

DEBATE

Reducing urban–rural population inequalities: The divergent roles of internal and international migration

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ABSTRACT This article addresses recent urbanisation trends in Europe. European countries are in the post-transitional stage of the demographic transition, where natural population growth is stagnant or negative, and the growth or decline of the total population is often determined by the size of the migration flows. This applies not only to countries, but even more so to regions within countries. At the same time, the role of international migration has become more pronounced. Our Debate contribution explores the role of migration in population change at different levels of urbanisation. The results show that natural population increase is still the rule in the metropolitan areas in Europe, in contrast to the strong negative growth rates in non-metropolitan regions. A typology of demographic change in European regions at the NUTS 3 level in Europe reveals that many declining regions still experience positive net migration change. The most important result of our analysis is that whereas internal migration generally follows the established pattern of urban regions gaining population at the cost of rural regions, the pattern of international migration is much more even, highlighting the potential for international migration to reduce regional demographic inequalities.

KEYWORDS Regional migration • Regional typology • Metropolitan and non-metropolitan population change • Spatial inequalities • International migration • Population growth • Sub-national population dynamics

Introduction

One of the most obvious forms of demographic inequalities – so obvious in fact that we tend to overlook its significance – is spatial inequality. We are social, not solitary creatures, and we therefore tend to cluster together in space. This trend has been visible since the earliest days of humankind. In the Palaeolithic era, when people lived as hunter-gatherers and the resources were very limited, the environment could typically only support small groups of 100 to 200 people, and even fewer in harsh natural and climatological conditions, such as those in the desert and the Arctic (Livi-Bacci, 2017). With the invention of agricultural techniques some 10,000 years ago, hunter-gatherers became sedentary, and the resource base increased significantly, which enabled the creation of hamlets, villages, towns and cities. Therefore, an increasing share of the population live in urban regions. This urbanisation process continues to this day. In 1950, according to the UN, 30% of the world population

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lived in urban areas. Today this percentage has almost doubled, and it is expected to increase further to 68% in 2050 (UN, 2018). According to the UN, 80% of the population in the more developed countries live in urban areas, compared to 37% in the least developed countries. However, as even in the least developed countries urban population growth exceeds rural population growth, half of the populations of these countries are projected to live in urban regions by 2050. If we take a very long-term perspective at a global scale, we see that urbanisation, alongside the demographic transition, is one of the two fundamental long-term and universal demographic processes, although the speed, timing and forms of urbanisation vary widely. Urbanisation and the demographic transition are also closely interlinked (Zelinsky, 1971). In the second and third stages of the demographic transition, birth rates are higher than death rates, population growth is high and urbanisation is occurring rapidly. The picture becomes fuzzier when we look at urbanisation in the countries in the post-transitional stage of the demographic transition, where populations are no longer growing or are even declining. This paper looks at the roles of natural increase and migration in population change across regions in European countries. We focus on population trends along the urban-rural gradient, and specifically on the role of migration. A key message of the paper is that it is very important to distinguish international migration from internal migration, since the patterns of the two groups are quite different, with internal migration exacerbating inequalities between urban and rural regions, and international migration contributing positively to population change in rural regions. This insight holds an important message for regional policymakers.

Measuring urbanisation

During the last decade, much progress has been made through collaborative efforts of the OECD, the EU and the UN (European Commission, 2021) to arrive at an international comparable and operational classification of regions along the rural–urban continuum: the so-called Degree of Urbanisation (Degurba: see Eurostat, 2018). This classification is based on a combination of population size, population density, spatial configuration and commuting patterns. The result is a set of related concepts at various spatial and geographical scales. In this Debate contribution, we use two classifications derived from the Degree of Urbanisation framework: the classification of NUTS 3 regions into urban, intermediate and rural categories and the distinction between metropolitan regions and other regions. The NUTS 3 region is a specific type of territorial unit used by the European Union for which statistical information is available. In general, the population size of these regions is between 150,000 and 800,000. In total, there are more than 1100 NUTS 3 regions in Europe. In Germany, the NUTS 3 level corresponds to the *Kreise*, while in Spain, it corresponds to the provincial level. This framework is applied at the global level, and the result is more valid than the UN definition (see Dijkstra et al., 2021). The typology is based on 1 km² grid cells. Depending on their population density and spatial configuration, these grids are clustered into urban centres (contiguous cells of 1500+ inhabitants per km² each, and a total population of 50,000 inhabitants or more) and urban clusters (clusters of grid

cells of 300+ inhabitants per km², and a minimum population of 5000 inhabitants). All other grid cells are called rural. From this grid-based typology the degree of urbanisation is defined for the smallest administrative units in a country, the local administrative units (LAUs, mostly defined as municipalities in the respective countries). Here, three categories of LAUs are defined: (1) cities, (2) towns and suburbs and (3) rural areas. Cities are LAUs where at least 50% of the population live in an urban centre; towns and suburbs are defined as LAUs where less than 50% of the population live in an urban centre, but at least 50% live in an urban cluster; and the other LAUs are in the rural category. From the grid-based categorisation into urban centres, urban clusters and rural grids, a direct link is also established with the NUTS 3 regional classification (or the TL3 level for other OECD countries), depending on the share of the NUTS 3 region living in urban clusters. This results in three types of NUTS 3 regions: predominantly urban regions (at least 80% of inhabitants live in urban grid cells), intermediate regions (between 50 and 80% of inhabitants live in urban grid cells) and predominantly rural regions (at least 50% of inhabitants live in rural grid cells). This distinction is therefore solely based on population density, contiguity and population thresholds. In the definition of metropolitan areas, which is also used in this contribution, a labour market dimension is added. A city, together with its commuting zone (those adjacent LAUs where at least 50% of employed residents commute to the city), is called a functional urban area. The OECD further classifies large functional urban areas of more than 250,000 inhabitants into metropolitan areas, and rural regions into those “with access to a metropolitan region”, those “with access to a small functional area” (of less than 250,000 inhabitants) and remote rural regions, based on the driving distance to a functional urban area. This work has resulted in several very useful databases: an urban–rural typology at the LAU level and the NUTS 3 level, as well as separate databases on metropolitan regions. They reveal more precisely the spatial inequalities at the regional level than was previously possible. We will use data at the metropolitan level and at the NUTS 3 level, divided into predominantly urban, intermediate and rural regions. Up to now, little use of this new definition has been made in the demographic community. Ghio et al. (2023) are among the first to use elements of this new definition in their analysis of local net migration age patterns in Europe.

Regional inequalities

The OECD (2023) Regional Economic Outlook Report carries the subtitle *The Longstanding Geography of Inequalities*. The report details the key regional demographic and socio-economic trends since 2001. The key regional differences are between metropolitan and non-metropolitan regions. While at the national level population growth is stalling in many OECD countries, metropolitan growth remains positive, with the largest metropolitan regions gaining the most. Table 1 provides details. The largest 25% of metropolitan regions in terms of population size have an average annual population growth rate of 5.1 per 1000 of the population between 2000 and 2020. The difference between the other quartiles is small, at around three per thousand. The biggest contrast is with the non-metropolitan regions, which show a negative growth rate of –0.6 per thousand for this period. A comparison of the 2000–2010 period with the 2010–2020 period shows an overall decline in growth

Table 1 Average annual population growth 2000–2020 (per 1000 of the population) of metropolitan and non-metropolitan regions, EU-27

Region	Quartiles of metropolitan regions by population size	2000–2010	2010–2020	2000–2020
Metropolitan regions	1st quartile	5.4	4.9	5.1
	2nd quartile	4.4	1.9	3.1
	3rd quartile	3.9	2.4	3.1
	4th quartile	2.0	3.4	2.7
Non-metropolitan regions		0.7	–1.9	–0.6

Source: Eurostat (2025a).

rates, except in the lowest quartile of metropolitan regions (which have populations between 225,000 and 372,000 inhabitants in 2000). For non-metropolitan regions, there is a low positive growth rate between 2000 and 2010, but a negative growth rate between 2010 and 2020 of –1.9 per thousand. This indicates that the disparities between metropolitan and non-metropolitan regions are becoming even larger over time.

This general positive trend for metropolitan regions is a trend break. Van den Berg et al. (1982) developed a theory of urbanisation that described the urbanisation trends in Europe since the 19th century, with four sequential phases: urbanisation, suburbanisation, deurbanisation and reurbanisation. In the 1980s, many European metropolitan regions were in the phase of deurbanisation, leading to an absolute decline in population numbers in many metropolitan regions. Kabisch and Hase (2011) observed a more varied development in the 1991–2004 period, with both suburbanisation and reurbanisation occurring at the same time, albeit for different age groups. In their view, city growth is largely a life course-related process, with young age groups moving to the city to study, work and enjoy the benefits of city life, and middle-aged and older age groups moving to the suburbs to have more space for family life (See also Rees et al., 1999). These dynamics tend to occur within the core and the fringes of metropolitan areas, and the contrast between metropolitan and non-metropolitan areas is very large.

An urban-rural typology of regional population change

Answering the question of whether these growth differentials are the result of natural growth or migration differences at the European scale is more difficult. The required data are only partially available at the NUTS 3 level. Eurostat calculates net migration M using the balancing equation: $M = P_2 - P_1 - B + D$, where P_1 and P_2 are the population sizes at times t_1 and t_2 , B is the number of births in this period and D is the number of deaths. However, if we apply this balancing equation to the estimates of population, natural growth and net migration at the NUTS 3 level in the years between 2010 and 2020, we find that the data are incomplete for many countries and years, and that the errors are sometimes substantial. By focusing on the 2015–2020 period, for which more data are available, we can draw up

Table 2 A typology of population change of NUTS 3 regions, 2015–2020, based on the level of urbanisation and the components of population change

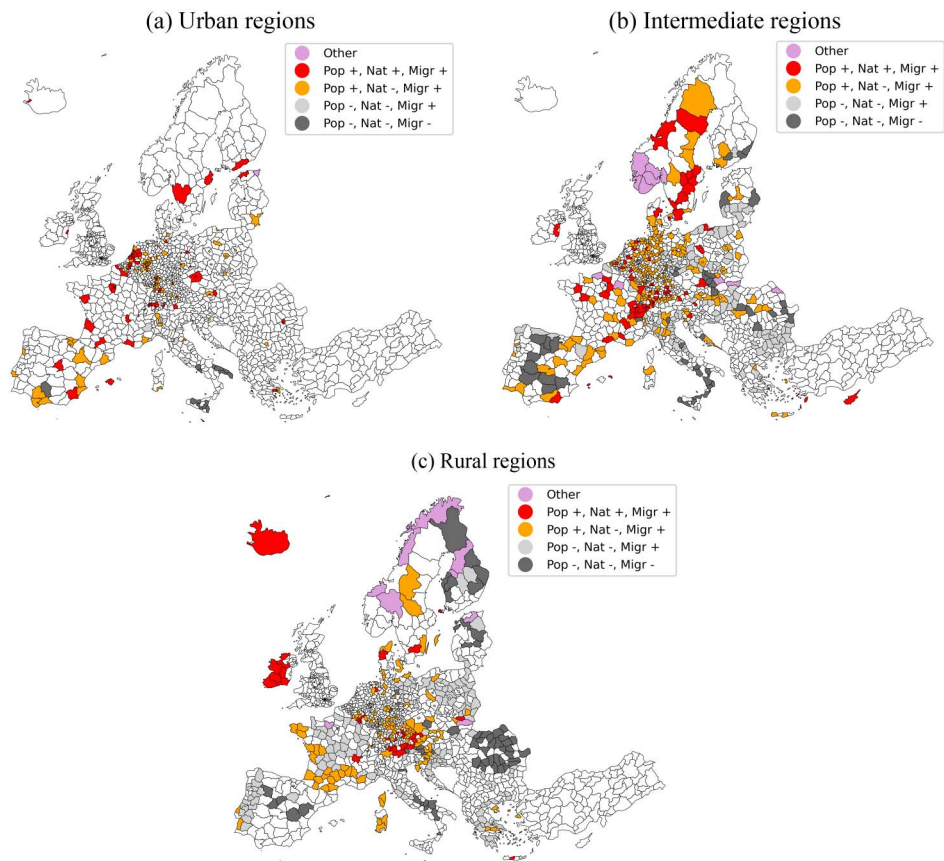
Total # NUTS 3 regions: 1189							
Primarily urban: 247 (21%)							
Pop. growth +: 197 (80%)				Pop. growth -: 50 (20%)			
	Netmig +	Netmig -	Total		Netmig +	Netmig -	Total
Nat. growth +	80	1	81	Nat. growth +	1 ^a	1	2
Nat. growth -	116	0	116	Nat. growth -	34	14	48
Total	196	1	197		35	15	50
Primarily intermediate: 527 (44%)							
Pop. growth +: 329 (62%)				Pop. growth -: 198 (38%)			
	Netmig +	Netmig -	Total		Netmig +	Netmig -	Total
Nat. growth +	86	3	89	Nat. growth +	2 ^a	2	4
Nat. growth -	240	0	240	Nat. growth -	147	47	194
Total	326	3	329		149	49	198
Primarily rural: 413 (35%)							
Pop. growth +: 171 (41%)				Pop. growth -: 242 (59%)			
	Netmig +	Netmig -	Total		Netmig +	Netmig -	Total
Nat. growth +	34	2	36	Nat. growth +	2 ^a	1	3
Nat. growth -	134	1 ^a	135	Nat. growth -	176	63	239
Total	168	3	171		178	64	242

^aThese cells should logically be zero, but due to the imprecise nature of the data, since the balancing equation $P2 = P1 + B - D + M$ does not always hold, they are not.

Note: The total number of NUTS 3 regions is 1256, of which 67 have missing information on one of the population components, i.e., natural growth or net migration.

Source: Eurostat (2025b).

Table 2, which is a simple typology of population change by components at the NUTS 3 level. Figure 1 provides a map of the typology. From this table we can draw a number of interesting conclusions regarding current regional population change in Europe. First, we find that positive natural population growth is the exception, not the rule. In total, only 215, or 18% of all NUTS 3 regions, have positive natural population growth between 2015 and 2020, and most of these regions are intermediate (93) or urban (83). Only 39 out of 413 rural regions (9%) have positive natural population growth during this period. Clearly, migration is the key driving demographic force of regional population growth. Second, there is a strong positive gradient between level of urbanisation and population growth. We observe that 80% of the urban regions are growing, compared to 41% of the rural regions. Thus, the majority of the rural regions (59%) are declining. Third, zooming in on the regions that are growing, we see that almost all of them have positive net migration numbers. Moreover, most of them are growing despite experiencing negative natural growth (490 out of 690,

Figure 1 Map of the typology of population change of NUTS 3 regions, 2015–2020

Note: Explanation of legend: Pop +/- Total population growth; Nat: Natural increase; Migr: Net migration.

or 71%). Finally, of the declining regions, most (362 out of 490, or 74%) still have positive net migration, but the migration component is clearly not sufficient to reverse their negative population growth.

The role of international versus internal migration in urbanisation

What is the role of international migration in this process? International migration has grown substantially in the last decades in Europe. The number of immigrants entering EU countries (both from within and outside the EU) grew from 2.9 to 6.9 million annually between 2013 and 2022, whereas net migration increased from 720,000 in 2014 to 2.9 million in 2023.

Even in countries with advanced statistical systems, estimates of subnational international migration are often lacking (Wilson, 2017). For Europe, only a selection of countries publish information on the subnational distribution in immigration or emigration. Nevertheless, the issue has received some attention in the literature (Stillwell et al., 1999; Van Der Gaag and Van Wissen, 2001; Wilson and Rees, 2005; Wilson, 2017). From this literature various factors emerge as possible explanations or predictors: e.g., the regional stock of migrants; the regional unemployment rate; a large volume of internal outmigration from the region to other regions; and the level of urbanisation of the region, with more urban regions receiving more immigrants or net migration than others. We are not aware of recent European-wide studies on the topic. In the context of the surge of international migration in Europe, in combination with the ageing trend of the last decades, there is certainly a need to revisit the issue. Below we present some first results based on six European countries where both internal and international migration data are publicly available at the NUTS 3 level: the Netherlands, Spain, Italy, Hungary, Bulgaria and Sweden. This list is not exhaustive, but it includes countries in Northwestern Europe, as well as in Southern and Eastern Europe. The results lead us to conclude that some of the established ideas may need rethinking. The results for these six countries are largely similar (Table 3). On average, the urban NUTS 3 regions gain from internal migration, while the intermediate (with the exception of Italy) and rural NUTS 3 regions lose from internal migration, in a clear indication of the familiar rural–urban migration pattern. In contrast to this internal migration pattern, international migration benefits all three types of regions in all six countries. In the Netherlands, Sweden, Spain and Italy, the net inflow rates for rural regions are of the same order of magnitude as that for urban regions, while in Hungary and Bulgaria, they are much lower, but still positive. In Sweden, Spain and Bulgaria, the intermediate regions benefit the least from international migration. Intermediate regions in Bulgaria have the only observed negative net outflow out of all regional categories in the six countries.

These numbers are averages over the NUTS 3 regions by level of urbanisation. Individual regions within these categories may show a different pattern. For instance, in the Netherlands, the region of Groot-Amsterdam (urban) is a heavy loser in terms of internal migration, but a heavy winner in terms of net international migration. Similarly, in Sweden, the urban region Göteborg loses population due to internal migration, but gains population from international migration, while the rural region Gotland is a net winner in terms of internal migration.

Why is the pattern of international migration different from that of internal migration? Why are rural regions also attractive for international migrants? A number of explanations may be relevant here. First, migration between adjacent regions across national borders may benefit the more rural peripheral regions of the country. Second, foreign labour migrants may be recruited to work in sectors in the rural economy with a shortage of local labour supply, such as the agricultural sector. Third, asylum reception centres are often located in remote rural regions. Various countries, such as Sweden, have specific policies to prioritise remote and depopulating regions when searching for locations for asylum seekers. Fourth, international migrant retirees may seek to move to rural regions away from the larger metropolitan areas with their more expensive housing (see, e.g., Benson and O'Reilly, 2009). Fifth, universities are important assets for regional development

Table 3 Average annual net internal and international migration rates (per 1000) by urban–rural typology of NUTS 3 regions, 2010–2020, the Netherlands, Sweden Spain, Italy, Hungary, Bulgaria

Country	Urbanisation level	Natural increase (+/–)	Net internal migration	Net international migration	Population change
The Netherlands	Urban	2.18	0.60	3.19	5.98
	Intermediate	0.42	–1.83	3.21	1.80
	Rural	–3.22	–2.65	3.81	–2.07
Sweden	Urban	6.15	0.18	8.38	14.71
	Intermediate	1.23	–0.30	0.46	1.39
	Rural	–1.18	–2.40	8.92	5.34
Spain	Urban	1.85	0.57	1.23	3.65
	Intermediate	–0.40	–0.88	0.40	–0.88
	Rural	–6.80	–2.66	1.35	–8.11
Italy ^a	Urban	–4.29	–0.32	3.23	–1.38
	Intermediate	–5.25	0.57	3.42	–1.26
	Rural	–6.31	–0.78	3.48	–3.61
Hungary	Urban	–1.72	1.17	0.80	0.25
	Intermediate	–2.05	0.31	0.42	–1.32
	Rural	–2.44	–2.06	0.43	–4.07
Bulgaria	Urban	–1.37	3.18	0.55	2.36
	Intermediate	–6.54	–0.65	–0.77	–7.96
	Rural	–7.96	–0.98	0.19	–8.75

^aFor Italy the data are from 2019–2024.

Source: Statistics Netherlands (2025); Statistics Sweden (2025); Instituto Nacional de Estadística INE (2025a, b); Italian National Institute of Statistics ISTAT (2025); Hungary Statistical Office (2025a, b); National Statistical Institute of Bulgaria (2025a, b, c).

(Benneworth and Fitjar, 2019), and universities located in the centres of rural regions may attract higher educated international migrants. These motives are very country- and region-specific. For instance, for the Netherlands, the motives of agricultural labour demand, the location of asylum centres and border migration are most applicable. For Spain and Sweden, work in agriculture and forestry alongside the attractiveness of rural areas for migrant retirees are more important.

Conclusions

Natural population increase has reached very low and often negative levels in most European countries. This is clearly visible at the regional level in all countries. More than 80% of the NUTS 3 regions in Europe have negative natural growth in the 2015–2020 period. Non-metropolitan regions in Europe have experienced negative annual population

growth rates since 2010. In the metropolitan regions, by contrast, the population is still growing, with the largest regions having the highest growth rates. Moreover, only 20% of the urban NUTS 3 regions are declining, compared with 60% of the rural regions. Against the backdrop of almost universal negative natural growth in all regions in Europe, the decisive factor in whether a region grows or shrinks is migration. Here again, a strong urbanisation gradient is visible, with 80% of the urban regions growing due to migration, compared to 41% of the rural regions. Interestingly, 74% of the declining regions have positive net migration.

The role of international versus internal migration in this process is quite different. We looked at six European countries where this information is publicly available: the Netherlands, Sweden, Spain, Italy, Hungary and Bulgaria. The results are strikingly similar: internal migration follows the familiar rural-urban migration pattern, with rural regions losing and urban regions gaining, thus leading to increasing spatial demographic inequalities. In contrast, we find that, on average, international migration equally benefits urban, intermediate and rural regions.

A second conclusion is that from a scientific point of view, the disparities between the locational choices of international migrants compared to those of internal migrants along the urban-rural continuum need more attention. The locational choices of international migrants are still poorly understood. The current analysis is based on only six countries, and the list is not exhaustive. Many countries do not publish statistics on the regional distribution of international migration. This is closely related to the problems around estimating international migration in general. Very few countries publish statistics on the internal migration of international migrants. International migrants may become internal migrants once they have settled in the country of arrival. This is, for instance, often the case with asylum migrants, who frequently move to urban regions after being granted asylum status. In addition, in quite a few countries, including Germany and France, statistics on internal migration in general are scarce. While the IMAGE project (Stillwell et al., 2014) has tried to fill this knowledge gap on interregional internal migration, more research on this topic is needed. It is also important to look at the motives of international migrants, and the relevant attractiveness factors for individual regions.

A third conclusion is that from a societal point of view, the findings reported in this article potentially hold an important message for policymakers in rural regions who seek to increase the liveability of their regions. In light of the discussion on regional population decline in European countries, international migration could be a potential asset for regions facing such challenges. Regional population decline and the development of left-behind regions are serious issues on the political agenda. Addressing the rural-urban divide, not only in terms of demographics, but also in terms of economic, social, cultural and environmental conditions, is an important societal challenge for national and European policymakers. The map of European voting behaviour clearly shows that this divide is also present along the political spectrum (De Dominicis et al., 2022). Nevertheless, the irony of the situation is that the regions with particularly strong anti-migrant sentiments are among those that could benefit the most from international migration.

More research on the role of international migration at the regional level is clearly needed, as the analysis presented here only scratches the surface of the trends that are

unfolding. First, international migration data are the least reliable of all demographic components, and this lack of reliability may also influence our results at the regional level. This issue is less applicable to Sweden and the Netherlands, and certainly to Bulgaria and Hungary. Therefore, our results should be treated with some caution, as we await more reliable estimates. Second, a thorough analysis of the separate roles of internal and international migration in population change at the NUTS 3 level is required, initially for those countries with sufficient data to make the distinction, and, if possible, for other countries as well using survey, census or other data. Third, the regional preferences of international migrants should be studied in more detail by focusing on origins and motives, and broken down by gender and age. Finally, the results of these analyses should benefit the policy agendas for the development of left-behind regions.

Acknowledgements

The results reported in this paper are based on research in the Horizon Europe project PREMIUM_EU (Grant Agreement number: 101094345).

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