social sciences

MDPI

Article

Socioeconomic Factors of Immigrants' Location Choices. Evidence for the South of Europe

José María Martín Martín [1,*] and Juan De Dios Jiménez Aguilera [2]

[1] Faculty of Law, Social Sciences and Humanities, Business Area, International University of La Rioja, Avenida de la Paz 137, Logroño 26006, Spain
[2] Department of Applied Economics, Faculty of Economics and Business, University of Granada, Paseo la Cartuja, 7, Granada 18011, Spain; juande@ugr.es
* Correspondence: josemaria.martin@unir.net; Tel.: +34-958-241-000

Academic Editor: Martin J. Bull
Received: 13 March 2017; Accepted: 19 May 2017; Published: 26 May 2017

Abstract: This paper takes as a reference, empirical analyses conducted in northern European countries and the United States which associate socioeconomic factors to the location patterns of immigrants. It has been suggested that the socioeconomic context of southern Europe could impact immigrants' location choices. We analyze data on the location of immigrants in municipalities of the Andalusian region in southern Spain with respect to the factors that most influence immigrants' location preferences as discussed in the literature: a pre-existing immigrant community, economic dynamism, population size and other scarcely investigated factors such as the territorial characteristics of the municipality and its productive structure. We conclude that immigrant location patterns in Andalusia are very similar to those found in geographical areas outside Spain, with the exception of specific characteristics related to the social and labor model of the region.

Keywords: immigrant flows; location factors; socioeconomic

1. Introduction

Although foreign immigration is not an entirely new phenomenon in Spain, it has grown significantly in recent years. The increasing number of immigrants in Spain has been affected by the socio-political situation of the country. In particular the rapid growth of Spain's economy primarily from the mid-1990s to the middle of the first decade of the century, the development of immigration policy marked by on-going regularization processes, and the signing of bilateral agreements to regulate migration flows have all had a positive impact (Díez 2005), in addition to the growing importance of pull factors, particularly family reunification flows (Izquierdo 2002).

This paper focuses on specific factors that could determine the residential location patterns of immigrants through a comparative analysis of data drawn from municipal registers. The study is based on a review of the research conducted with data on immigrant location factors and focuses on the main determinants of immigrants' location preferences in other geographical areas. Following a review of the literature, we describe the research goals and our contribution to the literature. We then contextualize migration in the region of study and discuss the methodology used. Finally, we present the results and conclusions of the research, comparing the various factors analyzed.

The main studies in the literature on immigrants' location patterns have been conducted in northern Europe and the United States. The analysis of a region of the southern periphery of Europe such as Andalusia is of interest due to the possible differences between location patterns in different geographical areas. According to Malheiros (2002), the spatial distribution of immigrants in southern European cities varies from those in the north due to differences in the migration process and the

socio-urban context. The differences in the social and structural factors of societies in northern and southern Europe could have an effect on this process (Arbaci 2004).

The location and mobility patterns of immigrants have been examined from various approaches. One of these focuses on the influence of immigrant labor mobility and its contribution to regional economic imbalances. According to Rephann and Vencatasawmy (1999) such analyses are of interest to academics and policymakers given that migration is the most important source of demographic change at the regional or local level. A vast body of research on this topic compares the mobility patterns of immigrants with those of the native population. Some of the most important studies in this vein are Moore and Rosenberg (1995) or studies that examine internal mobility patterns of immigrants such as Antolin and Bover (1997), De la Fuente (1999), Juarez (2000) and Martí and Ródenas (2004).

An additional line of research centers on urban and metropolitan location patterns to explain integration or segregation processes of the immigrant community. Examples for the Spanish case include works by authors such as Malheiros (2002), Arbaci (2004), Bayona (2007), Fullaondo (2003), Fullaondo and Roca (2007), Checa and Arjona (2006) and Leal (2007). Studies on the United States include Kritz and Nogle (1994), who examine the concentration of immigrants in metropolitan areas and argue that migratory movements tend to favor ethnic grouping. It has also been shown that the origin of migration flows determines immigrants' preferences for settling in rural or urban environments (Fullaondo and Roca 2007).

A final line of work in this field, which mirrors the approach taken in this paper, focuses on factors that influence the geographical location of immigration flows. In this regard, identified determinants of immigrants' location choices include mainly economic and social factors. Some analyses have shown that economic opportunities are not the most powerful force of attraction, but that ethnic communities composed of similar individuals have a greater influence on the immigrant population (O'Loughlin 1995; Clark 1996). Some studies have explored this factor further by differentiating the location patterns of immigrants in first (Borjas 2001; Zavodny 1999); and subsequent migrations within the host country (Åslund 2005; Funkhouser 2000). Moreover, most studies in the urban economics literature relating location, commuting and nationality focus on racial differences and possible social and occupational segregation (Crampton 1992; Crampton 1999).

The most complete studies on immigrant location factors in specific geographical areas have been carried out in the United States, Canada, Sweden and Denmark. Some of them have focused specifically on urban and metropolitan location patterns. In his study of Canada, Owusu (1999) underlines the importance of factors such as personal and cultural preferences, proximity to the ethnic group, the role of social identity, and the effects of actual or perceived discrimination in the housing market. Most studies on immigrants' location choices conducted in the United States argue that immigrants are attracted to large cities where other co-ethnic immigrants have settled before (Zavodny 1997; Jaeger 2000; Bauer et al. 2002, 2005). With regard to the United States, Åslund (2005) concluded that the presence of earlier immigrant communities is the primary determinant of recent immigrants' location choices. However, other studies have shown that labor market prospects are also determinants (Borjas 2001; Jaeger 2000). Migration theory predicts that immigrants will be drawn to regions with favorable income prospects. Studies in the United States, however, have found evidence that immigrants are sensitive to regional differences in labor market conditions, welfare eligibility and levels of benefits (Borjas 2001; Zavodny 1997; Jaeger 2000). For the case of Sweden, Åslund (2005) points to the main conclusions of studies in the United States, showing that the presence of co-ethnic groups and a large overall immigrant population have an impact on the initial location choice. The study also confirms the role of economic prospects in attracting immigrants.

This work aims to fill the void for studies which analyze the location patterns of immigrants in a comprehensive manner in a specific area of Southern Europe. With the exception of partial studies, the main determinants of immigrants' location patterns have not been analyzed in a comprehensive manner. The growing migration pressure in the region of Andalusia justifies the selection of this area, while its large population and socio-economic heterogeneity make this region an interesting field of

study. Our aim is to provide a comparative analysis of immigrants' location patterns in the region, and determine the most significant influences as well as differences with other geographical areas. Our analysis includes scarcely investigated variables such as the productive structure or the territorial nature of the host municipalities to contribute new standards of analysis to the literature on the subject.

Before proceeding with the analysis, some data are necessary to contextualize the region under study. The region of Andalusia (Spain) is situated on the southern tip of the Iberian Peninsula. It has an area of 87,268 square kilometers and a population of 8.4 million inhabitants (2016). Until 2006, the evolution of the labor market in Andalusia was marked by a decrease in unemployment rates due to economic growth. In that same year, the region achieved the lowest unemployment rates of the last three decades (12.68%), although it was still unable to absorb the full demand for labor due to the growth of the economically active population.

The rapid growth of international migration flows to Spain in the last decade can be defined as one of the most important demographic and social phenomena in Andalusian society (Lopez 2006; Arango 2006). Spanish immigration is a relatively new phenomenon (Reher and Silvestre 2009), this process reflects a transformation of migration flows characterized by the increasing prominence of Southern European countries that have traditionally been senders of migrant labor such as Italy and Greece as destination countries (King 2002; Carella and Pace 2001). Andalusia has become a pole of attraction for immigrants who perceive the region as an expanding area of a country with a high level of both economic and social well-being. To this we must add another set of pull factors such as the physical proximity to sender countries of North Africa, cultural links with Latin American countries and perceived employment opportunities transmitted through the exchange of information between co-ethnic groups, which also contributes to the so-called pull factor (Gutierrez 2003).

Andalusia has not been immune to the dramatic growth of the immigrant population registered in Spain in the last decade (Table 1). According to the latest data of the municipal register of inhabitants (2015), 727,176 foreigners (8.64% of the total population) currently reside in the region, of which almost half (49%) are non-EU nationals. According to the last census of immigrants in Spain, Andalusia is the region with the third highest number of foreign residents or registered foreigners, second only to Catalonia (1,053,293) and Madrid (838,976). Indeed, in just a decade, the foreign population registered in Andalusia grew by 343%. Our interest in analyzing the determinants of immigrants' location choices has arisen precisely from this dramatic growth in immigration flows. To this we must add the fact that Andalusia is a territorially diverse region in Southern Europe with major cities as well as coastal, mountain and inland areas, thus permitting us to compare and contrast immigrants' location patterns in the region.

Table 1. Evolution of the immigrant population registered in Spain and Andalusia. Weight relative to the total population. Period 2005–2015.

	Immigrant Population Andalusia	Immigrant Population Spain	Weight Immigrants/Total Population Andalusia	Weight Immigrants/Total Population Spain
2005	164,145	1,370,657	2.22%	3.33%
2011	531,827	4,519,554	6.60%	10.00%
2015	727,176	5,730,667	8.64%	12.15%
Increase 2005–2015	343.0%	318.1%		
Increase 2005–2011	224.1%	229.7%		
Increase 2011–2015	36.7%	26.8%		

Source: Municipal register of inhabitants. Data as of 1 January of each year.

2. Methods

To analyze the factors that influence immigrants' location patterns in Andalusia, we review the literature on this phenomenon in other geographical areas. We use data from municipal registers of immigrants and relate them to factors such as the size of the municipality, the pre-existing immigrant

population, the economic dynamism of the area, as well as the territorial characteristics and productive structure of the municipality. Special attention is given to these last two factors as they have been scarcely investigated in the literature. Our aim is not to analyze mobility patterns as such, but rather to draw a final picture of the process.

Municipal registers are a valid source of statistical data on immigrants' location patterns due to the accuracy of their records and the fact that data is broken down at the municipal level. Immigrants who have entered Spain make it a priority to register in the municipal register as it is a means of demonstrating proof of residence and gaining access to certain basic public services. In Spain, both illegal and legal migrants have access to medical services if they are in the Municipal register (Bradatan and Sandu 2012).

Although municipal-level data is used as a basis of reference in this study, we have aggregated the data into supra-municipal territorial units. We have chosen this alternative as the location assigned to immigrants may correspond to a territorial unit above the municipality level as a result of commuting or residence-work flows, especially in metropolitan areas. For example, the analysis of the relationship between the number of immigrants that have settled in a municipality and its productive structure could be biased by potential commuting when the workplace and place of residence are located in different municipalities. Neither the municipal mosaic for its excessive fragmentation, nor the provincial mosaic for its artificiality and small number are suitable for the proposed objectives (Rodríguez and Zoido 2001). To overcome this problem, we use the map proposed by Benabent (1998); an aggregation that is widely accepted in academia. The map divides Andalusia into 63 territorial units, which delimit an intermediate area between municipalities and provinces.

To analyze the relationship between the immigrant population located in the municipalities/territorial units and the structural factors described above, we employ two statistical methods: the linear correlation coefficient (LCC) and principal component analysis (PCA). LCC is used to determine the correlation between the factors described and the immigrant population. The absolute values of LCC range from 0 to 1, where 1 denotes the maximum correlation and 0 the minimum. When referred to the sign, the LCC takes values between -1 and +1. In this case the magnitude of the relationship is specified by the numerical value of the coefficient, where the sign denotes the direction of that value. Thus, a value of +1 is as strong as a value of -1. In the first case, the correlation is perfect positive, while in the second it is perfect negative. Once the correlation coefficient is calculated, it is necessary to determine whether this value indicates that the variables X and Y are truly related or the relationship is simply a random result. Therefore, we analyze the significance of the correlation coefficient. A correlation coefficient is said to be significant if it can be stated, with a certain probability, that it is different from zero. In statistical terms, the analysis of the significance of a correlation coefficient confirms the probability that the coefficient derives from a population whose value is zero. We consider two possible hypotheses: (1) H0: The correlation coefficient derives from a population whose correlation is zero ($p = 0$); and (2) H1: The correlation coefficient derives from a population whose correlation coefficient is non-zero ($p \neq 0$). Under the null hypothesis, the sampling distribution of correlations from a population characterized by a zero correlation follows a Student's t-distribution with n-2 degrees of freedom.

Moreover, we apply the PCA multivariate analysis technique to develop a synthetic indicator of economic dynamism. This indicator relates the number of immigrants in each of the 63 territorial units to the economic dynamism of the territorial units. This widely extended method permits transforming the original dimensions of a set of correlated p observed variables called original variables into a new set of uncorrelated m orthogonal variables known as principal components. Numerous works have discussed the statistical properties of PCA. According to Zoido and Caravaca (2005), compared to other multivariate procedures, this method overcomes specific problems in building a synthetic indicator.

Given that our goal is to measure the economic dynamism of the 63 territorial units of Andalusia as a determinant of immigrant location patterns, we have selected 11 variables grouped into four dimensions to build the synthetic indicator. The variables were selected following the contributions of previous works on measurements of internal imbalances in the region of Andalusia (Rodríguez and

Zoido 2001; Zoido and Caravaca 2005; Cabello and Torres 1999; Sánchez and Rodríguez 2003). These studies permitted us to determine which variables best reflect the economic dynamism in the region, as well as its internal imbalances. The availability of reliable and homogeneous statistical data at the municipal level was also a determining factor in the selection of variables.

Table 2 shows the partial indicators used to build the synthetic indicator of economic dynamism by PCA. Demographic growth was calculated as the percent variation among the resident population in each municipality in the years 2005 and 2011 and shows the capacity of a territory to attract inhabitants, which is a reflection of the opportunities it offers. Declared income per inhabitant is the most reliable indicator of personal income since it takes as a reference the income tax on wages, which is the main direct tax in Spain. It is estimated as the quotient between declared income in a municipality and the number of inhabitants in the municipality. The employment rates of the potentially active population (16–64 years) indicates the likelihood of finding employment in the area as it is defined as the quotient between the number of employed individuals and the potentially active population. Business dynamism refers to the business density per inhabitant and is the quotient between the number of active businesses in each municipality and the total population of the municipality. The number of productive properties per inhabitant (commercial, industrial, offices and the hotel industry), as well as the average value of these properties, provides information on the productive base of each municipality. The ratio of the number of bank branches per inhabitant is a complementary indicator of wealth. Finally, personal assets as a reflection of the opportunities the area offers is examined through the number of residential properties per inhabitant and their average property values. This is complemented by the number of vehicles per inhabitant. To show the penetration of new technologies, we have also considered number of ADSL lines per inhabitant. These data reflect the opportunities that a territory offers and hence its economic dynamism in an objective manner.

Table 2. Variables selected to measure economic dynamism in the 63 territorial units of Andalusia.

Variables	Source
Population Dynamics	
1. Population growth in 2004–2011	INE. Official population figures
Income and Employment	
2. Declared net income per inhabitant	Statistics Institute of Andalusia. SIMA
3. Employment rate of population aged 16–64	The author based on SEPE and INE data
Business and financial activity	
4. Number of businesses per inhabitant	Statistics Institute of Andalusia. SIMA
5. Number of productive properties per inhabitant	Land Registry Statistics Office
6. Average value of productive property according to land registry	Land Registry Statistics Office
7. Number of bank branches per inhabitant	Statistics Institute of Andalusia. SIMA
Personal Assets	
8. Number or residential properties per inhabitant	Land Registry Statistics Office
9. Average value of residential properties according to land registry	Land Registry Statistics Office
10. Number of vehicles per inhabitant	Statistics Institute of Andalusia. SIMA
11. Number of ADSL lines per inhabitant	Statistics Institute of Andalusia. SIMA

The exploratory analysis of the suitability of PCA to build the synthetic indicator is based on the correlation matrix and shows the level of association between two variables, eliminating the influence of third variables. Three tests are generally used to confirm the validity of PCA: the matrix determinant, Bartlett's test of sphericity and the Kaiser-Meyer-Olkin test (KMO). In this case, the determinant of the correlation matrix showed a value of 0.001. Given that the value is very close to zero, it indicates that the data are suitable to perform the analysis. Bartlett's test verifies the hypothesis that the correlation matrix is an identity matrix with "ones" on the main diagonal and that the remaining values are "null variables" using a chi-squared estimation, with a transformation of the correlation matrix. If the critical value is higher than 0.05, then the null hypothesis cannot be rejected. In our analysis,

the significance is maximum as it reaches the value 0.000. Hence, the null hypothesis can be rejected given the goodness of fit of the variables, which show high intercorrelations according to the PCA. Finally, the Kaiser-Meyer-Olkin (KMO) test compares the data of the correlation coefficients obtained in the correlation matrix with the correlations of the anti-image matrix, indicating the proportion of the variance that the variables have in common. The result was 0.672, which is a good value according to Kaiser (1974). For Kaiser (1974), factorial model results equal to or greater than 0.6 are acceptable. In conclusion, the tests applied to the correlation matrix confirm the suitability of applying PCA to our dataset.

To develop the indicator we used the SPSS v.15 statistical package, and rotated the factors by the Varimax method in order to obtain a better understanding of the components extracted. According to Cattel (1996) the factors that explain a relatively high percentage of the variance should be retained. Therefore, we extracted factors whose eigenvalues are greater than 1. In our study we obtained four components that meet this condition and explained over 75% of the variance, and eliminated only the less important factors. Table 3 shows the ordered factors as a function of the weights of the variables. The factors which have a higher correlation with each of the components are highlighted in the table.

Table 3. Matrix of rotated components ordered by factorial saturation.

	Factor 1	Factor 2	Factor 3	Factor 4
Number of ADSL lines per inhabitant	0.887	0.21	0.025	−0.014
Average value of productive properties according to land registry	0.856	−0.263	−0.097	−0.028
Declared net income per inhabitant	0.846	0.01	−0.158	−0.278
Average value of residential property according to land registry	0.83	−0.33	−0.031	0.078
Population growth 2000-2007	0.788	−0.073	0.271	0.06
Number of residential properties per inhabitant	−0.097	0.868	0.026	0.247
Number of bank branches per inhabitant	−0.164	0.641	0.522	0.271
Number of vehicles per inhabitant	0.172	0.046	0.824	0.171
Number of productive properties per inhabitant	−0.196	0.523	0.62	−0.265
Number of businesses per inhabitant	0.118	0.473	−0.035	0.806
Registered unemployment rate of population aged 16 to 64	−0.262	0.041	0.443	0.754

Source: The authors. Rotation method: Varimax with Kaiser normalisation. The rotation converged in 12 iterations.

Once the main components are identified, each factor is expressed as a linear combination of all the original variables and a value is obtained for each territorial unit considered. To do so, we use the coefficient matrix to calculate the factor scores, retaining the values by means of the regression method. The resulting estimates have a zero mean and variance equal to the square of the multiple correlations between the estimated factor scores and the true factor values. To construct the synthetic indicator of economic dynamism from the four factors extracted, weights must be assigned to each component. In our case, we use the percentage of variance explained by each factor as weights according to the following expression:

$$IS = \frac{\sum_{i=1}^{N} VAR\ (P_i) \times\ P_i}{\sum_{i=1}^{n} VAR\ (P_i)} \quad (1)$$

where P_i is the value of the component for each region, VAR (P_i) is the percentage of total variance explained by P_i and n is the number of components extracted (in our case four). By sorting the values of our synthetic indicator in descending order, we obtain the ranking of each territorial unit in Andalusia in terms of level of economic dynamism. Thus, territorial units with higher values are more economically dynamic than the other units, while the opposite occurs with the lowest values. In short, measuring economic dynamism through a synthetic indicator of proven reliability such as the one proposed here permits an association to be established between the number of immigrants and the economic dynamism of each territorial unit. This analysis, which is complemented by the other correlations, allows us to determine the factors that most influence the location choices of immigrants in the region of Andalusia.

3. Results

3.1. Economic Dynamism in Andalusia

The PCA has allowed us to characterise the economic dynamism of the 63 territorial units in which the region of Andalusia has been divided. The rationale for this analysis responds to the empirical evidence observed in previous studies, which has shown that the economic and labour conditions of certain areas is not a decisive factor in immigrants' location decisions, but is contingent upon other factors such as the presence of a pre-existing, co-ethnic community. The synthetic indicator constructed by PCA provides insight into the economic reality of the region.

In Table 4, the values of the synthetic indicator have been normalized from 0 to 100 (minimum and maximum) to facilitate the interpretation. The table shows the complete ranking of the 63 territorial units, as well as the codes for each territorial unit and the province to which the unit belongs. As regards the ranking in quartiles, the first quartile, which has a high level, includes five of the nine regional centers as defined in the POTA. Specifically, this quartile includes the capitals of Almeria, Granada, Huelva, Malaga and Seville and all the municipalities that comprise their urban areas, as well as the territorial units located on the coast of the provinces of Almeria, Granada, Huelva and Malaga, together with the central-north part of the province of Jaen. In 2011, 54.7% of the total population of Andalusia was concentrated in the territorial units included in the first quartile. None of the major urban areas of Andalusia are included in the fourth and lowest ranking of the synthetic indicator. In 2011, 12.3% of the population of Andalusia was concentrated in these units. The units that achieve a medium-high level (second quartile) are located next to the wealthiest territorial units, mainly around large urban areas and in coastal areas of the region. The same occurs with the territorial units in the medium-low level (third quartile), which are distributed around less developed units corresponding to mountain and inland areas within the region. Together, the units in the second and third quartile absorbed one-third of the population of Andalusia in 2011. This analysis highlights the existing disparities in economic dynamism in Andalusia since more than half of the population lives in the most economically active areas, which account for only 26.1% of the entire surface area of the region.

Table 4. Ranking of territorial units of Andalusia based on the results of the synthetic indicator of economic dynamism. 2011.

Ranking	Province	Territorial Unit	Synthetic Indicator	Ranking	Province	Territorial Unit	Synthetic Indicator
1	Malaga	Costa del Sol Occidental M6	100.00%	33	Seville	Écija S7	17.22%
2	Almeria	Levante Almeriense A3	70.86%	34	Cordoba	Subbético de Córdoba CO8	17.12%
3	Almería	Poniente Almeriense A7	57.36%	35	Granada	Alpujarra Granadina G9	15.61%
4	Granada	Vega de Granada G5	50.56%	36	Huelva	Sierra de Huelva H1	15.58%
5	Almeria	Almería-Campo de Níjar A6	46.70%	37	Cadiz	Campiña de Jerez CA2	15.07%
6	Málaga	Axarquía M5	45.27%	38	Granada	Poniente Granadino G4	15.03%
7	Jaen	Sierra de Segura J4	42.84%	39	Malaga	Serranía de Ronda M2	14.86%
8	Malaga	Málaga-Valle del Guadalhorce M4	41.89%	40	Granada	Guadix G6	14.59%
9	Jaen	Campiña de Jaén J1	40.93%	41	Jaen	Sierra Mágina J8	14.14%
10	Seville	Sevilla S5	37.96%	42	Seville	Sierra Morena de Sevilla S1	12.09%
11	Granada	Costa Granadina G10	35.53%	43	Cordoba	Palma del Río CO4	11.27%
12	Jaen	El Condado-Las Villas J3	35.36%	44	Cadiz	Bahía de Cádiz CA4	10.86%
13	Seville	Aljarafe S4	34.23%	45	Granada	Baza G3	10.80%
14	Jaen	La Loma J6	34.13%	46	Almeria	Alpujarra Almeriense A5	9.19%
15	Huelva	Huelva H5	30.58%	47	Seville	Vega de Sevilla S3	8.99%
16	Huelva	Costa Occidental H4	29.35%	48	Seville	Corredor de la Plata S2	8.03%
17	Cordoba	Córdoba CO5	29.01%	49	Jaen	Sierra Morena de Jaén J2	7.38%
18	Almeria	Alto Almanzora A2	28.12%	50	Seville	Campiñas de Morón and Marchena S9	6.39%
19	Jaen	Alcalá la Real J7	27.40%	51	Granada	Los Montes G2	6.15%
20	Almeria	Los Vélez A1	26.82%	52	Cordoba	Puente Genil CO6	5.43%
21	Malaga	Antequera M1	26.55%	53	Cordoba	Campiña de Baena CO7	5.09%
22	Jaen	Campiña Norte de Jaén J5	24.05%	54	Seville	Osuna S10	3.86%
23	Cadiz	Campo de Gribraltar CA6	23.51%	55	Cadiz	La Janda CA5	3.48%
24	Cadiz	Costa Noroeste de Cádiz CA1	22.82%	56	Cordoba	Valle del Guadiato CO_2	3.18%
25	Seville	Campiña de Carmona S6	21.66%	57	Granada	Huéscar G1	2.77%
26	Granada	Valle de Lecrín G8	21.42%	58	Almeria	Campo de Tavernas A4	2.53%
27	Malaga	Sierra de las Nieves M3	21.05%	59	Cordoba	Los Pedroches CO1	2.02%
28	Huelva	Condado H6	18.82%	60	Huelva	Cuenca Minera H2	1.84%
29	Jaen	Sierra de Cazorla J9	18.72%	61	Cadiz	Sierra de Cádiz CA3	1.84%
30	Seville	Estepa S11	18.45%	62	Seville	Bajo Guadalquivir S8	1.09%
31	Granada	Alhama-Temple G7	17.56%	63	Huelva	Andévalo H3	0.00%
32	Cordoba	Alto Guadalquivir de Córdoba CO3	17.39%				

Source: The authors. Interpretation: 0% = minimum value, 100% = maximum value.

3.2. Analysis of Factors that Determine Immigrants' Location Choices

We have divided the results of our analysis of location factors into two parts. First, we study the distribution of immigrants based on the characteristics of the municipality of residence, considering its size and territorial nature. Secondly, we discuss the correlations between the factors analyzed and the data related to the location choices of immigrants.

To study the correlation between population size and the number of immigrants that have settled in the area, we compare the number of immigrants that have settled in the area and the population of each individual municipality. We also analyze the presence of immigrants with reference to the territorial characteristics of the municipality as follows: mountain municipalities, inland municipalities and cities, regional centers, and coastal centers.

When examining the municipalities individually and the relationship between the total population and foreign residents, some clear conclusions can be drawn. As shown in Table 5, migration pressures are greater in municipalities with a population of 50,000 to 100,000 inhabitants, which are estimated to be 15.42%. The proportion of immigrants in these cities is considerably higher than that reported in larger municipalities such as the provincial capitals, which is similar to other areas outside Andalusia. In Andalusia, 30.28% of the immigrant population is concentrated in medium-sized municipalities compared with 19.16% in the major regional centers. This phenomenon may be due to the fact that immigrants settle in municipalities located in the metropolitan belts around the major regional centers of Andalusia, rather than in the municipality itself. These data show that migration pressures in municipalities with more than 100,000 inhabitants are comparable to municipalities with less than 50,000 inhabitants. Moreover, migration pressures in the main urban areas of Andalusia are similar to those reported in small settlements of less than 5000 inhabitants.

We completed the above analysis taking into account the territorial characteristics of the municipality where the immigrants reside. When grouping the immigrant population according to the four territorial units defined above, we found that 42.33% of the regional immigrant population is concentrated in the metropolitan areas of the main cities of Andalusia. This corroborates the hypothesis that lower migration pressures in large cities may be due to the fact that immigrants reside in the metropolitan area rather than in the city itself. An explanation for this could be the different ways immigrants access housing relative to other European or American environments. It is also interesting to note that 44.50% of the immigrant population settles in coastal areas, where their presence is much greater than in other areas of Andalusia. The migration pressure in coastal areas is 17.56%, far above the Andalusian average of 6.6%. We can therefore conclude that immigrants' location patterns are polarized in the metropolitan and coastal areas of Andalusia.

Table 5. Analysis of migration pressure by size of municipality (Andalusia, 2011).

Size of Municipality	Population	% Population	Immigrants	% Immigrants	Migration Pressure
<5000	934,611	11.60%	51.790	9.74%	5.53%
5000–20,000	1,775,761	22.04%	90.181	16.96%	4.88%
20,000–50,000	1,298,787	16.12%	78.536	14.77%	6.66%
50,000–150,000	1,838,650	22.82%	209.342	39.37%	21.83%
>150,000 inhab.	2,209,184	27.42%	101.879	19.16%	4.88%
Total Andalusia	8,056,993	100%	531.729	100%	6.60%
Location Type	**Population**	**% Population**	**Immigrants**	**% Immigrants**	**Migration Pressure**
Total Regional Centre	4,448,848	55.22%	225.078	42.33%	5.06%
Total Inland	1,353,932	16.80%	47.128	8.86%	3.48%
Total Mountain	906,452	11.25%	22.885	4.30%	2.52%
Total Coast	1,347,761	16.73%	236.638	44.50%	17.56%
Total Andalusia	8,056,993	100.00%	531.729	100.00%	6.60%

Source: Authors based on data from the municipal register of inhabitants.

After determining these first location patterns, we estimated the correlation between population size and the presence of foreigners, which was found to be 0.716 (Table 6). This correlation reveals that there is a positive relationship between population size and the presence of immigrants. However, as we pointed out above, this relationship is not complete as it becomes stronger in medium-sized municipalities. The correlation decreases to 0.642 when comparing the immigrant population in each of the 63 territorial units to the total population of the territorial unit rather than the population of each municipality.

In Andalusia, we find a strong correlation between the economic dynamism of the area and the immigrant population that has settled there. The degree of correlation between the economic dynamism of the territorial units and the immigrant population that has settled in them is 0.738, and remains significant. This comparison is based on the relationship between the immigrant population residing in each territorial unit, and the above synthetic indicator. This is the second most correlated factor among those analyzed, after the pre-existing immigrant community. However, similar to what has been found in other geographical areas outside Spain, economic dynamism is not the most decisive factor, since we have also found powerful evidence for the other location factors analysed, which will be discussed below.

According to economics literature, the existence of a pre-existing foreign community is one of the factors that has the greatest impact on the location choices of immigrants. Hence, new immigration flows will tend to settle in areas with a prior immigrant population. The analysis proposed to test this hypothesis refers to the year 2004, and the number of new immigrants that settle in the 63 territorial units in the period 2004–2011. In this case, the correlation between the factors was maximum (0.877). Complementarily, the analysis of the correlations between migratory pressure defined as the percentage of immigrants compared to the total population and the new flows of immigrants indicates a higher correlation than that determined from the number of immigrants that make up the pre-existing immigrant community. In consequence not only is the number of immigrants important, their relative importance in the local community matters too. In other words, there is an almost perfect relationship between the baseline situation and the direction of new flows, the strongest correlation among those considered. These findings highlight that there is a significant relationship between a pre-existing immigrant community and the location choices of new immigration flows. We find that this correlation is stronger when considering the 63 territorial units rather than individual municipalities. Together with the findings of the previous analysis, this reinforces the idea that location choices respond more to territorial than municipal criteria.

The last location factor analysed focuses on the productive structure of the territorial units. This analysis examined whether there was a relationship between the location patterns of immigrants and the predominant activities in these areas since, as noted in previous works, the location of immigrants in rural or urban areas is strongly influenced by the type of labour demanded. The use of 63 territorial units instead of individual municipalities permits us to obtain homogeneous groups that capture immigrants' place of residence and work since it is more likely that a worker will commute daily between municipalities than between different territorial units as a result of living and working in different locations. The analysis was performed using municipal-level aggregate data provided by the Ministry of Labour and Immigration and the General Treasury of the Social Security Administration. These data provide information about the number of active workers in agriculture, construction, industry and services and hence the productive structure of the municipality. Although the correlation is not very strong, the data reveal that areas with a productive structure that is more oriented towards the service and construction sectors are more likely to attract migratory flows. In the case of areas specialised in agriculture, the opposite trend occurs. Although it might be thought that agriculture attracts immigration flows, we have observed this phenomenon in only a few territorial units with very special characteristics. The dynamics of agricultural production mean that labour, particularly that related to intensive harvesting, is required only at certain times of the year. Because immigrants rotate among the different areas in Andalusia depending on crop harvesting needs and work only

on a sporadic basis, they do not register in these municipalities. This explains the inverse correlation between migration and specialisation in agricultural activities. As regards the presence of industrial activities, we did not find enough evidence to draw conclusions.

Table 6. Strength of correlation between the immigrant population and the factors studied.

Comparison Factor	LCC	Error Probability	Validity
Economic dynamism territorial units	0.738	0.0000	YES
Population territorial units	0.643	0.0000	YES
Population municipalities	0.716	0.0000	YES
Pre-existing community territorial units	0.877	0.0000	YES
Pre-existing community municipalities	0.769	0.0000	YES
Migration pressure municipalities	0.887	0.000	YES
Specialisation agriculture	−0.542	0.0000	YES
Specialisation industry	−0.105	0.4197	NO
Specialisation construction	0.473	0.0001	YES
Specialisation services	0.555	0.0000	YES

4. Conclusions

From the empirical evidence analyzed, we can conclude that the main location patterns of immigrants in the region of Andalusia follow a very similar trend to those observed in geographical areas of northern Europe and the United States. However, we have detected specific characteristics that may be related to the labor and social model characterizing this region of southern Europe as has been postulated in the literature reviewed. This similarity is especially true with regard to the importance of a pre-existing immigrant community as a determinant in attracting new immigration flows. We found an almost perfect relationship between the baseline situation and the direction of new immigrant flows in Andalusia. This correlation is stronger when considering the 63 supra-municipal territorial units in which we have divided Andalusia compared with the correlation for municipal data. This reinforces the idea that, in line with the rest of analysis, location choices respond more to territorial than municipal criteria.

As regards the hypothesis that wealth and employment rates are not determinants of the location decisions of immigration flows, we have found a strong correlation between economic dynamism in the area where immigrants reside and the immigrant population that has settled there. However, as found in other geographical areas outside Spain, economic dynamism is not the most important determinant, since as stated above, we have found more powerful evidence for the other location factors analyzed, namely a pre-existing immigrant community.

With respect to the characteristics of the host municipalities, we found that medium-sized municipalities are exposed to stronger migration pressures. This phenomenon may be due to the fact that immigrants settle in municipalities located in metropolitan belts around the major regional centers of Andalusia, rather than in the municipality itself as a result of better access to housing. Moreover, migration pressures in the main urban areas of Andalusia are similar to those reported for small settlements. This is one of the main differences with regard to the evidence found in other studies. We also found that 42.33% of the regional immigrant population is concentrated in the metropolitan areas of large Andalusian cities, thus corroborating the hypothesis that lower migration pressures in major cities are due to the fact that immigrants reside in localities in the metropolitan areas of these cities. We have also observed that 44.50% of the immigrant population settles in coastal areas, far higher than its population weight. The migration pressure in these areas is 17.56%, high above the Andalusian average of 6.6%. Thus, immigration in Andalusia is practically polarized in metropolitan areas and on the Andalusian coast.

The final location factor analyzed, productive structure, shows how areas in which the weight of the services and construction sectors is greater are more likely to attract migration flows. In the case of areas specialized in agriculture the opposite phenomenon occurs. While it has been argued that

immigrants are attracted to agricultural areas, we have observed this pattern for only a few territorial units. Indeed, the dynamics of agricultural production means that labor, particularly that related to intensive harvesting, is required at certain times of the year so immigrants fail to register in the municipalities where they work on a sporadic basis. This explains the inverse correlation between migration and specialization in agricultural activities.

The authors attempted to develop complementary analyses, but limitations were found. For instance, it is not possible to find disaggregated municipal data based on the nationality of immigrants nor access data of internal mobility patterns once the immigrants have arrived at their destination. Since immigrants must enroll in the official registry considered by this study (Municipal Register) to be able to access to the municipal services, the authors opted to consider their current residence as the analysis criteria. We would rather restrict the use of the data to that available at the municipal level, which we trust. The authors have already begun to develop a specific survey for immigrants that would allow us to carry out conditioned analyses since the current database would not generate reliable data in this context. We have tried, but the results were not significant. Therefore, the new survey would allow continuing in this line of work, while also completing and improving it. This study must be completed since the authors have observed new patterns in the last few years such as the growth of the number of immigrants in areas with a higher specialization in agricultural activities, a sector that has been able to resist the crisis better than others. It is also relevant that many groups of immigrants have been returning to their home countries.

Acknowledgments: This research was supported by the Government of Andalusia, Spain (SEJ-393), we gratefully acknowledges the financial support.

Author Contributions: José María Martín designed the study, analyzed the data and wrote the manuscript; Juan de Dios Jimenez provided good advice throughout the paper.

Conflicts of Interest: The authors declare no conflict of interest.

References

Antolin, Pablo, and Olympia Bover. 1997. Regional Migration in Spain: The effect of Personal Characteristics and of Unemployment, Wage and House Price Differentials Using Pooled Cross-sections. *Oxford Bulletin of Economics and Statistics* 59: 215–35. [CrossRef] [PubMed]

Arango, Joaquin. 2006. La Inmigración en España a Comienzos del siglo *XXI*. In *Informe Sobre la Situación Demográfica en España*. Madrid: Fundación Fernando Abril Martorell.

Arbaci, Sara. 2004. Southern European Multiethnic Cities and the Enduring Housing Crisis: Framing the Urban and Residential Insertion of Immigrants. Paper presented at the ENHR Conference, Cambridge, UK, July 2–6.

Åslund, Olof. 2005. Now and forever? Initial and Subsequent Location Choices of Immigrants. *Regional Science and Urban Economics* 35: 141–65. [CrossRef]

Bauer, Thomas K., Gil S. Epstein, and Ira N. Gang. 2002. "Herd Effects or Migration Networks? The Location Choice of Mexican Immigrants in the U.S." IZA Discussion Paper No. 551, the Institute for the Study of Labor (IZA), Bonn, Germany. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=327560 (accessed on 24 May 2017).

Bauer, Thomas K., Gil S. Epstein, and Ira N. Gang. 2005. Enclaves, Language and the Location Choice of Immigrants. *Journal Popular Economics* 18: 649–62. [CrossRef]

Bayona, José. 2007. La Segregación Residencia de la Población Extranjera en Barcelona. Una Segregación Fragmentada? *Scripta Nova* 9: 235.

Benabent, Manuel. 1998. *Estudio Territorial para la Delimitación de Ámbitos Comarcales en Andalucía*. Sevilla: Junta de Andalucía.

Borjas, George J. 2001. Does Immigration Grease the Wheels of the Labour Market? *Brookings Papers on Economic Activity* 2001: 69–133. [CrossRef]

Bradatan, Cristina E., and Dumitru Sandu. 2012. Before Crisis: Gender and Economic Outcomes of the Two Largest Immigrant Communities in Spain. *International Migration Review* 46: 212–43. [CrossRef]

Cabello, Francisco, and José L. Torres. 1999. Estructura Productiva y Crecimiento en Andalucía. *Boletín Económico de Andalucía* 25: 153–72.

Carella, Maria, and Roberta Pace. 2001. Some Migration Dynamics Specifics to Southern Europe: South-North and East-West Axis. *International Migration* 39: 63–99. [CrossRef]

Cattel, Raymond B. 1996. The Scree Test for the Lumber of Factors. *Multivariate Behavioral Research* 1: 245–76. [CrossRef] [PubMed]

Checa, Juan C., and Ángeles Arjona. 2006. Ecología Factorial en Roquetas de Mar (Almería). La Importancia de las Migraciones en la Configuración Socioespacial. *Scripta Nova* 10: 219.

Clark, William A. V. 1996. Scale Effects in International Migration to the United States. *Regional Studies* 30: 589–600. [CrossRef] [PubMed]

Crampton, Graham R. 1992. *Urban Structure and the Labour Market: Worker Mobility, Commuting and Underemployment in Cities*. Oxford: Clarendon Press Oxford.

Crampton, Graham R. 1999. *Urban Labour Markets. Handbook of Regional and Urban Economics*. Amsterdam: Applied Urban Economics.

De la Fuente, Angel. 1999. La Dinámica Territorial de la Población Española: Un Panorama y Algunos Resultados Provisionales. *Revista de Economía Aplicada* 7: 53–108.

Díez, Juan. 2005. *Las dos Caras de la Inmigración*. Madrid: Ministerio de T.A.S.

Fullaondo, Arkaitz. 2003. *Análisis de la Distribución Territorial de la Inmigración Extranjera en Barcelona*. Barcelona: CPSV.

Fullaondo, Arkaitz, and Josep Roca. 2007. La Distribución de la Inmigración Extranjera dentro de la Estructura Socio-residencial del Área Metropolitana de Barcelona. Paper presented at the 5th Congreso Nacional Sobre Inmigración en España, Barcelona, Spain, June 15.

Funkhouser, Edward. 2000. Changes in the Geographic Concentration and Location of Residence of Immigrants. *International Migration Review* 34: 489–510. [CrossRef]

Gutierrez, José A. 2003. Notas sobre la Desigual Distribución de los Inmigrantes en España. *Papeles de Geografía* 37: 65–75.

Izquierdo, Antonio. 2002. *Panorama de la Inmigración en España al Alba del Siglo XXI, Procesos Migratorios, Economía y Personas*. Almería: Instituto de Estudios Cajamar.

Jaeger, David A. 2000. Local Labour Markets, Admission Categories, and Immigrant Location Choice. In *Mimeo. Hunter College and Graduate School*. New York: CUNY.

Juarez, Juan P. 2000. Analisis of Interregional Labor Migration in Spain Using Gross Flows. *Journal of Regional Science* 40: 377–99. [CrossRef]

Kaiser, Henry F. 1974. An Index of Factorial Simplicity. *Psychometrika* 39: 30–45. [CrossRef]

King, Russell. 2002. Toward a New Map of European Migration. *International Journal of Population Geography* 8: 89–106. [CrossRef]

Kritz, Mary M., and June M. Nogle. 1994. Nativity Concentration and Internal Migration among the Foreign-Born. *Demography* 31: 509–24. [CrossRef] [PubMed]

Leal, Jesús. 2007. Cambios en la Morfología Social de las Grandes Ciudades Españolas: Apuntes para una Investigación. *Arquitectura, Ciudad y Entorno* 3: 153–62.

Lopez, Daniel. 2006. El Impacto de la Inmigración Extranjera en las Regiones Españolas. In *Análisis Territorial de la Demografía Española*. Madrid: Fundación F. Abril Martorell.

Malheiros, Jorge. 2002. Ethnicities: Residential patterns in the Northern European and Mediterranean Metropolises-Implication for Policy Design. *International Journal of Population Geography* 8: 107–34. [CrossRef]

Martí, Mónica, and Carmen Ródenas. 2004. Migrantes y Migraciones: De Nuevo la Divergencia en las Fuentes Estadísticas. *Estadística Española* 156: 293–321.

Moore, Eric G., and Mark W. Rosenberg. 1995. Modelling Migration Flows of Immigrant Groups in Canada. *Environment and Planning* 27: 699–714. [CrossRef]

O'Loughlin, John. 1995. The Geographic Distribution of Foreigners in West Germany. *Regional Studies* 19: 365–77. [CrossRef] [PubMed]

Owusu, Thomas Y. 1999. Residential Patterns and Housing Choices of Ghanaian Immigrants in Toronto, Canada. *Housing Studies* 14: 77–97. [CrossRef]

Reher, David S., and Javier Silvestre. 2009. Internal Migration Patterns of Foreignborn Immigrants in a Country of Recent Mass Immigration: Evidence from New Micro Data for Spain. *International Migration Review* 43: 815–49. [CrossRef]

Rephann, Terance J., and Coomaren Vencatasawmy. 1999. Determinants of the Spatial Mobility of Immigrants in Sweden. Paper presented at the 38th Annual Southern Regional Science Association Meeting in Richmond, VA, USA, April 15.

Rodríguez, Francico, and Florencio Zoido. 2001. Desarrollo Territorial y Evaluación de la Diversidad y la Desigualdad Intrarregional: Una Aproximación desde Andalucía. *Boletín de la Asociación de Geógrafos Españoles* 32: 113–25.

Sánchez, María A., and Noelia Rodríguez. 2003. El Bienestar Social en los Municipios Andaluces en 1999. *Revista Asturiana de Economía* 27: 99–119.

Zavodny, Madeline. 1997. Welfare and the Locational Choices of new Immigrants. *Federal Reserve Bank of Dallas Economic Review* QII: 2–10.

Zavodny, Madeline. 1999. Determinants of Recent Immigrants' locational Choices. *International Migration Review* 33: 1014–30. [CrossRef]

Zoido, Florencio, and Ignacio Caravaca. 2005. *Segundo I.D.T.A.* Sevilla: Secretariado de Publicaciones de la Universidad de Sevilla.