Title:

Demographic transformation across regions: the role of migration on population growth in Spain.

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Abstract:

This paper presents a comparative analysis of the role played by migration in recent population growth trends in six Spanish regions. This work contributes to a better understanding of how both the movements and births of national- and foreign-born individuals have influenced population growth trends in Spain. The databases used are the Spanish Residential Variation Statistics and the Natural Movement of the Population for the period 2002-2021. Through the estimation of the Population Turnover Rates, Migration Share of Turnover and Birth Share of Turnover, the analysis shows that external migration has driven most population growth across all regions, especially after 2013. Although the Birth Share of Turnover of the native-born individuals has diminished during the last two decades in all regions, there is an increasing or stable contribution of births from foreign-born parents. Additionally, a negative internal balance is found in all regions (except for the Community of Madrid), which has contributed to the aging of those regions with a population decline trend. Finally, foreign-born migration has contributed to population growth not only in terms of entries but also through births, which vary according to the migrant population's composition.

Extended summary:

1) Theorical-framework

The aim of this research is to analyse the role played by migration in recent population growth trends in Spain during the last two decades through a comparative analysis at the regional level. Since the beginning of the 21st century, Spain has experienced a strong population growth especially marked by the large arrival of immigrants or "migration boom" during the late 90s and early 2000s (Mujica & Guerra, 2009). Although international immigration was reduced after the economic crisis of 2008, since 2015 the population of those born abroad has increased gradually and unevenly across regions in Spain, the Autonomous Communities (CCAA). At the same time, Spain has experienced a strong population aging and a reduction in birth rates, reaching one of the lowest fertility levels worldwide (Esteve et al., 2021). These demographic challenges highlight the relevance of studying the unequal distribution of migrants across Spanish regions and its influence on demographic dynamics.

In the debate about the role played by migration in the generational replacement process, some authors emphasise that migration has become a key factor for population growth and replacement in a large part of European countries (Ediev et al., 2014; Ediev & Yüceşahin, 2016; Preston & Wang, 2007). Likewise, Del Rey & Cebrián-Villar (2010) highlight the migration component as the main driver of this process in Spain, comparing two CCAA such as Madrid and Castilla y León. On the contrary, Serrano-Martínez & García-Marín (2018) stress the ineffectiveness of migration to generate significant changes in demographic trends. Regional empirical evidence shows a great variety and territorial disparity in relation to demographic processes and behaviours (Carioli et al., 2021; Del Rey & Ortega, 2010). However, as far as we know, comparative analyses at the regional level on the contribution of migration to population growth in Spain are practically non-existent.

In this paper, we assume that migration plays a key role when explaining recent population growth trends of some CCAA. Moreover, we expect foreign-born immigrants to positively impact demographic growth in Spanish regions not only at their arrival but also through births over time. Considering the unequal distribution of immigrants by origin, we might expect internal and external migration to have affected asymmetrically population trends in each CCAA. Therefore, we have formulated the following hypotheses:

Hypothesis 1. Migration has had a positive effect on the population growth of all CCAA. However, differences are expected across regions. This different contribution is expected not only in the number of entries and exits but also in the number of births.

Hypothesis 2. Differences in population growth and births are expected according to the immigrant population's composition, with a greater contribution of immigration in those CCAA with higher shares of individuals born in Africa, a group with higher fertility rates.

Hypothesis 3. We expect a decreasing trend in the total population of native-born individuals of native-born parents in all CCAA, even in those with a greater number of internal entries.

2) Data sources

The data used in this research comes from the Residential Variation Statistics (EVR) of the Municipal Register and the Natural Movement of the Population (MNP), provided by the Spanish National Institute of Statistics (INE). These databases allow us to obtain homogeneous and precise annual data at the regional level on births, entries and exits of people from the territory between 2002 and 2021. Another advantage of these databases is the possibility of distinguishing both internal and external movements, while, at the same time, we can identify the individuals' country of birth. In this case, we analyse 6 CCAA: the Community of Madrid, Catalonia and Murcia that have experienced population growth, and Castilla y León, Extremadura and Galicia that suffered a decrease during the aforementioned period. Regarding the country of birth, it has been grouped according to different geographical areas, such as Europe, Africa, South America, Central America and the Caribbean, North America, Asia and Oceania.

3) Research methods

The methodology approach used in this paper includes a decomposition by country of birth of the Population Turnover Rate (PTR) proposed by Billari (2022). With P_t and P_{t-1} being the total population in the current period *t* and *t-1*, the population growth of territory *j* can be calculated as:

$$P_{j,t} - P_{j,t-1} = B_{j(t-1,t)} - D_{j(t-1,t)} + I_{j(t-1,t)} - E_{j(t-1,t)}$$

where $B_{j(t-1,t)}$ represents the total number of births, $D_{j(t-1,t)}$ the deaths, $I_{j(t-1,t)}$ the immigration and $E_{j(t-1,t)}$ the emigration, between periods *t-1* and *t*. To measure the overall population's change between *t* and *t-1*, Billari (2022) defines the Population Turnover Rate (PTR) as:

$$PTR_{jk(t-1,t)} = b_{jk(t-1,t)} + d_{jk(t-1,t)} + i_{jk(t-1,t)} + e_{jk(t-1,t)}$$

with,

$$b_{jk(t-1,t)} = \frac{B_{jk(t-1,t)}}{T \times P_{jk(t-1,t)}} \quad ; \quad d_{jk(t-1,t)} = \frac{D_{jk(t-1,t)}}{T \times P_{jk(t-1,t)}} \quad ; \quad i_{jk(t-1,t)} = \frac{I_{jk(t-1,t)}}{T \times P_{jk(t-1,t)}} \quad ; \quad e_{jk(t-1,t)} = \frac{E_{jk(t-1,t)}}{T \times P_{jk(t-1,t)}}$$

being T the number of years between periods *t* and *t-1*. What we add to this methodology approach, is the disaggregation of these four components by the country of birth of individuals, represented by *k*. In this case, the number of births can be decomposed by the parents' country of birth: (i) both native-born, (ii) both foreign-born, and (iii) one native- and one foreign-born. Once the PTR has been calculated, we also analyse the specific contribution of migration and births to the total population change by calculating both the Migration Share of Turnover (MST) and Births' Share of Turnover (BST), again by country of birth:

$$MST_{jk(t-1,t)} = \frac{i_{jk(\boldsymbol{t-1,t})} + e_{jk(\boldsymbol{t-1,t})}}{PTR_{jk(\boldsymbol{t-1,t})}} = \frac{I_{jk(\boldsymbol{t-1,t})} + E_{jk(\boldsymbol{t-1,t})}}{B_{jk(\boldsymbol{t-1,t})} + D_{jk(\boldsymbol{t-1,t})} + I_{jk(\boldsymbol{t-1,t})} + E_{jk(\boldsymbol{t-1,t})}}$$

$$BST_{jk(t-1,t)} = \frac{b_{jk(\boldsymbol{t-1,t})}}{PTR_{jk(\boldsymbol{t-1,t})}} = \frac{B_{jk(\boldsymbol{t-1,t})}}{B_{jk(\boldsymbol{t-1,t})} + D_{jk(\boldsymbol{t-1,t})} + I_{jk(\boldsymbol{t-1,t})} + E_{jk(\boldsymbol{t-1,t})}}$$

It should be noted that our approach differs from the one used by Billari (2022) in three aspects. First, for both $I_{j(t-1,t)}$ and $E_{j(t-1,t)}$ we include the net balances, since the objective of this paper is to measure population growth and not population change. Secondly, we decompose both $I_{j(t-1,t)}$ and $E_{j(t-1,t)}$ in the internal and external movements. Thirdly, we also analyse the role of births in population growth by calculating the BST. Accordingly, we can study the contribution of immigration in Spain across regions not only taking into account its influence on the migratory balance, but also on the natural balance.

4) Findings

Based on the analysis, certain differences on population growth and demographic trends are observed across regions (CCAA) according to the different patterns of migration. We present the following conclusions regarding the role of migration in population growth according to different factors by country of birth in Spain:

1. Although the total population of Spain increased from 2002 to 2021, we found that some CCAA have experienced a decrease in population, such as Castilla y León, Extremadura and Galicia. On the contrary, the population has increased in Catalonia, the Community of Madrid and Murcia, where the PTR is greater for all the period analysed. Interestingly, we found a decreasing trend in the evolution of the PTR in all CCAA. These differences in population growth have been affected, among other factors, by the arrival of foreign-born population, which is reflected in a considerably greater MST in those regions that have experienced population growth. In this sense, immigration has contributed to the growth of the population in Spain while it helped slowing the decline of population in Castilla y León, Extremadura and Galicia.

2. We observe a similar evolution of migration balances in the six CCAA analysed, with a negative balance after the Great Recession and a subsequent increase starting between 2013 and 2015. When comparing the external balances, we see how the attraction of foreign-born is especially high in those regions where the population has grown (measured through the MST). However, while in the CCAA where the population has decreased, we observe a continued departure of native-born individuals, especially young people, in those where the population has increased, we find two different patterns: in Madrid and Murcia there has been a strong arrival of native-born individuals since 2008, while in Barcelona their arrival is scarce.

3. The BST is found to be greater in those regions that have experienced population growth than in those with population decline. Consequently, a negative natural balance is observed in Castilla y León, Extremadura and Galicia. The decomposition analysis on the individuals and parents' country of birth shows a growing trend in the native-born population from foreign-born parents, which is similar in all regions. Moreover, we observe how in all CCAA, the population of native-born from native-born parents has decreased continuously, especially since 2008. It is concluded that immigration has contributed to population growth through an increase of both the foreign-born population and the number of births. However, the BST of the foreign-born population is remarkably greater in those CCAA that have experienced population growth, which in fact, are also the ones with a greater MST of foreign-born.

4. Those CCAA, such as Catalonia and Murcia, where the percentage of immigrants born in Africa and Central America is higher, show a greater growth in the share of native-born individuals from foreign-born parents. Therefore, the composition of the immigrant population also influences the natural balance of the recipient population.

These conclusions support most of the previous evidence on the effects of immigration in relation to the demographic processes of the receiving countries or regions. However, through a comparative analysis at the regional level in Spain from 2002 to 2021, we have been able to identify the different evolution and causes of population growth and decrease in the CCAA. One of the contributions of this paper is the inclusion of the country of birth as a determinant of the contribution of immigrants to population growth. In a context where the Spanish population is characterised by continuous aging and reduced birth rates, our results show the role that the immigrant population has in favouring generational replacement. Furthermore, considering the movement of young people towards large urban centres and towards certain CCAA, such as the Community of Madrid, they show the relevance that attracting the foreign population can have in regions with very low fertility rates and share of young people, such as Castilla y León or Extremadura, which also have lost population during the last two decades.

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