What Drives Migration Moves to Urban Areas in Spain? Evidence from the Great Recession

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Abstract:

During the Great Recession, two opposite migratory phenomena occurred in Spain. While international emigration skyrocketed, internal migration strongly declined. However, when we focus our attention on migration to the larger urban areas in Spain, we observe an increase in population since the crisis outbreak. In this work, we determine the effect of labour market factors on migration flows towards 45 Spanish Functional Urban Areas for the recent recessive period. By performing this analysis, we link two strands of academic literature: the literature on migration in Spain, which obtains inconclusive results on the effect of labour market factors on internal migration in previous instability periods, and literature related to cities, generally acknowledging that they attract population as they offer more jobs and better wages. We use an extended gravity model and consider economically consistent territorial units. Our results indicate that wages and employment rates highly influence migration to cities. We check the results considering provinces and Local Labour Market Areas as origins of the flows. From the results, we can confirm the strong role of labour markets in migration to cities, irrespective of the origin unit considered.

Keywords: migration, Spanish urban areas, labour market factors

JEL classification: C23, J61, R23

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1. Introduction

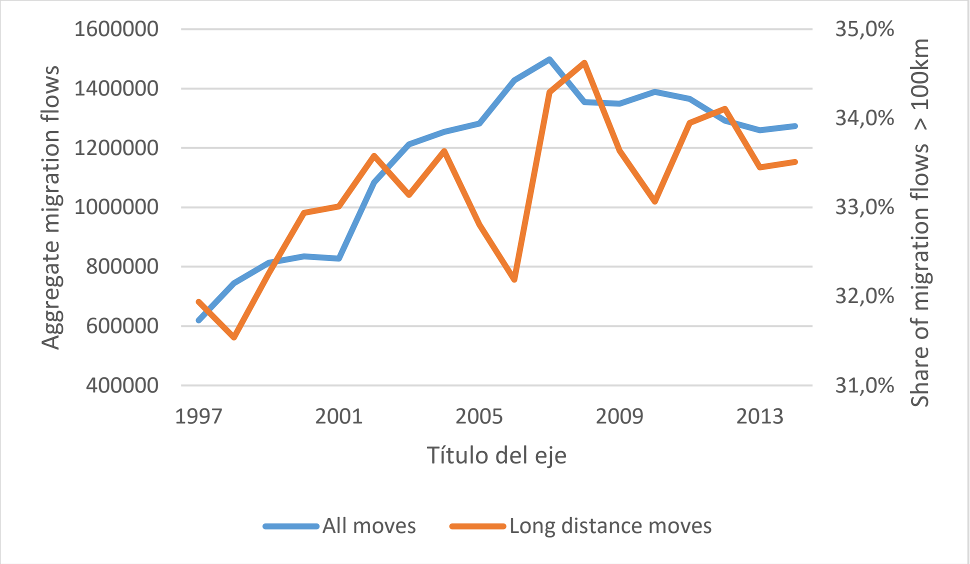
Migration flows have traditionally occurred as a result of the pursuit of personal improvement. Achieving better personal and environmental conditions has motivated individuals to move from one place to another over short and long distances. For developed economies, the literature has generally acknowledged the influence of economic and labour market differentials on migratory flows. In Spain, internal migratory flows respond to similar patterns as those observed for most countries of the European Union. During decades of economic prosperity, regional disparities in economies and employment opportunities have motivated migration flows. However, regional disparities in Spain were not the drivers of population flows in the 1980s and early 1990s, when several periods of economic instability took place. Inconclusive results were obtained in studies on migration in this period: Bentolila and Blanchard (1990), Bentolila and Dolado (1991), Antolín and Bover (1997), Bentolila (1997), Ródenas (1994), and De La Fuente (1999) found small or insignificant responses to labour market variables. Economists debated the underlying causes of the unresponsiveness to traditional explanatory variables, with Mulhern and Watson (2010) labelling it an enigma.

In parallel, a vast body of literature on agglomeration economies has focused on why people concentrate in cities. A popular hypothesis is that cities are more productive and have more jobs and better wages. Royuela et al. (2017) analyse the evolution of cities in Spain. They find that the most populated cities are the areas that have gained the most population and that have increased their weight in economic activity in the country. While in 2001 60.5% of Spaniards lived in the largest 45 cities, in 2016 this share increased to 61.9%. This growth in concentration was faster during the years of the Great Recession.

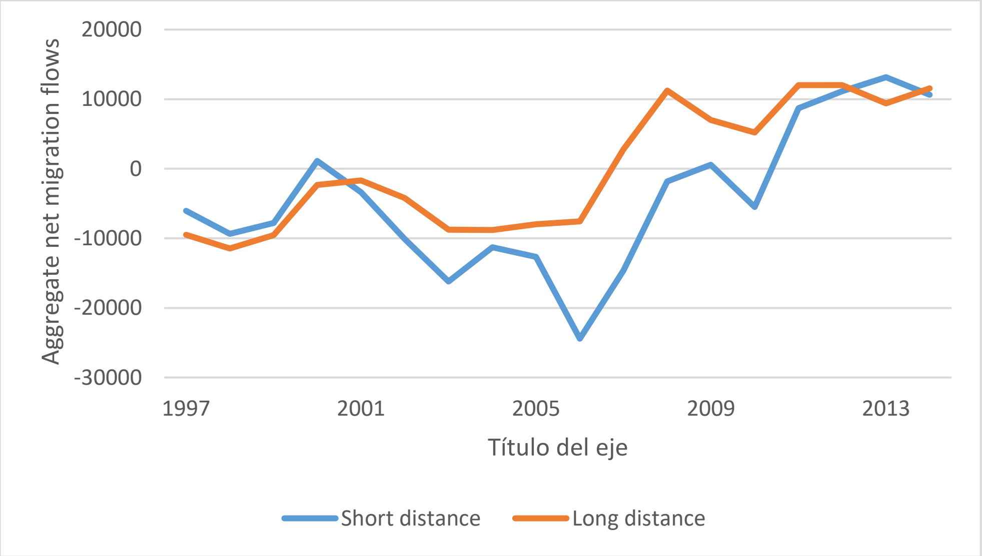
For Spain, the Great Recession resulted in a decrease of 15.5 p.p. in economic activity in just six years. The unemployment rate increased by 18 p.p., and real wages declined by 7.2 p.p. In this context, international emigration skyrocketed, resulting in a net loss of population. Meanwhile, as Figure 1a shows, internal movements have declined since the start of the crisis despite the persistence of internal economic and labour market differences across regions (Cuadrado-Roura and Maroto, 2016). As in the past, the generalized recession in the country affected all cities and regions, constraining migration decisions (Palomares-Linares and Van Ham, 2018). Nevertheless, the impact has not been spatially neutral: while larger urban areas grew in absolute terms, the smallest cities and the rest of Spain experienced population losses. In fact, as depicted in Figure 1b, between 1997 and 2007, while internal migrations resulted in a loss of some 180,000 inhabitants from Spain's largest 45 cities, from the start of the Great Recession in 2008 to 2014 internal flows towards these cities resulted in a net surplus of some 105,000 inhabitants, averaging a gain of 15,000 per year. Among these urban areas, the largest are those relatively increasing their weight. Therefore, migration flows have resulted in an increase in spatial concentration in cities. What remains to be explained is whether such urban population moves are indeed responding to labour market differentials. This paper investigates urban growth by looking at the drivers of internal migration flows in Spain during the crisis and paying special attention to labour market factors. We perform the analysis by considering an extended gravity model of migration.

Figure 1. Migration flows in Spain

a. Internal migration in Spain



b. Net migration flows of Functional Urban Areas



Note: Long distance moves refer to any move in which the origin and destination are more than 120 km apart.

Our work is innovative as, in an effort to unifying both bodies of literature, it is the first study that analyses the determinants of migration to Spain's main urban areas.[1] The study covers the 2008-2014 period of recession, and we resort to economically consistent spatial units of analysis at destination, the 45 largest Spanish cities defined as Functional Urban Areas (FUAs), and at origin, Spain's 483 Local Labour Market areas (LLMs). The use of these spatial units has numerous advantages compared to using provinces. FUAs are defined by taking into

[1] As we specify in the data section, we consider only moves beyond a distance threshold to avoid calling moves that only imply a residential variation "migration." We follow the generic rule of 100 km to eliminate pairs of flows that can conceal moves within the same labour market due to the cross-border effect.

account density and commuting flows to the city as criteria. In a parallel approach, the entire Spanish territory is divided into LLMs, which are spaces where the population lives and works, but in this case every Spanish municipality is assigned to a LLM. In addition, the relevance of analysing internal migration in the recent recessive period is undoubted. The crisis, which stalled world economies as a consequence of the bursting of the housing bubble (Jimeno and Santos, 2014; Pozueta et al., 2019), particularly affected youth and low-educated workers (Jansen et al., 2016). The recession strongly affected LLMs, especially those in urban areas (Melguizo, 2017).

From the methodological perspective, this work is also innovative. The literature lacks studies using count data models together with wide structures of fixed effects controlling for multilateral resistance to migration. Most academic literature focused on Spain has analysed aggregate migration flows at the regional level. Some of these works consider a panel structure, and only few studies use origin and destination fixed effects to control for unobserved heterogeneity (such as Martínez-Torres, 2007). Furthermore, although some articles consider count models using the number of migrants between origin and destination (Devillanova and García-Fontés, 2004; Reher and Silvestre, 2009; Faggian and Royuela, 2010), most of the literature considers linear models in which the dependent variable is the migration rate or the log of migrants. Additionally, we develop our analysis for different population groups, including nationals and foreigners, returned migrants, and different age cohorts. In many migration models, personal characteristics have been included as regressors (Antolín and Bover, 1997; Bover and Arellano, 2002; Recaño, 2014). Other studies have focused on a collective of migrants to study their specific motivations for moving or to develop a comparative analysis between groups, such as nationals and foreign born (Reher and Silvestre, 2009, Maza et al, 2013; Clemente et al., 2016, Ramos and Royuela, 2017; Gutiérrez-Portilla et al., 2018; Maza et al. 2019, Liu, 2018, Hierro et al., 2019, Viñuela et al., 2019). In this work, we look not only at the national / foreign pattern, but also at life cycle patterns and the phenomenon of return migration.[2]

Our results show a strong role of labour market factors in influencing migration towards FUAs in this recessive period. Employment rates and real wages are significant and behave as expected. When we disaggregate migrants into different groups, we observe that while the employment rate variable remains significant except in the case of returnees, foreigners, and older people, wages only significantly affect migration to cities of youths between 18 and 30 years old. We check our results by considering provinces as origin areas instead of LLMs. Our basic results hold and are indeed reinforced, thanks to the higher aggregation of the data, which results in less volatile flows. Employment rates and wages remain significant, even when we exploit the personal information of the micro dataset (except in the case of foreigners). Lastly, we look at a subsample of internal movements, which includes only flows that have FUAs as origin and destination. In this case, some results hold, but several differences arise. Now, employment for younger urban cohorts is not significant, whereas for middle-aged cohorts employment is significant. This may point to an increasing size of urban generations living in big cities.

[2] We consider returnees those nationals who migrate to a municipality of the urban area where they were born.

The rest of the paper is organized as follows. Section 2 reviews the migration literature and the theories explaining these moves. Sections 3 and 4 describe the methodology and data, respectively. In Section 5, we present our main results, and Section 6 concludes.

2. Literature Review

2.1. A General Overview of Migration Theories

Migration and its main motivations have been the focus of extensive discussions in the economics literature. Authors have frequently resorted to economic differentials to explain migratory flows: Ravenstein's pioneering works (1885, 1889) acknowledge the importance of economic disparities in understanding people movements; Hicks (1932) and Bartel (1979) point out that wage differentials motivate people to move to areas with higher salaries; Greenwood (1975, 1985) argues that migration is mainly due to the job seeking process; and Jackman and Savouri (1992) consider migration as a mechanism to improve job-matching between employers and workers. These analyses fall within the disequilibrium theories, which assume that economic differentials among territories tend to level off in the long run. Migration flows and other mobility factors foster the equilibrium among areas, although rigidities in the labour and housing markets may complicate the adjustment process and determine the speed at which the equilibrium is reached.

The disequilibrium approach is called into question as a consequence of a number of studies reporting un-hypothesized signs for unemployment and real wages. The studies of Graves (1976, 1979, 1980, 1983), Marston (1985), and Knapp and Graves (1989) highlight the importance of spatial equilibrium. The equilibrium approach establishes that economic differentials among territories may occur in the long term due to other kinds of factors, such as climatic conditions and natural and social endowments, encouraging people to stay in areas where economic and labour market conditions are relatively worse. Thus, economic disparities in equilibrium are a result of constant utility across areas, where amenities and non-economic factors play a relevant role in individual preferences.

The equilibrium and disequilibrium approaches were seen as competitors throughout the 1980s and most of the 1990s. However, recent economics literature has been able to reconcile both views around the utility maximization principle, which assumes that migration flows are not only due to the specific attributes of the areas, but also to the value that individuals give to these attributes, which in turn depends on the needs and preferences of individuals and households.

2.2. Recent Evidence on Migration Processes and the Case of Spain

The utility maximization principle justifies the heterogeneity in results obtained for Europe and the US regarding their internal migration processes. In the US, people tend to be much more mobile than in Europe (Rupansigha et al., 2015). In Europe, economic disparities between territories add to significant cultural and social heterogeneity among regions. Besides, the main motivations driving migration in the US also differ from those observed in Europe. Works addressing internal migration in the US, like Partridge et al. (2008), Partridge (2010), and Faggian et al. (2012), find that natural amenities highly influence people movements, and they attribute a secondary role to employment opportunities. In Europe, economic and labour market differences among regions are key determinants of migration. Biagi et al. (2011) and Etzo (2011) find evidence for Italy: unemployment rate and per capita GDP differentials are relevant factors in explaining migration from poorer southern regions to richer regions in the north. For Germany, Hunt (2006) highlights the influence of wage differentials in attracting young skilled workers from eastern to western regions. Détang-Dessendre et al. (2016) analyse 88 French labour market areas and find evidence of a significant influence of employment opportunities on people moves and commuting flows.

With respect to cities, there is a bulk of literature that analyses the factors leading to the growth of urban areas. This is a related line of literature, because, as Chen and Rosenthal (2008) point out, the growth or decline of population in cities is mainly driven by migration flows. Migration to cities became a hot topic among urban economists in the 1990s as a consequence of the resurgence of some cities after decades of population loss. Thus, many analysts have studied which cities are appealing and have tried to determine the factors attracting people, with a special emphasis on the role of amenities and labour market variables. In this sense, we find relevant studies for the US and the European countries (Champion, 2001; Glaeser and Shapiro, 2001; Glaeser and Gottlieb, 2006; Cheshire, 2006; Champion and Townsend, 2011). The analysis of migratory flows to cities is of great interest, among other reasons, due to the preference of certain collectives to locate in urban environments. A preference of the high-skilled population for cities is acknowledged, owing to the higher probabilities of finding a satisfactory job and the availability of consumption amenities (Glaeser et al.,2001; Dalmazzo and de Blasio, 2011; Moretti, 2013; Nifo and Vecchione, 2013). These flows of highly educated people have relevant economic and social implications for the territory (Berry and Glaeser, 2005). Florida (2002) also acknowledges a preference of the creative class for cities as a consequence of a climate of openness and tolerance, which is measured by an ethnic diversity variable. Besides, Chen and Rosenthal (2008), who take into account the life-cycle in the migration phenomenon, acknowledge the attraction of cities to young movers, as they are usually places with favourable business environments; the opposite occurs for retirees.

In Spain, internal migration shows similar patterns to those observed in Europe. Economic disparities between regions have led to disequilibrium factors and have traditionally played a relevant role as determinants of population movements throughout the territory. Many studies have analysed the determinants of regional migration, but few have analysed the growth and decline of the country’s cities. The first regional analyses that studied migration motivations date back decades and show that wages and employment opportunities motivated the massive movements that took place in the 1960s and 1970s from the poorer regions to the developed regions of Madrid, Catalonia, and Basque Country (Santillana del Barrio, 1981). More recent analyses, such as Maza and Villaverde (2004) and Maza (2006), acknowledge the influence of regional income in the decision to move. Juárez (2000) and Mulhern and Watson (2009, 2010) obtain that, in addition to income, unemployment rate differentials also remain relevant factors, whereas Clemente et al. (2016) observes that labour market factors play a substantial role if the economic situation in the origin region is relatively unfavourable.

However, these results contrast with those obtained during the period of high economic instability that took place in Spain in the 1980s and early 1990s. In that period, the great increase in moves within regions —a consequence of the increase of the relevance of services in the industrial composition (Bover and Arellano, 2002)— contrasted with the decline of interregional migration flows. Additionally, poorer regions that had previously been net out-migration areas became net immigration regions; the opposite occurred for richer regions (Bentolila and Blanchard, 1990; Bentolila and Dolado, 1991). This situation attracted the attention of many economists who analysed the phenomenon and obtained un-hypothesized signs; in some cases, their results lacked significance for labour market variables. Ródenas (1994) pointed to the discouraging effect that high unemployment exerted on migration. This analysis also acknowledged the potential influence of barriers to access to housing and other quality of life factors. De la Fuente (1999) also noted that the reduction of regional disparities, as well as factors related to quality of life, may be behind these results. Finally, Antolín and Bover (1997) attempted to unmask the enigma of the wrong signed effect of the labour market variables by including a variety of personal characteristics in their analysis. After including many controls, a small effect of unemployment rates for non-registered unemployed were found, as were un-hypothesized results on the effect of wage differentials.

Throughout the decades, the phenomenon of migration has been changing, as have the personal characteristics of migrants. Internal migrations have intensified, but there has been a reduction in interregional moves. In addition, the selectivity of migrants and the heterogeneity of flows have been considered key factors in explaining recent population flows (Faggian et al., 2017: D'Ambrossio, et al., 2018). Foreign immigration also became an important phenomenon in those years (Maza et al., 2013, Gutiérrez-Portilla et al., 2018), resulting in an important change in internal migration patterns (Recaño and Roig, 2006; Recaño et al., 2014). Foreigners are much more mobile than natives and, as Minondo et al. (2013) point out, about 80% have urban areas as their destination.

Therefore, despite the large body of literature on the topic, there is a need to study migration flows during the Great Recession, the most significant crisis experienced in the country since the Civil War in 1936. It is interesting to know whether economic and labour market determinants are relevant or behave as in the previous high-instability period, when their effect was inconclusive. In addition, it is interesting to pay attention to cities in order to determine if migration moves that have them as destination are occurring for the same reasons. Finally, the distinction of migrants based on their nationality, age, and their link with the destination enriches the study and provides relevant information on the heterogeneity of the migration patterns of different population groups.

3. Methodology

3.1. Theoretical Approach

According to the maximization utility principle, migrants decide where to go based on the relative factor endowments of the area and their individual preferences for these factors. The utility *(U)* that the i-th area reports to the k-th individual is a function of economic and amenity endowments of the area $(Z_{i.})$ and individual idiosyncratic tastes $(\mathcal{E}_i^k)$:

$$U_i^k = u(Z_i) + \mathcal{E}_{i-k.} \tag{1}$$

The deterministic part is "common" to all individuals and is a function of a vector of economic factors and amenities. Given this utility function and following Faggian and Royuela (2010), k-th individual decides to move if the expected utility of a destination area j is higher than the expected reported utility of the origin area i plus the costs of moving $c(D_{ij})$, frequently proxied in the literature by the distance between i and j locations:

$$E(U^k{}_j) - c(D_{ij}) > E(U^k{}_i) \tag{2}$$

We aggregate individual decisions at a macro level following the works of Santos Silva and Tenreyro (2006) and Miguélez and Moreno (2014), and we define a dummy variable y_{ijt}^k that takes the value 1 when equation (2) is met at period t and 0, otherwise. The sum of all individual decisions is represented by y_{ijt}, which captures the number of flows registered between every pair of spatial units *i* and *j* at period *t*. Thereby, we can write an extensive form of the gravity model including y_{ijt} as the dependent variable and migration potential motivations as independent variables in addition to the origin and destination population size and the distance between the aforementioned origin and destination areas. The general gravity equation specification is as follows:

$$y_{ij} = e^{\beta_0}(D_{ij})^{\beta_k} \prod_{l=1}^{L} F_{il}^{\lambda_{il}} \prod_{l=1}^{L} F_{jl}^{\lambda_{jl}} \mathcal{E}_{ij} \tag{3}$$

where y_{ij} depends multiplicatively on L push $(F_i^{\lambda_{il}})$ and pull $(F_j^{\lambda_{jl}})$ factors and $\mathcal{E}_{ij}$ is the idiosyncratic error. Nevertheless, an important source of endogeneity can be the result of multilateral resistance to migration, the influence that third area characteristics may exert on the migration flows between two given areas. Not considering the potential sources of multilateral resistance to migration may bias the results and lead to endogeneity (Hanson, 2010). To avoid this source of bias and given our focus on the characteristics of urban areas as destinations, we include a wide fixed effect structure. In our models, we include dyadic origin-time and monodic destination fixed effects. This specification allows us to proxy different sources of multilateral resistance to migration. It also helps us deal with another potential source of endogeneity: destination fixed effects take into account any permanent specificities of urban areas, while origin-time fixed effects consider the changes that modify migration preferences by origin or any other circumstance, both fixed and time varying, for every labour market expulsing population. In addition to the econometric advantages of this alternative, it allows us to skip the collection of data in all municipalities in the country, which can be particularly problematic for the rural spatial units. An additional endogeneity problem may arise due to the reverse causality problem, as migration may affect labour market variables. To avoid such an impact, we lag all right-hand variables by one year.[3] As a result, the model becomes

$$y_{ijt} = e^{\beta_0}(D_{ij})^{\beta_k} \prod_{l=1}^{L} F_{jt-1l}^{\lambda_{jl}} \prod_{t=1}^{T} e^{\theta_t d_t} \prod_{i=1}^{I} \prod_{t=1}^{T} e^{\theta_{it} d_{it}} \prod_{j=1}^{J} e^{\theta_j d_j}\, \varepsilon_{ijt} \tag{4}$$

where d_{it} and d_j are the dyadic origin-time and monadic destination time fixed effects, and where all right hand covariates are lagged one year.

3.2. Estimation Strategy

The most common practice in empirical migration analyses has been to transform the multiplicative gravity equation by taking natural logarithms and estimating the model using Ordinary Least Squares. However, the log-linear transformation of the model gives rise to several problems. The first problem relates to the presence of zero migration flows between pairs of areas, which becomes particularly relevant when we focus on specific population groups. Since the logarithm of zero is not defined, truncating and censuring these zero migration flows or transforming the data are two common procedures that may be accompanied by efficiency reductions due to the loss of information and estimation and sample selection bias (Westerlund and Wilhelmsson, 2009). Another problem that emerges is the presence of heteroscedasticity, which frequently occurs with migration data. The OLS estimation is based on the homoscedasticity assumption. This implies that the expected value of the error term is a function of the regressors and that the estimation variance is biased, affecting the model's inference. These failures have led to the use of mixed models and nonlinear methods to estimate the gravity equation. Among them, the Poisson Pseudo Maximum Likelihood (PPML) technique, proposed by Santos Silva and Tenreyro (2006), has become the workhorse in gravity analyses. PPML, as a count data model, deals in a natural way with the presence of zero migration flows. In addition, it does not make any assumptions about the form of heteroscedasticity, thus it is applicable under different heteroscedasticity patterns. These characteristics make PPML the appropriate method for our analysis. In order to carry out the PPML estimation, we resort to the property establishing the conditional expectation of y_{ijt} given by the set of regressors $x_{ijt} = (1, D_{ij}, F_{jt-1l}, d_{it}, d_j)$ as in the following exponential function:[4]

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[3] We admit that additional reverse causality can take place if there is a strong persistence in the considered variables of the model. However, we expect that, as gross internal migration flows in Spain represent a small share of the labour market, once we account for other factors, such an impact on the residuals can be expected to be low.

[4] Given the vast fixed effects structure, we used the stata command ppmlhdfe, designed by Correia et al. (2019), to estimate Poisson models with High-Dimensional Fixed Effects.

$$E\left(y_{ijt}|x_{ijt}\right) = exp\left[\beta_0 + \beta_k \, ln\left(D_{ij}\right) + \sum_{k=1}^{K} \lambda_{jl} \, lnF_{jt-1l} + \sum_{i=1}^{I} \sum_{t=1}^{T} \theta_{it} d_{it} + \sum_{j=1}^{J} \theta_j d_j\right] \tag{4}$$

4. Data

4.1. Urban Areas

As reported above, we focus our analysis on migration towards the urban areas defined in the Urban Audit project in 2011 (OECD and European Commission). A FUA is the closest definition of a city, based on population and density criteria and its commuting zone. In Spain, the 45 FUAs included 951 municipalities in 2013, although the number of municipalities has varied over the period of analysis. We follow the work of Ruiz and Goerlich (2015) to identify municipality changes in FUAs.[5] Figure 2 maps Spain's FUAs, which represent about 10% of the national territory and, in 2013, accounted for over 61% of the population and about 68% of employment. The other unit of analysis that we use relates to the LLMs, which are our source of migrants. Viñuela et al. (2019) also consider LLMs when analysing foreign immigrant flows in Spain. We use the 2011 definition for LLMs developed by Boix et al. (2015) and Sforzi and Boix (2019), who derive 483 LLM, averaging 17 municipalities and 96,927 inhabitants. Every LLM is obtained by applying an iterative algorithm assembling municipalities if at least 75% of the resulting population lives and works within the area and a maximum of 25% commutes outside the area.

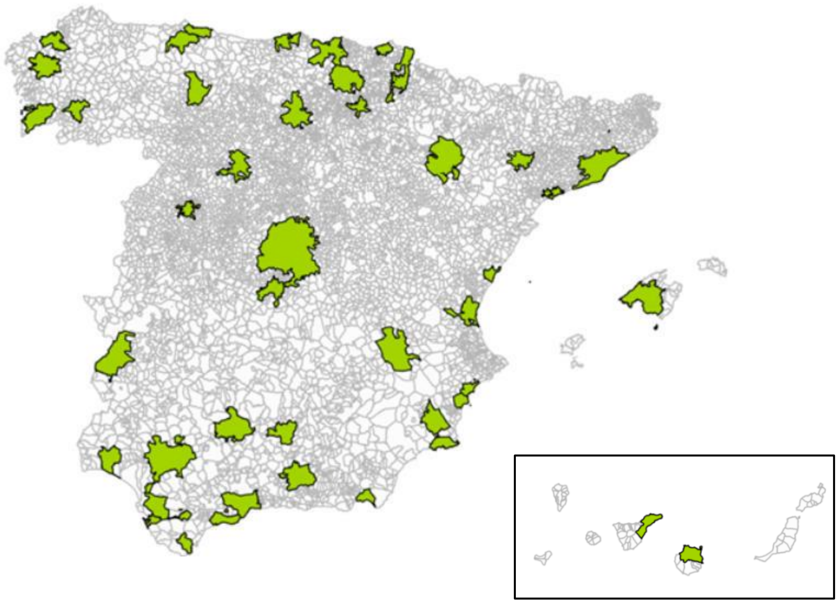
Selecting FUAs and LLMs as our units of analysis has a number of advantages. They are not mere geographical areas, but territories that are economically and socially integrated and prove to be the best approximation to the concept of local labour markets. Urban areas differ, not only in economic and labour factors, but also in amenities and infrastructure, which may affect their attractiveness. Similarly, LLMs are self-contained spatial units that are internally homogeneous.

Determining the influencing factors of migration towards FUAs requires a precise analysis of long distance moves to remove from our observations those residential variations that may not imply a migration move, i.e., municipality changes that do not involve a social or a workplace change for the migrant. This implies the use of distance thresholds. In our analysis, we remove from our observations the migration moves between LLMs and FUAs with distances of less than 100 km.[6]

Figure 2: Representation of Spain's Functional Urban Areas

[5] We consider specifically the cases that affect the number of municipalities in the FUAs. These are the cases of "Villanueva de la Concepción" and "La Canonja" municipalities, which emerged during the considered period due to the disaggregation from "Antequera" and "Tarragona" respectively. We also take into account the case of "Oza-Cesuras," which emerged from the aggregation of "Oza Dos Rios" and "Cesuras," which no longer exist.

[6] Tables A.1 and A.2 in the appendix report total and urban moves in Spain by distance. Total moves between 90 and 120 km represented 4.8% of all moves, while moves towards FUAs were 4.1%. Within this average threshold, every 10 km threshold represents, on average, some 1% of total flows.



4.2.Data Sources

The analysis of the determinants of migration between the 45 Spanish FUAs and the 483 LLMs for the 2008 to 2014 period requires the use of disaggregated data at municipality level. The final data involves a list of sources.[7] Migration flows are obtained from the Residential Variation Statistics (*Estadística de Variaciones Residenciales*, EVR). This micro dataset contains information on individual moves that involve a municipality change, and it is compiled on the basis of municipality registration data. EVR exploits information such as the date of the residential variation and the municipalities of departure and arrival. It also accounts for nationality, birth place (either municipality or country of origin), birth date, and gender, which allows us to identify some characteristics of migrants and makes it possible to determine the migration motivations for specific groups that may present heterogeneous behaviour. EVR provides high-quality information due to the application of advanced control and data collection procedures, but also because of the Continuous Register implementation, which updates residential variation information immediately. The potential criticism of the use of this data is that it represents only registered moves. However, in Spain, a registration certificate is mandatory to gain access to basic social and municipal services and the right to vote, which serves as an incentive for movers to register.

As for the explanatory variables of our empirical model, we had to work with municipal data to build FUA consistent variables. Data for population comes from Spain's Continuous Register, and we consider the Euclidean distance between the origin and destination of weighted population centroids. We resort to Spain's Social Security records for information on employment. The workers' affiliation records with Social Security provide data on registered employment at the municipality level, and we obtain municipal working age population data

[7] Detailed information about the datasets and the components and sources of information are compiled in Table A.3. Descriptive statistics are displayed in Table A.4 in the Appendix.

from Spain's Continuous Register. We use the average provincial wage provided by the Spanish Tax Agency (AEAT), and we obtain industry composition from the Spanish Labour Force Survey (EPA). We use information on local housing costs collected by Idealista, a web-based real estate firm that works at the national level. We deflate nominal variables using provincial (NUTS 3) Consumer Price Indexes (CPI).

5. Results

We estimate the effect that labour market factors exert on migration for people older than 18 to remove the bias that family responsibilities may generate in our results. We also disaggregate adult migrants by citizenship, their link with the destination (return/non-return migration), and age cohort. The distinction of the groups allows us to determine the heterogeneity related to the preferences of internal migrants, which makes it possible to ascertain the role of labour market factors as determinants of migration towards the main urban areas in Spain.

Table 1 displays the basic results. As expected, all regressions show a significant and important effect of distance that is higher for older cohorts and lower for foreign migrants. The model for the full flows (Column 1) shows how employment rates and real wages in cities exert a significant and positive effect, attracting population flows towards cities. On the contrary, no significant effect is found for city size, housing costs, or industry mix. These results are in favour of an aggregate significant effect of market forces in population moves. Columns (2) to (5) display the results by citizenship and link with the destination. Our results show a significant effect of city size on non-returned nationals and foreigners. On the contrary, returned nationals, a subgroup likely to be less affected by market forces, have a not significant parameter. During the Great Recession, only non-returned nationals were significantly attracted by urban areas with higher employment rates. The few employment opportunities in cities during the crisis were not a significant factor pulling non-Spanish migrants, probably for having less employment opportunities than nationals. While real wages were significant at the aggregate level, we find no significant effects by population group, probably due to small precision in the estimates. Housing costs have a deterrence effect on foreigners and returned nationals. Urban areas with a moderate declining trend in housing costs (housing prices declined in almost all cities) are attracting lower flows of people. This parameter is particularly strong and significant for returned nationals, while they are not significantly affected by labour market forces. For this group of people, amenities and quality of life are more important than labour market issues. The share of services for foreigners is the only variable reporting a significant and positive parameter among the industry mix. This result is likely to capture any labour market pull factor for this population group, demonstrating the importance of the types of jobs rather than overall employment opportunities or salary differentials.

Columns (6) to (8) report the results by age cohort. We find a positive and significant effect of city size and real wages for the youngest and oldest cohorts. Employment opportunities are also important for the youngest. The oldest are more affected by distance and city size, with the highest parameters among all population groups. Only with the exception of distance, we have not found significant results for the middle age cohorts.

In order to check the robustness of our results to the definition of the spatial units, we have also estimated the models of migration flows from provinces to FUAs. The results are shown in Table 2. Despite working with fewer spatial units, the more aggregate nature of the provincial structure (52 provinces against 483 LLM) allows to work with less volatile data, resulting in more precise estimates and improving the significance of the estimated parameters. In considering this technical aspect, the basic results hold and are indeed reinforced. Distance is more important for older cohorts and matters less for foreigners. City size is not a pull factor for returned nationals, and it is marginally important for people in the middle age cohorts. Among labour market factors, we do not find significant parameters for foreigners, while the employment rate is significant and positive for returned nationals and middle age cohorts. Real wages are now significant for all population groups except for foreigners. Housing costs have the same negative and significant parameters for returned nationals and foreigners, but we now see positive and significant parameters for returned nationals and younger cohorts, signalling migration flows of these groups towards areas with more amenities. Sectoral shares now display more significant results: positive for the services share (with the exception of non-returned nationals) and negative for some groups with regards to the industry share.

Finally, we have estimated the flows between FUAs. We focus now on a subsample, considering only migration moves between urban areas. Most of the results hold, and few but interesting differences arise. As in Table 1, and contrary to the findings in Table 2, the employment rate for returned nationals is not significant. What is different now is the fact that the employment rate is not significant for younger urban cohorts, while for middle age cohorts it is significant. This surprising result can only be explained by the increasing size of urban generations living in big cities. This cohort is the urban population group with a higher parameter associated with population size, while in previous regressions we saw a positive differential for older cohorts. We can say that urban youth migrate to larger cities even if there are no additional job opportunities. The other aspect to be signalled is the fact that foreigners do not have a significantly negative parameter for housing costs. The difference in the national results of Tables 1 and 2 implies that foreigners living in small cities and rural areas face an important penalty in terms of housing affordability.

We finally investigate the role of the distance threshold in defining interregional migration. We have estimated the models from the LLMs to FUAs for distance thresholds from 50 to 200 km of Euclidean distance, and we have done so for every population group. Due to the small precision of the estimates, the confidence intervals are computed at a 10% significance. The results for the total flows are displayed in Figure 3, while those for population groups are displayed in Figure A.1 in the Appendix.

In general, we see that the importance of city size increases with the distance threshold, meaning that large cities matter more if they are further away. The importance of employment decreases with distance, which is quite reasonable, as there are likely to be more job opportunities for those with deeper knowledge of the labour market, which is more likely to be seen in neighbouring areas. As for real wages, we see a differentiated pattern for some population groups. While real wages are generally flat or decreasing with distance, they display an increasing pattern for the youngest cohorts—those whose expected returns need to be higher when moving further away. Finally, for housing prices we observe a flat pattern, which declines with distance for returned nationals. Housing prices are a strong deterrent for moving further distances, as they entail increasing costs for movers.

Table 1. PPML Estimation results for total migrants (≥18) from Local Labour Market Areas to Functional Urban Areas

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total	**Nationals**	**Non-returned nationals**	**Returned nationals**	**Foreigners**	**Total 18-30**	**Total 31-60**	**Total 61+**
ln Population	1.058	1.673*	1.787*	0.822	1.283**	1.401*	0.569	2.461*
	(0.830)	(1.011)	(0.979)	(1.478)	(0.619)	(0.793)	(0.834)	(1.285)
ln Distance	-0.979***	-1.008***	-1.014***	-1.043***	-0.865***	-0.920***	-0.979***	-1.110***
	(0.0127)	(0.0145)	(0.0141)	(0.0216)	(0.00906)	(0.0128)	(0.0132)	(0.0124)
Empoyment rate	0.363*	0.428*	0.454*	0.362	0.231	0.450*	0.228	0.667
	(0.209)	(0.229)	(0.250)	(0.238)	(0.253)	(0.246)	(0.201)	(0.533)
ln Real wage	0.579*	0.483	0.402	0.805	0.350	0.686**	0.487	1.030*
	(0.350)	(0.425)	(0.409)	(0.618)	(0.309)	(0.341)	(0.360)	(0.581)
ln Housing costs	0.00612	0.0243	0.0872	-0.345***	-0.202**	0.0709	-0.0270	0.0341
	(0.0804)	(0.0943)	(0.0976)	(0.116)	(0.0786)	(0.0800)	(0.0758)	(0.168)
Services share	0.00463	-0.00273	-0.00539	0.00911	0.0166***	0.000446	0.00794	-0.000203
	(0.00594)	(0.00708)	(0.00703)	(0.00828)	(0.00496)	(0.00584)	(0.00602)	(0.00913)
Industry share	-0.000920	-0.00933	-0.0117	0.00156	0.00779	0.00270	-0.00226	-0.00452
	(0.00721)	(0.00892)	(0.00895)	(0.0111)	(0.00667)	(0.00706)	(0.00717)	(0.0135)
N	126,696	126,696	126,696	122,657	124,428	126,521	126,653	71,118
R2	0.917	0.892	0.890	0.802	0.899	0.881	0.903	0.737
Log pseudolikelihood	-363495	-333968	-287508	-114478	-145387	-177545	-246722	-111358
Log l fixed-effect-only regression	-4.357e+06	-3.087e+06	-2.608e+06	-577830	-1.446e+06	-1.498e+06	-2.541e+06	-424115
Chi2	6049	4882	5173	2535	9275	5266	5606	8039
Number absorbed FE	2942	2942	2942	2849	2890	2938	2941	2918

Notes: Robust standard errors in parentheses. *** p<0.01, **p<0.05, * p<0.1

Table 2. PPML Estimation results for total migrants (≥18) from Provinces to Functional Urban Areas

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total	**Nationals**	**Non-returned nationals**	**Returned nationals**	**Foreigners**	**Total 18-30**	**Total 31-60**	**Total 61+**
ln Population	0.992***	1.566***	1.654***	1.038	1.312***	1.423***	0.490*	2.251***
	(0.226)	(0.246)	(0.247)	(0.654)	(0.458)	(0.321)	(0.257)	(0.462)
ln Distance	-0.983***	-1.012***	-1.019***	-1.053***	-0.868***	-0.919***	-0.985***	-1.176***
	(0.0453)	(0.0504)	(0.0493)	(0.0629)	(0.0311)	(0.0463)	(0.0457)	(0.0447)
Empoyment rate	0.330***	0.399***	0.451***	0.296**	0.197	0.415**	0.205**	0.676**
	(0.0945)	(0.0909)	(0.126)	(0.126)	(0.234)	(0.188)	(0.0868)	(0.301)
ln Real wage	0.603***	0.524***	0.455***	0.738**	0.375	0.699***	0.524***	0.911***
	(0.137)	(0.149)	(0.154)	(0.314)	(0.254)	(0.191)	(0.155)	(0.273)
ln Housing costs	0.0127	0.0471	0.102***	-0.289***	-0.211***	0.0775*	-0.0220	0.0611
	(0.0334)	(0.0312)	(0.0314)	(0.0717)	(0.0666)	(0.0469)	(0.0389)	(0.0571)
Services share	0.00508**	-0.00199	-0.00452*	0.00917**	0.0164***	0.000484	0.00855***	0.000960
	(0.00235)	(0.00240)	(0.00240)	(0.00412)	(0.00457)	(0.00303)	(0.00259)	(0.00412)
Industry share	-6.56e-06	-0.00850***	-0.0105***	0.000761	0.00914	0.00268	-0.000998	-0.00273
	(0.00289)	(0.00299)	(0.00303)	(0.00596)	(0.00596)	(0.00401)	(0.00308)	(0.00539)
N	13,626	13,626	13,626	13,626	13,626	13,626	13,626	13,546
R2	0.908	0.858	0.872	0.787	0.965	0.921	0.908	0.805

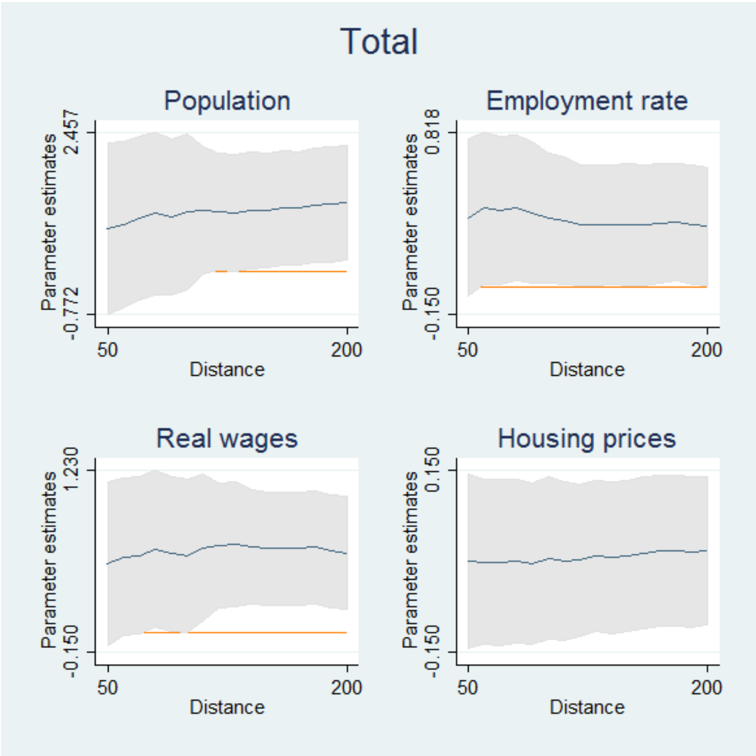
Notes: Robust standard errors in parentheses. *** p<0.01, **p<0.05, * p<0.

Table 3. PPML Estimation results for total migrants (≥18) between Functional Urban Areas

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total	**Nationals**	**Non-returned nationals**	**Returned nationals**	**Foreigners**	**Total 18-30**	**Total 31-60**	**Total 61+**
ln Population	1.021***	1.620***	1.765***	0.457	1.016**	1.318***	0.694**	1.291**
	(0.254)	(0.284)	(0.292)	(0.737)	(0.493)	(0.413)	(0.288)	(0.561)
ln Distance	-0.799***	-0.794***	-0.807***	-0.774***	-0.760***	-0.755***	-0.812***	-0.880***
	(0.0450)	(0.0517)	(0.0510)	(0.0606)	(0.0259)	(0.0453)	(0.0454)	(0.0451)
Empoyment rate	0.346**	0.330***	0.431***	0.110	0.585	0.401	0.265**	0.514
	(0.138)	(0.106)	(0.167)	(0.189)	(0.379)	(0.266)	(0.132)	(0.335)
ln Real wage	0.622***	0.536***	0.460**	0.729*	0.471*	0.733***	0.490***	1.682***
	(0.171)	(0.193)	(0.200)	(0.407)	(0.276)	(0.239)	(0.188)	(0.376)
ln Housing costs	0.0631	0.0433	0.0967**	-0.288***	-0.120	0.163**	0.0284	-0.0346
	(0.0444)	(0.0424)	(0.0430)	(0.0842)	(0.0815)	(0.0639)	(0.0507)	(0.0697)
Services share	0.00411	-0.00212	-0.00485*	0.0102**	0.0138***	-0.000160	0.00575*	0.00621
	(0.00282)	(0.00283)	(0.00292)	(0.00504)	(0.00495)	(0.00359)	(0.00319)	(0.00507)
Industry share	-0.000728	-0.0103***	-0.0130***	0.00185	0.00467	0.00271	-0.00401	-0.00615
	(0.00358)	(0.00361)	(0.00372)	(0.00724)	(0.00676)	(0.00484)	(0.00387)	(0.00676)
N	11,616	11,616	11,616	11,616	11,616	11,616	11,616	11,517
R2	0.961	0.925	0.933	0.842	0.984	0.963	0.960	0.846

Notes: Robust standard errors in parentheses. *** p<0.01, **p<0.05, * p<0.1

Figure 3: Sensitivity of parameter estimates to the distance threshold for defining interregional flows. Total flows from LLMs to FUAs.



6. Discussion and Concluding Remarks

The analysis of the role of labour market factors in migration towards cities during the Great Recession in Spain is interesting for several reasons. First, this recent economic downturn has had a strong effect on wages and, more importantly, on unemployment rates, which have greatly absorbed the economic shock. In this context, we observe an increase in spatial concentration, a decline in internal migration, and an increase in migration to the highest Functional Urban Areas (FUAs). This led us to wonder about the extent to which urban migration has been motivated by economic and labour market factors. Second, the results for migration determinants obtained in the previous period of instability in Spain—the 1980s and early 1990s—cast doubt on the influence of labour market factors on migration during the current economic crisis. Third, there is a clear need to study migration phenomena in Spain using economically consistent spatial units instead of administrative areas.

In order to perform the analysis, we have used a gravity model for migration flows towards urban areas, including several controls and a complex structure of fixed effects to avoid potential endogeneity problems as a consequence of variable omission. We performed the estimation using the Pseudo Poisson Maximum Likelihood (PPML) methodology. As a count data model, PPML deals in a natural way with the presence of zero migration flows and, as it does not make assumptions about the form of heteroscedasticity, it is robust to different sources of heteroscedasticity. We conducted estimations for all migrants, but we also exploited the available information and distinguished migrants according to age, nationality, and linkage with the destination.

The results highlight that labour market factors exert a significant influence on internal migration towards urban areas. When we disaggregate into different collectives by exploiting the micro dataset, the effect of employment rate is confirmed for nationals, non-returned nationals, and the youngest group of migrants. The influence of wages in migration to cities is confirmed when we consider provinces as origin instead of LLMs, probably because the more aggregate nature of the information favours less volatile results. Finally, a subsample with flows between FUAs provides a new, interesting finding. For younger urban cohorts, employment rate is not significant. Thus, urban youth migrate to larger cities even if there are no additional job opportunities, probably because of their career development perspectives and their attraction to higher wages.

Therefore, from a general perspective, we confirm a significant influence of labour market factors on migration towards the Spanish urban areas, whatever unit of origin considered. These results contribute to the literature stating that the labelled "enigma" of migration motivations in high instability periods did not take place during the Great Recession. Additionally, we have provided a better understanding of the migration-specific motivations of different collectives, taking into consideration the role of labour market determinants and controlling for factors of origin, and the attributes of third areas.

In addition to labour market factors, we have found a relevant role of city size in attracting migrants. These results are in line with the stylised facts of an increase in spatial concentration in the Spanish system of cities. Growing cities are a major destination for all population groups except for returned migrants, who, as expected, display different behaviours that are less based on traditional factors. These results hold for broad flows, but also for flows between cities, reinforcing the idea of spatial concentration on a small number of big cities.

The obtained results show that if the neoclassical approach applies, population flows have a strong role as a driver of spatial equilibrium in the labour market. The largest population group, non-returned nationals, migrate to large and more affluent cities, even if housing prices are high. In fact, some of the models for younger cohorts display a positive and significant parameter for housing prices, which reflects a differentiated pattern of population sorting. It is likely the case that highly qualified individuals concentrate in large cities, leading to an increase in regional labour market differentials. From a policy perspective, any effort to foster economic convergence in the country needs to account for the role of migration and particularly for heterogeneity in the flows, calling for tailored policies promoting migration for some subgroups. We believe that further research can be devoted to the interaction between internal and foreign migration flows and to the analysis of vulnerable territories (de Cos and Reques, 2019). Additionally, it would be interesting to determine the consequences of migration for the territories and for individuals.

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Appendix

Table A.1: Internal moves in Spain by distance. All moves.

Distance	Total	National	Return National	No Return National	Foreign
0	1.192.207	851.572	123.587	727.985	340.635
10	1.656.634	1.223.646	218.894	1.004.752	432.988
20	1.044.597	761.184	145.957	615.227	283.413
30	649.376	473.267	92.113	381.154	176.109
40	403.054	306.705	59.704	247.001	96.349
50	301.601	226.976	43.908	183.068	74.625
60	234.109	177.548	34.762	142.786	56.561
70	169.687	129.722	24.958	104.764	39.965
80	139.674	107.334	20.069	87.265	32.340
90	134.414	102.604	19.917	82.687	31.810
100	118.511	90.026	16.637	73.389	28.485
110	103.859	78.795	14.639	64.156	25.064
120	90.344	68.586	12.453	56.133	21.758
130	76.051	58.604	10.848	47.756	17.447
140	73.976	55.441	10.204	45.237	18.535
150	62.851	48.783	9.096	39.687	14.068
160	57.234	43.187	7.368	35.819	14.047
170	64.596	48.321	8.820	39.501	16.275
180	55.364	41.348	7.377	33.971	14.016
190	49.315	36.263	6.564	29.699	13.052
200	43.630	31.514	5.445	26.069	12.116
210	50.513	38.318	6.806	31.512	12.195
220	40.736	29.356	5.236	24.120	11.380
230	47.067	34.775	6.378	28.397	12.292
240	36.058	27.035	4.779	22.256	9.023
250	33.366	23.712	4.167	19.545	9.654
260 +	2.352.564	1.602.773	271.262	1.331.511	749.791
Total	9.281.388	6.717.395	1.191.948	5.525.447	2.563.993

Table A.2: Internal moves in Spain by distance. Moves towards Functional Urban Areas

Distance	Total	National	Return National	No Return National	Foreign
0	826.001	581.075	79.161	501.914	244.926
10	1.096.444	810.902	152.125	658.777	285.542
20	739.574	529.875	108.050	421.825	209.699
30	423.336	299.465	63.345	236.120	123.871
40	249.738	188.726	37.183	151.543	61.012
50	167.091	124.581	25.841	98.740	42.510
60	125.811	94.468	19.529	74.939	31.343
70	78.312	60.142	12.916	47.226	18.170
80	66.726	51.750	9.323	42.427	14.976
90	71.968	54.500	10.847	43.653	17.468
100	66.867	51.007	8.760	42.247	15.860
110	53.568	40.856	7.459	33.397	12.712
120	45.428	34.693	5.862	28.831	10.735
130	37.042	28.962	5.370	23.592	8.080
140	38.111	28.859	4.989	23.870	9.252
150	32.283	25.732	4.888	20.844	6.551
160	30.281	23.372	3.615	19.757	6.909
170	37.278	28.082	5.175	22.907	9.196
180	29.406	22.309	3.796	18.513	7.097
190	25.448	19.112	3.194	15.918	6.336
200	21.641	15.861	2.325	13.536	5.780
210	27.485	21.541	3.659	17.882	5.944
220	20.742	15.170	2.491	12.679	5.572
230	26.589	20.085	3.506	16.579	6.504
240	17.453	13.484	1.945	11.539	3.969
250	16.220	11.952	1.761	10.191	4.268
260 +	1.453.580	988.123	157.683	830.440	465.457
Total	5.824.423	4.184.684	744.798	3.439.886	1.639.739

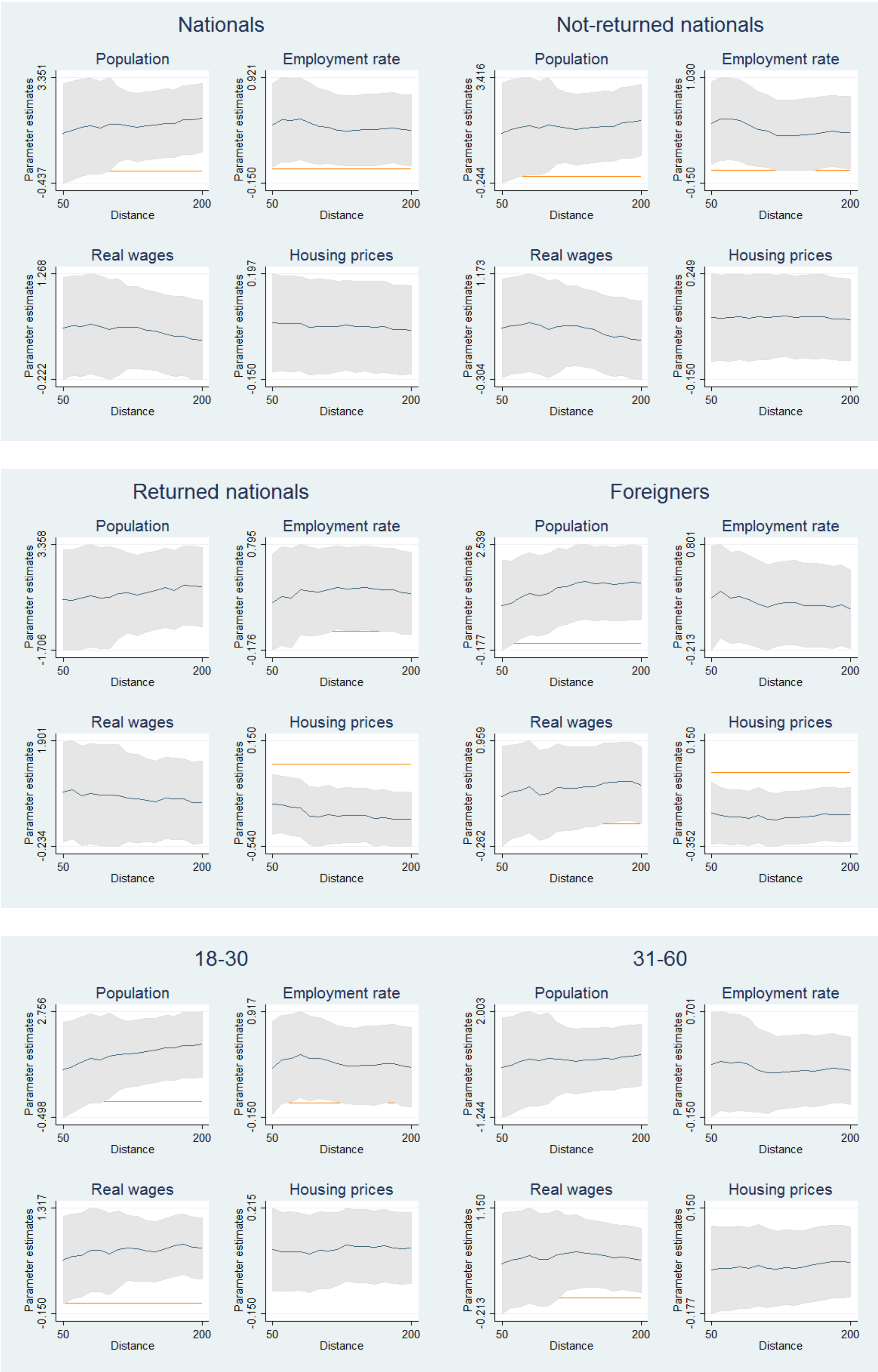
Table A.3: Variables definition and information sources

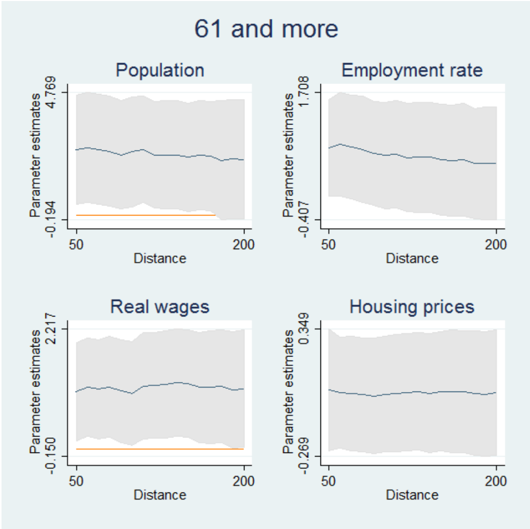
Variable	Proxy	Source
Migration flows	Counts of people flows over 18 years old flows that take place between FUAs which are located at a minimum distance of 120 km.	EVR
Population	Total population	Continuous Register (INE)
Geographical distance	Driving distance in time (minutes) Flight distance in time (minutes) if origin and/or destination FUAs are located in an island	Google maps and own calculations
Employment Rate	Registered employment in the municipalities that integer the FUAs divided by the FUAs working age population	Public State Employment (Social Security Database)
Real Wage	Nominal Wage deflated by CPI (NUTS 3 level). For the Basque country and Navarra the data is obtained from the Wage Structure Survey. The final average income of these FUAs takes into account the relationship between NUTS 2 regional average income provided by the Tax Agency and the EES wage.	AEAT
Industry Structure	The industrial structure is a measure of the relative importance of each economic sector in the economy. It is calculated by dividing the number of people employed in each economic sector by total employment.	EPA
Housing costs	Average cost of housing per sq-m of the municipalities within every FUAs with at least 50 sale advertisements on the webpage. We calculate the average housing costs for every FUAs as a by weighted average in terms of local population.	Idealista

Table A.4: Descriptive Statistics

	Mean	Overall	Between	Within	Min	Max	Perc of zero flows
LLMs to FUAs (N=152,145)							
Total migration flows	38,3	1237,6	1236,6	48,6	0	139487	43%
Nationals	27,5	817,9	817,3	34,0	0	89938	49%
Not returned nationals	22,6	692,4	691,8	29,1	0	77617	51%
Returned nationals	4,9	126,9	126,6	9,0	0	14002	75%
Foreigners	10,8	428,5	424,2	60,5	0	53429	64%
Flows 18-30	11,8	372,2	368,9	49,6	0	46105	59%
Flows 31-60	22,5	751,9	751,5	26,0	0	85983	52%
Flows 61 and more	6,9	154,2	126,3	9,9	0	13654	75%
Provinces to FUAs (N=16,380)							
Total migration flows	355,6	3789,2	3786,5	160,1	0	134345	1%
Nationals	255,5	2517,2	2515,2	111,8	0	86327	1%
Not returned nationals	210,0	2125,4	2123,6	95,6	0	74721	2%
Returned nationals	45,5	398,9	397,9	28,8	0	13098	18%
Foreigners	100,1	1304,4	1291,1	187,5	0	51826	7%
Flows 18-30	109,9	1144,6	1134,3	155,0	0	44409	4%
Flows 31-60	209,0	2297,2	2296,0	85,0	0	82419	2%
Flows 61 and more	36,9	360,9	359,1	24,2	0	13013	19%
FUAs to FUAs (N=11,880)							
Total migration flows	86,7	250,0	249,3	20,0	0	5203	1%
Nationals	59,6	157,5	156,7	15,8	0	2827	2%
Not returned nationals	50,0	136,3	135,6	13,8	0	2533	4%
Returned nationals	9,6	24,4	23,9	4,5	0	385	25%
Foreigners	27,0	100,9	99,3	18,0	0	2865	10%
Flows 18-30	28,5	84,7	83,7	13,0	0	2040	7%
Flows 31-60	50,6	148,1	147,6	13,2	0	3218	3%
Flows 61 and more	7,7	20,5	20,1	3,5	0	341	30%
Covariates							
log population	11,0	4,5	0,7	4,5	0,0	15,7	
log Euclidean distance	6,3	0,7	0,7	0,0	0,0	8,0	
Employment Rate	0,4	0,2	0,1	0,2	0,0	0,7	
log Real Wages	9,8	0,2	0,2	0,1	9,4	10,2	
log Housing Costs	7,6	0,3	0,2	0,1	6,9	8,4	
Services Share	60,8	25,6	5,3	25,0	0,0	87,4	
Industry Share	12,7	7,5	4,9	5,6	0,0	31,1	

Figure A.1: Sensitivity of parameter estimates to the distance threshold for defining interregional flows. Population groups flows from LLMs to FUAs.




61 and more
Population
Employment rate
Real wages
Housing prices
Parameter estimates
4.769
-0.194
1.708
-0.407
2.217
-0.150
0.349
-0.269
50
200
Distance