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Spanish mortgage crisis and accumulation of foreclosed housing by SAREB: a geographical approach

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ABSTRACT

SAREB (Sociedad de Gestión de Activos Procedentes de la Reestructuración Bancaria – Company for the Management of Assets proceeding from the Restructuring of the Banking System) has played a key role in the process of restructuring the Spanish banking system and managing the property assets of the banks since the bursting of the housing bubble. This company has concentrated the housing stock that the rescued banks had accumulated through foreclosures. As a result, the identification of the territorial patterns of its assets is key to understanding the spatial logics of the housing crisis in Spain. There are no publicly available data about the location of the housing stock in the hands of SAREB. For this reason, the study explores an alternative secondary source. The resulting map allowed the researchers to check the utility of this source and to carry out calculations of spatial correlation using indicators relating to the impact of the property boom in different municipalities. This made it possible to spatially correlate exposure to the hyperproduction of housing and the concentration of housing in the hands of SAREB as a result of mortgage foreclosures and to open a route towards a novel geographical reading of Spain's mortgage crisis.

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1. Introduction

In Spain, the global financial and property crisis has resulted in the highest rate of mortgage foreclosures and related evictions amongst Western European countries (Cano, Etxezarreta, Dol, & Hoekstra, 2013; European Mortgage Federation, 2011). In fact, the proliferation of mortgage foreclosures and evictions has been one of the main manifestations of the consequences derived from the Spanish property and financial model (Gutiérrez & Delclòs, 2016; Gutiérrez & Domènech, 2017a, 2017b; Vives-Miró, González-Pérez, & Rullan, 2015). This model was based on the notion of housing as a form of investment and as an instrument for generating and appropriating rents (Naredo, 2009). All of this was fuelled by a sustained growth in indebtedness (Gutiérrez & Delclòs, 2015; López & Rodríguez, 2011).

According to data from the Consejo General del Poder Judicial (General Council for Judicial Power), between 2008 and 2015 there were more than 600,000 mortgage foreclosures in Spain which resulted in around 380,000 evictions.

This extension of evictions resulting from failure to pay mortgage credits was accompanied, and fuelled, by what have been referred to as processes of 'restructuring' and 'sanitising' the Spanish financial sector (Garrido Torres, 2012; Royo, 2013). This first entailed the rescue of financial entities with

public money and the subsequent conversion of the regional savings banks into private banks (i.e. restructuring). Secondly, it involved the transfer of assets from the property sector – land; empty, unsold and/or unfinished housing; and housing acquired via mortgage foreclosure – to the Sociedad de Gestión de Activos Procedentes de la Reestructuración Bancaria (Company for the Management of Assets proceeding from the Restructuring of the Banking System) – SAREB (i.e. sanitising) (Gutiérrez & Domènech, 2017b). According to data from the Bank of Spain, the value of direct aid to the banking sector has so far reached €61,000 million.¹ The most significant fact about this process is that it has been precisely the banks that were rescued with public money that have carried out the most evictions. Data from Catalonia show that around 65% of evictions due to mortgage foreclosures from 2008 to 2015 were carried out by financial entities rescued with public money (Gutiérrez & Delclòs, 2017).

The Memorandum of Understanding signed between the Spanish government and the European Commission (RDL 24/2012 and Real Decreto 1559/2012) set out the mechanisms for the constitution of SAREB. The mission of this organisation was to acquire housing stock and loans with arrears or high risk of default from the banks that had been rescued

in order to then sell it on to private investors, companies and/or investment companies (such as so-called vulture funds). In total, SAREB has so far received almost 105,000 property assets and 80,000 loans, with a total value of €50,781 million. These property assets include foreclosed houses (almost 40,000 housing units), empty or unfinished new real estate projects, commercial properties and land. As a result, SAREB has become one of the biggest ‘bad banks’ in Europe, both in terms of housing units accumulated and public funds received (Byrne, 2016). It should be underlined that 55% of SAREB’s capital is private, while the other 45% remains in the hands of the Fondo de Reestructuración Bancaria (Bank Restructuring Fund, or FROB) and is covered with public money.²

Despite the important volume of public resources that SAREB has concentrated and its central role in the management of the Spanish housing crisis, there are no data available for open access on its property asset portfolio. As a result, there is also a lack of detail about its spatial distribution. This deficit of public information has made it difficult to carry out academic studies and critiques of the territorial logic of the Spanish property crisis and of the policies applied after the bank rescue. For this reason, the first instrumental objective of the work presented here was to identify and exploit an alternative data source that would permit such a geographic approximation. This alternative data source made it possible to draw up the first detailed map of the housing stock accumulated by SAREB. This novel map provides enough details to perform readings at different geographic scales. Therefore, it not only facilitates the analysis of the spatial distribution of SAREB housing, but it also allows the development of two lines of research in greater detail, which are the two main objectives of this study. On the one hand, it offers the possibility of detecting and analysing the territorial logic of the Spanish mortgage crisis. On the other hand, it allows the study of the territorial logic behind the processes of financial and property restructuring that were supposed to generate new rents based on managing the property assets accumulated via evictions.

2. Data

Faced with a lack of official data that would have made it possible to identify the housing properties adjudicated to SAREB on an individual basis, we had to use a secondary, alternative source. This made it possible to identify and georeference up to 33,205 housing units. The housing units belonging to SAREB are currently marketed via the websites of the property companies that have signed commercialisation agreements with SAREB (Altamira, Haya, Servi habitat and Solvia³). In the last few years, these web portals have become increasingly popular as a channel for publicising (for rental or sale)

the housing stock in the hands of the Spanish banks, and SAREB has also used these platforms to promote and sell its properties.

All housing units owned by SAREB (HOS) can be identified from these websites (since the advertisements incorporate its logo). As the advertisements have information about the postal address of every housing unit, we carried out a systematic compilation of this variable over a period of five months, from November 2015 to March 2016. We then designed a database of 33,205 housing units that represented the housing stock accumulated by SAREB as of March 2016. With this information, it was possible for the first time to georeference all the housing stock accumulated by SAREB. Thus, this process allowed us to study, analyse and understand the uneven geography of the housing crisis in Spain.

3. Methods

To study the spatial distribution of SAREB’s properties in detail and to carry out spatial analysis at various different scales, we have analysed the tendency of spatial clusterisation of housing stock accumulated by SAREB and its spatial correlation with key indicators related with the intensity of the housing bubble at the municipal level. To do this, we first calculated the totals of housing units by municipalities and autonomous communities (the regional level in Spain). Secondly, we weighted the collection of the total HOS with respect to the total number of housing units in each of the territorial units used in the analysis. The expression of the values in relative terms facilitated a comparative reading between different territories and complemented analyses based on the distribution of absolute values (accumulated stocks). For this work, we used the following indicators:

- Number of HOS per 1000 housing units by the autonomous community.
- Number of HOS per 1000 housing units by the municipality.

Once these calculations were done, we carried out an analysis of the patterns of territorial distribution of the HOS. To do this, we used the Exploratory Spatial Data Analysis (Anselin, 1995). This approach has been used in a wide range of academic research: in the health sector (Loughnan, Nicholls, & Tapper, 2008; Penney, Rainham, Dummer, & Kirk, 2013; Sridharan, Tunstall, Lawder, & Mitchell, 2007); for understanding the territorial logic of different sociodemographic variables (López-Gay et al., 2015); in the analysis of economic disparities between regions (Méndez & Prada-Trigo, 2014); and even – as in the present study – for an analysis of the distribution of evictions due to foreclosures

(Gutiérrez & Delclòs, 2016). First, we used the local version of Moran's I calculation to identify the spatial autocorrelation (Anselin, 1995).

Based on maps of Local Indicators of Spatial Association (LISA) the Local Moran's I indicator makes it possible to identify areas with high and low spatial values and also elements that are not statistically significant (Anselin, 2005). The reference variable used for the calculation was the number of HOS per 1000 inhabitants by municipalities.

Secondly, we used the bivariate version (Wartenberg, 1985) of the Local Moran's I indicator. In this case, we highlighted the relationship between the number of HOS per 1000 housing units in each municipality and the values of a second variable in its neighbouring municipalities. Calculations were made with two different variables that enabled us to weight the intensity of the property boom in each municipality. The aim was to use this to check the spatial correlation between the overproduction of housing and overexposure to credit risk during the boom period and the concentration of housing belonging to SAREB.

The variables used were:

- *The total number of housing transactions for each municipality between 2004 and 2007 (inclusive).* Since 2004, the Ministerio de Fomento (Ministry of Public Works) has published the number of housing transactions carried out by each municipality. Although it does not cover the whole period corresponding to the property bubble, this is considered an indicator that is particularly useful for detecting the areas in which the greatest expansion of the property market has taken place. The expansive phase of the property cycle in Spain corresponded to the decade 1997–2007, although it was in the six-year period 2002–2007 that the greatest levels of prices, housing production and expansion in mortgage credit took place (López & Rodríguez, 2011; Naredo, 2009; Romero, Jiménez, & Villoria, 2012). For this reason, the volume of housing transactions in the period 2004–2007 was considered an appropriate indicator for identifying the territories which experienced the greatest expansion in the property market. Along these lines, it was postulated that a greater exposure to mortgage credit risk could have resulted in a higher concentration of foreclosures due to mortgage arrears.
- *The increases in housing stock in each municipality between 2001 and 2011.* They were calculated on the basis of data from the Population and Housing Census elaborated by the National Institute of Statistics. In this case, we refer to a value expressed in relative terms; this makes it possible to identify the relative growth of the housing stock in each municipality. The bivariate correlation, therefore, makes it possible to verify whether SAREB accumulated

more housing units in the municipalities with the highest rates of housing construction during the years of the property boom.

In Spain, there are 8206 geographically irregular, different-sized and contiguous municipalities⁴ that cover the whole country. For this reason, a first-order queen contiguity weights matrix was used for the spatial autocorrelation and the bivariate correlation measures. The application of this type of spatial relation allows considering as neighbours of a municipality all those municipalities that share borders and vertices with it. Therefore, no municipalities are discriminated according to their size as the distance weights matrix would do.

4. Results

4.1. The territorial distribution of the HOS

The territorial distribution of the HOS can be defined on the basis of two different tendencies (Figure 1). Firstly, it can be observed that the largest cities tended to concentrate the main volumes. Although the distribution was logical, there were notable differences between cities of a similar size. Secondly, the Mediterranean coast accumulated a significant part of this stock. Thus, of the 33,205 HOS identified using the proposed methodology, Catalonia (8186 units) and the Community of Valencia (9255) accumulated 52.5% of the total. This percentage reaches 66.2% if we also include Andalucía (4525 housing units).

As Burriel (2014) points out, the map of the economic crisis is the negative map of the property boom. Alternatively, and as Méndez and Plaza (2016) have shown, the territories that experienced the greatest expansion of credit associated with the property bubble have been the ones that have subsequently concentrated an accelerated growth in mortgage foreclosures. The tourist areas along the coast have played a central role within this context. These are areas that have also suffered particularly intense pressure as a result of massive-scale urbanisation processes. If the data are expressed in relative terms using the indicator of HOS per 1000 housing units, the Community of Valencia shows the highest rate in Spain, followed by the Murcia region, Catalonia, Castilla-La Mancha and the Balearic Islands. As already mentioned, as well as along the Mediterranean coast, the southern part of the metropolitan area of Madrid (the part of Castilla-La Mancha that borders on the Community of Madrid) is another area with a high concentration of HOS. In contrast, the Basque Country, Galicia, Extremadura and Cantabria are the regions with the lowest ratios of HOS concentration per thousand housing units (see Table 1 for more details).

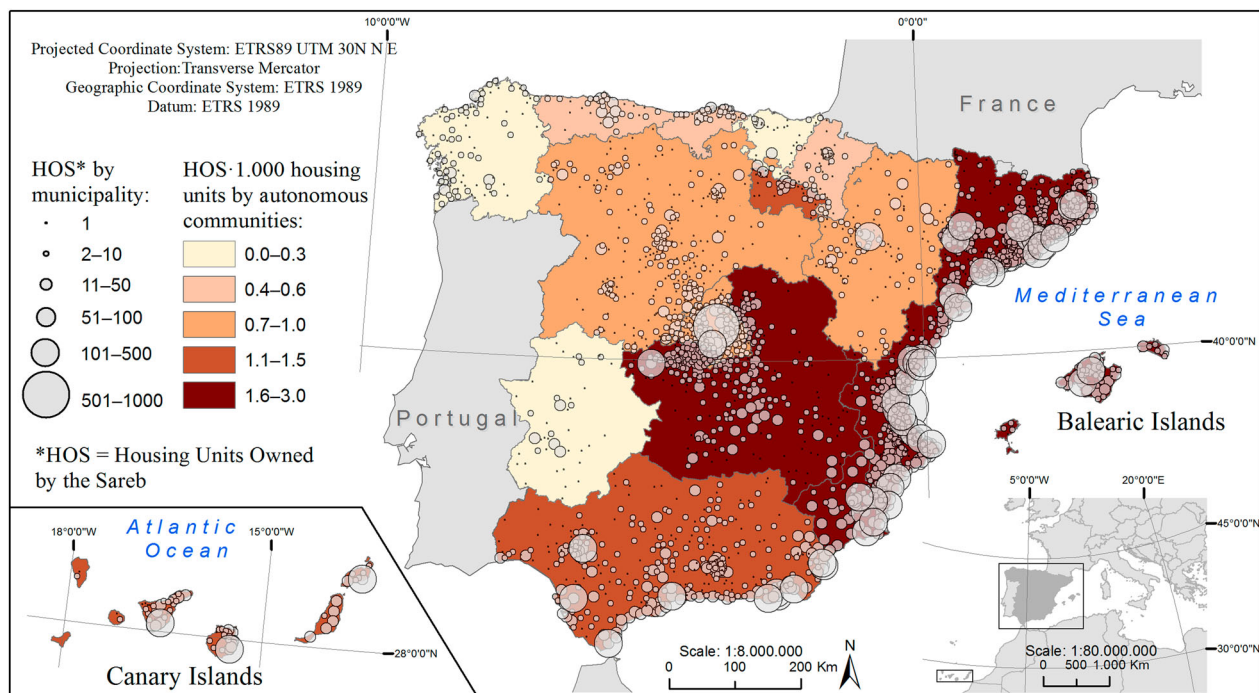


Figure 1. Housing belonging to SAREB. Source: Own elaboration based on data from the property portals of the banks and the 2011 Population and Housing Census.

4.2. HOS clustering and spatial correlation with variables relating to the property boom

The Local Moran's I spatial autocorrelation applied at the municipal level, which considers the HOS ratio per 1000 housing units, made it possible to confirm the existence of significant clusters of high rates (see the results presented in Figure 2 and in Table 2). The cluster in the southern metropolitan area of Madrid includes the southernmost part of the Community of Madrid, the western part of the province of Guadalajara and the northern part of the province of Toledo.

Table 1. Housing belonging to SAREB by autonomous community.

	HOS	Housing 2011	HOS per 1000 housing units
Community of Valencia	9255	3,147,060	2.9
Region of Murcia	1998	776,700	2.6
Catalonia	8186	3,863,380	2.1
Castilla – La Mancha	2219	1,244,940	1.8
Balearic Islands	907	586,710	1.5
Canary Islands	1165	1,040,950	1.1
La Rioja	218	198,670	1.1
Andalucía	4525	4,353,150	1.0
Aragón	642	778,315	0.8
Community of Madrid	2016	2,894,680	0.7
Castilla y León	1087	1,718,750	0.6
Navarra	136	308,600	0.4
Asturias	222	613,905	0.4
Cantabria	124	358,500	0.3
Extremadura	150	648,350	0.2
Galicia	278	1,605,480	0.2
Basque Country	77	1,017,600	0.1
Total	33,207	25,155,740	1.3

Source: Own elaboration based on data from the web portals of property companies and Population and Housing Census 2011.

Note: There were no available data for the autonomous cities of Ceuta and Melilla.

As far as the Mediterranean coastal cluster is concerned, it is particularly relevant to highlight the Community of Valencia, Catalonia and the Region of Murcia.

Figure 3 shows the bivariate correlation by municipality between the total HOS and the number of property transactions carried out between 2004 and 2007. The map demonstrates how there has been a greater concentration of housing stock owned by SAREB in municipalities in which there have been a large number of housing purchase-sale operations. In other words, the territories with the greatest number of property transactions during the bubble period have also been the ones with the greatest exposure to mortgage credit risk. As a result, after the bubble burst and the financial crisis began, these territories have been the ones that have concentrated the greatest volumes of mortgage foreclosures. Again, it is possible to observe the formation of clusters in municipalities along the Mediterranean coast, on the Canary Island archipelago and in the heart of the metropolitan regions of Barcelona and Madrid. In contrast, municipalities in the rural areas of the northern part of the peninsula form large low-low clusters.

The map in Figure 3 takes as its reference the number of HOS by municipality expressed as absolute values. This may mask situations that are relevant in relative terms, but which do not reach the volume exhibited by the largest cities. For this reason, the map in Figure 4 presents the results of the Local Moran's I bivariate spatial correlation between the ratio of HOS per 1000 housing units and the relative increase in the housing stock during the intercensal period

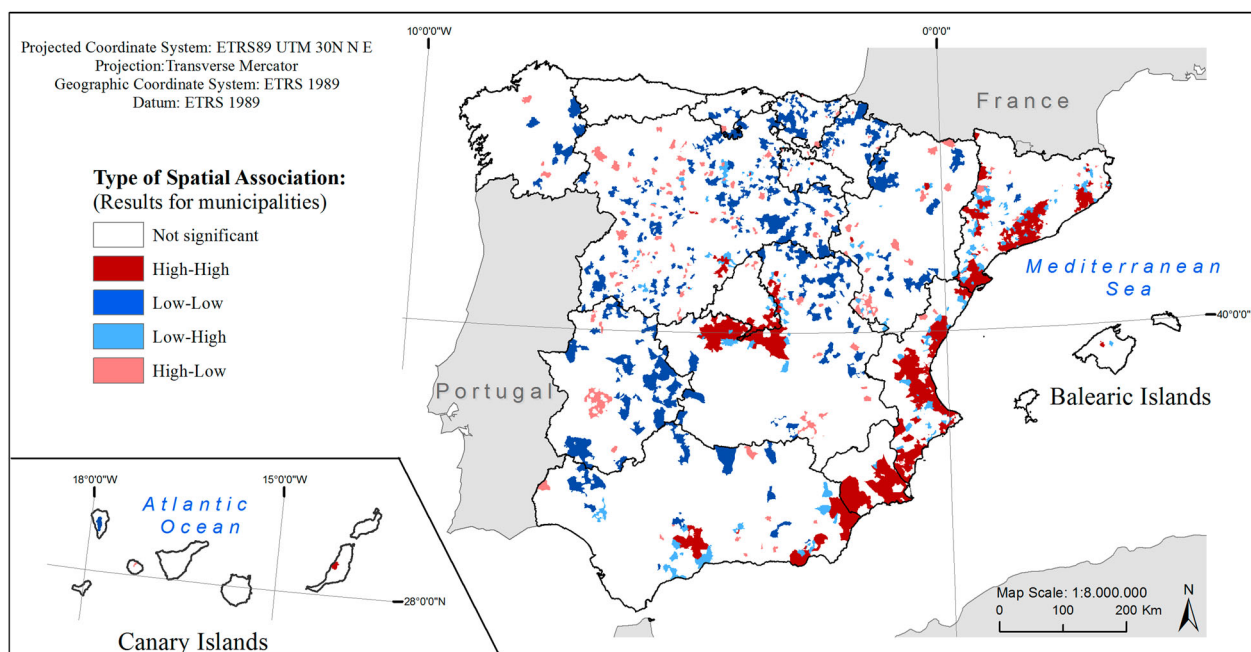


Figure 2. Univariate Moran's I LISA cluster maps for HOS per 1000 housing units by municipality. Source: Own elaboration.

between 2001 and 2011. The areas identified as high-high clusters correspond to the municipalities that most noticeably increased their housing stock during the period of the property boom and, additionally, are those where SAREB accumulated more properties because of their greater relative concentration of mortgage foreclosures after the great recession. Figure 4 once more highlights the southern part of the metropolitan area of Madrid and, to a lesser degree, the coastal areas of the Mediterranean (the southern part of the Community of Valencia, the Region of Murcia and the coast of Almería province). The municipalities with populations ranging from 5000 to 50,000 inhabitants are the ones that present the highest bivariate spatial correlations, especially those located in northern Toledo province, south of Madrid, in small villages of Barcelona province and

also in southern Alicante province and the north coast of Murcia.

5. Conclusions

The study presented here made it possible to draw up the first detailed map (*Main Map*) of the housing units accumulated by SAREB. The spatial analysis subsequently carried out allowed us to demonstrate how the spatial distribution of this phenomenon has been intimately related to the spatial logics of the property boom and the Spanish mortgage crisis. This has also made it possible to identify the Mediterranean coast and the Madrid metropolitan area (especially its southern part) as the territories that have been most intensively affected by the predatory logic of the Spanish property model.

Table 2. Number of municipalities that form spatially significant high-high clusters and average HOS ratios per 1000 housing units by province.

by province:										
Area	Autonomous communities	Province	HH	HOS per 1000 housing units	Area	Autonomous communities	Province	HH	HOS per 1000 housing units	
Mediterranean coast	Andalucía	Almería	21	5.28	Southern metropolitan area of Madrid	Community of Madrid	Madrid	12	2.44	
		Granada	1	7.34		Castilla-La Mancha	Guadalajara	10	5.79	
		Málaga	5	1.61			Cuenca	4	5.33	
	Catalonia	Barcelona	62	4.1	Other scattered clusters	Castilla y León	Toledo	67	5.93	
		Girona	18	4.26				Ávila	1	6.45
		Tarragona	62	5.07				Burgos	1	7.32
		Lleida	31	5.51				Segovia	10	6.87
	Balearic Islands	Balearic Islands	2	1.35						
		Community of Valencia	Castellón	30	5.67			Valladolid	2	2.10
			Valencia	119	5.19	Aragón	Zaragoza	1	2.00	
			Alicante	43	5.46			Huesca	3	11.51
Region of Murcia	Murcia	17	3.71		Canary Islands	Las Palmas	1	3.53		

Source: Own elaboration based on data from the web portals of property companies and Population and Housing Census 2011.

Note: HH: number of high-high clusters.

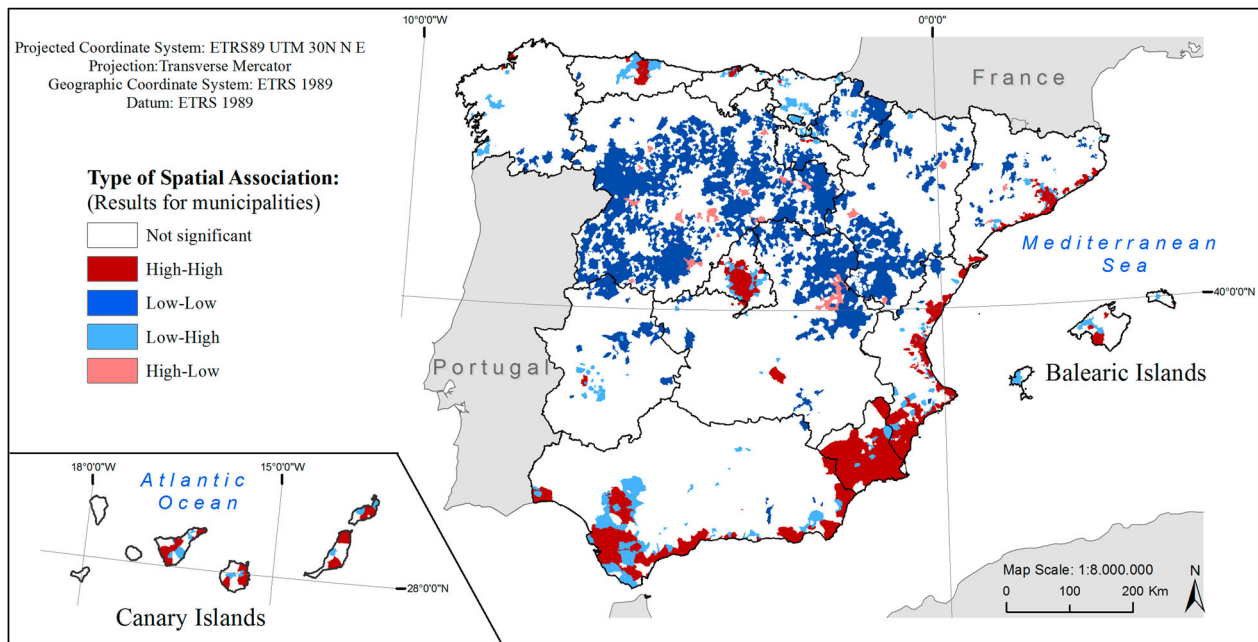


Figure 3. Bivariate Moran's I LISA cluster maps for total HOS and housing transactions between 2004 and 2007, by municipality. Source: Own elaboration.

The territories with the greatest exposure to the effects of the property boom, hyperproduction of housing and overexposure to credit risk have been those in which SAREB has accumulated the most housing acquired via mortgage foreclosures.

This work demonstrates the relevance of incorporating the spatial dimension into the study of the mortgage crisis. The lack of disaggregated data relating to foreclosures at the municipal and infra-municipal levels has hitherto limited the development of the required geographic analysis of this phenomenon.

The validation of the source used in this study and the utility of the resulting maps have made it possible to open the door to future studies that may explicitly incorporate the spatial dimension as a central axis within the study of the mortgage crisis in Spain.

Software

The georeferencing of HOS was carried out using Esri ArcGIS 10.3 software, based on the coordinates of the housing units. The same software has previously been

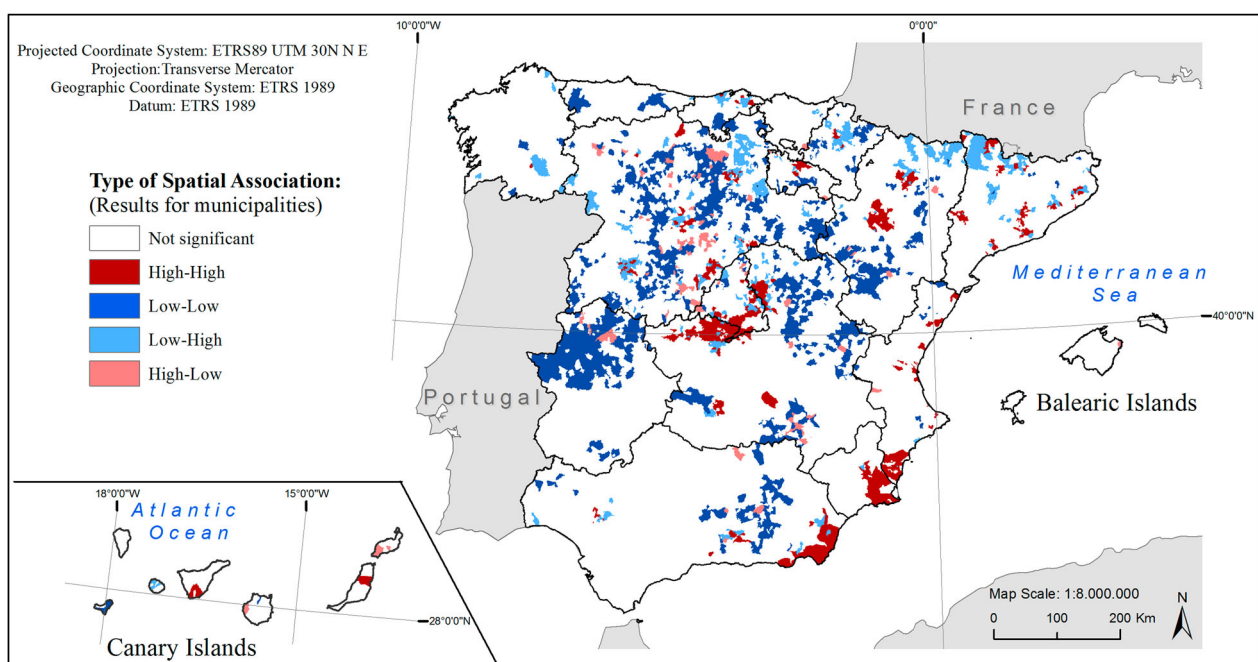


Figure 4. Bivariate Moran's I LISA cluster maps for HOS per 1000 housing units and the variation in housing stock between 2001 and 2011, by municipality. Source: Own elaboration.

used for related procedures, such as summing the HOS by municipalities and combining data on inhabitants, housing units, total numbers of housing transactions and variations in housing stock. The resulting shapefile was processed with GeoDa 1.6.7, which was used for spatial analysis (autocorrelation and bivariate correlation of the Local Moran's I). Esri ArcGIS 10.3 was used to elaborate the final edited maps. All of these maps were created using the ETRS89 reference system and UTM 30 N. The statistical data were also processed with SPSS 20 and Microsoft Excel 2007.

Notes

1. http://www.bde.es/f/webbde/GAP/Secciones/SalaPrensa/NotasInformativas/Briefing_notes/es/notabe120614.pdf.
2. <https://en.sareb.es/en-en/about-sareb/Pages/faqs.aspx>.
3. www.altamirainmuebles.com; www.solvias.es; www.haya.es; www.servihabitat.com.
4. <http://centrodedescargas.cnig.es/CentroDescargas/index.jsp>.

Disclosure statement

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