

Metropolisation and Regional Inequalities in Central and Eastern Europe: The Role of Demographic Change

Introduction

Metropolisation can be regarded as one of the most important spatial manifestations of the contemporary knowledge-based economy. The growing role of large urban centres reflects a broader shift from territorially embedded production systems towards network-based spatial structures, in which metropolitan regions function as key nodes of innovation, capital accumulation, and advanced services (Castells, 1998; Scott, 1998). This transformation has been widely discussed in the context of European spatial development and the increasing importance of metropolitan regions within national settlement systems (Krätke, 2007).

The relationship between metropolisation and regional inequality remains, however, far from straightforward. Classical interpretations link metropolitan growth with spatial polarisation, particularly in earlier stages of development (Williamson, 1965). Yet empirical studies suggest a more nuanced picture, including the relative stability of regional disparities despite ongoing structural transformations (Dijkstra et al., 2013). This raises the question of whether conventional interpretations sufficiently account for the mechanisms shaping regional convergence and divergence (Henning et al 2023).

Central and Eastern Europe (CEE) provides a particularly revealing context for examining these dynamics. Since the systemic transformation of the 1990s, CEE countries have undergone rapid economic restructuring and integration into global markets, with capital regions acting as key gateways of transformation (Gorzela & Smętkowski, 2005; Smętkowski, 2018). These processes have been accompanied by profound demographic changes, including migration towards metropolitan areas, uneven population decline, and growing spatial concentration of human capital.

This paper investigates how demographic change interacts with economic growth to shape regional disparities in CEE countries between 2000 and 2022. It argues that demographic processes—particularly uneven population change between metropolitan and non-metropolitan regions—may significantly modify trajectories of regional convergence and divergence. By combining conceptual modelling with comparative empirical analysis, the paper seeks to provide a more integrated understanding of the relationship between metropolisation, demographic transition, and territorial cohesion.

Conceptual background

The literature on regional inequalities has long emphasised the evolving relationship between economic development and spatial disparities. Classical approaches suggest that polarisation tends to increase during early phases of development and decline at higher levels of economic maturity (Williamson, 1965). More recent studies, however, question the universality of this trajectory and point to persistent disparities shaped by technological change, global restructuring, and institutional diversity (Petrakos et al., 2005).

Within this debate, metropolisation has emerged as a key mechanism shaping spatial inequalities. Metropolitan regions benefit disproportionately from agglomeration economies, concentration of highly skilled labour, and integration into global networks of production and knowledge (Florida, 2005; Taylor, 2007). In CEE, capital regions have played a particularly prominent role in post-socialist transformation, attracting foreign investment and advanced services while consolidating their position within national urban hierarchies (Smętkowski, Wójcik, 2012).

At the same time, demographic dynamics may significantly influence observed patterns of regional inequality. Migration from peripheral to core regions, differential natural population change, and international mobility can alter the denominator of per capita indicators such as GDP per capita (Batista e Silva et al., 2016). As a result, regional convergence or divergence measured using standard indicators may partly reflect demographic redistribution rather than purely economic processes.

Despite this potential importance, demographic factors are often treated as background variables rather than integral components of regional inequality dynamics. This paper adopts a different perspective by explicitly incorporating demographic change into the analysis of metropolisation and convergence. It assumes that economic and demographic processes jointly shape spatial disparities and that ignoring demographic change may lead to incomplete interpretations of regional development patterns.

Methodology and data

The study combines a conceptual simulation with a comparative empirical analysis. This dual approach allows both theoretical exploration of mechanisms and empirical verification using cross-country data.

First, a stylised simulation model illustrates how differences in population dynamics between two regions—one more developed and one less developed—affect trajectories of regional convergence measured by GDP per capita. The simulation explores scenarios of economic convergence and divergence under varying assumptions about population growth and decline. It is not intended as a forecast but rather as an analytical tool highlighting the potential magnitude of demographic effects on convergence indicators.

Second, the empirical analysis examines the relationship between capital metropolitan regions and the rest of the national territory across selected CEE countries. The analytical framework follows a core–periphery logic, comparing the relative economic performance of capital regions against national averages. Metropolisation is captured through changes in the population share of capital regions, while regional inequality is assessed using relative GDP per capita indicators.

The empirical analysis relies primarily on Eurostat regional statistics, including GDP per capita and population data at the NUTS-3 level. The use of a finer spatial scale allows capturing internal differentiation between metropolitan cores and their wider regional context, which is particularly relevant in Central and Eastern Europe where capital regions often dominate national spatial structures. The time frame covers 2000–2022, allowing the study to capture long-term structural changes associated with EU accession, the global financial crisis, and recent demographic shifts.

Results

The simulation demonstrates that demographic dynamics can substantially alter trajectories of regional convergence measured using per capita indicators. Under conditions of economic divergence, faster population growth in the more developed region may partially offset increases in income disparities. Conversely, population decline in less developed regions may produce apparent convergence even without strong economic catching-up. These results underline the sensitivity of convergence indicators to demographic assumptions.

The empirical analysis shows that metropolisation in CEE has not uniformly resulted in increasing regional inequalities. Capital regions generally maintain higher levels of GDP per capita compared to national averages, yet the dynamics of relative disparities vary across countries. In several cases, rapid population growth in metropolitan regions has moderated increases in income disparities by lowering

per capita indicators relative to national averages. This pattern reflects strong internal and international migration flows towards metropolitan areas, which dilute per capita values while reinforcing metropolitan dominance.

At the same time, demographic decline in peripheral regions contributes to structural imbalances. Population loss in non-metropolitan areas often coincides with ageing, labour market contraction, and human capital depletion. These processes may intensify long-term development challenges even where national-level inequality indicators appear stable.

Taken together, the findings suggest that demographic concentration in metropolitan regions may partly mask underlying economic polarisation. Stable regional disparities at the national scale do not necessarily imply balanced spatial development but may reflect counteracting demographic forces.

Discussion and implications

The findings have important implications for both regional analysis and policy debates. First, they challenge simplified narratives that equate metropolisation with inevitable spatial polarisation. In line with recent debates on territorial cohesion and place-based development (Iammarino et al., 2019; Rodríguez-Pose, 2018), the results suggest that demographic dynamics may significantly mediate the relationship between metropolitan growth and regional inequality.

Second, the results call for a more cautious interpretation of convergence indicators. Per capita measures may obscure structural imbalances if demographic redistribution offsets economic divergence. A more nuanced analytical framework is therefore needed, one that integrates demographic and economic perspectives.

Third, the analysis highlights the importance of demographic sustainability for territorial cohesion. While metropolitan concentration may stabilise national inequality indicators, it can simultaneously intensify depopulation and institutional challenges in peripheral regions. These dynamics raise broader questions about spatial equity, service provision, and long-term regional resilience.

More generally, the study contributes to debates on place-based development by emphasising that regional inequalities cannot be fully understood without accounting for demographic transitions. Policies aimed at reducing disparities should therefore consider not only economic competitiveness but also migration patterns, ageing, and uneven population change shaping territorial futures.

Conclusions

This paper argues that demographic change is a crucial yet often overlooked factor shaping regional inequality dynamics in Central and Eastern Europe. By combining conceptual modelling with empirical analysis, it demonstrates that demographic processes can significantly modify interpretations of convergence and divergence in the context of metropolisation.

The findings suggest that relatively stable regional disparities in CEE do not necessarily reflect balanced development but may result from counteracting economic and demographic forces. Incorporating demographic dynamics into regional analysis is therefore essential for a more accurate understanding of spatial inequalities and for designing effective territorial policies.

Future research should further explore the links between migration, ageing, and regional economic performance, as well as extend the analysis to functional urban areas and multi-scalar spatial frameworks. Such approaches would help deepen the integration of demographic and economic perspectives in regional science.

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