalities with left-centre wing and left-wing mayors have lower number of empty houses than municipalities whose mayors belong to right wing parties. Municipalities with left-centre and left wing majors have 28.1% and 67.5% less empty houses than municipalities governed by right-wing mayors, respectively. Coefficients for municipalities whose mayors belong to nationalist and regionalist parties/alternancy are statistically insignificant.

The control variable *Regions* (Region) is statistically significant. Autonomous regions with the highest coefficients are Murcia (1,357), Galicia (1,340), Valencia (1,312) and Castile-Leon (1,196). 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 populated regions of Spain. The most populated regions were Madrid, Catalonia, Andalusia and Valencia.

The variable *Maximum house price increase between 2005q1-2013q1* ($HPgrowth_i$) has a negative but not statistically significant coefficient.

The coefficient of the variable *Population in the year 2001* ($logpopul2001_i$) is positive and statistically significant. The most populated municipalities tend to have larger number of empty houses. The number of empty houses increased by 0.84% while municipal population increased by 1%.

Model 2A presents the estimation results when the dependent variable is the *Percentage of empty houses over the total housing stock* in each municipality ($sharevacantH_i$). Results are consistent with those given in Model 1A. Those municipalities with left-centre and left wing mayors have a lower proportion of empty houses in their housing stock.

Comparing municipalities governed by right wing mayors with municipalities governed by left and left-centre wing mayors, it can be observed that the latter ones have 18% and 38% fewer empty houses in their housing stock, respectively. The coefficients for municipalities whose mayors belong to nationalist and regionalist parties/alternancy are not statistically significant.

The variable *Regions* ($Region_i$) is statistically significant. Again the autonomous regions with the highest ratios are Murcia (10.6), Galicia (10.0), Castile-Leon (9.1), Extremadura (9.1), Rioja (7.6) and Valencia (7.1). In general, it can be seen that regions concentrating the largest number of empty houses, have in turn the highest proportion of empty houses.

The variable *Maximum house price increase between 2005q1-2013q1* ($HPgrowth_i$) has a positive coefficient and is statistically significant.

The coefficient of the variable *Population in the year 2001* ($logpopul2001_i$) has a negative and statistically significant sign. This result suggests that the most populated municipalities are not those with the highest proportion of empty houses. The percentage of empty houses decreases by 78.4% when municipal population increases by 1%.

Table 6. Results. Terms of office 1995-1999 and 1999-2003[16]

	Model 1A		Model 2A		Model 3A	
Dependent variable	logvacantH		sharevacantH		HPpeak-drop	
Political Parties						
Left-centre wing	-0.281	***	-1.797	***	-0.009	
Left wing	-0.675	***	-3.819	***	-0.042	
Nationalists wing	-0.148		-2.311		-0.001	
Regionalist wing and others	-0.102		-0.1665		0.009	
Regions						
Andalusia	1.078	***	5.919	***	0.118	***
Aragon	1.180	***	7.453	***	0.164	***
Asturias	1.010	***	5.883	***	0.035	
Balearics	0.767	**	2.190		0.108	***
Canary Islands	0.911	***	5.404	***	0.140	***
Cantabria	0.949	***	4.311	***	0.080	***
Castile-Leon	1.196	***	9.067	***	0.089	**
Castile-La Mancha	1.006	***	6.569	***	0.144	***
Catalonia	0.842	***	4.690	***	0.178	***
Valencia	1.312	***	7.070	***	0.177	***
Extremadura	1.114	***	9.143	***	0.036	
Galicia	1.340	***	10.02	***	0.082	***
Community of Madrid	0.121		0.0825		0.194	***
Murcia	1.357	***	10.066	***	0.153	***
Navarre	0.469	***	2.015	*	0.048	**
Rioja	1.086	***	7.619	***	0.130	***
House price increase	-0.351		3.982	*	0.123	***
logpopulation	0.842	***	-0.7843	**	0.004	
Intercept	-1.544	***	15.48	***	0.179	***
R-squared	0.797		0.523		0.478	
F(20,252)						
N	280		280		280	

legend: * p<.05; ** p<.01; *** p<.001

Model 3a presents the estimation results when the dependent variable is *Percentage fall in house prices since the peak* ($HPpeak\text{-}drop_i$). The coefficient of the independent variable is not significant in statistical terms. This means that the drop in house prices has been so far independent of the political party to which the mayor of a municipality belongs.

[16] 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.

The variable *Regions* ($Region_i$) is statistically significant. Autonomous regions with higher price declines are: Madrid, Catalonia and Valencia, with coefficients of 0.194, 0.178 and 0.177, respectively.

The variable *Maximum house price increase between 2005q1-2013q1* ($HPgrowth_i$) has a positive sign and is statistically significant. This result suggests that municipalities that have experienced the greater price increases are those that are suffering the highest price adjustments. The coefficient of the variable *Population in the year 2001* ($logpopul2001_i$) has a positive sign and is not statistically significant.

Considering the results so far, it seems that the political party of the major might influence the development of a housing bubble in terms of the stock of empty housing, but it is the market mechanism which so far has determined its burst via prices.

However it might also be argued that the process of the bursting of the housing bubble has not yet finished, especially in those places where there is a high stock of empty houses which will force further falls in house prices in the future (Hoekstra and Vakil-Zad, 2011). The last quarterly data are suggesting that the recovery of the market may be starting in some areas while others still show drops in prices. If this hypothesis becomes true, the changes produced in our dependent variable (*Percentage fall in house prices since the peak*) in Model 3A might lead to different results, that is, the role of political parties would be expected to be similar to Models 1A and 2A: municipalities with the higher rates of vacant houses will experiment higher drops in house prices.

5. - Could politicians have prevented the development of the housing bubble?

A logical question that arises in the light of the previous results is whether politicians could have prevented the development of the housing bubble once it started.

In order to better answer this question, we have estimated Models B (1B, 2B and 3B) with the same dependent and control variables but with an independent variable that covers a longer period of time. The independent variable for these models is $PolParties_{1995\text{-}1999\text{-}2003}$, which now represents the political party of the mayor of each municipality during the terms of office 1995-1999 1999-2003 and 2003-2007. That is, it incorporates an additional term of office that begins in 2003 and ends in 2007.

The results obtained are presented in Table 7. It is observed that the values of the coefficients and their statistical significance remain with slight variations. This leads us to think that, once the housing bubble started and developed during the terms of office 1995-1999 and 1999-2003, incoming mayors in the term of office 2003-2007 did or could do little to stop the advance of the bubble. These results are consistent 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 7. Results. Terms of office 1995-1999, 1999-2003 and 2003-2007

	Model 1B		Model 2B		Model 3B	
	logvacantH		sharevacantH		HPpeak-drop	
Political Parties						
Left-centre wing	-0.265	**	-1.502	*	0.012	
Left wing	-0.891	***	-5.007	***	-0.033	
Nationalists wing	-0.178		-1.520		0.022	
Regionalist wing and others	-0.128		-0.065		0.015	
Regions						
Andalusia	1.033	***	6.244	***	0.129	***
Aragon	1.193	***	7.979	***	0.174	***
Asturias	0.882	***	5.722	***	0.040	
Balearics	0.723	**	2.580		0.122	***
Canary Islands	0.856	***	5.625	***	0.151	***
Cantabria	0.878	***	4.410	***	0.089	***
Castile-Leon	1.186	***	9.620	***	0.105	***
Castile-La Mancha	0.994	***	7.097	***	0.156	***
Catalonia	0.752	***	4.441	***	0.179	***
Valencia	1.263	***	7.398	***	0.188	***
Extremadura	1.126	***	9.788	***	0.052	*
Galicia	1.314	***	10.519	***	0.094	***
Community of Madrid	0.112		0.603		0.206	***
Murcia	1.333	***	10.676	***	0.173	***
Navarre	0.436	***	2.393	**	0.060	**
Rioja	1.064	***	8.139	***	0.149	***
House price increase	-0.315		3.948	*	0.006	***
logpopulation	0.849	***	-0.678	**	0.118	
Intercept	-1.624	***	13.723	***	0.141	***
R-squared	0.792		0.516		0.482	
F(20,252)						
N	275		275		275	

legend: * p<.05; ** p<.01; *** p<.001

6. - Conclusions

The Spanish housing market has experienced one of the major bubbles and bursts in Europe. Research regarding 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 housing bubbles and the role of political parties.

The aim of this paper is to analyze the role of local politicians in the development of the housing bubble in Spain. More precisely, it intends to determine whether different political ideologies matter and as a result municipalities run by political parties of different ideology show housing bubbles of different intensity. The housing bubble in Spain has been characterised, as noted above, taking into account two main elements: the increase in house prices (and the subsequent fall when the bubble burst) and the stock of unsold houses that propel the subsequent house price falls.

We have estimated three OLS models with heteroskedasticity-robust standard errors. We use three dependent variables (the log of the number of empty houses, the percentage of empty houses over the total housing stock and the percentage fall in house

prices since the peak) one main independent variable (*political party to which belongs the mayor* of the municipality during two terms of office); and a set of control variables.

The main estimation results show that municipalities with left-centre wing and left-wing mayors have lower number and percentage of empty houses than municipalities whose mayors belong to right wing parties. Coefficients for municipalities whose mayors belong to nationalist and regionalist parties/alternancy are statistically insignificant. However, the drop in house prices has been so far independent of the political party to which the mayor of a municipality belongs. It seems that the political party of the major might influence the development of a housing bubble in terms of the stock of empty housing, but it is the market mechanism which so far has determined its burst via prices.

It might be argued that the process of the bursting of the housing bubble has not yet finished in Spain, especially in those places where there is a high stock of empty houses which will force further falls in house prices in the future. However, more research would be needed in the future once the adjustment of the housing market has been concluded in all regions and municipalities.

Appendix

Figure A1. House Price evolution (in levels)

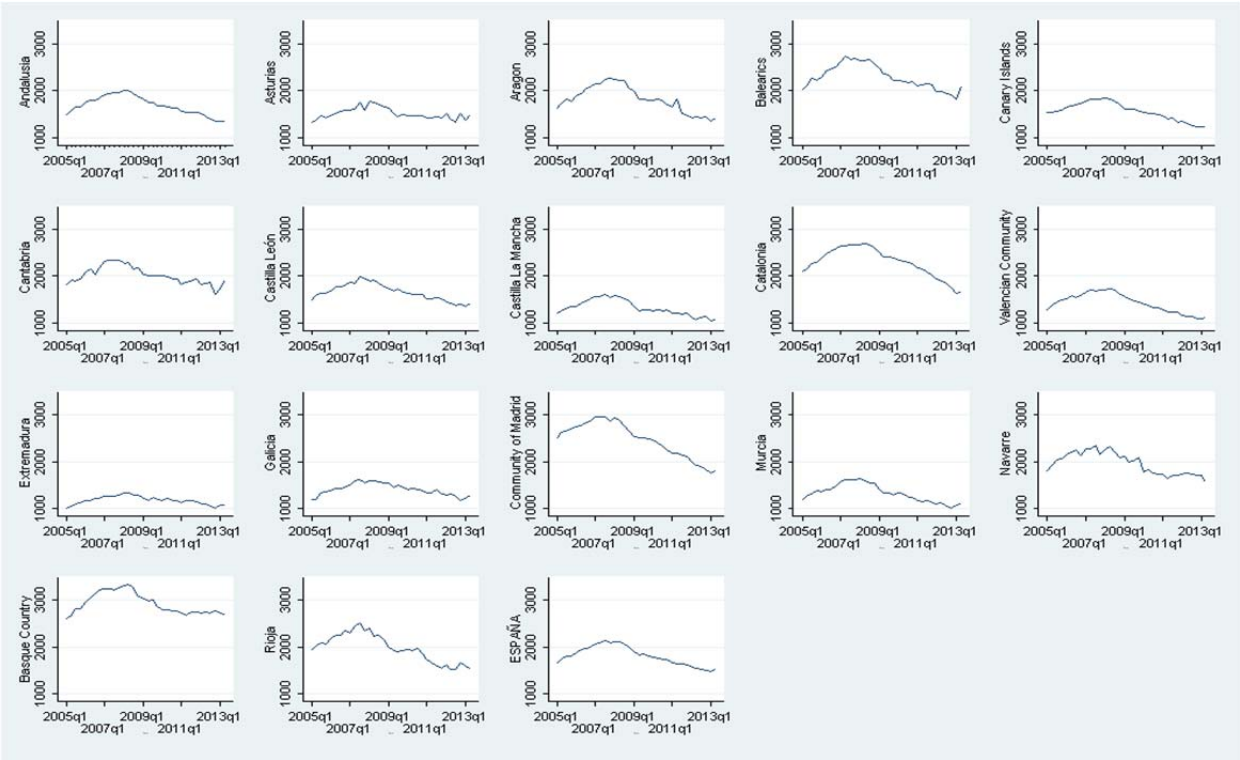
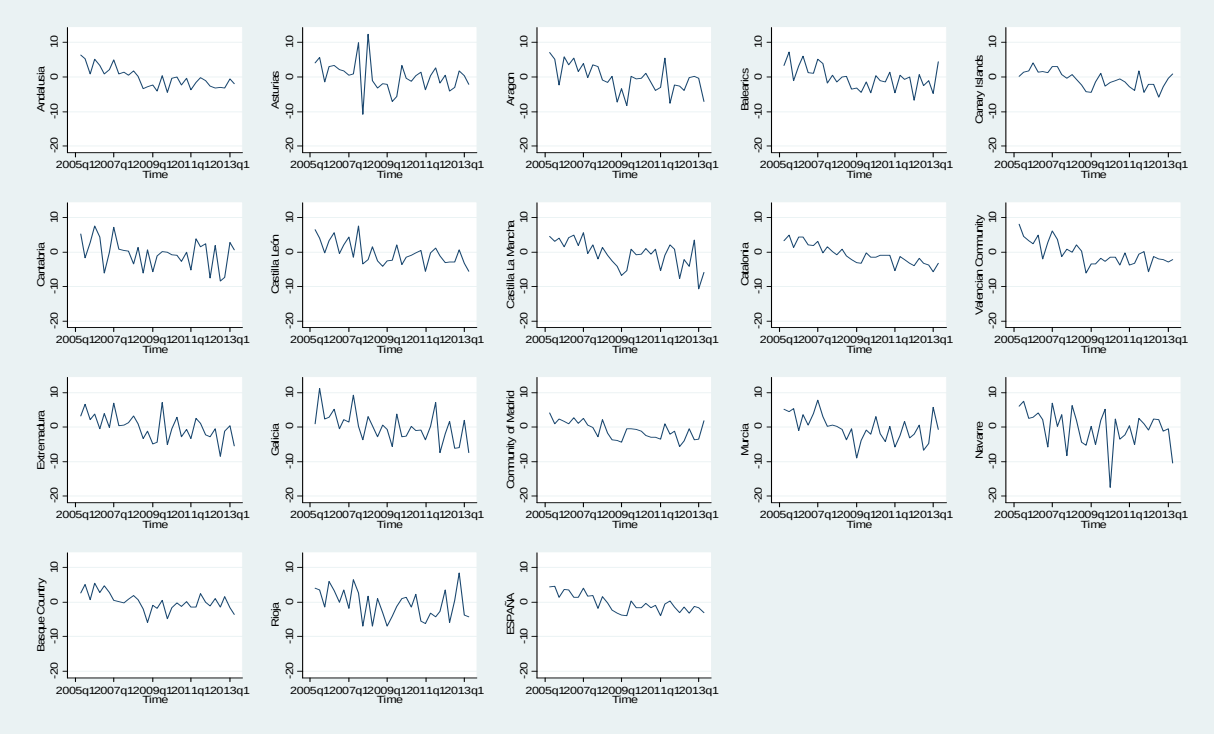


Figure A2. House Price evolution (in growth rates)



Source: Ministry of Public Works and own elaboration

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