

González-Leonardo, Miguel

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Between leading and lagging: Interregional migration, unemployment and over-education among college graduates in the aftermath of the 2008 recession

Miguel González-Leonardo¹

¹ El Colegio de México, Mexico City, Mexico and International Institute for Applied Systems Analysis, Laxenburg, Austria

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Abstract. In this paper, we analyse the interregional migration of Spanish-born young adults by educational attainment and explore unemployment and over-education in the labour market among internal migrants and sedentary individuals with a university degree. We used register data of population movements from 2000 to 2018 to analyse internal migration patterns and the Labour Force Survey to study the educational attainment of migrants, as well as unemployment rates and over-education among college graduates. Our results indicate a regional polarisation after the economic crisis. Peripheral regions in the interior of Spain have been affected by an increasing exodus of university graduates, in addition to high levels of unemployment and over-education among individuals with a university degree who remain at origin. However, peripheral regions in the north-west and south of Spain have been less affected by out-migration. The central region of Madrid has emerged as the main destination for university graduates, with a large capacity to employ populations with university education from other regions. Semi-central regions of the Mediterranean and north-east of Spain retain local college graduates and exhibit good labour market conditions among residents with a university degree, but they are not destinations of individuals with university education from other regions.

Key words: Human-capital mobility, internal migration, unemployment, over-education, Spain

1 Introduction

Skilled human capital is essential for economic development, as the globalisation production system is characterised by an increasing importance of the knowledge economy (Dotti et al. 2013, Corcoran, Faggian 2017). The level of human capital is therefore linked to the potential for economic growth and innovation (Florida et al. 2008). Areas with low levels of human capital show low levels of economic growth, while those with a concentration of skilled workers thrive in today's globalised economy (Sassen 1991, Haapanen, Tervo 2012). The characteristics of jobs in an area depend on the local economy. Typically, global cities concentrate technological, financial activities and advanced service and therefore most skilled jobs (Sassen 1991, Sánchez-Moral et al. 2018). However, the economy of peripheral regions, usually with rural areas and small and medium-sized

cities, has traditional industries and a low-tech service sector ([Kabisch, Haase 2011](#), [Nelle 2016](#)).

Human capital mobility responds to inequalities in the spatial distribution of economic activities ([Myrdal 1957](#), [Sassen 1991](#), [Sleutjes, Roterman 2014](#)). Internal migration, mainly among the highly educated population, is driven by a mismatch between economic activities and the characteristics of the local labour force ([Beine et al. 2008](#), [Martin-Brelot et al. 2010](#)). Central regions with global cities concentrate technological activities and high salaries, attracting high-skilled migrants ([Sjaastad 1962](#), [Fielding 1992](#), [Harvey 2006](#)). These regions also offer better opportunities of socio-economic progression ([Kooiman et al. 2018](#)). The economy of peripheral regions, however, is based on traditional industries which demand medium- and low-skilled workers ([Nelle 2016](#)). Levels of unemployment and over-education among university graduates in peripheral regions are therefore higher than the national average ([Serracant 2005](#), [Sánchez-Sellero et al. 2013](#)), and this encourages the out-migration of highly qualified populations ([Martin-Brelot et al. 2010](#), [González-Leonardo et al. 2022](#)). Since the 2008 economic crisis, some studies have documented an increasing polarisation both between countries ([Pernagallo, Torrisi 2022](#)) and among regions and a low resilience in some peripheral regions with traditional industries and high levels of mono-specialisation ([Rodríguez-Pose, Ketterer 2012](#), [Nelle 2016](#)). In addition, public-sector job cutbacks have had a notable impact on the employability of university graduates in these regions – regions where graduates would normally have a large share of public-sector employment ([Cox, Schmuecker 2010](#), [Tomaney et al. 2010](#)).

Peripheral regions are typically affected by brain drain and thus by the loss of high-skilled human capital ([Sassen 1991](#), [Docquier, Rapoport 2012](#), [González-Leonardo et al. 2019](#)). These human capital flows usually move from peripheries to central regions of the territorial hierarchy, especially towards areas with global cities ([Sassen 1991](#), [Fielding 1992](#), [González-Leonardo et al. 2022](#)). Brain drain has negative consequences at the origin, with increasing accumulation dynamics at the destination ([Myrdal 1957](#), [Beine et al. 2008](#), [Sleutjes, Roterman 2014](#)). Mobility is explained as a rational decision by individuals to obtain higher returns on their skills, which are better rewarded in chief regions ([Fielding 1992](#), [Rowe et al. 2017](#), [Sánchez-Moral et al. 2018](#)). The greater the mismatch between skills and the returns on them at the origin, the greater the out-migration of highly skilled human capital ([Martin-Brelot et al. 2010](#)). Non-economic factors, such as cultural activities or a cosmopolitan environment, also influence the choice of place of residence, especially among the “creative class” ([Florida 2002](#)). However, economic factors usually have a more significant influence on the decision to migrate ([Martin-Brelot et al. 2010](#), [Thomas 2019](#)).

Most studies analysing the mobility of qualified human capital have focused on international migration ([Docquier, Marfouk 2006](#), [Docquier, Rapoport 2012](#), [Cavallini et al. 2018](#)) and talent attraction in global cities ([Florida 2002](#), [Faggian, Royuela 2010](#), [López-Gay et al. 2020](#)). Less is known about the patterns of internal migration by educational attainment ([Faggian et al. 2007](#)). In this research, we contribute to this topic through a case study on Spain. Like other Southern European countries, Spain shows great inter-regional inequalities that determine human capital mobility ([Cavallini et al. 2018](#), [Basile et al. 2019](#)). Madrid region, the Mediterranean area, and the north-east of Spain have developed and diversified economies with more technological industries, a higher GDP per capita and lower unemployment rates, while regions of the interior, northwest and south of Spain have a traditional and less diversified economy, a lower GDP per capita, higher rates of unemployment and a great dependence on public jobs, specifically to employ university graduates ([Peña-Sánchez, Jiménez-García 2013](#), [Cavallini et al. 2018](#)). Despite low levels of internal migration in Spain ([Bell et al. 2015](#), [Rowe et al. 2019](#)), there is a great territorial heterogeneity when migration patterns by educational attainment are assessed, with Madrid as a main destination of internal migrants with a university degree and the regions surrounding the capital of Spain as sending areas ([González-Leonardo 2020](#), [González-Leonardo et al. 2022](#)). The interregional polarisation observed after the 2008 economic crisis in other counties ([Nelle 2016](#)) suggests that the economy of Spain’s peripheral regions may have been significantly affected and, as a result, migration

patterns by educational attainments between regions.

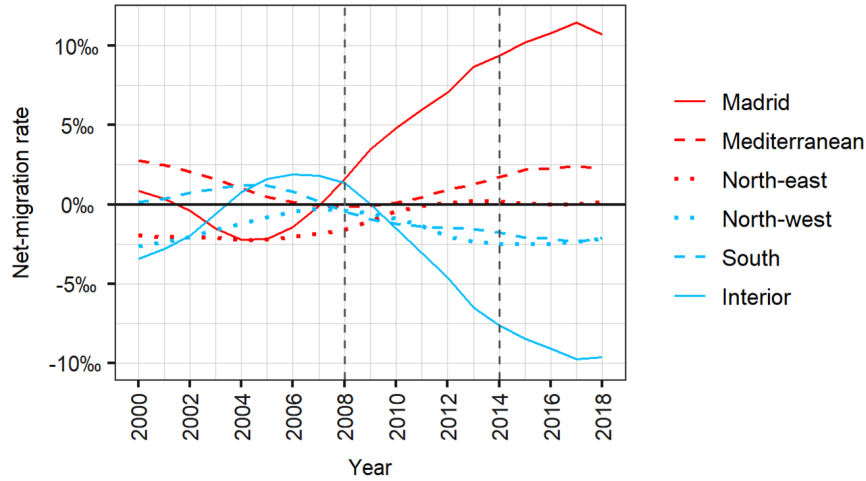
In this paper, we aim to analyse the interregional migration of Spanish young adults by educational attainment from 2000 to 2018. Drawing on register data from the Residential Variation Statistics and socio-demographic information from the Spanish Labour Force Survey, we study how the mobility patterns and educational attainment of migrants changed during the period 2000–2018 at NUTS 1 level. First, we analyse trends of internal migration and the educational profile of internal migrants of each region. We then explore unemployment rates and over-education levels in the labour market among in-migrants, out-migrants and sedentary individuals with a university degree, as they are potential driving forces of changes in internal migration. We specifically aim to respond to the following research questions: How did internal migration patterns change during the economic crisis 2008–2013 and the recovery period from 2014? How did the educational profile of internal migrants vary? How did unemployment rates and over-education levels change among sedentary and non-sedentary university graduates? We expect a polarisation between regions in terms of internal migration patterns and the educational selectivity of internal migrants since the economic crisis of 2008, as well as increasing unemployment and over-education levels among college graduates in peripheral regions. The remainder of the paper is structured as follows: a section on methods and data (Section 2); a division of the results (Section 3) into three sub-sections (internal migration patterns, educational profile of internal migrants and an analysis of unemployment and over-education); and finally, a discussion of this research and our conclusions (Section 4).

2 Data and method

We used micro-data from two sources of the National Institute of Statistics (*Instituto Nacional de Estadística* [INE]) for the period 2000–2018: Residential Variation Statistics (*Estadística de Variaciones Residenciales* [EVR]) and the Labour Force Survey (*Encuesta de Población Activa* [EPA]). The EVR comprises granular register data, including all changes of residence across regions. We used this source to analyse interregional migration patterns. As the EVR includes only basic demographic variables, such as place of birth, sex and age, we used the EPA to analyse the educational attainment and labour market characteristics of migrants. The EPA is a quarterly survey of 160,000 individuals designed to study the labour market, which allows an analysis of internal migration through comparison of the variables “region of birth” and “residence”.

We focused our study on the Spanish population aged 25–39, the most mobile population group in Spain. We used Eurostat’s NUTS 1 units as regions (see Eurostat’s NUTS 1 map- <https://ec.europa.eu/eurostat/web/nuts/nuts-maps>) but included the Canary Islands with Andalusia and Murcia because they have a similar location (southern Spain) and characteristics. Initially, we tried to use NUTS 2 regions, but internal migration is a rare event, and the EPA sample did not allow us to analyse unemployment and over-education among migrants at this territorial level. The final classification includes the following categories: ES1-north-west (Galicia, Asturias and Cantabria), ES2-northeast (Basque Country, Navarre, La Rioja and Aragon), ES3-Madrid, ES4-interior (Castile and León, Castile-La Mancha and Extremadura), ES5-Mediterranean (Catalonia, Community of Valencia and Balearic Islands) and ES6+ES7-south (Andalusia, Murcia and Canary Islands).

First, we used the EVR to calculate net migration rates in each region (NMRⁱ) to measure the loss or gain of young adults by internal migration. Second, we used the EPA to study the educational profile (people with and without a university degree) of the sedentary population (individuals living in their region of birth), out-migrants (those who left the region of birth i and live in the region X) and in-migrants (populations residing in the region i who were born in the region X). Finally, we analysed unemployment rates and the labour profile of university graduates for sedentary individuals, out-migrants and in-migrants in each region. In this stage, we categorized the years into three sub-periods according to GDP growth and unemployment levels to simplify the visualisation of the results: the economic growth during the first seven years of the 21st



Source: Compiled by authors using data from *Residential Variation Statistics* and *population counts* (INE)

Figure 1: Net migration rate by geographical area for the Spanish-born population aged 25–39: 2000–2018.

century, the recession from 2008 to 2013 and the economic recovery between 2014 and 2018. We created the labour profile variable by recoding the original *Código Nacional de Ocupaciones* (CNO) classification into three categories: high-skilled jobs (directors and managers, technicians and scientists), medium-skilled jobs (support technicians, administrative workers, medium-skilled workers of industry, construction or farming and machinery assemblers) and low-skilled jobs (personal services and elementary occupations). We defined a person with a university degree as over-educated in the labour market if this individual is working in the last two categories rather than in the first one.

$$NMR_{25-39}^{i,t+1} = \frac{(I_{25-39}^{i,t+1} - O_{25-39}^{i,t+1})}{(P_{25-39}^{i,t} + P_{25-39}^{i,t+1})/2} * 1000$$

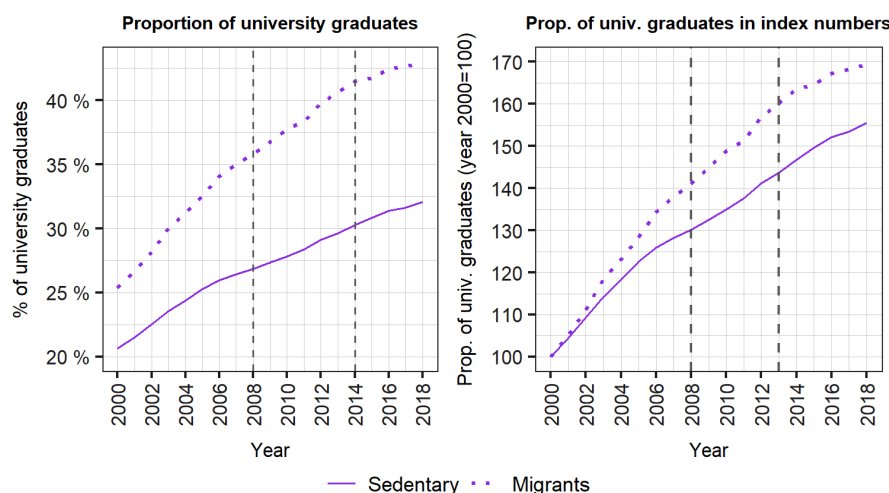
where I is the number of in-migrants to the region i during the period $t + 1$, O is the number of out-migrants from the region i , $P^{i,t}$ is the initial population at 1 January, and $P^{i,t+1}$ is the final at January 1st of the following year.

3 Results

3.1 Population lost due to internal migration in peripheral regions of the interior vs. concentration of individuals in Madrid

During the period 2000–2018, the interregional migration rate of the Spanish-born population aged 25–39 increased from 11.8‰ to 17.9‰. Before the 2008 economic crisis, this increase was unaccompanied by significant variations in net migration rates in the Spanish regions, as in-flows and out-flows were closely balanced (Figure 1). However, we do identify a regional polarisation from 2008. Madrid's net migration rate increased from 2.5‰ to 11‰ between 2008 and 2018 and declined in the peripheral interior regions during the crisis and the post-crisis period, from 2.5‰ in 2008 to -10‰ in 2018¹. Variations on net migration rates in the peripheral southern and north-western regions were of less importance than those in the regions of the interior. Generally, the semi-central regions of the Mediterranean and north-east showed balanced rates over time.

¹We observe positive net migration rates in the Interior between 2004 and 2008, but rates are lower than 2 per thousand. It was caused by a specific trend of suburbanisation from the Metropolitan Area of Madrid to the north of Guadalajara and Toledo provinces which are located within the interior region and bordering Madrid.



Source: Compiled by authors using data from the *Labour Force Survey (INE)*.

Figure 2: Proportion of university graduates in % (left) and index numbers (right) among sedentary population and internal migrants: 2000–2018. Spanish-born population aged 25–39.

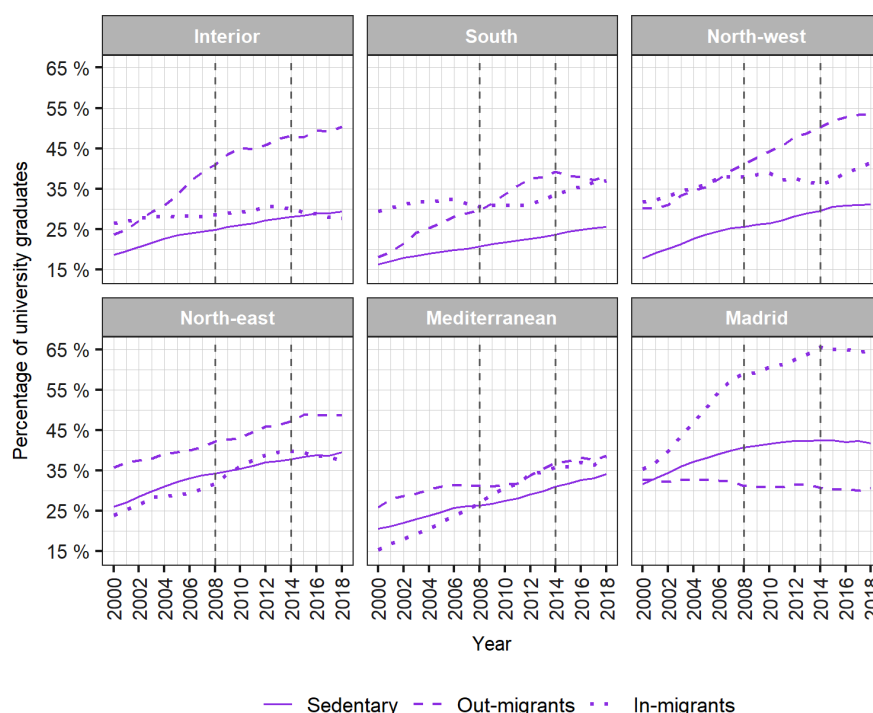
3.2 Internal brain drain vs. brain gain

In this section, we analysed the educational attainment of internal migrants and educational selectivity by comparing the proportion of university graduates between migrants and the sedentary population (Figure 2). The proportion of university graduates increased among both sedentary and internal migrants over the period 2000–2018 due to educational expansion. Nonetheless, the increase in the number of university graduates was higher for migrants, thus increasing the educational selectivity of internal migration. The percentage of the sedentary population with a university degree increased from 21% in 2000 to 32% in 2018, a growth of 55%, whereas among internal migrants, it increased by 70%, from 25% to 43%. As the rise in selectivity displays an almost linear growth trend from 2000 to 2018, it did not show an effect of the economic crisis.

We next compared the proportion of university graduates between the sedentary population, internal out-migrants and in-migrants in each region (Figure 3). We reveal that out-migrants from the peripheral regions of the interior were more educated than the sedentary population, and that this mismatch increased over time. The educational profile of out-migrants was also higher than that of in-migrants, and this gap also increased between 2000 and 2018. In 2018, 47.5% of out-migrants, 27.5% of the sedentary population and 27.5% of in-migrants had a university degree, while in 2000 these values were 24.5%, 17%, and 25.5%, respectively.

In the peripheral regions of the north-west and south of Spain, the proportion of out-migrants with a university degree was also higher than that of sedentary individuals and internal in-migrants. The mismatch between groups was, however, lower. In these regions, we observe the effect of the economic crisis only on the decline in the educational achievement of in-migrants, compared to that of out-migrants. In semi-central regions of the north-east and the Mediterranean, we also observe educational selectivity among out-migrants who, since the economic crisis, were also more educated than in-migrants in the former region.

We observe negative selectivity only among out-migrants in Madrid, where the educational level of people leaving this region was lower than that of the sedentary population. In addition, out-migrants were more educated than in-migrants. We also identify a significant increase in the proportion of university graduates among internal in-migrants. The percentage of university graduates for the sedentary population, out-migrants and in-migrants was around 25–27% in 2000, whereas this proportion increased to 42.5% for sedentary individuals, 27.5% for out-migrants, and 65% for in-migrants in 2018.



Source: Compiled by authors using data from the *Labour Force Survey (INE)*.

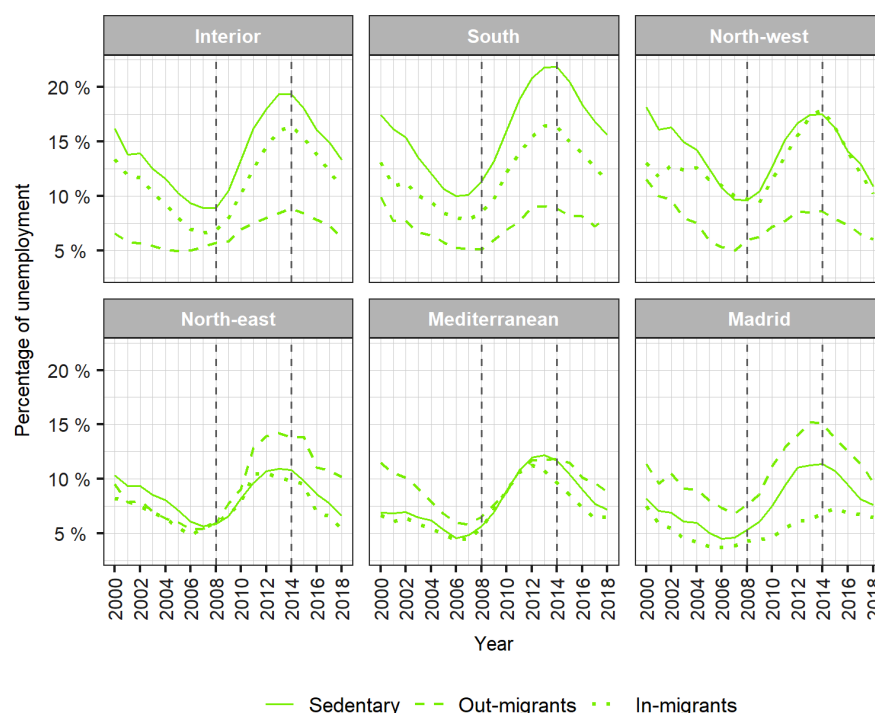
Figure 3: Percentage of university graduates among the sedentary population, internal out-migrants and in-migrants by geographical area: 2000–2018. Spanish-born population aged 25–39.

3.3 Unemployment and over-education among migrants and sedentary individuals with a university degree

We identify the effect of economic cycles on the unemployment rates of young Spaniards with university degrees in all regions: these decreased over the economic growth period 2000–2007, increased during the crisis from 2008 to 2013 and declined during the economic recovery between 2014 and 2018 (Figure 4). We observe that in both periods of growth and economic downturn, the highest levels of unemployment were among the sedentary population in the peripheral regions of southern and interior Spain and, to a lesser extent, in the north-west: these were, respectively, 15.5%, 14%, and 11% in 2018. Levels of unemployment were much lower among out-migrants—around 7.5% for the same year. Generally, in-migrants were also less affected by unemployment than the sedentary population. Our results may underpin the fact that out-migration in these regions plays an important role in the avoidance of high regional unemployment levels at origin. Irrespective of educational attainment, however, we should consider that unemployment rates are much higher per se in southern Spain. Moreover, the interior and the south, as we have seen, show similar levels of unemployment among the sedentary university graduates.

In central and semi-central regions of the north-east and the Mediterranean, lower unemployment rates among sedentary young adults with a university degree were observed – around 7% in 2018 – with levels not being much different from those of out- and in-migrants. Among the sedentary population of Madrid, the unemployment rates were similar to those of the Mediterranean and the north-east; internal out-migrants from Madrid were more affected by unemployment, a trend that contrasts with what was observed in other regions. In-migrants in Madrid, however, have the lowest levels of unemployment in the whole country.

Finally, we explore the labour profile among the sedentary population, out- and in-migrants with a university degree. To summarise the information according to what



Source: Compiled by authors using data from the *Labour Force Survey (INE)*.

Figure 4: Unemployment rate among the sedentary population, internal out-migrants and in-migrants with a university degree by geographical area: 2000–2018. Spanish-born population aged 25–39.

we observed in previous results, we grouped our period of study into three sub-periods corresponding to the economic cycles (GDP growth and unemployment): growth from 2000 to 2007, recession between 2008 and 2013 and economic recovery since 2014. During the economic growth period of 2000–2007, 57% of sedentary young adults with a university degree worked in high-skilled jobs (national average). The north-west and north-east regions had, however, a lower proportion of university graduates working in high-skilled jobs than the national average, while Madrid, the Mediterranean and the south had a higher share (Figure 5). In all the regions, the proportion of out-migrants with a university degree and, to a lesser extent, of in-migrants working in high-skilled jobs was higher than that of sedentary individuals, with the out-migrants from the interior and in-migrants in Madrid showing the highest shares. Despite the economic downturn between 2008 and 2013, the proportion of the sedentary population with a university degree working in high-skilled jobs increased slightly in most regions, but with territorial variations, as well as among out-migrants from the interior, the north-east and the Mediterranean and among in-migrants in Madrid and the Mediterranean.

In the post-crisis period of 2014–2018, the share of the sedentary population with a university degree working in high-skilled jobs increased in all regions, but again with significant territorial variations. We observed the greatest rise in Madrid and the Mediterranean, where, respectively, 67.5% and 65.3% of sedentary individuals with a university degree worked in high-skilled jobs, while the lowest proportions were in the interior (58.6%), and the north-west (57.6%). We also observed increases among out-migrants and in-migrants, but certain significant features can be highlighted. For instance, 68.4% of out-migrants with a university degree from the interior worked in high-skilled jobs, compared to 58.6% of the sedentary population. As for unemployment, our findings suggest that out-migration may help to avoid over-education in the labour market at origin among graduates from these regions. We also found that 73.3% of internal in-migrants in Madrid had high-skilled jobs, the highest proportion in the whole country.



Source: Compiled by authors using data from the *Labour Force Survey (INE)*.

Figure 5: Percentage of university graduates by level of job qualification and geographical area among the sedentary population, internal out-migrants and in-migrants: 2000–2018. Spanish-born population aged 25–39.

4 Discussion and conclusion

Interregional migration of Spanish young adults has increased over the 21st century. The rise in internal migration did not lead to significant variations in net-migration rates in the Spanish regions before the 2008 economic crisis. From 2008, however, we observed a regional polarisation in terms of internal migration, probably driven by growing processes of regional socio-economic inequality. The peripheral regions of the interior showed significant negative net migration rates both during the economic crisis and the post-crisis period. We identified a growing exodus of young adults, as well as an increase in the educational selectivity of out-migrants who were much less educated than in-migrants.

Net migration trends in peripheral regions in the south and the north-west were less affected than those of the interior. These regions also lost a higher proportion of young people since 2008 due to internal migration compared to the pre-crisis period, and the educational attainment of the out-migrants was higher than that of the sedentary population and internal in-migrants. Nonetheless, these figures are far from the values recorded in the interior.

Our results in terms of internal migration are in line with the international literature, which argues that there has been an increasing polarisation between regions since the economic crisis of 2008 (Nelle 2016). Our findings also indicate rising inequalities among regions in the employability of university graduates after 2008, suggesting that out-migration among university graduates could be a strategy for avoiding high levels of unemployment and over-education at origin.

However, we find region-specific dynamics, probably driven by contextual factors. For instance, the interior had lower rates of unemployment than the south for the total population, but both regions registered similar levels of unemployment among university graduates. In this context, it should be considered that not having a job in a region with large unemployment rates, while perhaps socially accepted, could be a social burden in a region with similar levels of unemployment that the national average, thus encouraging out-migration. Rising rates of unemployment in the interior might therefore underpin

the increase in out-migration to Madrid among university graduates. The distance to the main urban agglomerations might also explain different migratory behaviour among peripheral regions. The main urban centres tend to attract population from surrounding areas, and therefore individuals from peripheral regions bordering urban agglomeration are more likely to migrate than those from other peripheral regions farther away. (von Berlepsch, Rodríguez-Pose 2021). It could explain why the interior regions, the closest to Madrid, show the highest loss of human capital due to internal migration. Furthermore, it should be noted that peripheral regions are highly dependent on public-sector employment (Tomaney et al. 2010). The interior of Spain shows higher proportions of university graduates than the national average (González-Leonardo et al. 2019), and a high share of university graduates works in the public sector which has great importance on the employability of college graduates in these regions (Cucarella Tormo et al. 2011). Therefore, cutbacks since the economic crisis may have played a major role in the rising numbers of university graduates leaving the interior of Spain to Madrid.

The attractiveness of Madrid to young adults with a university degree has increased considerably since the economic crisis of 2008. Previous studies pointed to large economic growth in Madrid caused by the following factors: the capital-city effect; the development of radial infrastructures around Madrid; and agglomeration economies, preliminarily driven by the growth in foreign investment, which included an important share of technological activities involving electronics, telecommunications and various advanced services. (Gutiérrez-Portilla et al. 2019, Rodríguez-Pose, Hardy 2021).

In semi-central regions of the Mediterranean and the north-east, out-flows and in-flows were closely balanced, both before and after 2008, and the educational profile of out-migrants and in-migrants was similar, although out-migrants were selected by education. These regions showed a high share of the population with a university degree working in high-skilled jobs, but they do not attract university graduates from other regions.

Our findings provide evidence on the impact of the economic crisis on human capital mobility in Spain, as well as its effect on unemployment and over-education levels among internal migrants and sedentary individuals with a university degree. Our results suggest that variations on human capital mobility among regions are driven not only by regional differences with respect to unemployment and over-education among university graduates, but also by other contextual factors. This study shows that human capital mobility has changed since the economic crisis and suggests a regional polarisation in terms of the labour market. However, this work is descriptive, and we can only hypothesize a potential relationship between changes in the labour market and internal migration. Therefore, future lines of research should explore causal mechanisms between labour market and human-capital mobility in Spain, as well as other factors underpinning variations on internal migration, such as cutbacks related to the economic crisis or the distance to main urban agglomerations. Policymakers should be aware of our results and give preferential attention to the economic development of the peripheral regions to reduce the territorial polarisation driven by today's globalised economy.

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