DEMOGRAPHIC RESEARCH

A peer-reviewed, open-access journal of population sciences

DEMOGRAPHIC RESEARCH

VOLUME 46, ARTICLE 9, PAGES 261–272
PUBLISHED 17 FEBRUARY 2022
https://www.demographic-research.org/Volumes/Vol46/9/
DOI: 10.4054/DemRes.2022.46.9

Descriptive Finding

Assessing the demographic impact of migration on the working-age population across European territories

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Demographic Research: Volume 46, Article 9
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Abstract

BACKGROUND
Ageing is central in the European Union (EU) policy debate, with all member states being concerned about implications of growing shares of older people and declining shares of working-age populations for the sustainability of welfare and health systems. Beyond this general context, ageing patterns differ largely across EU territories because of distinctive demographic and spatial dynamics.

OBJECTIVE
We study the relative contribution of cohort turnover and migration flows in shaping the demographic evolution of the working-age population at the local level.

METHODS
Using Eurostat data, we decompose the changes that have occurred in the working-age population into cohort turnover and net migration effects for the 2015–2019 period, at territorial (NUTS3 and urban-intermediate-rural) levels.

RESULTS
The majority (63%) of European (NUTS3) territories experienced negative cohort turnover effects alongside positive net migration effects during the 2015–2019 period. However, in only 27% of these territories, net migration counterbalanced the deficit in the working-age population due to cohort turnover.

CONCLUSIONS
In 2015–2019, migration was the underlying force in the evolution of the working-age population, partially compensating for the loss of population due to the cohort turnover. This effect was particularly pronounced in urban areas.

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CONTRIBUTION
Our contribution is twofold. First, we map EU NUTS3 territories where the working-age population is declining rapidly. Second, we give an assessment of the varied role of migration in mitigating the effect of ageing and shrinking working-age populations across EU urban, intermediate, and rural areas.

1. Introduction

Population ageing in the member states (MS) of the European Union (EU) has direct impacts on the labour supply and sustainability of social security systems. EU MS, which significantly vary in their age structures, labour markets (Mingione 2002), social care (Esping-Andersen 1999; Ferrera 1996), and welfare systems (Saraceno 2000; Kalmijn and Saraceno 2008), have responded differently to the challenges presented by ageing. Main concerns are shared on how to provide for the growing proportion of retirees while depending on a declining proportion in the active labour force (Lutz et al. 2019).

Overall, the policy debate has focused on the role of international migration that could have rejuvenating effects, considering that migrants are usually young when they arrive in the EU and have more children compared to native populations (Coleman 1995). In the most attractive countries for workers, migration has been seen as an alternative to revitalise the economy and mitigate labour shortages. However, national aggregates hide what plays out locally in terms of ageing and migration and the related consequences on the local age structures.

This contribution examines the demographic components of change in the working-age populations across the EU by focusing on the differences linked to migration that significantly vary along spatial patterns. Specifically, we seek to answer the following question:

> *To what extent do cohort turnover and migration effects shape the demographic dynamics of labour supply at the local level?*

The analysis decomposes the change in the working-age population into cohort turnover and net migration effects at NUTS3 levels, distinguishing between rural, intermediate, and urban areas. Using Eurostat datasets, we assess heterogeneity across the EU and outline peculiarities related to rural versus urban dynamics within each MS over the 2015–2019 interval.

Our contribution to the policy debate is twofold. First, we map territories where the working-age population is declining rapidly or reporting a slow and steady evolution.

Second, we give a preliminary quantification of the role of migration in mitigating the effects of ageing and shrinking working-age populations across EU rural and urban areas.

2. Data and method

We examine the dynamics of the working-age population using Eurostat annual datasets on populations and deaths (Eurostat 2021a, 2021b), stratified by five-year age groups. The analysis is carried out from 2015 to 2019 at NUTS1 (national) and NUTS3 (territorial) levels. To investigate how net migration and cohort turnover effects differ between rural and urban areas, we adopt the Eurostat classification (Eurostat 2020), which distinguishes territories into three predominant categories: (a) urban areas, where more than 80% of the population lives in urban agglomerations; (b) rural areas, where at least 50% of the population lives in rural agglomerations; and (c) intermediate areas, where more than 50% and up to 80% of the population lives in urban agglomerations.

We apply the following definitions: ‘working-age population’ to mean the population aged 15 to 64 years (OECD 2021) during the reference period; ‘entry cohort’ to mean the 15 to 19 age group becoming part of the working-age population during the reference period; and ‘exit cohort’ to mean the 60 to 64 age group leaving the working-age population during the reference period. Although the 15 to 64 age group is a conventional representation of the working-age population that might be disconnected from reality, especially in Europe, it is a standard measure and therefore useful as such to assess changes across territories with different demographic and labour supply patterns (participation and employment are clearly beyond the scope of this analysis).

The components of changes in the working-age population are identified by applying the equation below:

$$netmigr_{j,t-(t+x)}^{15-64} = (pop_{j,(t+x)}^{15-64} - pop_{j,t}^{15-64}) + deaths_{j,t-(t+x)}^{15-64} - (entry_{j,t-(t+x)}^{15-19} - exit_{j,t-(t+x)}^{60-64}),$$

where

- j indicates the territorial unit;
- t and $t+x$ identify the starting (2015) and ending (2019) periods of reference;
- x corresponds to the years (5) of interval;
- $netmigr_{j,t-(t+x)}^{15-64}$ is the net migration estimated for the age 15 to 64 working-age population for the territorial unit j;

- $pop^{15-64}_{j,(t+x)} - pop^{15-64}_{j,t}$ denotes the change in the size of the working-age population; and
- $deaths^{15-64}_{j,t-(t+x)}$ represents the number of deaths occurring in the working-age population.

We assume that only half of the deaths reported for the age group 60 to 64 occurred during the reference period and should be related to the working-age population (details are available in Goujon et al. 2021). Death statistics for 2019 that were not available at the time of analysis are filled using the average of the annual values recorded in 2017 and 2018; $entry^{15-19)}_{j,t-(t+x)} - exit^{60-64}_{j,t-(t+x)}$compares the size of the entry and exit cohorts to identify the cohort turnover effects.

Incomplete official statistics on migration at subnational levels during intercensal periods generates the need for these net migration estimates. We derive net migration as the residual component of changes in the working-age population, net of cohort turnover and mortality effects (de Beer, Van der Erf, and Huisman 2011). Noticeably, the estimated net migration suffers from limitations. First, this indirect method of measuring net migration relies on the accuracy of all other components, which is not necessarily the case. Second, the method does not allow any distinction between neither immigration and emigration flows nor intra-EU mobility and international migration. Third, entry and exit cohorts are expected to be interchangeable despite studies demonstrating that interchangeability between cohorts of workers is negatively correlated with the age interval between them (Morin 2015).

Nevertheless, the adopted decomposition method is built on a widely recognised approach and commonly applied to detect declines in the size of entry cohorts compared to exit cohorts, which in turn can generate substantial shifts in the relative size of active/inactive populations (Keiding 2011) approximated by the working-age groups.

3. Results

Figure 1 visualises the estimated effects on the change in the size of working-age populations by component during the period 2015–2019 across European territories.

Figure 1: Relationship between components and changes in working-age populations, 2015–2019

Notes: Y-axis plots the estimated effects of mortality, cohort turnover, and migration; x-axis plots the change in the size of the working-age population.

The bivariate relationship between each component and the working-age population is represented using the locally weighted scatterplot smoothing (LOWESS) method with a 95% confidence interval. By this technique, the distribution of effects is displayed giving evidence of variability across components. It should be noted that the effects of mortality are more concentrated, reporting tighter coefficients and range of distribution. The heightened heterogeneity in the effects of cohort turnover and, even more, of net migration is also a sign of their higher relative volatility by period. Thus, the rest of the paper focuses on the interplay between cohort turnover and migration effects that are more likely to be tackled by short-term policy interventions, while acknowledging the relative and differentiated importance of mortality in affecting the working-age population.

Between 2015 and 2019, 22.9 million young Europeans became part of the working-age population, while 26.6 million people reached retirement age: This indicates a possible gap of around 3.8 million potential workers. Due to the disproportionate growth in the number of older people compared to the population at working age, MS face challenges related to the long-term sustainability of their welfare and health systems. Within this generalised trend, only 27% of EU territories (24% of the EU working-age population in 2019) benefitted from migration flows that were able to compensate for the deficit in the working-age population due to a negative cohort turnover, which dominated in the remaining territories, leading to the shrinking of the labour supply.

3.1 Cohort turnover and migration effects on working-age populations across EU territories

To facilitate the interpretation of changes in the size of the working-age population, we group the 1,166 EU MS territories into four clusters, which derive from combinations between net migration and cohort turnover effects. The cluster results are summarised in Table 1, while the geographical distribution of relative changes in the working-age population, as well as its components, cohort turnover, and migration effects, are displayed in Figure 2.

Table 1: Territories and working-age populations by cluster, 2015–2019

Cluster		Cluster 1		Cluster 2		Cluster 3		Cluster 4		All clusters	
		(+) Cohort		(+) Cohort		(-) Cohort		(-) Cohort		Total	
		(+) Net mig.		(-) Net mig.		(+) Net mig.		(-) Net mig.			
WAP changes		Nbr of NUTS3	WAP /1,000	Nbr of NUTS3	WAP /1,000	Nbr of NUTS3	WAP /1,000	Nbr of NUTS3	WAP /1,000	Nbr of NUTS3	WAP /1,000
(+)	Abs	94	37,500	10	6,576	319	69,900	0	0	423	113,976
	%	96%	98%	16%	21%	43%	45%	0%	0%	36%	40%
(-)	Abs	4	927	54	24,500	419	85,300	266	63,500	743	174,227
	%	4%	2%	84%	79%	57%	55%	100%	100%	64%	60%
Total	Abs	98	38,427	64	31,076	738	155,200	266	63,500	1,166	288,202
	%	8%	13%	5%	11%	63%	54%	23%	22%	100%	100%

Notes: Number of territories (nbr of NUTS3) and working-age population (WAP/1,000) are divided in four clusters depending on cohort turnover (Cohort) and net migration (Net mig.) effects (columns) and changes in working-age population (WAP, rows).

3.1.1 EU territories with both positive cohort turnover effects and net migration (cluster 1)

NUTS3 territorial units where both components are positive represented approximately 8% of territories (13% of EU working-age population in 2019), mainly distributed across the following countries: the Netherlands (20 territories), Belgium (15), Spain (12), and Germany (11).

In the vast majority of territories (94), the positive effects coincided with an increase in the size of the working-age population during the 2015–2019 period. Those were located in the north-western EU, including in Austria (6), Belgium (14), Denmark (5), Germany (11), Ireland (7), the Netherlands (18), Sweden (3), and Spain (12). Deficits in the size of the working-age population, despite positive migration and cohort effects, were rare and concerned only four territories, mostly in the Netherlands (2).

3.1.2 EU territories with positive cohort turnover effects and negative net migration (cluster 2)

The cluster with positive cohort turnover effects and negative net migration was the smallest one: only 5% of EU territories accounting for 11% of the EU working-age population in 2019, mostly located in France (30). Among these, the majority (54 territories, corresponding to 8% of the EU working-age population) reported a decrease in the size of the working-age population. Those were located in countries such as Spain (10), France (22), Romania (5), Italy (4), and Portugal (4). The territories that experienced an increase in their working-age populations were mainly located in France (8).

3.1.3 EU territories with negative cohort turnover effects and positive net migration (cluster 3)

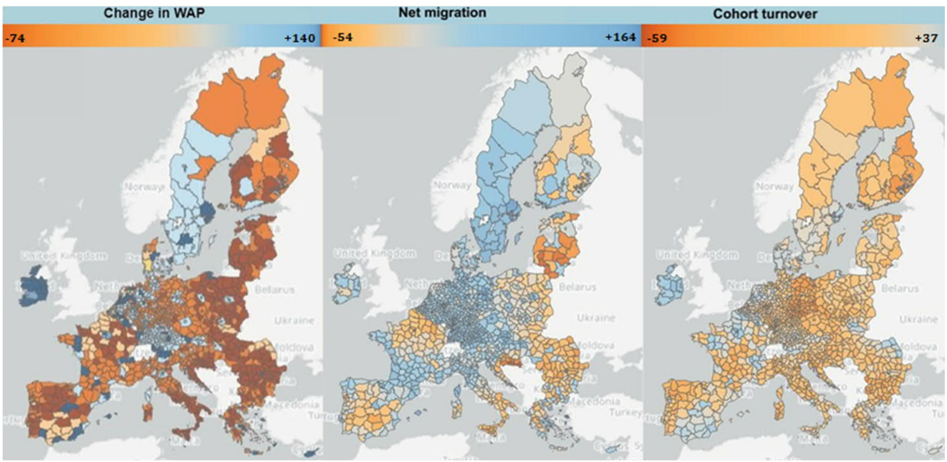
The cluster with negative cohort turnover effects and positive net migration included the largest share (63%) and number (738) of EU territories, representing 54% of the EU working-age population in 2019.

In 419 territories (57% of the cluster territories and 55% of the cluster working-age population), the size of the working-age population shrank between 2015 and 2019 as migration effects were too small to compensate for the negative cohort turnover. This was, for instance, the case in 162 German, 58 Italian, 33 French, and 26 Polish territories. For 319 territories (43% of cluster territories), the change in the size of the working-age population was positive. They were mainly located in Germany (225), Austria (16), Sweden (16), and Belgium (13).

3.1.4 EU territories with both negative cohort turnover effects and net migration (cluster 4)

The cluster with both negative cohort turnover effects and net migration was the second largest and consisted of 266 territories, corresponding to 23% of EU territories and 22% of the EU working-age population in 2019, mostly distributed across eastern EU MS such as Bulgaria (18), Romania (31), and Hungary (9); central eastern EU MS such as Poland (40); south-eastern EU MS such as Croatia (18); and southern EU MS such as Greece (18) and Italy (41). These territories all logically showed a pattern of decline in the working-age population between 2015 and 2019.

Figure 2: Relative changes in the size of the working-age population, net migration, and cohort turnover, NUTS3, 2015–2019



Notes: Colour gradient ranges from dark red for negative values to dark blue for positive ones; minimum and maximum values are reported in thousand; WAP (working-age population).

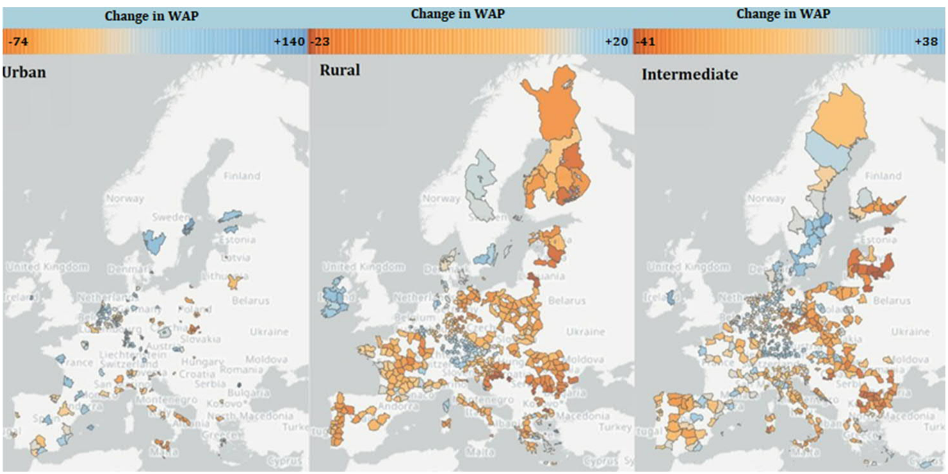
3.2 Cohort turnover and migration effects on working-age populations across rural and urban areas

The analysis is further refined by looking at differentials by place of residence distinguishing between urban (21% of EU territories), intermediate (60% of EU territories), and rural (18% of EU territories) areas. During 2015–2019, on average the size of the working-age population decreased in rural and intermediate areas (by −2.9% and –1.1%, respectively), whereas it increased in urban areas (0.8%).

Looking at the geographical distribution, Figure 3 shows that positive changes in the working-age population were mostly limited to urban (144) and intermediate (247) areas, for instance, in Austria (21), Belgium (26), Germany (233), Spain (15), France (18), the Netherlands (27), and Sweden (11). During the 2015–2019 period, the rare cases of rural (34) areas experiencing a growth of their working-age populations were predominately located in Sweden (8 territories), a pattern requiring further analyses to understand how these MS were able to retain population in rural areas.

Although negative cohort turnover affected almost all EU territories, cohort effects, computed as a relative proportion of the working-age populations in 2015, mainly drove the decrease in working-age populations in rural areas when compared to urban ones (–1.9% and –0.7%, respectively). In contrast, when working-age populations benefitted from the positive relative contribution of net migration, effects appeared to be more remarkable in urban and intermediate areas (2.4% and 1.4%, respectively) than in the rural areas (0.4%). This implies that positive net migration was more able to protect urban and intermediate areas from further shrinkage of the labour supply compared to rural areas.

Figure 3: Relative changes in the size of the working-age populations across EU urban, rural, and intermediate areas, 2015–2019



Notes: Colour gradient ranges from dark red for negative values to dark blue for positive ones; minimum and maximum values are reported in thousand; WAP (working-age population).

4. Conclusion

Our decomposition analysis reveals the role of migration as an underlying force in the evolution of the working-age population at the territorial level over the 2015–2019 period. Despite the shrinking of the working-age population in most EU territories (63%), net migration was able to counterbalance the deficit due to cohort turnover and generate an increase in the working-age population in 324 territories (27%). Yet, differences by place of residence remain relevant. Between 2015 and 2019, we observed that the working-age population decreased in rural and intermediate territories by –2.9% and –1.1%, respectively, and increased by 0.8% in urban areas. Approximately 60% of urban areas benefitted from positive net migration during the same period.

Although limited in time, our research highlights the challenge currently facing many territories confronted with the loss of working-age populations due to negative net migration and negative cohort effects, particularly, but not only, in rural areas. Due to the growing share of older people and the declining proportion of the working-age populations, all EU MS face challenges related to the sustainability of their welfare and health systems. Revitalising depopulating territories to break the cycle of rapid ageing is high on the agenda of many local and national authorities (and of the European Commission). Yet, the loss of the working-age population and the weakening of economic development and employment require a structural and coordinated policy action. This analysis could provide relevant insights for approaching short- and medium-term interventions. Evidence-based responses could point to the opportunities offered by rural territories in terms of quality of life, as has become more visible during the recent COVID-19 lockdown, but also to the potential of the silver economy and new employment opportunities, such as in the healthcare sector (Grubanov-Boskovic et al. 2021), that would attract a younger working-age population.

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