



A Spatial Approach to the Study of the Electoral Resurgence of the Extreme Right in Southern Spain

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Abstract

This study analyzes at a local level (i.e. census tract) the spatial patterns and main contextual factors related to the electoral resurgence of the extreme-right party (VOX) in Southern Spain (Andalusia) in 2018 and 2019. The 2019 electoral data was associated with the percentage of total foreign-born population, degree of territorial concentration of economic migrants, average income level, percentage of elderly people, urban/rural areas and the percentage of vote for VOX in 2018 ($t - 1$). We used a global and local spatial autocorrelation analysis to detect the spatial patterns of the vote for VOX and a spatial Durbin regression model to assess the role of contextual variables and spatial effects. The results underline the importance of space in modelling the vote for VOX and point to the existence of a spatial diffusion process. Previous electoral behavior and the urban milieu also play key roles in explaining the vote for VOX. Moreover, the territorial concentration of economic migrants is negatively related with the vote for VOX, which illustrates the positive character of interracial contact.

Keywords Migrants · Extreme right-wing vote · Southern Spain · Spatial patterns

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1 Introduction

The significant growth in electoral support for extreme right-wing parties, together with the increased support for anti-Europeanist positions (Allen, 2017; Dijkstra et al., 2020; Rodríguez-Pose & Dijkstra, 2021) are among the key social challenges facing Western European societies in order to maintain the levels of social and territorial cohesion they have enjoyed since the end of the Second World War. The proliferation of the xenophobic, nationalist, authoritarian, and exclusionary discourses of these political parties has resulted in their presence in different government institutions at local, regional, and national levels (David et al., 2018), and the parties have even contributed to the formation of coalition governments in countries such as Hungary or Poland. The studies which have analyzed this phenomenon have so far been carried out mainly in central and northern Europe, as this is where this type of political party first gained electoral support (e.g. Biggs & Knauss, 2012; Bowyer, 2008; Coffe et al., 2007; Ford & Goodwin, 2010; Johnston et al., 2000; Lubbers et al., 2002; Pattie & Johnston, 1999). However, this electoral trend and populist discourse have also begun to develop in other Eastern European countries (e.g. Reháč et al., 2021), South America (de Souza, 2020), Turkey (Deniz et al., 2021), and southern European countries such as Italy (Bobba & McDonnell, 2016; Passarelli, 2013), Greece (Charalambous & Christoforou, 2018), and, more recently, Spain, with the appearance of VOX (Simón, 2020).

It should be remembered that in the 1979 Spanish general elections, an extreme right-wing party called *Fuerza Nueva*, which was a successor to the previous dictatorial regime, obtained one parliamentary representative with 2.1% of the vote. However, the new political party VOX cannot be considered as a successor to *Fuerza Nueva*, nor does it bear a direct relationship with the political forces which express nostalgia for General Franco's dictatorship. VOX represents a break-off group from the ideological environment of the PP (Popular Party) which has become disillusioned with what they understand to be the PP's drift towards the moderate center (Ortiz Barquero et al., 2020). Thus, the arrival of VOX has led to a greater polarization of Spanish politics, and the party has assumed an ideological discourse in line with other European far-right populist parties, based on national patriotism, cultural traditionalism, and a clear anti-immigration stance as the central axis of its political message. VOX emerged for the first time in Spain in December 2018, during the regional elections held in Andalusia, the southernmost region of this country. This extreme right-wing party obtained 10.97% of the total votes and twelve seats in the Andalusian Parliament. Later, in November 2019, VOX was the third most-voted party in the country in the national elections, thus ending the total absence of the extreme-right in the Spanish Parliament since the restoration of democracy in 1978.

This study aims to analyze the spatial pattern and contextual determinants of the vote for the extreme right, in order to achieve a better understanding of the behavior of this political party from the moment it first appeared on the scene (Iglesias-Pascual et al., 2021). Given the novel character of this electoral trend

in Andalusia and Spain and its unequal acceptance in Spanish territory (Simón, 2020; Turnbull-Dugarte, 2019; Turnbull-Dugarte et al., 2020), and to investigate in greater depth the geographical diversity of the VOX vote in Andalusia, we first decided to focus our analysis on identifying spatial clusters of the vote for VOX in the 2018 and 2019 Andalusian elections. Lastly, using the percentage of vote for VOX in 2019 as a dependent variable, we applied a Spatial Durbin model to assess, on the one hand, the impact of the main contextual variables usually analyzed in the academic literature to analyze right-wing vote, and, on the other, to verify the existence of a spatial diffusion trend in electoral behavior.

To achieve this, our study is based on 5944 census tracts from Andalusia. The census tract is the smallest statistical unit used in Spain, covering, on average, between 800 and 1000 voters. Using this local scale has allowed us to make a significant number of observations which make our statistical analyses more robust (Rydgren & Ruth, 2013) and to use areas of great socio-economic uniformity as our units of analysis.

We hope to contribute to the studies of the electoral geography of extreme right-wing parties by analyzing (i) the spatial dimension of the electoral resurgence of an extreme right-wing party in Spain; (ii) the main contextual factors relating to the electoral resurgence of the extreme right-wing in Andalusia in the 2018 and 2019 elections; and finally (iii) to determine whether this recent phenomenon in southern Europe presents a similar pattern to those already analyzed in other European countries or, on the contrary, shows different patterns of behavior.

Firstly, we will review the main contextual variables highlighted in the literature that account for the vote for extreme right-wing parties. Secondly, we will present data about Andalusia as our study context and describe the method carried out. Then, we will show the results, classified according to the three established objectives. Finally, we will discuss the results obtained in light of the existing literature, analyze their main implications and offer ideas for lines of future research.

2 Explaining the Vote for the Extreme-Right Party

To detect the contextual variables related to the electoral growth and geography of the radical right, research carried out mainly in central and northern Europe has highlighted the relationship between the presence of a migrant population or ethnic minorities (Coffe et al., 2007; Lubbers et al., 2002; Savelkoul et al., 2017; Schneider, 2008; Stockemer, 2016; Valdez, 2014) and the socio-economic level of the receiving native population, on the one hand, and the tendency to support extreme right-wing forces on the other (Biggs & Knauss, 2012; Hjerm, 2009).

2.1 Migrant Population and Support for the Extreme Right

The presence of a migrant or ethnic minority population has been highlighted by nearly all the studies as the key element to explain the vote for the extreme right. When analyzing this variable, studies have focused on aspects such as the degree

and evolution of ethnic diversity in the area studied (Arzheimer & Carter, 2006; Bowyer, 2008; Lubbers & Scheepers, 2000; Savelkoul et al., 2017; Van Gent et al., 2014), or the nationality of the immigrant population (Coffe et al., 2007; Rydgren & Ruth, 2013).

This presence of migrants has been traditionally measured by the proportion of the population belonging to the minority group in each of the areas analyzed. Studies ascribing to the conflict theory affirm that contact between the migrant population and the receiving society is related to anti-immigrant prejudice, and that this increases with the out-group size (Semyonov et al., 2004). The greater the anti-immigrant prejudice, the more support for radical right-wing parties (De Blok & Van der Meer, 2018; Green et al., 2016; Kaufmann, 2017), especially when the migrant population is of non-Western origin (Biggs & Knauss, 2012; Ford & Goodwin, 2010).

However, rather than focusing on the proportion of the migrant population, recent studies in Spain (Iglesias-Pascual et al., 2019) and Europe (Hoxhaj & Zuccotti, 2020) have underlined the importance of including the territorial concentration of the migrant population, as this can be considered a key element to understanding the attitudes held by the receiving society and the support for parties with radical right-wing ideology. The territorial concentration shows the degree of visibility of a social group in a specific territorial area (van Wijk et al., 2019) and most certainly helps to indicate the likelihood of real contact between migrants and the receiving society. The contact theory argues that the greater the territorial concentration of immigrants, the more familiarization and contact there is with the ethnic minority population, and the more positive attitudes there are towards this population (Pettigrew & Tropp, 2006). It therefore follows that ethnically diverse environments should produce a greater possibility of contact and should reduce electoral support for far-right parties (Biggs & Knauss, 2012; Kaufmann, 2017). This is found in some studies (Arzheimer & Carter, 2006; Biggs & Knauss, 2012; Janssen et al., 2019), which state that contact and daily observation in the immediate environment favor familiarization with the immigrant population (Schneider, 2008) and, in turn, reduce the probability of supporting radical right-wing parties (Lonsky, 2021; Savelkoul et al., 2017). However, other studies relate this micro-scale to a tendency to support the far-right more (Kaufmann & Goodwin, 2018). In fact, these areas of migrant territorial concentration in municipal areas with a low presence of migrants could play a key role in the support for extreme right parties (Charitopoulou & García-Manglano, 2018). As a result, the research has not yet offered generalizable results, and there is a significant disparity when it comes to interpreting the influence of the proportion or territorial concentration of immigrants and the increase in right-wing voting.

2.2 Socio-economic Context and Support for the Extreme Right

Another factor that has been closely linked to the likelihood of voting for extreme right-wing parties is the socio-economic composition of neighborhoods. Thus, the perception of competition for resources and employment, leads to a potential conflict between the minority group and especially among the most disadvantaged

population of the host society (Blalock, 1967; Semyonov et al., 2008). In fact, some studies even stress that socio-economic factors are of greater importance than the proportion of the immigrant population in accounting for the increased support for radical right-wing parties (Rydgren & Ruth, 2013).

When explaining the characteristics of the socio-economic context, two variables are usually used to categorize them: the level of unemployment and average income (De Blok & Van der Meer, 2018). Regarding unemployment, a significant number of studies have found a positive relationship between the level of unemployment in the area and the probability of voting for far-right parties (David et al., 2018; Rydgren & Ruth, 2013; Strömblad & Malmberg, 2016). However, not all studies have found a close link and, in some cases, unemployment rates have been shown to be a poor indicator of electoral support for these parties (Arzheimer & Carter, 2006; Green et al., 2016; Lubbers et al., 2002).

In view of the lack of clear indications that unemployment is a predictor of the vote for the extreme right, other research has chosen to assess the characteristics of the context through the level of average income, either as a complementary factor or as a main variable (Lubbers et al., 2000; Van Gent et al., 2014). The level of wealth, in turn, allows us to directly link the relationship between voting for the extreme right with the idea of social class, which allows a more realistic overall assessment of the environment than that offered by unemployment.

2.3 The Neighborhood Effect and the Spatial Diffusion Process

The role of the neighborhood effect has been extensively analyzed in the general literature on electoral geography (Gallego et al., 2016) but has been almost totally neglected in studies that have analyzed the electoral growth of extreme-right parties (van Wijk et al., 2019). In highlighting the importance of the neighborhood in the way people vote, Miller (1978) showed how people are more likely than would be expected to support a party in their neighborhood based solely on their individual characteristics. This effect has been reaffirmed in different investigations (Gallego et al., 2016; Johnston & Pattie, 2006). Analyzing this aspect can therefore contribute to understanding the expansion and geographical diffusion of the vote for the extreme right and how this ideology is reproduced from its first areas of support to later growth throughout the territory. In this context, and in general in our study, the concept of spatial diffusion process constitutes a highly relevant issue. In the words of Morrill et al. (1988, p. 7): “*The spatial diffusion process is the process by which the behaviour or characteristics of the landscape change as a result of what happened elsewhere earlier. Spatial diffusion is the spread of the phenomenon, over space and time, from limited origins*”. The idea is that the diffusion through space of a given behavior (for example, in our case, electoral behavior) can occur through two processes: by contagion or through a hierarchical process (Doignon et al., 2021; Morrill et al., 1988; Saint-Julien, 2007). In this paper, we deal with both of these concepts of the spatial diffusion process. Firstly, we deal directly with this point by using a spatial global and local autocorrelation analysis and a spatial regression analysis (Spatial Durbin Model) based upon the concept of the first law

of Geography (Tobler, 1970), which can be considered as the theoretical background to all spatial diffusion process theories. Secondly, we deal with it indirectly when we use the urban/rural divide as a covariate in the spatial regression model, assuming that urban census tracts are hierarchically higher compared to rural census tracts.

2.4 The Urban/Rural Dimension in the Extreme-Right Vote

The relationship between right-wing extremist voting and the contextual factors suggests that voting behavior differs according to urban and rural areas (Alba & Foner, 2017; David et al., 2018; van Gent et al., 2014). Here, we encounter opposing views. While some studies affirm that there is a marked urban character of the vote for the extreme right (David et al., 2018), other studies developed in Europe highlight the more rural and suburban character of the vote for the extreme right (de Maesschalck, 2011; Fourquet, 2012; van Gent & Musterd, 2013). In these cases, anti-urban sentiment, revanchism in the face of social change and the deterioration of public services are cited as key elements which explain the increased support for the extreme right in non-urban areas (Rickardsson, 2021; van Gent et al., 2014). In this context, the first contextual studies carried out in Andalusia show that although the tendency is broadly similar, the association with the vote for the extreme right is greater in rural areas than in metropolitan areas (Iglesias-Pascual, Hurtado-Rodríguez & De Oliveira, in press).

3 Context and Method

3.1 Andalusia: the Context of the Resurgence of the Extreme Right in Spain

Since the restoration of democracy in Spain in 1978, the political landscape has been dominated electorally by a two-party system consisting of the PSOE (Spanish Socialist Workers Party) and the PP (Popular Party), without any significant presence of alternative political forces such as green parties or the extreme right. As a result of the economic crisis starting in 2008, two new parties arrived on the scene (Ciudadanos and Podemos), which clearly weakened the dominance of this two-party system, and led to a new, highly unstable political scenario. Against this backdrop, after successive elections failed to produce a solid parliamentary majority, VOX managed to become the third most popular political party in the Spanish parliament in the November 2019 elections (15, 1% of the vote and 52 parliamentary seats). However, this rapid electoral growth in Spain in 2019 was anticipated by their emergence in the 2018 Andalusia elections, in which they obtained 395,978 votes (10.97%).

Andalusia, the southernmost region of Spain, accounts for 17.9% of the Spanish population, constitutes the most densely-populated region of the country and contains 7.4% of the foreign-born population, which is below the national average (10.1%; INE, 2019). A significant proportion of the foreign-born population resident in Andalusia is made up of European Union nationals who have chosen to live in

this region during their retirement (Rodríguez et al., 2004). The foreign-born population that could be classed as economic migrants is therefore even smaller. Furthermore, within Andalusia, the foreign population is not evenly distributed, with the provinces of Malaga and Almeria being home to 60%. However, despite the lesser importance of the foreign population in the region, the strategic position of Andalusia as one of the southernmost borders of the EU and the important role it plays as an entry point for immigration flows from Africa ensure that the social perception of the presence of immigrants has become a hotly-debated issue in Andalusian politics.

Despite this, it is generally considered that anti-immigrant attitudes in Andalusia have always been moderate, and not even the grave social consequences arising from the 2008 economic crisis led to a growth in these feelings (Rinken & Trujillo-Carmona, 2018). However, results from a recent survey on the attitudes of the Andalusian population to immigration (OPAM, 2019) show an increased perception of immigration as a problem among the Spanish population in general and the Andalusian population in particular. These social attitudes, although not held by the majority, constitute a significant change in the trend of Andalusians' attitude towards immigration and could be related to the emergence of VOX in December 2018.

3.2 Study (Dependent) Variable and Independent Variables

The study variable is the percentage of VOX votes in 2019 recorded at the 10,033 polling stations in the eight Andalusian provinces. In order to maintain a consistent data unit level, we grouped the data according to the 5,944 census tracts in Andalusia, as the contextual factors are usually described using this scale. For the 2019 elections, which were national elections, the data were obtained from the Spanish Ministry of the Interior. As can be observed from Fig. 1, the geographical distribution of the study variable presents a fairly high spatial variability in 2019. In particular, the greatest electoral support for VOX is to be found in coastal areas, normally characterized by tourism and intensive greenhouse agriculture. To a lesser extent, we find isolated areas of high support for VOX in the interior of Andalusia, the provincial capitals and some areas with a mainly rural economy.

From a statistical point of view, it can be seen (Table 1) how the average level of the variable in 2019 was fairly high (20.3%), which corresponds to a certain level of variability (sd is equal to 6.4).

Electoral data from each census tract were then associated with the contextual factors considered in this study. We included demographic (INE, 2018) and socio-economic (INE, 2017) data obtained from the Spanish National Institute of Statistics.¹

The contextual variables used in the regression model are related to the presence of foreign population, the degree of territorial extent of economic migrants, the level of wealth, the level of aging in the resident population, the urban/rural divide and,

¹ For the demographic data, we used information from Continuous Municipal Population Register of 2018, the date of the first election analyzed. For the socio-economic data, that of 2017 was used, data issued by Spanish Household Income Distribution Atlas of the Spanish National Statistical Institute (INE).

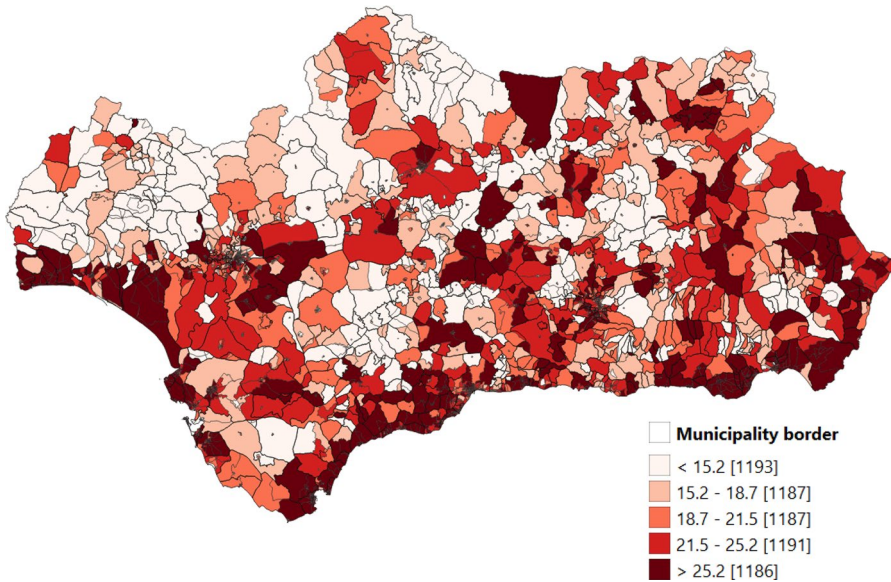


Fig. 1 Geographical distribution of the study variable (percentage of vote for VOX 2019) at census tract level (quintiles map)

Table 1 Descriptive statistics of the study variable (vote for VOX 2019%)

Statistical parameters	2019
Min	0.6
Max	48.8
Q1	16.2
Median	20.1
Q3	24.0
IQR	7.8
Mean	20.3
Standard deviation	6.4

finally, the percentage of vote for VOX in 2018 ($t-1$). The presence of foreign-born population was measured by using the percentage of foreign-born population in the total population resident in each census tract. By using this variable, we aimed to analyze the different relationships with the extreme right produced by the presence of foreigners. The territorial concentration of economic migrants was been measured by the use of Local Quotient (LQ) only in a subset of the foreign-born population, the economic migrant population. For the identification of this sub-group of population, we consulted reports from the Spanish Monitoring Centre on Racism and Xenophobia (Cea D'Ancona & Vallés, 2015) and other studies (Iglesias-Pascual et al., 2019, 2021), which identified economic migrants as the foreign-born population from South America, Central America and the Caribbean, Africa, Asia, and

those from Russia, Ukraine, Romania, Poland and Bulgaria. The LQ allows us to compare the percentage of foreign-born individuals of X country relative to population T of a particular section i with the percentage that shares the same country across the administrative municipality. This indicator, which varies from 0 to ∞ , enables us to assess the over-representation ($LQ > 1$) of an immigrant population in a city's different census tracts, and has been used successfully in studies conducted in several cities (Iglesias-Pascual et al., 2019; Wright et al., 2005). In the dimension of socio-economic status, we used the average income level (Gross Domestic Product per capita) from the data of the Spanish Household Income Distribution Atlas (INE, 2017). Demographic ageing is measured as the percentage of elderly people (aged 65 and over) in the total population resident in each census tract. The idea is that where the proportion of elderly people is higher the 'traditional' values have a major social impact, and therefore the 'racial prejudice' tends to be more accentuated (Ford, 2011; Gorodzeisky, 2011; Pichler, 2010). The urban/rural area divide is a crucial variable in explaining many aspects of human behavior. In their demographic studies, Champion and Hugo (2004) noted that where people live can be a relevant factor in explaining demographic behaviour and, therefore, social attitudes. However, the latter are also strictly linked to electoral behavior (e.g. David et al., 2018; Rickardsson, 2021; van Gent et al., 2014). To differentiate between urban and rural contexts, our research considered the OECD delimitation for urban areas in Europe (Dijkstra et al., 2019). Finally, in order to measure how the 2018 percentage of vote for VOX can have influenced for Andalusia the level of the same variable in national elections, one year later—i.e. our dependent variable—we used as a covariate the observed variable at $t - 1$, i.e. one year before. The idea here is quite clear: in our view, the temporal dimension can be a relevant factor in explaining the VOX's electoral growth and especially its dimension of temporal diffusion. In Table 2 and Fig. 2, information about the independent variables used in the model is given.

3.3 Statistical Analysis

The first step was to detect the level of global and local spatial autocorrelation of the study variable (in 2018 and in 2019). In particular, we were interested in verifying whether and how the study variable is clustered across the whole territory and whether its level of spatial autocorrelation (i.e. spatial clustering) changed from 2018 and 2019. For this purpose, we considered the classic global Moran's I index of spatial autocorrelation (1948) and, as a measure of local spatial association, the local index G_i^* (Ord & Getis, 1995). Both indicators allow us to detect whether the spatial distribution of a variable—represented here by the percentage of vote for VOX—follows a random distribution or, in contrast, is characterized by spatial autocorrelation (i.e. spatially clustered). The difference between the two indicators is that Moran's I is a global index and is therefore a single number that varies between -1.0 (negative spatial autocorrelation, i.e. similar values of the variable which tend to repel each other spatially) to $+1.0$ (positive spatial autocorrelation, i.e. similar values which tend to attract/to cluster one each other in space). On the opposite the Ord and Getis index (G_i^*) is a local indicator which enables us to identify clusters of

Table 2 Descriptive statistics of the independent variables used in the regression analysis

Independent Variables	Min	Max	Q1	Median	Q3	IRQ	Mean	Standard deviation
Foreign-born population (%)	0.0	72.4	1.7	3.3	7.2	5.5	6.4	8.3
LQ economic migrants	0.0	8.4	0.5	0.8	1.3	0.8	0.9	0.7
Average annual income	2987.0	27745.0	7308.0	8283.5	9829.5	2521.5	8931.5	2664.2
Elderly people (%)	0.9	50.0	13.6	18.6	23.5	9.9	18.6	7.1
Vote for VOX 2018 (%)	0.0	36.9	6.9	9.9	13.0	6.1	10.3	4.9

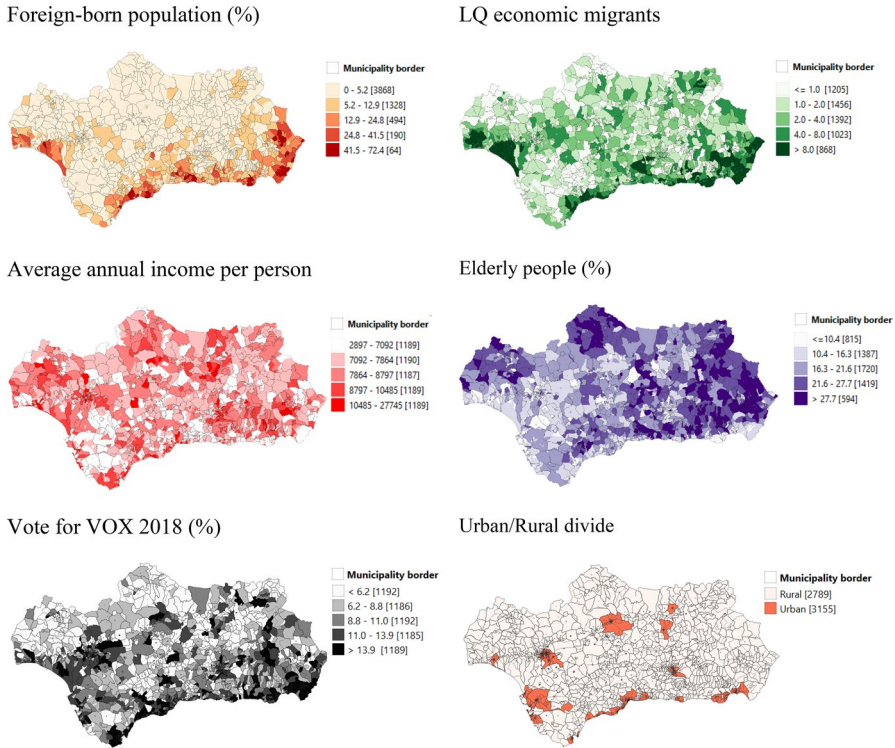


Fig. 2 Territorial distribution of the contextual variables used in the regression analysis. Maps created using Qgis 'Odense' version 3.20.2. These categories have been computed using the Jenks methods (natural breaks) for the variables: "Foreign population (%)" and "Elderly people (%)"; for LQ variables, the categories were computed manually on the basis of the meaning of LQ and its distribution. For "Average annual income per person" and "Percentage vote for VOX 2018", the categories were computed as quintiles

hot spots (i.e. census tracts in our case, where high values of the observed variable are spatially clustered) and cold spots (census tracts in our case, where comparative low values of the observed variable are spatially clustered). The hypothesis for the existence of a condition of spatial clustering is tested at a level of statistical significance $\leq 5\%$ ($p\text{-value} \leq 0.05$). We also followed a spatial approach for statistical modeling of VOX voting: from the several models existing in the literature, we adopted the spatial Durbin model (Anselin, 1988). The reasons for this choice are straightforward. In fact, the spatial Durbin model has been proved to outperform the more classic autoregressive spatial econometrics models such as spatial error or spatial lag because, as underlined in Yang et al. (2015), it is the only means of producing unbiased coefficient estimates (Elhorst, 2010). Moreover, the kind of model used in our case study allows us to detect if it is the characteristics of neighboring territories (i.e. census tracts) that influence the proportion of vote for VOX in a given territory (i.e. a specific census tract i), also taking into account the spatially-lagged effect of y . In other words, this kind of spatial regression model allows us to find

more evidence to support the discourse on the spatial diffusion process (in a strictly geographical sense—see Sect. 2.3). In fact, following the work of Yang et al. (2015), a spatial Durbin models are made up of three components (LeSage & Pace, 2009): a spatially-lagged dependent variable, a set of explanatory variables belonging to a spatial unit (in our case, the census tract), and a set of spatially-lagged explanatory variables. The model, again following Yanget al. (2015), can be expressed as:

$$y = \rho W_y + \alpha I_n + X\beta + WX\theta + \varepsilon, \varepsilon \sim N(0, \sigma^2 I_n)$$

where y denotes an $n \times 1$ vector of the dependent variable (i.e. percentage of vote for VOX in 2019), W is the spatial weight matrix, W_y represents the spatial lagged dependent variable (endogenous interaction relationship), ρ denotes the effect of W_y , known as the spatial autoregressive coefficient, and I_n indicates an $n \times 1$ vector of ones associated with the intercept parameter α . X represents an $n \times k$ matrix of k independent variables (see previous section), which are related to parameters β ; WX reflects the spatially-lagged explanatory variables (exogenous interaction relationships), and θ denotes an $k \times 1$ vector of the effects of WX . The error term, ε , follows a normal distribution with a mean 0 and a variance $\sigma^2 I_n$, where I_n is an $n \times n$ identity matrix. The equation above clearly indicates that the characteristics of a specific unit (the census tract, in this study) and its neighbors are considered simultaneously in the analysis (Yang et al., 2015). This paper uses this spatial regression approach to detect whether the percentage of vote for VOX in 2019 in any census tract is related to the features of its neighborhood and, if so, to discover how they are associated. Specifically, we looked into whether the dependent variable of a census tract is associated with the features of surrounding census tracts after accounting for the characteristics of the specific census tract, in terms of the independent variables introduced in the model. In both spatial analysis procedures—i.e. global/local spatial autocorrelation and spatial regression—the spatial weight matrix (W) is defined as a “Queen” contiguity of first order: two census tracts are neighbors if and only if they share a boundary or a geographical vertex. One crucial aspect of the spatial Durbin model, and in general of all spatial autoregressive regression models, is the interpretation of the coefficients: this cannot be done in the same way as OLS models, as the direct and indirect (spatial spillover) effects need to be taken into account (Golgher & Voss, 2016). According to these authors, the direct effect “*represents the expected average change across all observations for the dependent variable of a particular region due to an increase of one unit for a specific explanatory variable in this region*” (Golgher & Voss, 2016, p. 185), while the indirect effect “*represents the changes in the dependent variable of a particular region arising from a one-unit increase in an explanatory variable in another region*” (Golgher & Voss, 2016, p. 185). In our analysis, for “region”, we should read “census tract”. In the analysis, we compare the classic regression model (OLS) and spatial Durbin model (SDE) using AIC (Akaike, 1974) to determine whether one model is better than the other, assuming that the model with a smaller AIC value should be preferred, as it is more likely to minimize the information loss compared to the true model which generates the observed data (Burnham & Anderson, 2002; Yang et al., 2015). From an interpretative point of view, the comparison between OLS and SDE is relatively

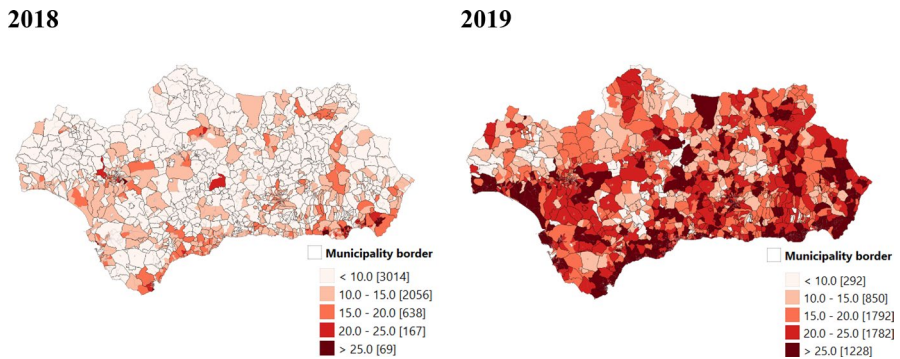


Fig. 3 Geographical distribution of votes for VOX in 2018 and 2019

straightforward: OLS model parameters are estimated under the explicit assumption that the observations are independent, which means that changes in values for one observation do not “spill over” to affect values in other observations (Golgher & Voss, 2016). Spatial regression models, on the other hand, assume that observations are not independent and can influence each other reciprocally, as is clearly stated in the first law of geography by Tobler (1970). Global and local univariate and bivariate spatial analysis is carried out using GeoDa (version 1.18 10.12.2020), and regression models (OLS and SDE) are estimated using R Studio (Mendez, 2020).² The thematic maps were created using Qgis “Odense” version 3.20.2.

4 Results

4.1 Spatial Diffusion Process of the Vote for VOX³

Our first objective was to analyze the spatio-temporal variations of votes for VOX in Andalusia and detect spatial clusters (hot spots, in particular). The variable is the percentage of votes for VOX in 2018 and 2019 (i.e. a single variable referring to two years). From 2018 to 2019, the statistical parameters of the study variable changed significantly (see Table 1 and the last row of Table 2), with the mean rising from 6.1% to almost 8% and the variability also increasing (standard deviation rose from 4.9 to 6.4). However, the biggest change was seen in the impressive increase of the median: 9.9% in 2018 and 20.1% in 2019.

For our purposes, the geographical distribution of the vote for VOX in 2018 and 2019 and its variations across space and time are highly relevant. This is a crucial

² The package used are: ‘tidyverse’, ‘spdep’, ‘spatialreg’, ‘rgdal’, ‘rgeos’ (Mendez, 2020).

³ The analysis and processing of the data was carried out at census tract level; however, the cartographic representation of the results has been expressed by showing a map of the municipal boundaries. Our aim here is to show the results more graphically, in a way which is more closely related to the political and social reality of Andalusia.

aspect to investigate when the spatial units of analysis are, as in our case, territories, and especially when we are attempting to detect the spatial diffusion patterns of a given process/phenomenon (Matthews & Parker, 2013). From Fig. 3, it can be seen how the number of territorial units (i.e. census tracts area) with a percentage of vote for VOX greater than 25% was as little as 69 in 2018 (1.2% of all census tracts in the region), while the percentage vote for VOX was less than 10% in 3,014 territorial units (almost 51%). One year later, the situation had changed dramatically: the census tracts with over 25.0% of vote for VOX had grown to 1,228 (almost 21% of all census tracts), while in the lowest category (<10.0% vote for Vox) the number of territorial units had decreased to 292 (4.9% of the total census tract).

From the maps in Fig. 3, it can clearly be seen how spatial proximity influenced the geographical variation of the vote for VOX from 2018 to 2019. This aspect allows us to hypothesize the existence of a spatial diffusion pattern which will be better to investigate using spatial autocorrelation analysis and the spatial Durbin model. For now, it is interesting to note that after an initial concentration of the VOX vote on the coast and in specific inland areas in 2018, one year later this pattern had not only consolidated, but had spreading throughout the region. The results about spatial global and spatial autocorrelation (Fig. 4) provide some other important elements that help us to understand the spatio-temporal variation of the vote for VOX. First of all, the spatial distribution of the variable under study is fairly spatially clustered in both years. In fact, the global Moran's I index remains practically stable from 2018 to 2019 (0.66 and 0.65, respectively), indicating a condition of positive spatial autocorrelation at global level. This means that in both years, a similar value of the percentage vote for VOX tended to spatially clustered. This holds from a local perspective too: in 2018, there were 915 hot spots, while in 2019, there were 982 (15.4% of the total census tract of Andalusia in 2018 and 16.5% one year later). What is important to keep in mind, however, is that this stable level of spatial autocorrelation (both at a global and local level) is associated with a very intense growth in the level of vote for VOX from 2018 to 2019 (see Fig. 3). What also seems interesting to note is that the little growth there was in the number of hot spots from 2018 to 2019 (+67) seems to have originated in some cases from some of the major municipalities (Malaga, Granada and Jerez de la Frontera), while in other cases this was not so (especially the clusters that are scattered on the east and on the west border). From this analytical perspective, it will be interesting to understand the role of urban–rural divide in influencing (or not) the geographical variation of the percentage of vote for VOX and, of course, the value of y at $t - 1$ too (Table 3).

4.2 OLS and Spatial Durbin Model

The results of the model are highly interesting. As a matter of fact, the spatial Durbin model outperformed the OLS model (with a lower AIC in the case of the spatial Durbin model). In the OLS model, all the coefficients are statistically significant. For two variables—foreign-born population (%) and vote for VOX (%)—the relationship with the dependent variable is positive. The effects are extremely weak in the case of the first variable (0.08) while, in contrast, they are fairly relevant for the second

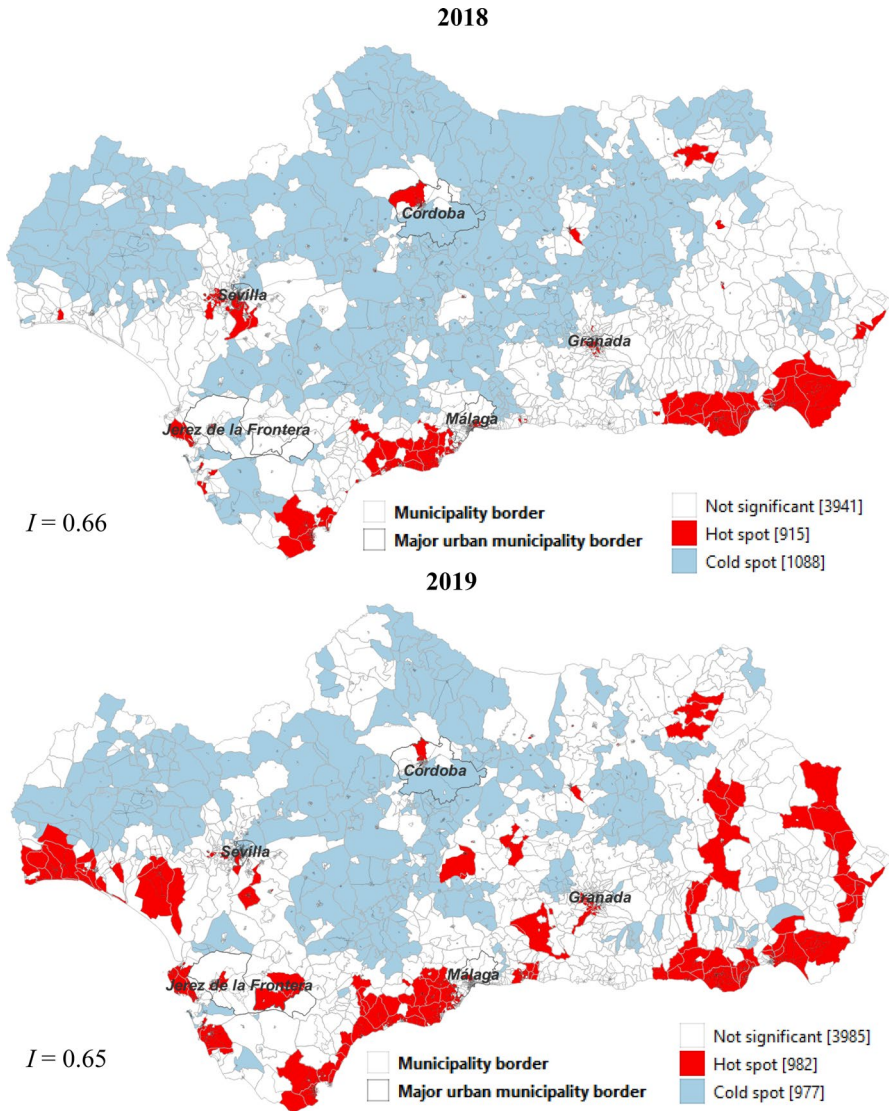


Fig. 4 Local spatial clusters (based on local index G^*) for the variable “vote for VOX (%)”. 2018 and 2019. Main urban areas are those ones with over 200,000 residents in 2018

variable (1.11). The other four variables (LQ economic migrants, average annual income, elderly people (%), urban) show an inverse relationship with the dependent variable. In the case of average annual income and elderly people, the effects on the dependent variable were very low. In contrast, LQ economic migrants and, in particular, the urban variables both present high effects: -0.46 and -1.32 respectively. Therefore, from an a-spatial perspective, it seems that the contextual factors which have a more relevant effect on the decrease in vote for VOX, all conditions

Table 3 OLS and spatial Durbin model

Independent variables	Ordinary least square	Spatial Durbin model			
	Coefficients	Coefficients	DE	IE	TE
Intercept	15.8300	5.5977			
Foreign-born population (%)	0.0755	0.0325	0.0336	0.0170	0.0506
LQ economic migrants	-0.4565	- 0.0324	- 0.0739	-0.6200	-0.6939
Average annual income	-0.0005	-0.0001	-0.0002	-0.0007	-0.0008
Vote for VOX in 2018 (%)	1.1060	0.9280	0.9493	0.3192	1.2686
Elderly people (%)	-0.0813	-0.0829	-0.0807	0.0328	-0.0479
Urban (opp. to rural) area	-1.3180	0.6704	0.5620	-1.6196	-1.0576
Lag in foreign population (%)		- 0.0151			
Lag in LQ economic migrants		-0.2063			
Lag in average annual income		-0.0002			
Lag in vote for VOX 2018 (%)		-0.4916			
Lag in elderly people (%)		0.0664			
Lag in urban (opp. to rural)		-1.0342			
Rho (spatial lag parameter)		0.6560			
AIC	32,186	29,889			

Coefficients in bold are not statistically significant. All others are statistically significant at least at $p \leq 0.05$

being equal, are an urban rather than rural area, and a comparatively higher level of concentration of economic migrants. In addition, the most important factor which, all conditions being equal, boosted the percentage of vote for VOX in 2019 is represented by the same variable at $t-1$ (2018). This implies a sort of ‘endogenous’ effect of the electoral behavior.

The effects of the other contextual variables are less relevant in the OLS model. However, results of the spatial Durbin model are somewhat different from the OLS model. In fact, two variables which are not more statistically significant (LQ economic migrants and urban area) both recorded an inverse relationship with the dependent variable in the OLS model. When interpreting the results, although we cannot directly interpret the coefficients (as in the OLS model), we do need to take into consideration the direct effect (DE) and indirect effect (IE). The foreign population (%) has a positive, weak, direct effect on the dependent variable, while the indirect effect is not statistically significant. The opposite is true for the LQ economic migrants effect, which still has a negative impact on the dependent variable, although it is statistically significant only as an indirect effect. It seems that the two variables related to the presence of foreigners had opposite effects on the percentage of vote for VOX in 2019, albeit with different spatial effects (a direct effect in the former, an indirect effect in the latter). Average income maintains a weak effect on the dependent variable which is negative both in terms of direct and indirect effects. The percentage of vote in 2018 still plays a crucial role, with a positive and high effect. Both direct and indirect effects play a role on y , with the former having a stronger impact (0.95). Meanwhile, the variable related to elderly people plays a

secondary role in explaining the variability of the vote for VOX. Its effects are again negative, but it is statistically significant only in the direct form and with low intensity (0.08). The last variable, urban area, is extremely interesting: in the OLS models it was the variable with the highest (negative) impact on the vote for VOX in 2019, which indicates that this electoral behavior is somehow related to the rural context (less modern and most probably less culturally developed, i.e. more conservative). In the spatial Durbin model, it can be seen how this effect is entirely attributable to an indirect effect, and that it is very strong (-1.62). The effects of the lagged independent variables are also of great interest: these are all statistically significant, with the exception of the foreign-born presence (%), proving the importance of the regression approach adopted here. Another interesting result is that the Lag LQ for economic migrants is now statistically significant, although not in terms of DE, and exercises a negative effect on the dependent variable. The lagged average annual income and elderly people still have a comparatively weak effect on the dependent variable (negative in the former case and positive in the latter). However, it is important to note that the lagged vote for VOX in 2018 changed to a negative (previously positive) effect on the dependent variable. This means that the electoral behavior was only partially transferable in space from one year to another. Most probably, other local effects played a key role in this process (for example, the different candidates and their electoral campaigns, local media, and so on). The urban/rural divide has also played a key role in other, better-known electoral/political polls, such as the Brexit referendum. Here, as can be seen in the lagged variable related to the urban/rural divide, there is still a negative, relevant (-1.03) effect on the dependent variable. Last but not least, there is the role played by the lagged dependent variable, expressed here by the spatial lag parameter ρ . All conditions being equal, the effect is positive and intense (about 0.66), which supports the idea of the spatial diffusion of y . This idea is reinforced by interpreting the indirect effect of the "Vote for Vox in 2018" variable as it represents the vote for Vox of neighboring territories in 2018 and it is positive (0.32). This means that the higher the neighboring territories had a Vox vote in 2018, the higher the Vox vote of territory i in 2019. Based on these results we believe that we can speak about a spatial diffusion process of the vote for VOX in Andalusia.

5 Discussion, Limitations and Future Developments

5.1 Discussion

In this paper, we have taken an original approach to the study of the resurgence of the extreme right in Andalusia. We first analyzed the spatial patterns of the vote for VOX in 2018 and 2019. Secondly, we estimated the relationship between a series of contextual variables and the behavior of the VOX vote in 2019 by comparing a classic OLS model and a spatial model (spatial Durbin model) in order to compare the results underlying the importance of the spatial dimension for electoral behavior.

The results suggest that the vote for VOX between 2018 and 2019 was greatly affected by a global and local spatial autocorrelation, which underlines the

importance of space in the process of electoral growth. Secondly, the OLS model reveals a clear relationship between the presence of the foreign-born population and the higher percentage of the VOX vote. However, the greater degree of territorial concentration, which in this research was associated with a higher possibility of the native population coming into contact with migrants, together with the average annual income, percentage of elderly people, and urban areas, show a negative relationship with the vote for VOX. Nevertheless, the aspatial nature of the OLS model obviously puts severe limits on its interpretative and explanatory capacity, given the intrinsically spatial nature of the phenomenon under study. At this point, it is particularly important to analyze the results of the spatial Durbin model. In this case, the positive relationship between the presence of foreign-born population and the vote for VOX was again confirmed, although more weakly and only in terms of the direct effect. The role of the concentration of economic migrants (LQ), despite remaining negative, was indirectly statistically qualified by the spatial effect. The variables of average income and ageing population show a very weak relationship in both cases (direct and indirect effects). In the case of average income, the results obtained by this spatial model qualify those obtained in other studies for Andalusia using non-spatial regression models (Iglesias-Pascual et al., in press). On the other hand, for the percentage of elderly people, the weakness of the results at the contextual level could show the need to analyze the incidence of this variable using individual data. However, this model perfectly reflects the importance of the VOX vote in 2018 in understanding the growth of the VOX vote in 2019 and confirms the important role played by space in the VOX results in 2019. This aspect is also highlighted in the relationship between urban areas and the VOX vote, underlining its negative character and confirming the greater importance of non-rural areas in the vote for the extreme right than other studies have shown (e.g. Rickardsson, 2021; van Gent et al., 2014).

All these findings have given rise to an interesting academic debate, on both a theoretical and methodological level, on the role of spatial diffusion patterns and socio-territorial variables in the increased electoral support for VOX in Andalusia. First, it is worth highlighting how the diachronic analysis carried out on the VOX vote between 2018 and 2019 has allowed us to analyze the spatial diffusion process of the VOX vote. This has enabled us to reflect, from a contextual dimension, on the neighborhood effect (Dülmer & Klein, 2005) and the role of the local regulatory context (Johnston & Pattie, 2006; van Wijk et al., 2019) in the vote for the extreme right. The fact that support for VOX spread out rapidly between contiguous census tracts allows us to conclude that the proximity to neighborhoods or districts with high levels of support for the extreme right also plays an important role (Iglesias-Pascual et al., 2021). In this context, it can be considered that, in our case, spatial contiguity has favored the expansion of capital and social reproduction, as understood from the viewpoint of Bourdieu (1984), which has influenced the diffusion of a social imaginary which has been expressed electorally in greater support for the extreme right.

Second, our results for the presence of the foreign-born population and the degree of territorial concentration of economic migrants offer new insights into the debate between the conflict and contact theories. Indeed, the results strengthen the idea that

the presence of certain nationalities or ethnic groups, especially those that are perceived socially as economic competitors, is linked to greater support for far-right parties, thus reaffirming the validity of the conflict theory in this study (Biggs & Knauss, 2012). Those areas with more migrant nationalities considered as economic migrants, and therefore as potential competitors for public resources, harbor greater support for VOX (Halikiopoulou & Vlandas, 2020; Kaufmann & Goodwin, 2018). However, beyond this trend, we also found an indirect relationship between the level of territorial concentration of economic migrants and support for VOX, which would seem to favor the contact theory (Pettigrew & Tropp, 2006). Thus, territorial concentration would be a good alternative way of measuring the role of the presence of a migrant population to assess the inter-ethnic contact, and it highlights the role of areas with a higher concentration of migrants despite their low numbers at the local level. This aspect also adds complementary nuances to the traditional use of out-group size (Charitopoulou & García-Manglano, 2018). Given that the traditional approach focuses on the percentage or size of the minority group in the host society (e.g., Hopkins, 2010; Savelkoul et al., 2017; van Wijk et al., 2020), we propose, following recent studies (Iglesias-Pascual et al., 2019), that the degree of spatial concentration of the role of migrants in the territory should be measured. This would provide us with new approaches and instruments to enrich the academic debate over whether it is contact or conflict that predominates in the electoral reaction to the presence of a migrant population.

Adding the analysis of the socio-economic results to the role of the presence of the migrant population helps us shape the socio-territorial mosaic that allows us to understand the rise of the extreme right in Andalusia. While a significant number of studies relate the rise of the extreme right to areas or individuals in a vulnerable economic situation, i.e. unemployed or with a low income or (e.g., Coffe et al., 2007; de Blok & van der Meer, 2018; Lubbers & Scheepers, 2000), other contextual studies in Andalusia show a different pattern (Iglesias-Pascual et al., in press). Thus, the relationship between support for VOX and the areas with the highest average income levels stood out when this phenomenon appeared in 2018. However, for the 2019 results, the application of the spatial Durbin model has allowed us to qualify these studies by showing that when taking into account the spatial dimension, at least at the contextual level, it is not possible to show a strong relationship between income level and a higher vote for VOX. Therefore, our results relativize the theory that that support for the extreme right has emerged in Andalusia only from economically privileged areas within the region. However, if we add this aspect to the pattern of the geographical spread of electoral support for VOX between 2018 and 2019, we could consider that the vote cast in the wealthiest areas of Andalusia established a model that was reproduced a year later in adjacent areas with a lower level of wealth. Thus, this first appearance of the extreme right in Andalusia became a generalized expression of the social uncertainties of the more economically favored areas, which were then socially "imitated" in the rest of the territory.

If we combine the analysis of the VOX results in Andalusia in 2018 and 2019, we can conclude that our results differ from the traditional views of other studies as regards the role of the presence of migrants and the socio-economic level (e.g. Coffe et al., 2007; Green et al., 2016; Rydgren & Ruth, 2013; Savelkoul et al.,

2017). Indeed, the fact that the greatest electoral support for VOX does not correlate with the areas of highest territorial concentration of economic migrants suggests that the rise of the extreme right in Andalusia is related to new forms of social support which the extreme right-wing parties are currently developing. The emphasis has shifted from voters' concerns about the role of migration towards the cultural threat, disaffection with traditional politics, a low opinion of the national government (Golder, 2016; Halikiopoulou & Vlandas, 2020), the limited possibilities of influencing the system through the majority parties (Akkerman et al., 2014; Alba & Foner, 2017; Stockemer et al., 2020), and other elements of Spanish internal politics (Ortiz Barquero, 2019; Simón, 2020). This is backed up by recent studies analyzing the latest changes in the dynamics behind the support for the far-right (Mudde & Rovira Kaltwasser, 2018; Stockemer et al., 2018, 2020).

5.2 Limitations and Perspectives for Future Research

Traditionally, studies such as this, based on the relationship between contextual elements and electoral results, have been criticized on two counts. Firstly, they have traditionally been viewed as suffering from the so-called ecological fallacy (Robinson, 1950), which argues that the characteristics of the administrative or spatial unit of analysis used can be extended to all the members of that administrative unit (de Blok & van der Meer, 2018; Savelkoul et al., 2017). However, in the case of Andalusia, this contextual analysis has been constructed from data obtained from the smallest statistical unit used in Spain, the census tract, with an average population of between 800 and 1000 people. This has allowed us to work with smaller territorial units than those recently used in other studies of electoral geography (e.g., de Blok & van der Meer, 2018; Kaufmann & Goodwin, 2018; Tolsma & Van der Meer, 2017). In turn, collating the electoral and socio-demographic data from the 5,944 census tracts in Andalusia has allowed us to make a significant number of observations which have made our statistical analyses more robust (Rydgren & Ruth, 2013) and have enabled us to use, as our units of analysis, areas of great socio-economic uniformity and sense of collective belonging (van Wijk et al., 2020). This homogeneity in the units of analysis, while not completely dismantling the ecological fallacy, does reduce its effect (Arzheimer, 2012).

Secondly, it is often pointed out that unless the results are broken down into the national and foreign voting population, it is impossible to conduct a rigorous analysis of the electoral results based on the socio-territorial context (van Wijk et al., 2020). However, the Spanish electoral system bars the foreign population from voting either in regional or national elections. In addition, the percentage of the Andalusian population of foreign origin able to vote is just 2%, and so, in general, the voting figures clearly reflect the electoral intention of the native population in each census tract. Moreover, we must take into account that studies focusing on individual attitudes based on surveys or focus groups referring to attitudes towards ethnic minority populations may suffer from a bias of social desirability in the responses (Arzheimer, 2012; Iglesias-Pascual, 2019; Krysan, 1998). Thus, this type of

approach based on individual behavior obtained through statistical samples could produce lower rates of right-wing voting intention than the real figure.

Last but not least, the contrasting differences and nuances between the results of the OLS model and the spatial Durbin model highlight the importance at all times of analyzing spatial behavior patterns by applying spatial statistical tools. Further research is therefore required to delve deeper into the patterns of geographical diffusion of support for extreme right-wing parties through the use of spatial statistical instruments. This could be a key factor in designing social policies to prevent the growth and diffusion of the ideas of extreme right-wing parties.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest. The opinions expressed in the paper are the ones of the Authors and does not necessary reflect the ones of their Institutions.

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