

# Divergence in internal migration trends: a multi-country panel approach to bilateral regional flows

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The decline in the level of internal migration in the United States has led to a growing interest in internal migration trends over the last two decades. Such works mainly focus on a single country, mostly the United States (Cooke, 2013; Fischer, 2002; Kaplan & Schulhofer-Wohl, 2017; Molloy et al., 2017) and, to a lesser extent, other developed nations such as Australia (Bell, Wilson, et al., 2018; Kalemba et al., 2020), Canada (White & Haan, 2021), and the United Kingdom (Champion & Shuttleworth, 2017), which have also recorded a decline. These studies have attributed declines in internal migration to population ageing, the rise of dual-earner households, reduced geographic variations in economic opportunities, and technological progress.

However, declines in internal migration are not universal, not even among countries with similar development levels (Alvarez et al., 2021; Bell, Charles-Edwards, et al., 2018). Alvarez et al. (2021) showed that the dwindling internal migration has been limited to non-European OECD countries, with most European countries exhibiting increasing or stable internal migration trends. The authors argued that although population ageing has put downward pressure on internal migration in most countries, different growth trajectories in information, economic disparities, and international migration have more than offset the effect of ageing in Europe. However, their proposed explanations partly explain the trend heterogeneity of internal migration in OECD nations and seem to fit better European than non-European countries.

A limitation of the scarce literature of cross-national comparisons of internal migration trends has been to relate national internal migration trends with other nationally aggregated economic and socio-demographic indicators (Alvarez et al., 2021; Bell, Charles-Edwards, et al., 2018; Van Der Gaag & Van Wissen, 2008), thus being unable to explore explanations for these overall trends emanating from the elements that constitute them, i.e., the bilateral migration flows trajectory and the spatial heterogeneity of regional economic and socio-demographic transformations that determine them. Indeed, using a dispersion statistic for income, Alvarez et al. (2021) found that regional income disparities are significantly positively associated with internal migration in both the short and long run, pointing that delving into trends in regional factors could be a promising line of inquiry.

Certainly, not considering the divergent trends of bilateral migration flows when describing national trends can lead to an insufficient understanding of overall internal migration trends because, for example, an increasing or decreasing interregional migration in a country could

1 be due to only a few but populous growing or declining flows rather than a general feature  
2 of all or most bilateral flows. This, in turn, implies that a given national trend could have been  
3 more pronounced if not for some bilateral flows exhibiting a trend in the opposite direction.  
4 The same happens when describing economic or socio-economic transformations that  
5 potentially affect internal migration and consequent implications to long-run trends. For  
6 instance, associating the declining internal migration in a country to diminished economic  
7 returns to migration (Haan & Cardoso, 2020; Kaplan & Schulhofer-Wohl, 2017) brings the  
8 question of whether the spatial homogenisation of economic opportunities is an economy-  
9 wide phenomenon or is it instead confined to a group of territories with historically  
10 numerous migration flows between them.

11 Therefore, to account for all these potential sources of variation, we deviate from previous  
12 studies on explaining internal migration trends by investigating the relationships between  
13 bilateral interregional migration flows and potential regional drivers over time rather than  
14 relations between nationally aggregated indicators only. Specifically, we establish whether  
15 regional variations in population size, income, unemployment, housing prices, human and  
16 physical capital, international migration, age composition, and information and  
17 communication technologies (ICT) have driven interregional migration flows and thus  
18 potentially explain the observed heterogeneity of internal migration trends across countries.

19 An additional drawback that this paper aims to address is the restrictive assumption through  
20 the abundant empirical literature of internal migration drivers of homogeneous effect sizes.  
21 Allowing for heterogeneous migration' triggers across pairs of regions is relevant because,  
22 for instance, migration motives can vary with distance (Biagi et al., 2011; Nedomysl, 2011).  
23 This study employs a more general bilateral migration model where the drivers' strength  
24 can differ by each origin-destination flow, inclusively allowing for different determinants in  
25 the two reversal flows between the same pair of regions. That is because, for example,  
26 economic factors could be more influential for one direction of the migration between a pair  
27 of regions, while other factors - e.g. natural amenities - could be the primary motivation for  
28 migrations in the opposite direction. Consequently, a regional approach to understanding  
29 trends in the overall intensity of internal migration seems further justified as it could be  
30 designed to handle the two sources of the heterogeneity mentioned above: disparities in the  
31 patterns that economic and socio-demographic transformations take across regions and  
32 variations in the drivers of bilateral migration across pairs of regions.

33 To meet these aims, we assemble annual bilateral internal migration and regional economic  
34 and socio-demographic data for five European countries - Austria, Finland, Italy, Spain,  
35 Sweden - and three non-European countries - Australia, Canada and the United States, for  
36 2003-2019 in most countries. To estimate long-run relationships between bilateral  
37 interregional migration flows and the regional factors, we estimate a gravity-type model  
38 employing heterogeneous dynamic panel regressions that account for cross-sectional  
39 dependence in each country. Specifically, we adopt, for the first time in the internal migration  
40 literature, the Chudik et al. (2016)'s cross-sectional distributed lag (*CS – DL*) long-run  
41 estimator, which augments the regressions with cross-sectional averages of the variables in  
42 levels and first differences to approximate common factors with heterogeneous effects  
43 across units. This augmentation is particularly relevant in migration regressions because it  
44 helps to account for multilateral resistance to migration (Bertoli & Moraga, 2013), i.e., the

1 influence exerted by third regions on the volume of migration between a pair of regions.  
2 Furthermore, we add the housing interest rate as an observable common factor due to its  
3 relevance not only to the housing market but also because it can control for unobservable  
4 common circumstances as it strongly correlates with the reference interest rate. A final  
5 contribution of our empirical model is the inclusion of regional physical capital as an  
6 explanatory factor, which has been surprisingly overlooked in the literature of determinants  
7 of internal migration despite its importance to labour or human capital productivity.

8 Finally, the descriptive findings will be presented in line plots and maps for each of the eight  
9 countries. The plots will exhibit the trends of national internal migration intensities as well  
10 as the most influencing bilateral flows intensities, while the maps will show the variations in  
11 regions' economic and socio-economic factors. On the other hand, the regression results will  
12 consist of tables with the long-run coefficients of the regional determinants on the bilateral  
13 migration flows for each country and the implied changes in internal migration resulting  
14 from the observed variations in these regional factors the estimated effect sizes.

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