The uneven distribution of evictions as new evidence of urban inequality: A spatial analysis approach in two Catalan cities

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1. Introduction

The increasing proliferation of evictions, which has been fueled by the bursting of the housing bubble, rapid economic decline, and the mortgage crisis, has become one of the major social, economic, and political challenges facing Spain (Álvarez, Zapata, & Zapata, 2015; Cano, Extezarreta, Dol, & Hoekstra, 2013; Colau & Alemany, 2012). The growing academic literature that has analyzed this phenomenon concerns in underlining the number of evictions experienced since 2009 as the most dramatic manifestation of the social problems generated by the Spanish real estate and financial model (Coq-Huelva, 2013; Hoekstra & Vakili-zad, 2011). Rising prices during the housing bubble period, the overexposure of household economies to credit, and the fragile and unstable situation of the Spanish labor market, finally led to a situation in which a growing number of families became unable to assume their mortgage debts. As a result, the spread of foreclosures and home dispossession has acquired a greater magnitude in Spain than in any other European country (Cano et al., 2013).

1.1. The housing bubble and the rapid increase in mortgage debt as precedent

During the decade 1997–2007, which was characterized by a real estate boom and rapidly rising prices in the property market, the pace of dwelling construction accelerated from year to year, culminating in the highest level of dwelling production per year in Spanish history (Gutiérrez & Delclòs, 2015). Within this context, Catalonia was one of the regions with the highest rates of dwelling construction, together with the autonomous communities of Madrid, Andalusia and Valencia (Naredo & Márquez, 2011; Romero, Jiménez, & Villoria, 2012). During this decade, a total of 657,550 new dwellings were built in Catalonia; this represented a construction rate of more than 180 finished dwellings per day. This rapid growth in construction activity was fueled by an expansive demand for new housing in a context of population growth, economic prosperity, and easy access to credit.

The culture of home ownership as the preferred tenancy system had already been firmly established in Spain several decades earlier (López & Rodríguez, 2010), but during the housing bubble, public and financial policies favored and fueled this tendency even more (Fernández-Tabales & Cruz, 2013). These circumstances resulted in Spain having the highest relative ratio of home ownership in Western Europe (approximately 80% in 2012, according to Eurostat data). Within this scenario, mortgage loans became the main source of access to the housing market. In other words, the Spanish version of the global financialization became particularly focused on the acquisition of housing (Coq-Huelva, 2013). The lowering of interest rates, the facilities given for obtaining mortgages and the high valuations that banks gave to housing resulted in the increase in demand and upward spiraling of prices that fueled the real estate bubble (Romero et al., 2012). As a result, the number of new mortgages granted every year in Catalonia increased by 24% during the period 2003–2006.
(according to the Spanish National Institute of Statistics). Furthermore, the average size of mortgages increased by 62% during the same period. At the peak of the real estate bubble and rapidly rising housing prices, the increases in the amortization period for mortgage loans and low interest rates facilitated a continuous growth in the number of transactions undertaken (Coq-Huelva, 2013; Gutiérrez & Delclòs, 2015). These factors led to a twelve-fold increase in the total value of the mortgage debt held by families in Spain during the period 1994–2007 (according to data from the Bank of Spain). All of this occurred within a context in which the global volume of private debt (that of families and companies) also tripled during that same period. The subsequent arrival of the financial and economic crisis implied the implosion of these growth models, with their dramatic consequences. The rapid increase in the unemployment rate observed from 2009 onwards, combined with the oversized mortgage loans led to a growing number of families finding it increasingly difficult to repay their contracted debt. The lack of public policies supporting families that suffering this situation has derived in the present mortgage crisis (Barbero, 2015).

1.2. Evictions as a subject of study in Spain

An increasing body of academic literature has analyzed the recent proliferation of evictions in Spain. This has been undertaken from several different angles, including: their economic and financial repercussions (Coq-Huelva, 2013; Hoekstra & Vakili-Zad, 2011); diagnoses of the resulting social impact (Colau & Alemanny, 2012); the emergence of social movements, activism and political participation campaigning for appropriate responses to this problem (Aguiló, 2010; Álvarez et al., 2015; Barbero, 2015; González García, 2015; Ordóñez, Feenstra, & Tormey, 2015; Romanos, 2014); and the impact of this crisis on public health (Gili, Roca, Basu, McKee, & Stuckler, 2013; Valiño, 2015). Although this should form part of a prominent line of research within current studies of urban, economic, and social geography in Spain, there has so far been an absence of geographic analysis of this phenomenon. Three of these sources correspond to work undertaken by Méndez, Abad, and Plaza (2014), Obeso (2014) and Vives-Miró, González-Pérez, and Rullan (2015). Obeso (2014) and Méndez et al. (2014) studied the distribution of evictions in 431 judicial districts in Spain – supra-municipal level of analysis – and Vives-Miró et al. (2014) analyzed the distribution patterns of evictions within the judicial district of the city of Palma (Majorca), based on data provided by the Common Service of Notices and Foreclosures of the courts of Palma. This lack of literature is explained by the dearth of official statistical data relating to this phenomenon. Spanish official statistics services do not provide data at the municipal or infra-municipal levels; they only provide aggregated data at the provincial and judicial district levels. This has so far limited the development of a potentially interesting field of research: the analysis of the spatial distribution of this phenomenon in urban areas.

As with any socioeconomic phenomena, evictions can be studied from a territorial perspective, which would include analyzing their uneven spatial distribution as a key variable for understanding the social and economic impact of the housing crisis in Spain. Surveys conducted by the Mortgage Victims Platform (PAH),1 involving families affected by foreclosures (Colau & Alemanny, 2012) and other qualitative studies undertaken by the DESC2 Observatory (Valiño, 2015) confirmed that evictions have particularly affected families with lower incomes. These have been the ones most affected by unemployment, along with the most vulnerable groups in society, such as single parent families and immigrants from outside the EU. Based on this preliminary assumption, the central hypothesis of this article is that the spatial distribution of evictions in cities should also reflect this inequality. We therefore propose that an analysis of whether the spatial pattern of evictions in cities tends to be uneven and, more concretely, whether they tend to be concentrated in more deprived neighborhoods. If this is so, spatial analysis should provide empirical evidence of how evictions have not only enhanced social inequality, but also increased the contrasts between neighborhoods. This type of analysis had not been previously undertaken in the Spanish context. Our analysis also suggests that this type of study could be used as a key indicator for interpreting social and spatial contrasts fueled by the economic crisis. Adopting this approach in the current study has enabled us to highlight the relevance and usefulness of incorporating spatial analysis into studies of processes of social and economic change of the type experienced in the current crisis. Geographical analysis adds a necessary interpretation of the spatial logic underlying such processes of change; it also enables researchers to identify, compare and contrast the resulting spatial changes and inequalities. This approach is especially relevant for studying variables such as evictions, which have been shown to particularly affect the poorest social groups.

To overcome the intrinsic limitations associated with the use of official eviction statistics at the non-disaggregated municipal and infra-municipal levels, this paper proposes a new methodological approach: the use of data on second-hand dwellings owned by financial institutions as a valid approximation for evictions deriving from mortgage foreclosures. Once these data have been validated and georeferenced, the pattern of concentration and spatial autocorrelation can be analyzed for evidence of the spatial clustering of evictions. Secondly, a bivariate correlation of the distribution of evictions and a socioeconomic indicator can be used to identify the types of neighborhood in which this phenomenon tends to concentrate.

2. Material and methods

2.1. Data

The official statistical sources available for the study of evictions in Spain (provided by the General Council of the Judiciary and the National Institute of Statistics) present their disaggregated data at the judicial district and provincial levels, respectively. This scale is not sufficiently detailed to allow an analysis of the relationship between this phenomenon and urban dynamics. This study therefore proposes an alternative data source that permits an approximation to the reality of evictions at the infra-municipal level: second-hand dwellings owned by banks (SHDOB). All such dwellings have been acquired by banks as a result of mortgage foreclosures and processes of judicial release (eviction). Financial institutions operating in Catalonia advertise their real estate assets through web portals dedicated exclusively to this purpose. This permitted a systematic gathering of all SHDOB advertisements published on the web portals of the real estate subsidiaries of the 17 main financial institutions in Catalonia.3 We therefore counted the number of dwellings advertised for sale between January and May 2014 and their distribution by municipality. Each advertisement also supplied information about the characteristics of the dwelling in question and its postal address. In this way, it was possible to geolocate each SHDOB.

In order to interpret these data, it is necessary to highlight some of their main characteristics, particularly as the data source was indirect and this entailed certain limitations and constraints. Firstly, it should be noted that part of the SHDOB, even in the case of acquisition by banks as a result of foreclosure, could have not corresponded to the habitual residence of their households. So, in these cases should not therefore have been computed as evictions from primary family residences. Secondly, it must be stated that the result of this count did

1 “PAH” is the Spanish acronym of “Plataforma de Afectados por la Hipoteca”.
2 This is the Spanish acronym of “Economic, Social and Cultural Rights”.
3 In 2014, these were: CaixaBank, Bankia, Banco Santander, Banco Sabadell, Banco Bilbao Vizcaya Argentaria (BBVA), Catalunya Caixa, Novagalicia, Banco Popular, Grupo Banco Mare Nostrum, Banesto, IberCaja, Barclay’s, Bankinter, CajaMar-CajaRural, Kutxa-Bank, Deutsche Bank, and BNP Parisbas.
not provide the total number of foreclosed dwellings for a particular period, but rather the total number accumulated by banks up to the date of the count. In other words, the total represents the number of dwellings that were not initially awarded by auction and that had not yet been sold at the time of the study. Finally, this methodology only allowed us to identify evictions resulting from the non-payment of mortgages and that banks had recovered by means of foreclosure; it did not allow us to include evictions resulting from the non-payment of rent. Assuming these limitations, it is important to stress that the objective of this methodology is not to obtain data that allow the quantification of the total number of evictions that occurred in a specific municipality or urban area, but instead to obtain a highly representative sample that would permit their characterization. What is more important is that this source allows precisely identifying their spatial distribution at postal address level. An information that is impossible to achieve using any official data source.

2.2. Area of study

Two medium-sized Catalan cities were chosen as case studies: Tarragona (132,000 inhabitants in 2014) and Terrassa (215,000 inhabitants in 2014). Dwellings were identified on the web portals of the real estate subsidiaries of the 17 main financial institutions in Catalonia. These were then geolocated using the postal addresses given on these websites. A total of 471 SHDOB were recorded in Tarragona and 594 in Terrassa. The results are shown in Fig. 1.

The selected case studies allow the analysis of two different urban and territorial realities. Terrassa is one of the major cities in the metropolitan area of Barcelona and is characterized by its compact urban structure and high population density. In contrast, Tarragona is the capital of the second largest urban region of Catalonia and is a city with a fragmented urban structure characterized by a discontinuity between the city center and the peripheral neighborhoods.

The census tract was used as the basic territorial unit with respect to which all the calculations and derived spatial analysis were carried out. Tarragona has a total of 87 census tracts, while Terrassa has 143. In order to present this data, a ratio was calculated based on the number of SHDOB for each 1000 residents in each census tract. This ratio allowed the data (the number of SHDOB) to be compared between different tracts, regardless of their population densities.

2.3. Methods

The well-known “First Law of Geography” (Tobler, 1970; Miller, 2004) states that all territories are related to each other, but that territories that are closer to one another tend to be more closely related than those that are farther away. Spatial analysis techniques allow us to study the way(s) in which specific phenomena appear in space. It also simultaneously allows us to identify relationships with other phenomena that occur at the same time and in the same place (Schabenberger & Gotway, 2004; Eagle, Pentland, & Lazer, 2008). With this in mind, this study sought to use Exploratory Spatial Data Analysis (ESDA) (Anselin, 1995) to identify the distribution patterns of SHDOB in each urban context and also to locate them in relation to other variables. This kind of spatial analysis has previously been used in a wide range of academic studies: in the health sector (Loughnan, Nicholls, & Tapper, 2008; Sridharan, Tunstall, Lawder, & Mitchell, 2007; Penney, Rainham, Dummer, & Kirk, 2014); for understanding the territorial logic of different socio-demographic variables (López-Gay et al., 2015); in the analysis of economic disparities between regions (Liao & Wei, 2015) and neighborhoods in the same city (Méndez & Prada-Trigo, 2014); and in urban studies covering such diverse topics as traffic patterns (Yamada & Thill, 2007), drug use among young people (Chaney & Rojas-Guyler, 2015) and crime (He, Páez, Liu, & Jiang, 2015), among others.

In the case of the spatial distribution of evictions, we used an indicator of global spatial autocorrelation: the Global Moran’s I (Moran, 1948). This indicator explains the extent to which the factors analyzed are spatially grouped (positive spatial autocorrelation), dispersed (negative spatial autocorrelation), or distributed in a random manner. The indicator has value ranging from −1 (maximum negative autocorrelation) to 1 (maximum positive autocorrelation), with 0 indicating the absence of spatial autocorrelation. The Global Moran’s I is defined as (Anselin, 1995):5

\[
I = \frac{(N/S_N) \sum_{i=1}^{N} \sum_{j=1}^{N} W_{ij} (X_i - \mu)(X_j - \mu)}{\sum_{i=1}^{N} (X_i - \mu)^2}
\]

However, this correlation may not be uniform across the whole set of territories analyzed. In order to look more deeply into the analysis and establish the presence and location of spatial clusters, we therefore propose the use of the local version of this indicator: the Local Moran’s I (Anselin, 1995), which is defined as6:

\[
l_i = \frac{(X_i - \mu)}{m_0} \sum_{j=1}^{N} (X_j - \mu)
\]

Using maps of Local Indicators of Spatial Association (LISA), the Local Moran’s indicator makes it possible to identify areas with high and low spatial values, as well as outliers and elements that have no statistical significance (Anselin, 2005).

Finally, in order to place the relationship of the distribution of SHDOB within the context of the sociodemographic characteristics of the neighborhoods in which they are concentrated, it is necessary to use the bivariate version of both the Global Moran’s I and its local application. To carry out this analysis, it is necessary to relate the value of a given census tract to the values of a second variable in its neighboring areas. We therefore compared the ratio of SHDOB per 1000 inhabitants in each census tract with an indicator that characterized the socioeconomic profiles of these urban areas. For this purpose, we used the percentage of registered foreign-born residents7 living in each census tract. In Catalonia (as in whole Spain), the vast majority of these residents were immigrants who had come from developing countries for economic reasons. A large body of literature highlights the spatial segregation of the foreign population and how it tends to become concentrated in the poorest areas of the city, due to its low income level and, consequently, reduced capacity to exercise choice within the housing market (Bayona, 2007; Bayona & López-Gay, 2011; Echazarra, 2010; Martori, Hoberg, & Surinach, 2006). The correlation between these two variables was therefore used as an indicator of the concentration of SHDOB in deprived neighborhoods suffering urban problems.

The different versions of the Moran’s I indicator identify four groups of entities corresponding to four scatter plot quadrants. The High-High group (upper right quadrant) contains census tracts that present high values for a variable in close proximity to other census tracts that also have high values for the same variable (univariate analysis) or high values for the second variable (bivariate analysis). The Low-Low group (lower left quadrant) contains census tracts that present low values for a variable in close proximity to census tracts that also have low values for the same variable (univariate analysis) or low values for

4 At the onset of the housing crisis, evictions linked to foreclosures were estimated at approximately 90% of the total number of foreclosures, but during subsequent years (and especially since 2011) these largely derived from the non-payment of property rentals. The percentage of evictions linked to foreclosure processes reached 57% in 2013, according to data provided by the General Council of the Judiciary for the whole of Spain.

5 Where N is the number of observations, i and j are the spatial units, \( \mu \) is the mean of the variable X, \( W_{ij} \) refers to the spatial weight of the adjacency matrix, and S_N is the sum of the whole spatial weight \( S_N = \sum_{i=1}^{N} \sum_{j=1}^{N} W_{ij} \).

6 Where \( m_0 = \sum_{i=1}^{N} (X_i - \mu)^2/\ N \).

7 Data obtained from the Municipal Population Census of 2012 in both municipalities.
other variable (bivariate analysis). The Low-High group (upper left quadrant) contains census tracts that present a low value of a variable in close proximity to census tracts that have high values of the same variable (univariate analysis) or high values for the second variable (bivariate analysis). Finally, the High-Low group (lower right quadrant) contains census tracts that present a high value of a variable in close proximity to census tracts that have low values of the same variable (univariate analysis) or low values for the other variable (bivariate analysis). These groups can be represented on LISA maps. With this in mind, we used the free Geoda© software (Anselin, Syabri, & Kho, 2006), version 1.4.6. For both the spatial autocorrelation and the bivariate correlation measures, we used a type 1 contiguity Queen matrix. This supposed that spatial neighbors were defined as all the elements that shared borders and vertices, rather than the Rook-type matrix, in which only entities that shared boundaries were considered neighbors (Anselin et al., 2006). GeoDa software provides the user with information about the p-value and also a z-score, which makes it possible to confirm the statistical significance of the Moran’s I results. A confidence level of 95% (p = 0.05) would have corresponding standard deviations of −1.96 and +1.96. For the result to be significant, the z-score must therefore be outside this interval (He et al., 2015). Final maps were created using the ESRI ArcGIS version 10.3© software.

3. Results and discussion

The territorial distribution of the SHDOB ratio per 1000 inhabitants in each case study is shown in Fig. 2. In both municipalities, the peripheral neighborhoods showed a considerable presence of SHDOB. In the case of Tarragona (a), such neighborhoods were found in the north and west of the city, far from the urban center. In the case of Terrassa (b), these neighborhoods were more widely distributed, but they were also clearly concentrated in peripheral neighborhoods, in the eastern and south-eastern parts of the municipality, and again at some distance from the city center. In the census tracts corresponding to these peripheral neighborhoods, the ratio exceeded 6 SHDOB per 1000 residents, and in some cases it even exceeded 9 SHDOB per 1000 residents. In contrast, in less affected areas these ratios were between 0 and 1 SHDOB per 1000 inhabitants.

The data presented in Fig. 2 allowed us to contrast the ways in which SHDOB are concentrated in specific areas of each city. Applying a spatial autocorrelation test made it possible to verify this premise and to reject the hypothesis that these foreclosures were spatially distributed in a random manner.

3.1. Spatial autocorrelation and identification of SHDOB clusters

The distribution of SHDOB in these case studies highlighted a positive tendency towards spatial grouping, as shown by the Global Moran’s I results (Fig. 3). The census tracts with the greatest presence of SHDOB tended to be located near other tracts with similar characteristics. Similarly, the census tracts with the lowest incidences of such dwellings were also found in closer proximity to each other. In Tarragona (a), the correlation between the SHDOB ratio per 1000 inhabitants at the census tract level and its deferred spatial version (spatial autocorrelation) had a Global Moran I index of 0.50, indicating a clearly positive autocorrelation. In Terrassa (b), there was also a tendency for spatial grouping at the municipal level; although the indicator was 0.39 and thus slightly weaker, it was still significant.

The results of the Global Moran’s I indicator treated the territory as uniform, which entailed a risk of masking important information. In order to investigate possible heterogeneity in the data at the infra-municipal level and to study the patterns of spatial autocorrelation at a more local level, it was necessary to use the local version of Moran’s I, whose results are represented on the LISA maps. Clusters of census tracts with high proportions of SHDOB were identified as

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*In the case of GeoDa©, this refers to a pseudo p-value. Statistical significance in this case is based on a permutation test. This was obtained from a comparison of the Moran’s I indicator with respect to a distribution reference of random spatial conditions, in this case obtained from 9999 permutations.*
High-High type; those with low proportions of such housing were identified as Low-Low, and the Low-High and High-Low types were considered outliers. When applying the local Moran I indicator did not provide significant results, these were not included on the LISA maps (Fig. 4).

The results shown in Fig. 4 enabled us to identify the census tracts that form part of SHDOB clusters. In the case of Tarragona (a), these corresponded to the peripheral neighborhoods in the western part of the city. The neighborhoods identified included Bonavista, Campclar, and Torreforta (from west to center), with a total of nine High-High type tracts in all. These neighborhoods were mainly developed in the 1970s and 1980s, in parallel with the development of Tarragona’s petrochemical complex. They are located at a significant distance from the main urban center and concentrate a high percentage of the city’s stock of social housing (Saladié, Roquer, Oliveras, & Muro, 2012). Much of this urban area has been targeted as part of an urban regeneration program under Catalan Neighborhoods’ Law. This is a regional program that provides a framework for area-based integrated initiatives in the disadvantaged neighborhoods of Catalan cities. The existence of this kind of program illustrates that this area was recognized by the public authorities as the most vulnerable neighborhood in the city (Roquer, Gutiérrez, Muro, & Alberich, 2014). High-High tracts were also found in the northern part of the Sant Salvador district, located in the northern part of the municipal area of Tarragona. This is also a deprived area with a high concentration of social housing built in the 1970s. It is also relevant to note the presence of a High-Low tract in the deprived part of the port neighborhood. In this case, a census tract with a high number of SHDOB was surrounded by tracts with notably fewer SHDOB. In contrast, almost the whole city center area clearly formed part of a Low-Low type cluster (census tracts with relatively few SHDOB close to other tracts of this type). The eastern side of the municipality, where the presence of SHDOB was virtually null, was classified in the “non-significant” category on the LISA maps. This sector corresponded to an area of higher quality housing stock and was home to the highest income brackets of the city’s population (Saladié et al., 2012).

The results in Terrassa (b) were similar. There was a clear cluster of tracts containing a high percentage of SHDOB in the eastern and...
southeastern parts of the municipality, following a peripheral belt in which most of the low-income neighborhoods were located. In the eastern neighborhoods of Égara and Can Anglada, there was a mixture of social housing dating from the 1950s and neighborhoods largely comprised of owner-built dwellings (de Terrassa & Fundació, 2009). On the opposite side of the municipality, it was possible to identify a small High-High type cluster around the Marina neighborhood, which had also originated in the 1940s. This mainly contained owner-built dwellings and was one of the poorest districts in Terrassa. Both of the aforementioned urban areas have been the beneficiaries of area-based urban regeneration programs financed within the framework of the previously mentioned Catalan Neighborhoods’ Law, which began in 2004 and 2008, respectively. As in the case of Tarragona, the presence of these programs confirmed which parts of the municipality had the greatest urbanistic and social needs. In contrast, the area corresponding to the urban center was classified as a Low-Low type cluster, due to the virtual absence of SHDOB. It was also possible to identify some High-Low type tracts along the periphery of the city center, indicating high levels of SHDOB bordering this area.

3.2. Bivariate correlation: SHDOB and immigrant population

In both Tarragona and Terrassa, there was a high statistical correlation between the ratio of SHDOB per thousand inhabitants and the percentage of foreign residents in the corresponding census tracts. As a consequence, the Pearson R values were 0.58 and 0.74, respectively. Even so, it should be underlined that this statistical correlation did not take into account the spatial distribution of the data analyzed. To do this, it would be necessary to apply bivariate measures of spatial correlation; this would help to meet the objective of examining the phenomena studied at the local scale (Lee, 2001).

As shown in the scatter plots presented in Fig. 5, the application of Bivariate Global Moran’s I at the census tract level to assess the ratio between SHDOB and the percentage of foreign-born residents exhibited
positive spatial correlations. There was an overall moderate tendency for SHDOB to be located close to census tracts containing a high proportion of foreign-born residents. In the case of Tarragona, the relationship between SHDOB and the proportion of foreign-born residents (a) was \( R = 0.27 \), whereas in Terrassa (b) it was slightly stronger, \( I = 0.43 \).

Bivariate results from Global Moran’s I showed a positive, but moderate, spatial correlation between SHDOB and foreign-born residents in the municipalities of Tarragona and Terrassa. As with the measurement of spatial autocorrelation, it was again interesting examine the neighborhood level of these two variables in closer detail by applying the Local Moran’s I statistic and then representing the findings on LISA cluster maps. The main clusters identified were: High-High (census tracts with high SHDOB ratios near others with high proportions of foreign-born residents); Low-Low (census tracts with low SHDOB ratios near census tracts with low proportions of foreign-born residents). On the other hand, the identification of Low-High and High-Low cluster types made it possible to identify areas that behaved differently to the rest of the neighborhood in which they were located. The results are shown in Fig. 6.

Once again, we were able to identify the relationship between the city center and its periphery for both cities. The correlation between the distributions of SHDOB and foreign-born residents showed that in Tarragona (a), the High-High cluster type was again most prevalent in the Sant Salvador (north) neighborhood and especially in the western neighborhoods. Only a few census tracts, clearly configured as Low-Low type clusters, appeared in the urban center. In the case of Terrassa (b), the eastern side of the municipality showed a greater tendency for High-High type clustering. In this case, the census tracts that stood out were those near the neighborhoods of Can Anglada, Montserrat, and Égara (east).

As well as the existence of spatial correlations at the municipal level, it was therefore also possible to identify bivariate clusters of evictions and immigrant population in the most deprived neighborhoods of both cities. This spatial correlation did not necessarily imply that the foreign-born residents were the ones most affected by eviction processes (although in this case that was probably also true, as highlighted by Colau and Alemany (2012) and Valiño (2015)), but rather that these variables coincided in space, thereby identifying the neighborhoods facing the greatest challenges.

4. Conclusions

The contributions of this work can be classified in two different areas. It validates an alternative data source for studying the distribution of evictions at the infra-municipal level and it contributes to the analysis of the spatial patterns of evictions, providing evidence of their contribution to increasing urban inequality.

4.1. Validation of an alternative data source for the study of the geography of evictions in Spain

The proliferation of evictions in Spain during the past seven years is a phenomenon that has had a deep social and economic impact. However, the lack of disaggregated statistical information at the municipal and the infra-municipal level has so far hampered the progress of studies that have sought to analyze their impact on urban areas. The present study uses two case studies to validate the use of a secondary data source, which now can be used as an alternative to official statistical sources. As demonstrated, the data generated makes it possible to attain higher levels of statistical significance and detailed information at neighborhood level.

The mortgage crisis has had an evidently geographical dimension that needs to be studied. For this reason, and in the absence of official data, it is essential to identify new approaches that allow spatial overviews of this phenomenon, which has had a major impact on Spanish cities. The present study therefore opens the door to future research based on the same data source. This will permit the study of other urban contexts, the application of other forms of spatial analysis to detect clusters or concentrations of SHDOB and their correlation with other variables, such as the characteristics of the housing stock or the quality of the built environment.

4.2. Spatial distribution of evictions as evidence of urban inequality

The analysis of the territorial distribution of evictions based on SHDOB confirmed a clear pattern of concentration in certain neighborhoods. This study provided evidence of a tendency towards clustering, especially in the peripheral and/or most deprived neighborhoods of both of the cities studied. We can therefore conclude that evictions had a tendency to affect some neighborhoods more than others and that they did not constitute a phenomenon with either a random or an equal distribution within the city.

In both of the cities studied, we identified neighborhoods in which SHDOB tended to be concentrated. The bivariate correlation demonstrated that the evictions were concentrated in the neighborhoods with a greatest presence of foreign residents. These neighborhoods were characterized by their socio-economic fragility and the

Fig. 6. Bivariate Moran’s I LISA cluster maps for SHDOB and the ratio of foreign-born residents in Tarragona (a) and Terrassa (b). Source: own elaboration.
concentration of problems associated with the degradation of their urban fabric. In fact, in both cities these neighborhoods had been subjected to area-based urban regeneration programs destined for the most vulnerable areas of each municipality. The concentration of evictions during recent years entails another problem for neighborhoods that historically have already accumulated major social and urban deficiencies. These results also illustrate how the concentration of evictions in the disadvantaged urban areas has contributed to the intensification of the dynamics of social exclusion and exacerbated the effects of segregation and urban inequality.

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