Looking Beyond the Influence of Origin and Destination Factors: The Role of Spillovers in Migration from Spain to Europe

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Abstract

This paper analyses the factors involved in out-migration of the working-age native population from Spain to European countries during and after the Great Recession (2008 – 2016), accounting for the role of spatial spillovers through a spatial panel Durbin model. Furthermore, the study provides a comparative analysis between young and adult out-migrants to explore whether they hold different motivations. The findings reveal that out-migration of natives responded mainly to labour incentives and social protection expenditure, although the presence of amenities also mattered. Furthermore, they point to the relevance of social networks of former Spanish out-migrants residing in Europe as a pull factor, being this effect higher for young than for adult out-migrants. Finally, results disclose, regardless of the age group, the existence of very remarkable spatial spillovers.

Keywords: *out-migration, natives, Spain, Great Recession, spatial spillovers*

JEL Classification: C23, F22, O15

Introduction

In today's globalised world, it is patently clear that the negative consequences of an economic crisis, such as the one the world faced in 2008, spread beyond national boundaries and are bound to affect different aspects of society. In this context, international migration is far from being an exception. Indeed, as postulated by the neoclassical theory, migration across countries is likely to occur at times of recession. As it is obvious, countries most severely hit by the downturn are expected to expel population, while countries with more prosperous economies

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are more likely to receive immigrants from abroad (González-Ferrer and Moreno--Fuentes, 2017).

Looking around Europe, it is interesting to stress that although the Great Recession seriously affected every single country, it did so with different intensity. The southern European countries were by far the most heavily impacted. Among them, the case of Spain is especially salient, as it suffered the largest increases in unemployment. Specifically, the unemployment rate in Spain rocketed from 8.2% in 2007 to a peak of 26.1% in 2013; after this year, it began to decrease, and in 2016, it was 19.6%.[1] Additionally, it is also important to highlight the severe impact of the crisis on young labour opportunities. According to figures from Eurostat, the youth unemployment rate (people aged 15 – 24) was 18.1% in the year 2007, reaching its highest level (55.5%) in 2013; from then on, and despite the weak economic recovery, it has remained notably high (44.4% in 2016). The massive levels of unemployment and the limited capacity of families to cope with the crisis placed many Spaniards, especially young ones, in a difficult situation (González-Ferrer and Moreno-Fuentes, 2017). As a result, many people found themselves somewhat forced to move abroad in search of better labour opportunities. Not only this, in processes of social change and transformation such as the one we are going through, other movements apart from those of economic nature are taking place.

Against this backdrop, this paper is aimed at analysing the main factors behind the out-migration of working-age natives (aged between 16 and 64 years) from Spain to European countries during and after the crisis (2008 – 2016); for reasons given above related to the vulnerability of youth to unemployment, our sample was split between young (16 – 34 years) and adult (35 – 64 years) people. There are important and linked reasons why we chose this case study. First, we decided to consider only native population since data on outflows for Spanish nationals are more reliable and complete than those of non-nationals. In addition, return migration, due to its idiosyncratic traits, would add a strong bias to the sample: out-migration and return migration should not be mixed in the same basket. Second, we decided to only address flows from Spain towards Europe for two reasons: 1) As we will see in the next section, more than half of the native population leaving Spain during the crisis moved to European countries, especially to northern ones where the consequences of the slump were not as devastating. 2) Migrants towards American countries – another important destination – were mostly citizens with dual nationality, so that once again return migration is likely predominant. In short, our decisions about the group of people (natives)

[1] Job losses during the recession were concentrated in four major sectors: manufacturing, financial services, travel-related services and, above all, construction.

and destination countries (European ones) provide, in our view, a relatively free of bias as well as representative enough sample.

By doing this, the paper tries to fill a gap in the literature on migration and economic cycles. Despite the emergence in recent years of a new strand of research specifically investigating the impact of the global recession on international migration flows worldwide (Castles and Vezzoli, 2009; Fix et al., 2009; Hatton and Williamson, 2009; Martin, 2009; Papademetriou and Terrazas, 2009; Findlay, Geddes and Mccollum, 2010; Green and Winters, 2010; Koehler et al., 2010; Tilly, 2011), there is still scant research in this field for Spain (Larramona, 2013; Izquierdo, Jimeno and Lacuesta, 2016; González-Ferrer and Moreno--Fuentes, 2017; Bermudez and Brey, 2017; Pérez-Caramés, 2017; Amuedo-Dorantes and Pozo, 2018). To be more precise, only two of these papers adopt an empirical approach to analyse different aspects of out-migration patterns. The first one, by Larramona (2013), differs from this article in that it analyses foreign--born population. By using data from the Residential Variations Statistics (RVS) database over the period 2002 – 2009, it distinguishes between return and non--return out-migration. The second one is the study by Izquierdo, Jimeno and Lacuesta (2016), which compares natives and foreigners' out-migration flows. It shows that the sensitivity of migration to unemployment is similar between them, as well as highlights the rapid creation of networks of Spaniards abroad as one of the main factors explaining out-migration.

Another important contribution of this paper lies in methodological issues. As far as we know, it is the first paper, regardless of the case study, analysing the effects of the Great Recession on international migration patterns by employing spatial econometric techniques. Surprising as it may sound, the role of the geographic location and spatial spillovers in shaping migrants' behaviour remains an open question in the literature, the present paper trying to contribute filling this research gap by employing a spatial panel Durbin model (SDM). This is important for different reasons. On the one hand, since the omission of spatial dependence can result in biased, inconsistent or inefficient estimates (LeSage and Pace, 2009). On the other hand, because assuming bilateral independence when estimating origin-destination flows represents an important drawback: migration flows not only depend on push/pull factors in the country of origin/destination, but also on these factors in the rest of potential destinations (LeSage and Pace, 2008).[2] In this vein, the inclusion of spatially lagged independent variables in the model allows us to test for the presence of spatial spillovers.

[2] See, for instance, the paper by Balaz and Karasová (2017) analysing spatial patterns in intra-European migration. The authors consider the system of the intra-European network as a specific substructure of the world migration system.

The remainder of the paper is structured as follows. Section 1 offers an overview of the phenomenon of out-migration of natives from Spain to Europe. Section 2 specifies the model and presents the results obtained for the total sample and its disaggregation by ages. The paper ends by outlining the main conclusions.

1. Out-migration from Spain: An Overview

In this section, we present a quick overview of the out-migration of the working-age native population (henceforth natives) in Spain during the Great Recession and its aftermath. Data were taken from the Residential Variations Statistics (RVS) database published by the Spanish National Statistics Institute (INE in the Spanish acronym). It is constructed based on the information regarding registrations and de-registrations due to changes of residence recorded in the Spanish population register (Municipal Register), giving rise to annual residential balances because of movements from or to foreign countries.

The RVS has, in any case, an important limitation. Some people may leave the country without de-registering since, as indicated by Izquierdo, Jimeno and Lacuesta (2016), only permanent out-migrants have real incentives to do it. Therefore, we must admit that our insight is limited – temporary mobility is mostly not included in the sample[3] – and our findings refer mainly to permanent migration which, on the other side, is no doubt the most important one for both sending and receiving countries (Portes, 2010). Despite this drawback, the RVS constitutes a reliable source of information to estimate out-migration of natives from Spain. Martí and Ródenas (2004) proved, for instance, that the RVS is preferred to alternative sources (Migration Survey) which further underestimate mobility.

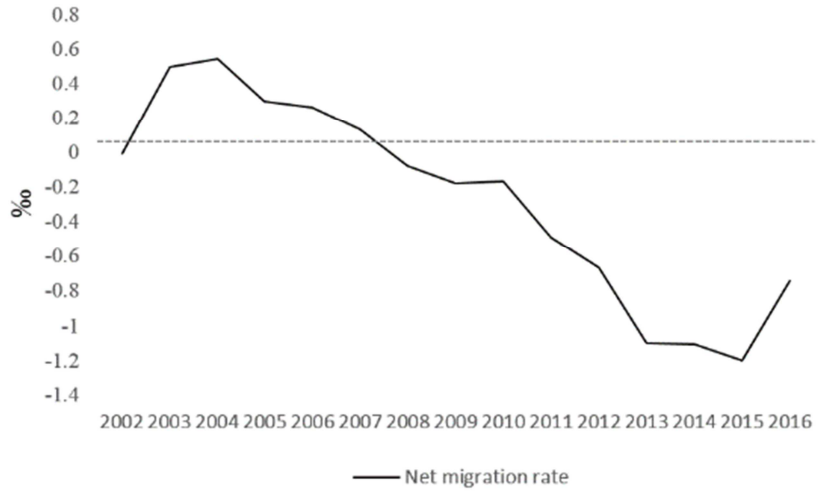
Bearing these considerations in mind, to gain a first insight into the impact of the change in the business cycle on migration patterns is pertinent to take a first look at the evolution of the net migration rate (‰)[4] of the natives over a longer period, 2002 – 2016 in this case (Figure 1). As can be seen, the eruption of the economic crisis marked a turning point in the net external migration balance: it turned from positive to negative in 2008. That is, over the years 2002 to 2007, in-migration was higher than out-migration; however, since the burst of the crisis outflows surpassed inflows. This fact, apart from clearly showing the relevance of the crisis, provides additional support for the choice of 2008 as the starting point of our analysis.

[3] Especially from 2013 because the registration in the destination country implies the loss of entitlement to free public health care (González-Enríquez and Martínez-Romera, 2017).

[4] It is computed as the net migration (immigration – emigration) of natives aged 16 – 64 from Spain divided by the Spanish population in that age group.

Figure 1

Net Migration Rate of Natives (2002 – 2016)



Source: INE.

Focusing now on outflows, Table 1 reports the evolution of out-migration (flows and rates) of natives from Spain over the years 2008 – 2016. The first two columns reveal that flows rose steadily from 2010, the rate[5] reaching a value of 2.6‰ in 2015. It is worth noting that when considering flows disaggregated by continent of destination, on average 51.5% of natives migrated to Europe, 39.2% to America and only around 5%, 3% and 1% to Asia, Africa, and Oceania, respectively. As for Europe, out-migration was 12,915 in 2008 and increased to 35,705 in 2016; accordingly, the rate was in 2016 three times as high as it was in 2008 (1.32‰ and 0.47‰, respectively). In the case of America, the flow has continuously increased from 8,379 (2008) to 27,261 (2016); as mentioned in the introduction, return migration is one of the factors explaining such a noticeable growth. Migration to Africa and Asia has not followed the same pattern over time, with many ups and downs. As for Oceania, although very scarce, it rose steadily since the year 2009.

Considering out-migration disaggregated by age groups, it can be seen that the flow of young natives surpassed that of adults in the first three years of the crisis, while the opposite happened from 2011 onward. When expressed in terms of rates, however, it can be said that out-migration was more intense among the young population over the whole period under study, almost doubling that for adults. Higher unemployment rates, as well as the lack of family responsibilities because of their age, might be tentative explanations behind this finding.

[5] Outflows of natives aged 16 – 64 from Spain divided by the Spanish population in that age group.

Table 1

Out-migration of Natives during the Great Recession (2008 – 2016)

			Distribution per continent of destination										Distribution by age groups			
			Europe		*Africa*		*America*		*Asia*		*Oceania*		*Youth (16 – 34 years)*		*Adults (35 – 64 years)*	
Year	Flow	Rate (‰)	Flow	Rate (‰)	Flow	Rate (‰)	Flow	Rate (‰)	Flow	Rate (‰)	Flow	Rate (‰)	Flow	Rate (‰)	Flow	Rate (‰)
2008	24,126	0.887	12,915	0.475	1,216	0.045	8,379	0.308	1,368	0.050	245	0.009	13,083	1.269	11,043	0.654
2009	23,792	0.875	12,550	0.462	1,240	0.046	8,444	0.311	1,327	0.049	231	0.008	12,498	1.241	11,294	0.660
2010	26,242	0.966	14,374	0.529	1,223	0.045	8,848	0.326	1,460	0.054	335	0.012	13,404	1.367	12,838	0.739
2011	38,980	1.437	21,123	0.779	1,606	0.059	13,404	0.494	2,451	0.090	391	0.014	19,038	1.998	19,942	1.133
2012	40,713	1.505	21,121	0.781	1,191	0.044	15,770	0.583	2,167	0.080	460	0.017	20,286	2.201	20,427	1.145
2013	52,745	1.956	26,015	0.965	1,319	0.049	22,178	0.823	2,697	0.100	534	0.020	25,474	2.856	27,271	1.511
2014	59,984	2.227	30,430	1.130	1,266	0.047	24,917	0.925	2,802	0.104	565	0.021	29,560	3.397	30,424	1.669
2015	71,492	2.656	35,271	1.311	1,549	0.058	30,093	1.118	3,806	0.141	767	0.028	34,554	4.065	36,938	2.006
2016	68,347	2.544	35,705	1.329	1,397	0.052	27,261	1.015	3,218	0.120	765	0.028	32,706	3.935	35,641	1.921

Source: INE.

Table 2

Out-migration to Europe (2008 – 2016). Rates (‰)

	2008			2010			2012			2014			2016		
Countries	*Natives*	*Youth*	*Adults*	*Natives*	*Youth*	*Adults*	*Natives*	*Youth*	*Adults*	*Natives*	*Youth*	*Adults*	*Natives*	*Youth*	*Adults*
United Kingdom	0.1195	0.2202	0.0580	0.1420	0.2527	0.0795	0.1969	0.3668	0.1092	0.2960	0.5744	0.1631	0.3938	0.7285	0.2439
France	0.0808	0.1153	0.0598	0.0966	0.1309	0.0772	0.1446	0.2094	0.1110	0.2180	0.3145	0.1720	0.2393	0.3539	0.1880
Germany	0.0639	0.0972	0.0435	0.0699	0.1035	0.0509	0.1329	0.2239	0.0859	0.2219	0.4115	0.1314	0.2453	0.4574	0.1503
Switzerland	0.0381	0.0488	0.0316	0.0494	0.0632	0.0416	0.0878	0.1230	0.0696	0.1016	0.1505	0.0782	0.1261	0.1943	0.0956
Belgium	0.0284	0.0309	0.0269	0.0375	0.0431	0.0343	0.0528	0.0621	0.0480	0.0629	0.0897	0.0500	0.0536	0.0753	0.0439
Netherlands	0.0223	0.0367	0.0135	0.0187	0.0311	0.0116	0.0249	0.0451	0.0144	0.0391	0.0708	0.0240	0.0420	0.0774	0.0261
Italy	0.0245	0.0359	0.0175	0.0223	0.0322	0.0167	0.0234	0.0339	0.0180	0.0270	0.0404	0.0206	0.0340	0.0507	0.0265
Ireland	0.0174	0.0375	0.0051	0.0139	0.0295	0.0051	0.0149	0.0280	0.0081	0.0245	0.0483	0.0132	0.0265	0.0541	0.0142
Portugal	0.0130	0.0181	0.0099	0.0133	0.0162	0.0116	0.0154	0.0200	0.0131	0.0143	0.0162	0.0133	0.0177	0.0227	0.0154
Sweden	0.0044	0.0071	0.0028	0.0084	0.0140	0.0052	0.0101	0.0170	0.0065	0.0166	0.0265	0.0118	0.0209	0.0395	0.0126
Austria	0.0050	0.0097	0.0022	0.0054	0.0083	0.0038	0.0110	0.0217	0.0055	0.0156	0.0323	0.0076	0.0156	0.3020	0.0091
Norway	0.0048	0.0090	0.0022	0.0049	0.0082	0.0030	0.0088	0.0151	0.0055	0.0146	0.0250	0.0095	0.0181	0.0306	0.0125
Denmark	0.0042	0.0084	0.0015	0.0048	0.0095	0.0022	0.0057	0.0112	0.0028	0.0087	0.0151	0.0056	0.0127	0.0270	0.0064
Luxembourg	0.0037	0.0053	0.0027	0.0005	0.0007	0.0003	0.0052	0.0081	0.0036	0.0055	0.0084	0.0042	0.0103	0.0161	0.0078
Finland	0.0028	0.0057	0.0011	0.0024	0.0048	0.0010	0.0033	0.0071	0.0013	0.0062	0.0133	0.0028	0.0043	0.0085	0.0024
Poland	0.0024	0.0037	0.0017	0.0025	0.0040	0.0017	0.0039	0.0071	0.0023	0.0048	0.0094	0.0026	0.0079	0.0154	0.0045
Czech Republic	0.0014	0.0019	0.0010	0.0026	0.0046	0.0014	0.0026	0.0042	0.0018	0.0030	0.0062	0.0015	0.0041	0.0096	0.0016
Romania	0.0031	0.0044	0.0023	0.0020	0.0018	0.0020	0.0017	0.0015	0.0017	0.0017	0.0010	0.0021	0.0012	0.0014	0.0011
Hungary	0.0034	0.0077	0.0008	0.0014	0.0023	0.0009	0.0011	0.0021	0.0006	0.0018	0.0031	0.0012	0.0018	0.0040	0.0009
Greece	0.0020	0.0023	0.0018	0.0017	0.0020	0.0014	0.0011	0.0013	0.0010	0.0022	0.0036	0.0015	0.0017	0.0028	0.0012
Malta	0.0002	0.0003	0.0002	0.0000	0.0001	0.0000	0.0013	0.0027	0.0006	0.0028	0.0062	0.0012	0.0040	0.0088	0.0019
Bulgaria	0.0019	0.0021	0.0018	0.0012	0.0021	0.0006	0.0009	0.0007	0.0011	0.0008	0.0014	0.0005	0.0015	0.0023	0.0011
Slovakia	0.0004	0.0006	0.0002	0.0003	0.0006	0.0002	0.0007	0.0011	0.0005	0.0011	0.0022	0.0006	0.0013	0.0026	0.0006
Lithuania	0.0007	0.0012	0.0005	0.0007	0.0012	0.0005	0.0005	0.0012	0.0001	0.0009	0.0023	0.0002	0.0005	0.0011	0.0003
Estonia	0.0004	0.0009	0.0002	0.0000	0.0000	0.0001	0.0003	0.0004	0.0002	0.0006	0.0013	0.0003	0.0007	0.0017	0.0003
Latvia	0.0040	0.0005	0.0004	0.0001	0.0003	0.0001	0.0003	0.0004	0.0002	0.0006	0.0014	0.0002	0.0004	0.0007	0.0003
Cyprus	0.0003	0.0003	0.0002	0.0001	0.0004	0.0000	0.0004	0.0008	0.0002	0.0004	0.0009	0.0002	0.0008	0.0017	0.0004
Slovenia	0.0003	0.0006	0.0002	0.0002	0.0002	0.0002	0.0004	0.0008	0.0002	0.0006	0.0013	0.0003	0.0003	0.0004	0.0003

Source: INE.

Now, we shift our attention to the distribution of natives leaving Spain among the sample of countries we are going to include in the below empirical analysis. It comprises the EU-27 members, except Spain for obvious reasons, together with Switzerland and Norway given the importance of the flows received by these two countries. Table 2 shows the corresponding out-migration rates over the period 2008 – 2016 (for the sake of space, we present them only for even-numbered years). As can be appreciated, the United Kingdom had the highest one, both for young and adult natives. France and Germany, followed by Switzerland also registered remarkable rates. On the other hand, the Baltic countries (Estonia, Latvia, and Lithuania) together with Slovakia, Slovenia, Bulgaria, and Cyprus presented the lowest ones.

Finally, to get a geographical view, Figure 2 depicts the spatial distribution of out-migration rates for natives as a whole, while those for youth and adults are displayed in Figures 3 and 4, respectively. The darker the colour of a country, the higher the rate. A relevant feature can be drawn from the three maps: there are clear signs of spatial dependence. However, a statistical test has to be provided in order to confirm it. Hence, we computed the Moran's I statistic on the out-migration rates (‰) for the three groups of population. To do so, we used a binary spatial weight matrix with a distance-based critical cut-off of 1,500 kilometres.[6]

The results, displayed in Table 3, confirmed the presence of positive spatial dependence for the three groups up to 2012, but the Moran's I statistic became not significant thereafter. In any case, it seems to be obvious that, to cope with potential problems of misspecification, we should test for the presence of spatial dependence in the migration model proposed below.

T a b l e 3

Spatial Dependence in Out-migration Rates (‰)

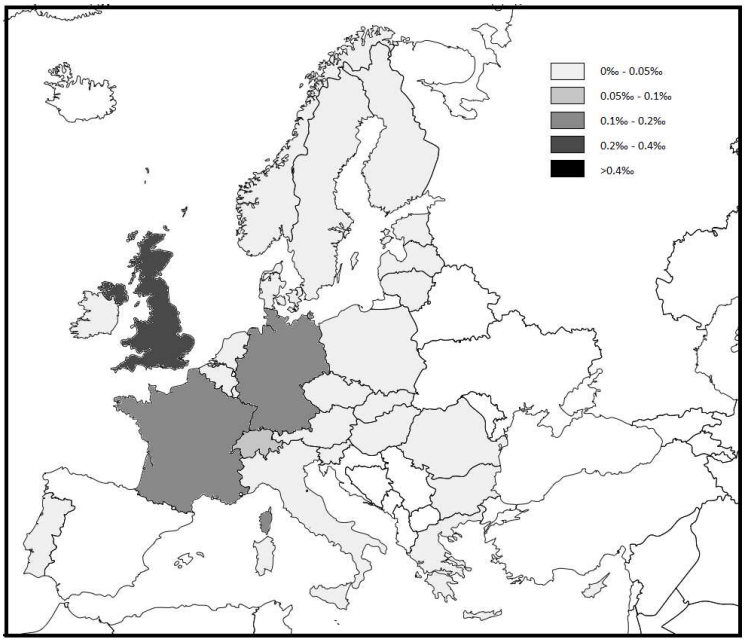
	Natives		**Young natives**		**Adult natives**	
Year	Moran's *I*	*p*-value	Moran's *I*	*p*-value	Moran's *I*	*p*-value
2008	0.06	0.02	0.06	0.02	0.06	0.03
2009	0.05	0.04	0.05	0.04	0.06	0.03
2010	0.05	0.04	0.05	0.04	0.05	0.04
2011	0.04	0.06	0.04	0.06	0.05	0.05
2012	0.03	0.09	0.03	0.09	0.04	0.07
2013	0.02	0.15	0.02	0.15	0.02	0.15
2014	0.02	0.15	0.02	0.15	0.02	0.13
2015	0.01	0.15	0.01	0.15	0.04	0.13
2016	0.02	0.14	0.02	0.14	0.02	0.12

Source: Own elaboration.

[6] As we will explain in the next section, this spatial weight matrix is the one showing the highest goodness of fit in the estimation of our out-migration equation.

Figure 2

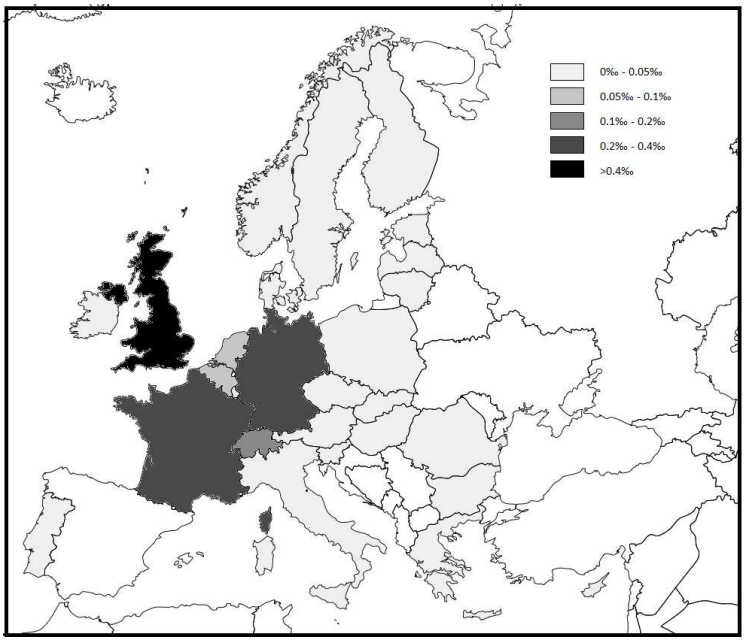
Out-migration Rates of Natives (16 – 64 Years) from Spain (2008 – 2016)



Source: Own elaboration.

Figure 3

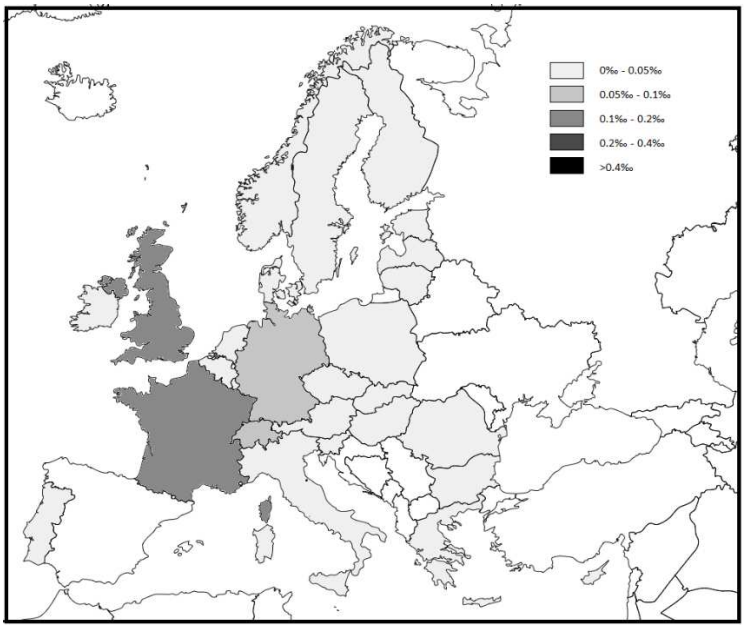
Out-migration Rates of Young Natives (16 – 34 Years) from Spain (2008 – 2016)



Source: Own elaboration.

Figure 4

Out-migration Rates of Adult Natives (35 – 64 Years) from Spain (2008 – 2016)



Source: Own elaboration.

2. Empirical Analysis

This section is devoted to studying the main factors behind the process of migration of the native population from Spain to Europe over the crisis. The analysis is also carried out for young and adult natives to uncover differences between both groups. Firstly, an out-migration model is postulated. Subsequently, we test for the presence of spatial dependence in it since the results would be misleading if standard estimation techniques were used in the presence of spatial effects; additionally, the inclusion of these effects enables us to consider the influence of alternative destinations on out-migration rates.[7] After confirming the existence of spatial dependence, the corresponding spatial model is specified. Finally, we estimate this model and discuss the main results.

2.1. Model Specification

To begin with, we consider the following model specification based on different theories of migration (Equation 1):

[7] An alternative approach to deal with this issue, based on different structures of fixed effects, can be seen in Maza et al. (2018).

$$om_{it} = \alpha_1 gdppc_{it-1} + \alpha_2 unem_{it-1} + \alpha_3 soc\_prot_{it-1} + \alpha_4 clim_{it-1} + \\ + \alpha_5 network_{it-1} + \alpha_6 fdi_{it-1} + \mu_i + \mu_t + \varepsilon_{it} \quad (1)$$

where *i* and *t* denote country of destination and year, respectively. Country fixed effects (μ_i) capture time-invariant characteristics of each country such as distance and language, while the time fixed effects (μ_t) account for temporal shocks affecting all or most of our set of countries. As the dependent variable, we used the out-migration rate (‰) of natives, which is then divided into youth and adults (om). Regarding independent variables, with associated parameters α, we collected the following data:

1. A major economic determinant of migration, namely income, which always plays an important role in traditional neoclassical models (e.g. Ravenstein, 1885; Harris and Todaro, 1970). Specifically, we use per capita gross domestic product (PPP, constant 2011 international dollar) ($gdppc$) to proxy income opportunities. Data on this variable were extracted from the World Bank Development Indicators (WDI) database.

2. Conventional models also link people movements to workers' desires to find employment, so we included as independent variable employment opportunities. Explicitly, we use the unemployment rate ($unem$) to capture employment prospects.[8] Once again, data were extracted from the WDI database.

3. In any case, as indicated by Kureková (2010, p. 4), "migrant decisions are not based purely on individual profit-maximizing calculations" as the neoclassical approach suggests, what "compels us to consider a set of other variables". Thus, from a different perspective, welfare systems act as a mechanism that affects the quality of life, for example by providing direct and indirect forms of income or alternatives to mediate different risks. Consequently, we entered a variable trying to capture social protection. Firstly, following Kureková (2013), we assemble data for five indicators: social expenditure per capita, active labour market policies (% GDP), unemployment benefit (% GDP), sickness/health benefits (% GDP), and family benefits (% GDP). Then, to compute a single indicator (*soc_prot*) we normalised data for each variable (by taking away the minimum value and dividing by the difference between the maximum and minimum value) and calculate the simple mean of all of them. This enables us to test the role of welfare systems in shaping migration. Data were extracted from Eurostat.

4. On the other side, given that location-specific amenities have been prominent features of migration analyses in the last decades (for a reference, see Knapp and

[8] In line with the extended neoclassical models, migration decisions can also be seen as forward-looking decisions. Therefore, we tested it by including, besides their levels, the growth rates of these first two economic variables. Additionally, and to test for the presence of nonlinearities, we included square variables. Nevertheless, in all cases the results were not statistically significant.

Graves, 1989), we included a variable measuring environmental amenities. To be precise, we use a climate variable defined as the average annual temperature ($clim$) since it has been proven that nice weather conditions contribute to higher quality of life (Rodríguez-Pose and Ketterer, 2012; Coniglio and Pesce, 2015). These data were extracted from the National Climatic Data Center (NCDC).

5. Taking into consideration the network theory, which justifies the perpetuation of migration even when wage differentials are not so important, we also incorporated the so-called 'network effect' as an additional pull factor (Massey et al., 1993; Epstein, 2008; Pedersen, Pytlikova and Smith, 2008; Maza, Villaverde and Hierro, 2013; Izquierdo, Jimeno and Lacuesta, 2016; Taylor, 2016; Nowotny and Pennerstorfer, 2017). The network effect refers to linkages stretching from home to host countries, that is, the fact that the presence of groups from the same geographical origin who are living in another place (or who previously migrated in a given country) allows future members of those communities to reduce their costs of assimilation and to ease their settlement in the new country (Massey et al., 1993). In this regard, the new economics theory of migration supports the idea that decisions are made by families or households rather than by individuals. The network effect (*network*) is measured as the stock of Spanish population registered abroad (in logs) in each of the European countries considered.[9] Data from the Register of Spaniards Resident Abroad (PERE in the Spanish acronym), provided by INE, were used.

6. Finally, both the dual labour market theory and the world systems theory establish a link between FDI and migration. In a globalized world, both enterprises and migrants have a tendency to agglomerate in specific host countries (Buch, Kleiner and Toubal, 2006). To test this hypothesis, we included the weight of each potential host country over the total FDI flows from Spain.[10] Data come from the Spanish Foreign Investment Registry (DataInvex).

That said, two important points have to be noted. First, all explanatory variables are, as usual, lagged one year to capture the fact that their impact on out-migration is not immediate. Second, the independent variables, except for the network effect and the FDI ones that are bilateral by nature, are defined in a bilateral form (Macková, Harmácek and Oprsal, 2019), namely in relative terms with respect to Spain. In line with theoretical models, we assume that potential migrants tend to compare these variables in the country of destination with those in origin.

[9] This information was not available for the years 2007 and 2008. Consequently, we proxied the stock in the year 2008 by subtracting the flow of natives that migrated from Spain to each European country in 2008 from the stock of Spanish population in each country in 2009. After that, we did the same for the year 2007.

[10] We do not take logs in this case because there are specific years for some host countries in which there was no FDI.

Additionally, before estimating the model, we have to rule out a potential, previously unstudied and quite important problem: the existence of spatial effects. Therefore, we estimated Equation (1) by ordinary least squares (OLS) and, then, applied the robust Lagrange multiplier (LM) tests: the robust LM-LAG, whose null hypothesis is the absence of substantive dependence, and the robust LM-ERR, whose null hypothesis is the absence of residual spatial autocorrelation. The results, reported in Table 4, point to the rejection of both hypotheses at the 1% level. Hence, Equation (1) should be enlarged to consider spatial dependence.

T a b l e 4

Lagrange Multiplier (LM) Tests for Spatial Dependence

	Statistic	***p*-value**
Tests	*Natives*	
Robust LM-LAG	42.25	0.00
Robust LM-ERR	33.56	0.00
	Young natives	
Robust LM-LAG	31.43	0.00
Robust LM-ERR	32.67	0.00
	Adult natives	
Robust LM-LAG	38.27	0.00
Robust LM-ERR	45.83	0.00

Note: the robust LM-LAG is the LM test for a spatially lagged dependent variable and the robust LM-ERR is the LM test for residual spatial autocorrelation).

Source: Own elaboration.

Accordingly, the next step is to determine the correct specification of the spatial model. To do so, we estimated a spatial panel Durbin model (SDM) and then we computed the Likelihood Ratio (LR) tests to examine whether the SDM could be simplified into a Spatial Autoregressive Model (SAR) or a Spatial Error Model (SEM). The results, displayed in Table 5, revealed that, in the three cases, both hypotheses can be rejected. Therefore, we concluded that the SDM is the most appropriate model.

T a b l e 5

Likelihood Ratio (LR) Tests for Spatial Dependence

	Statistic	***p*-value**
Tests	*Natives*	
LR test for spatial autoregressive (SAR) model	42.52	0.00
LR test for spatial error model (SEM)	35.54	0.00
	Young natives	
LR test for spatial autoregressive (SAR) model	223.91	0.00
LR test for spatial error model (SEM)	321.65	0.00
	Adult natives	
LR test for spatial autoregressive (SAR) model	206.92	0.00
LR test for spatial error model (SEM)	230.62	0.00

Source: Own elaboration.

Thus, the final specification of the SDM is as follows (Equation 2):

$$\begin{aligned} om_{it} &= \alpha_1 gdppc_{it-1} + \alpha_2 unem_{it-1} + \alpha_3 soc\_prot_{it-1} + \alpha_4 clim_{it-1} + \\ &+ \alpha_5 network_{it-1} + \alpha_6 fdi_{it-1} + \rho \sum_j w_{ij} om_{jt} + \theta_1 \sum_j w_{ij} gdppc_{jt-1} + \\ &+ \theta_2 \sum_j w_{ij} unem_{jt-1} + \theta_3 \sum_j w_{ij} soc\_prot_{jt-1} + \theta_4 \sum_j w_{ij} clim_{jt-1} + \\ &+ \theta_5 \sum_j w_{ij} network_{jt-1} + \theta_6 \sum_j w_{ij} fdi_{jt-1} + \mu_i + \mu_t + \varepsilon_{it} \end{aligned} \quad (2)$$

where w_{ij} denotes the elements of the spatial (row-standardised) weight matrix W. Following Elhorst, Zandberg and De Haan (2013), we use the spatial weight matrix associated with the highest value of the log-likelihood function. In our case, it is a binary spatial weight matrix with a distance-based critical cut-off of 1,500 kilometres.[11] For longer distances, therefore, spatial dependence is assumed negligible. Finally, ρ denotes the spatial autoregressive coefficient, and θ are the parameters associated with the spatial lags of the independent variables.

2.2. Empirical Results

This subsection is aimed at estimating the SDM, by maximum likelihood using Driscoll-Kraay standard errors robust to spatial and temporal dependence, and discussing its main results. Table 6 shows point estimates for natives, youth and adults.

To begin with, the coefficients associated with the spatial lags of the dependent variable are statistically significant for the three population groups. These results corroborate the existence of interactions across countries that should not be overlooked; in other words, the spatial structure of the data has to be taken into account when it comes to modelling. These coefficients turn out to be, contrary to expected, negative. Therefore, our findings seem to indicate that the positive spatial dependence that existed in the out-migration rates at least in the first years of the sample period (as previously seen by the computation of the Moran's I statistic) has been captured by those factors driving out-migration that we included in the model.

Concerning the rest of variables, it seems that the higher the per capita GDP, the social protection expenditure and the value of environmental amenities in a European country with respect to Spain, the higher the out-migration of natives.

[11] Provided that each country had at least one neighbour, we ran different permutations by increasing the distance 100 kilometres at a time. To compute these distances we used the coordinates of the geographical centroids corresponding to the capital of each country, being the minimum/maximum distance between countries 59.6/9322.4 km.

Table 6

Spatial Durbin Models (SDM) (2008 – 2016)

	Natives	Youth	Adults
Dep. variable: om_{it}	*Coefficients*		
$gdppc_{it-1}$	0.032** (0.015)	0.085*** (0.032)	0.011** (0.010)
$unem_{it-1}$	–0.046*** (0.014)	–0.078** (0.030)	–0.032*** (0.011)
soc_prot_{it-1}	0.211*** (0.048)	0.384*** (0.050)	0.137*** (0.018)
$clim_{it-1}$	0.032* (0.017)	0.055** (0.023)	0.022*** (0.008)
$network_{it-1}$	0.051*** (0.008)	0.089*** (0.009)	0.033*** (0.003)
fdi_{it-1}	0.016 (0.026)	0.021 (0.053)	0.013 (0.021)
$\sum_j w_{ij} om_{jt}$	–0.644*** (0.133)	–0.472*** (0.173)	–0.368** (0.123)
$\sum_j w_{ij} gdppc_{jt-1}$	0.393** (0.193)	0.880* (0.510)	0.238** (0.010)
$\sum_j w_{ij} unem_{jt-1}$	0.096** (0.046)	0.241** (0.100)	0.153** (0.070)
$\sum_j w_{ij} soc\_prot_{jt-1}$	0.941*** (0.243)	1.688*** (0.312)	0.593*** (0.129)
$\sum_j w_{ij} clim_{jt-1}$	0.093* (0.056)	0.155** (0.063)	0.070*** (0.025)
$\sum_j w_{ij} network_{jt-1}$	–0.179*** (0.036)	–0.294*** (0.034)	–0.125*** (0.017)
$\sum_j w_{ij} fdi_{jt-1}$	0.025 (0.090)	0.067 (0.104)	0.005 (0.035)
Number of observations	252	252	252
R squared	0.574	0.532	0.583

Notes: Driscoll-Kraay standard errors in parenthesis. *** (**) (*) Significant at 1% (5%) (10%) respectively. Time and country fixed effects are included.

Source: INE, Eurostat, DataInvex, World Bank and NCDC.

Besides, higher unemployment rates in destination discouraged migration, a result that is in accordance with González-Enríquez and Martínez-Romera (2017). As for the network effect, results indicate that social networks played an essential role as a pull factor of Spanish natives, which is in line with the evidence found by Izquierdo, Jimeno and Lacuesta (2016). The disaggregation by age groups disclosed that, as expected, the positive impact of social networks was significantly higher for young natives than for adults.[12] A potential explanation lies in the role of virtual communities to exchange information and mutual support

[12] To ensure a correct comparability of models, the use of normalised data is required. We did it (by taking away the mean and dividing by the standard deviation) so that with the new data you can directly compare the value of the coefficients for both young and adult natives. In this case, the coefficient for young natives was also higher than the one for adults.

(Pérez-Caramés, 2017), which are more important for younger generations. Finally, our findings indicate that FDI did not play a significant role in explaining out-migration of natives to Europe. As regards the spatial lags of the explanatory variables, they were statistically significant in the three cases (natives, youth, and adults) except for the FDI variable.

Although revealing, the results obtained by point estimates can only be used as an approximation for the actual effects. Indeed, they may lead to erroneous conclusions (LeSage and Pace, 2009) because point estimates do not consider feedback effects, which becomes especially risky in the case of an SDM as it produces global spatial spillovers.[13] We have to compute, consequently, the so-called direct, indirect and total effects, which are interpreted as follows: the direct one captures the effect of a change in a particular explanatory variable in country *i* on the out-migration rate from Spain to that country, while the indirect (or spillover) one can be interpreted as the cumulative effect of the changes in a variable in countries other than *i* on the out-migration rate from Spain to country *i* through the out-migration to the rest of European countries. Naturally, the total effect is the sum of both, direct and indirect ones. The results are displayed in Table 7.

Our findings confirmed the idea that most natives migrating from Spain to Europe over the period 2008 – 2016 had labour incentives (high income and low unemployment rate) so that they looked for better economic prospects (González--Enríquez, 2013). That is because the direct effect resulted positive and negative for per capita GDP and the unemployment rate, respectively. Regarding indirect effects, positive and significant spillover effects were found in these two variables, which were higher in magnitude than the corresponding direct effects. The results in terms of unemployment were quite relevant, as they convey the message that natives moved to a country presenting a relatively low unemployment rate not only with respect to Spain but also to the remaining potential destinations. As for the comparison between youth and adults, these effects were always higher in the first case.

Concerning the social protection variable, it showed statistically significant direct and indirect effects regardless of age. As for direct effects, it seems higher levels of social protection expenditure at destination than at origin help explain migration to Europe. As stated by Kureková (2013, p. 736), "migrants reach out to migration as a solution to dealing with labour market insecurities, and it replaces welfare elsewhere provided through public services or government policies". The indirect effects also pointed to the presence of positive spillovers in the social protection expenditure.

[13] Spillovers arising from spatial lags of the dependent variable allow for spillovers to neighbours, neighbours to neighbours, and so on, coming back in the end to the area they originated from.

Table 7

Spatial Durbin Models (SDM): Direct, Indirect and Total Effects

	Natives		
Variable	*Direct effects*	*Indirect effects*	*Total effects*
$gdppc_{it-1}$	0.016** (0.007)	0.213** (0.093)	0.229* (0.123)
$unem_{it-1}$	–0.051*** (0.016)	0.080** (0.038)	0.029* (0.016)
soc_prot_{it-1}	0.181*** (0.049)	0.404*** (0.104)	0.585*** (0.112)
$clim_{it-1}$	0.029* (0.017)	0.035* (0.021)	0.064** (0.029)
$network_{it-1}$	0.043*** (0.008)	–0.037*** (0.008)	0.006 (0.017)
fdi_{it-1}	0.021 (0.028)	0.002 (0.048)	0.023 (0.049)
	Youth		
Variable	*Direct effects*	*Indirect effects*	*Total effects*
$gdppc_{it-1}$	0.046** (0.019)	0.442* (0.255)	0.488** (0.227)
$unem_{it-1}$	–0.093*** (0.034)	0.180** (0.076)	0.087* (0.047)
soc_prot_{it-1}	0.326*** (0.043)	0.673*** (0.129)	0.999*** (0.144)
$clim_{it-1}$	0.051*** (0.019)	0.049*** (0.015)	0.100*** (0.030)
$network_{it-1}$	0.080*** (0.010)	–0.105*** (0.007)	–0.025 (0.020)
fdi_{it-1}	0.016 (0.057)	0.029 (0.075)	0.045 (0.029)
	Adults		
Variable	*Direct effects*	*Indirect effects*	*Total effects*
$gdppc_{it-1}$	0.034** (0.014)	0.324** (0.142)	0.358*** (0.167)
$unem_{it-1}$	–0.034*** (0.010)	0.126* (0.069)	0.092 (0.064)
soc_prot_{it-1}	0.121*** (0.016)	0.287*** (0.054)	0.408*** (0.058)
$clim_{it-1}$	0.020*** (0.007)	0.031*** (0.008)	0.051*** (0.014)
$network_{it-1}$	0.030*** (0.003)	–0.060*** (0.003)	–0.030 (0.020)
fdi_{it-1}	0.017 (0.025)	–0.008 (0.033)	0.009 (0.014)

Notes: Driscoll-Kraay standard errors in parenthesis. *** (**) (*) Significant at 1% (5%) (10%) respectively. Time and country fixed effects are included.

Source: INE, Eurostat, DataInvex, World Bank and NCDC.

Regarding amenities, the climate variable reported positive and statistically significant direct effects for both, youth and adults, and the whole sample. There seems to be a portion of migrants, thus, that even in times of crisis paid significant attention to this type of attributes. The indirect effect was also positive. This is naturally explained by the fact that in some way people considered migrating to major geographical areas composed of countries sharing similar weather conditions.

As for the variable capturing the network effect, both direct and indirect effects were, in all cases, statistically significant, but they compensate each other giving rise to a non-significant total effect. In any case, the direct effect was positive whereas the indirect one was negative, this fact reinforcing the idea that natives

preferred to settle in well-established communities. Linking these results with the descriptive analysis of the previous section, we can state that the existence of significant out-migration flows towards the United Kingdom, France, Germany, and Switzerland have created important networks in these countries.

Regarding the role played by FDI, the results revealed that FDI flows from Spain towards European countries have no effect on migration, so there is no complementarity between them. In other words, Spanish multinational enterprises did not seem to reallocate, at least not to a great extent, managers and workers (and even their relatives) to reside permanently in host countries. This result is not so unexpected, after all, since there is no strong consensus in the literature on whether out-migration and FDI are complements or substitutes (Globerman and Shapiro, 2008). As an example, Buch, Kleiner and Toubal (2006) find complementarity for the German case, whereas Aroca and Maloney (2005) conclude substitutability between them for the Mexican one. Finally, some comments regarding country fixed effects (which are available upon request) are in order. The highest positive values corresponded to countries such as the United Kingdom and France, which might be capturing characteristics such as distance and language.

Conclusions

This paper examines the main factors shaping the out-migration of natives from Spain towards a sample of 28 European countries during the Great Recession and its aftermath. It also explores potential differences between young and adult natives. To do so, a spatial panel Durbin model – which allows us to address the issue that migration flows not only depend on pull factors in the destination country but also on other potential destination countries – is estimated over the period 2008 – 2016.

The descriptive analysis of the first part of the paper clearly shows the influence of the outbreak of the crisis on migration patterns. Indeed, the net migration rate turned from positive to negative in the year 2008. Since then the outflows of natives steadily increased (except for a slight fall in 2009). As regards age groups, out-migration rates revealed that flows were particularly prominent among the young population, and were almost double those of adults. Regarding main destinations, Europe highlighted (51.5%), followed at some distance by America (39.2%). In terms of the geographical distribution of out-migration to Europe, countries such as the United Kingdom, France, Germany, and Switzerland stood out clearly.

After describing the main features of the new migration scenario in Spain, the article focused on the empirical analysis of the causality of flows towards the main destination: Europe. Some important conclusions can be drawn. First, Spanish

migrants moved mainly to countries with better economic prospects (higher per capita GDP and lower unemployment rates), although social protection and location-specific amenities (better climate) also mattered. Second, social networks have played a major role as a pull factor in migration decisions, this effect being higher among the group of young natives. Third, FDI flows were found to be non-significant in explaining out-migration of natives. Finally, the spatial econometric approach employed in the paper allows us to find evidence of positive spatial spillovers in per capita GDP, unemployment, social protection and climate conditions, as well as negative spillovers in the case of the network effect. In short, the above findings convey the message that migrants assess the situation of variables not only in a specific country but also in its surroundings. Particularly significant in these cases were the results obtained for both unemployment rate and network variables, reinforcing the idea that natives seek destinations with low relative unemployment and tend to create networks and ties with previous out-migrants.

The findings of this piece of work may contribute to the wide debate on migratory flows that has recently revived. The paper stresses here the importance that out-migration of natives from Spain to Europe had during the crisis, as well as the fact that it is largely composed of youth people between 16 and 34 years. This process, if it remains so, might aggravate some of the problems that Spain will have to cope with shortly: shortages of population, ageing population, pension system sustainability, and so on (Vázquez-Grenno, 2010; Díaz-Giménez and Díaz-Saavedra, 2017). Unfortunately, our findings point in that direction. People move around looking for better job conditions and higher levels of social protection expenditure and, unfortunately, Spain is not going to be able to catch up with other countries. Social networks, by way of reducing the cost of migration, are naturally important. Therefore, a continuous flow of natives migrating to European countries will no doubt contribute to the consolidation of large networks of Spaniards abroad and, in consequence, to increase the attractiveness of some European countries.

Finally, it should be mentioned that the lack of information on the qualification of the natives migrating from Spain towards European countries prevents us from determining whether these natives' outflows during the crisis corresponded mainly to highly qualified people in search of labour opportunities. If this were the case, we might be facing a brain drain from Spain to Europe. This is no doubt a topic for future research, providing that data become available,[14] since nowadays, with the Spanish labour market going through a gradual recovery, this circumstance would pose an extra challenge for decision-makers.

[14] Furthermore, by differentiating about the skill level of migration, some of our conclusions could be qualified. For instance, we believe the null relationship between migration and FDI would become positive if we could exclusively refer to highly educated out-migrants.

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