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When Resilience Matters: Avoiding and Escaping Regional Development Traps in the EU

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G01-1 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 26, 2026, 09:00 - 10:30

The concept of the regional development trap has recently gained recognition in the literature, identifying regions that struggle to sustain economic dynamism relative to their national and European peers (Iammarino et al., 2020; Diemer et al., 2022; Rodríguez-Pose et al., 2024). A regional development trap occurs when a region experiences persistent stagnation in income, productivity, and employment, struggle to sustain economic dynamism relative to their national and European peers (Iammarino et al., 2020; Diemer et al., 2022). While prior researchers have identified the structural and institutional determinants of development traps (Iammarino et al., 2020; Diemer et al., 2022), the relationship between these traps and a region's capacity for resilience during turbulent periods remains underexplored.

Understanding the dynamics of regional development traps is crucial, as their persistence can lead to widening territorial disparities, economic discontent, and long-term stagnation (Iammarino et al., 2020; Diemer et al., 2022; Rodríguez-Pose et al., 2024). Without effective interventions, development-trapped regions risk falling further behind, exacerbating socio-economic inequalities and fueling dissatisfaction with national and EU-level policies (Rodríguez-Pose et al., 2024).

This paper addresses this gap by investigating how regional economic resilience influences the likelihood of falling into or escaping a development trap. A region's ability to withstand, adapt to, and recover from economic shocks has significant implications for its long-term development trajectory. This issue has become even more pressing as we are experiencing periods of more frequent and intense shocks—ranging from financial crises and trade disruptions to pandemics and geopolitical conflicts—placing additional strain on regional economies. In this context, resilience plays a preventive role by helping regions avoid stagnation and a corrective role by facilitating recovery for those already trapped.

Our empirical analysis of NUTS 2 regions in the EU finds that higher levels of economic resilience represent a significant positive determinant for escaping a regional development trap. These findings highlight the need for policymakers to adopt forward-looking strategies that enhance regional resilience rather than relying solely on remedial policies. Strengthening resilience can serve as a crucial mechanism to counteract the growing divide between dynamic superregions and left-behind areas in Europe, helping to prevent long-term economic stagnation and the rise of territorial inequalities.

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Regional Resilience To Positive Shocks

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G01-1 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 26, 2026, 09:00 - 10:30

The term “shock” often represents negative (sudden) externalities in the economic literature. The unexpected rise of disequilibrating forces in output, labor or capital markets might trigger economic turbulence (Lütkepohl, 2008; Margalit, 2019). The shocks, however, are not bound with negative ones. On the other side of the coin, economies may also face positive externalities. Such technological advancements, discovery of new products or processes, i.e. digital transformation, productivity jumps, and unanticipated expansionary policies may represent some of them (Boschma, 2015; Martin, 2018). However, the empirical literature largely fails to consider the resilience with respect to positive shocks. This paper investigates the geographical patterns and determinants of positive resilience of Chinese provinces with respect to the productivity jump that occurred during the first decade of the Millennium. The dataset is obtained from NBS, OECD, World Bank and PWT websources (Feenstra et al. 2015). Having applied a range of empirical tools, such as Markov-Regime Switching Regressions, Panel Unit Root Tests, Panel Lagrange Multiplier Tests, Hausman Test and Spatial Panel regressions, we reach two main results (Anselin, 1988; Hamilton, 1989; Levin et al. 2002; Anselin et al. 1996; Millo and Piras, 2012; Baltagi, 2013a; 2013b; Elhorst, 2014a; 2014b; Bivand et al. 2021) First, resilience behavior of provinces with respect to the productivity jump is spatially very heterogeneous, in both initial response (transition capability) and post-shock behavior (positive adaptability). Second, we provide a set of strong evidence showing that the industrially specialized provinces benefit more from the productivity increase rather than specializations in services and agriculture sectors. This most likely arises from productivity gains through the Marshallian externalities; internal economies of scale, localization economies, agglomeration externalities, intra-industry knowledge spillovers, process and product innovation

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Resilience in lagging regions: Evidence from Italian micro firm-level data

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G01-1 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 26, 2026, 09:00 - 10:30

Resilience refers to the ability of countries and regions to effectively handle crises, adapt, and swiftly return to stability, a key topic in worldwide economic debates. In the past fifteen-plus years, different shocks – Great Recession; Covid-19 crisis; Ukraine-Russian war; inflation surge – have produced hard consequences on societies and economies with uneven patterns across people and places. To understand the overall impact of the crises and, in particular, the factors behind the different spatial trajectories observed during and after shocks, the decade-old concept of regional economic resilience has regained popularity among researchers and practitioners. The fast-growing resilience literature, however, has primarily used data at regional level and made comparisons across territories with different economic levels. What is missing is the analysis of resilience trajectories in lagging regions, namely, regions that show low-economic levels compared to other areas. Equally remarkable is the study of the presence of firm-, local- and sector-specific patterns when looking at the economic performance within lagging regions. The objective of this work is twofold. First, we provide novel, micro evidence on the resilience of lagging regions in the South of Italy, the so-called Mezzogiorno, during and after the Great Recession. Secondly, we study the performance of firms and local areas in the Italian lagging regions after the Great Recession and make comparisons across and within such regions in order to show which factors can help explaining differences in territorial resilience in less advanced regions. We finally discuss the key results of our work and the main policy implications, also in the light of the recent territorial asymmetries registered during the post-pandemic recovery phase.

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Casting shadows: How work from home rescales cities across the urban system

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G01-2 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 26, 2026, 11:00 - 13:00

We examine how the rise of remote and hybrid work reshapes the spatial structure, population distribution, and scaling of cities within an interconnected urban system. We embed the Alonso–Muth–Mills (AMM) model in a system of open cities where nationwide market-clearing determines reservation utility. The model is extended to allow households to optimize commuting frequency, balancing commuting costs against the opportunity costs of working remotely. This unified framework shows how changes in commuting behavior affect both the internal form of cities and the distribution of city sizes across the urban system. We characterize the system using AMM-based urban scaling laws, in which each quantity is proportional to central income through a tractable power-law elasticity. By changing the commuting technology, work from home alters the urban scaling exponent while preserving rank order, expanding cities above a system-wide commuting-distance threshold and casting urban shadows on cities below it. We illustrate the model's predictions with initial evidence from the UK National Travel Survey.

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Public Transport Network Resilience Across Different Urban Forms

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G01-2 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 26, 2026, 11:00 - 13:00

Investments in public transport (PT) in cities are an effective measure to both decrease negative externalities of private transport and increase accessibility for different categories of citizens. However, inefficient planning could negatively affect the resilience of the network. Moreover, cities differ greatly in their urban structures. There is significant literature on the effects of urban form on different variables. Despite that, there are limited studies analysing its impact on transport network resilience. This study aims to fill this gap. To do that, I analyse three cities having different urban forms: a monocentric city, a polycentric city, and an “elongated” city, whose form stretches in length, and perform a resilience analysis of their transport network through the simulation of different disruption scenarios. This work considers both public transport (PT) and bike-sharing (BS) networks, since the latter could alleviate the impact of PT disruptions, improving its resilience. To select the cities, I use different indicators. For monocentric and polycentric cities, I adopt the Urban Centrality Index of Pereira et al. (2013). On the other hand, for elongated cities, I adopt the Shape Index of Medda et al. (1998). For each city, I measure resilience through a connectivity analysis of the transport network. The analysis considers both unweighted and weighted networks. For weighted networks, an Origin-Destination (OD) matrix, measuring flows, is required, although it is rarely available online. Otherwise, it needs to be simulated, using different methodologies. In this study I adopt the following two: the first one is to disaggregate aggregate mobility data available online and simulate individual behavior through agent-based models. The second one is to simulate OD data through G1ODGEN, a data generator developed by Rong et al. (2025) simulating networks using satellite images. To perform the resilience analysis, I follow the approach of Malandri et al. (2023) using their SmartHubs Resilience Tool. To build the PT network of each city, I use GTFS data. BS networks are simulated with different methods depending on their nature (free-floating vs. station-based). Network resilience is measured through indicators of efficiency, accessibility and centrality of each node. Results of this study will be useful for policymakers to understand how to plan mobility interventions in cities with different urban forms. This study will also help policymakers deal with the case of elongated cities, which cannot be fully integrated into the monocentric or polycentric framework.

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Air pollution, mobility, remote work and the Great Lockdown

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G01-2 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 26, 2026, 11:00 - 13:00

This paper investigates the impact of mobility on pollution. To do so, we take advantage of the natural experiment provided by the
COVID-19 pandemic to assess the extent to which pollution levels can be reduced when mobility restrictions are implemented and technology remains unchanged. Thanks to the use of high-frequency data for Spain's major cities, we also analyze the impacts during different subperiods of the pandemic (first wave, new normality, and other waves) as well as across different hours of the day. Overall, the results of these analyses can be interpreted as an approximation of the potential effects
of increasingly relevant phenomena in our lives, such as teleworking and e-commerce.

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Changing office spaces and their spatial variation across the urban hierarchy in the era of hybrid work

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G01-2 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 26, 2026, 11:00 - 13:00

Hybrid work has reshaped urban office landscapes in ways that challenge pre-pandemic assumptions about how cities grow, organise, and absorb shocks. This paper examines how the structural anchoring of work-from-home (WFH) practices in Danish firms is transforming office demand and the spatial organisation of urban areas. Drawing on two nationwide firm surveys conducted in 2023 and 2024 and linked to administrative building and employment registers, the analysis traces the evolution from emergency WFH arrangements during lockdowns to the normalisation of hybrid work in the post-pandemic recovery phase.

Contrary to expectations of widespread downsizing, survey responses suggest a more nuanced reconfiguration of office use. Most firms retain their pre-pandemic office footprints, while WFH and hybrid work adopters are more likely to expand and repurpose space toward collaborative, social, and project-oriented functions. These findings raise key questions: How does the institutionalisation of hybrid work alter demand for and use of office space? And how do these transformations vary across the urban hierarchy? To address these questions, the paper examines three interconnected dimensions: (1) whether firms retain, reduce, or expand their total office area; (2) how they reallocate space toward collaborative and relational activities; and (3) whether these adjustments differ across urban contexts, including large, medium-sized cities, and small towns.

The study draws on two main sources of information to understand how new hybrid work practices shape office space demand. First, the two nationwide representative surveys capture how Danish firms managed the initial COVID-19 lockdowns and how they have transitioned to permanent hybrid work models. Second, we use official administrative records from 2014 to 2023 to track firms' office space use over the last decade, allowing us to distinguish pandemic-induced changes from longer-term trends. Third, geographical data are integrated to identify variations across the urban hierarchy by grouping workplaces and firm locations into urban size: large cities (over 100,000 inhabitants), medium cities, and small towns. Finally, we apply statistical models to assess whether a firm's location or local industry-mix shapes its likelihood of expanding or repurposing office space. This allows us to determine whether the "reconfigured office" represents a national pattern or diverges across different urban settings.

This research contributes by analysing how office space use has evolved during and after the COVID-19 pandemic using a unique combination of survey and register data. Beyond its scientific contribution, the study offers policy-relevant insights into the potential need for reevaluating urban policies and spatial planning.

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Recreational night economy in italian cities

prof elisabetta Ottoz[1], Professor Francesca Rota[2], Dr Lisa Sella[3], Miss Maria Caligaris[4]
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G01-2 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 26, 2026, 11:00 - 13:00

In the last decades, several scholars and policymakers have focused on the opportunities and risks of the night economy. A vibrant night scene is vital to the urban economy, stimulating commercial activities, jobs, and investments. Moreover, it has proved to be a powerful lever of tourism, attractiveness, and regeneration. Nevertheless, the night economy is also a complex, contradictory phenomenon. Night-time recreational activities tend, in fact, to cluster in specific areas within the urban fabric, the so-called Movida neighborhoods, determining tensions with residents. These neighborhoods are thus extensively studied because of their contribution to the creative economy and the conflicts accompanying them in terms of alcohol abuse, foulness, vandalism, criminality, noise violations, and disturbance of public peace. Institutional, social, and cultural contributions represent the majority of the literature on the night economy. In contrast, little attention is paid to the supply side, its quantification in terms of local units, employees, and turnover and the dynamic analysis of its effects on the sectoral diversification of the local economy. The paper aims to fill this gap considering 10 italian cities, both big and medium sized. Using data from Istat database ASIA at years 2018 and 2023 the paper runs and economic analysis of how the night economy changed composition and dimension in the pre- and post-covid period, classifying the local units according to both the type of service they provide and their opening time.

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Long-run Zipf's and Gibrat's Laws Deviation: Spanish Population Impact

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G01-3 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 26, 2026, 17:00 - 19:00

This paper analyzes the population effects of the deviation from the Zipf and Gibrat laws for all the municipalities of Spain in the last censuses from 1900 to 2020 in NUTS-3 level (provinces). A novel econometric technique of Difference-in-Differences (DiD)
with multiple time period treatments is employed. The noncompliance of the Zipf law robustly leads to higher population while the rejection of the Gibrat law leads to lower inhabitants only when climate factors are considered. An example of agglomeration shadows is found at the province of the capital of Spain, Madrid, and its surrounding provinces.

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Unveiling spatial patterns of population in Italy

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G01-3 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 26, 2026, 17:00 - 19:00

We study the evolution of local population density in Italy from 1985 to 2020, moving beyond traditional administrative classifications by adopting a fine spatial grid of approximately 82,500 cells (locations). We propose a novel empirical approach to characterise the dynamics of spatial distribution and derive five location types from projected long-run demographic trajectories, shedding new light on urbanisation, depopulation, and spatial clustering. We illustrate policy relevance through two applications: evaluating the Italian National Strategy for Inner Areas and constructing a forward-looking taxonomy of NUTS-3 regions that complements standard urban–rural classifications.

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Worldwide Geographies of Wealth and the ‘Valued Attribute’ Concept

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G01-3 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 26, 2026, 17:00 - 19:00

The patterns of concentration of wealth across the globe are not immediately clear. Even in Europe, a relatively small and densely populated continent, the location of places that generate the most national wealth looks quite irregular, with isolated ‘peaks’ surrounding by ‘hollows’ that border each other. Quite often, the ‘spikes’ on this map are the largest cities of nations and their capitals, while the ‘depressions’ between them are less populated regions and rural areas, but not always. Thus, in a large number of cases, this general observation is not upheld. The conceptual model, termed the ‘valued attribute concept’, is suggested to explain such (ir)regularities. According to this concept, during each historical period, several attributes of location were important and the most valued, and places, which accumulated most of these favorable attributes, concentrated collective wealth as a result. If in antiquity, such attributes included the availability of fresh water, a temperate climate, and fertile land for agriculture and the cultivation of life stock, later elevated and naturally protected places gained importance, while previously valued attributes retained their importance as well. With accelerated industrial development, the proximity to natural resources gained prominence, while the importance of size became even stronger than before, due to the size of the market for produced goods and services, albeit not due to sole defense considerations, as before. As development progressed, the available services and other urban functions, as well as the infrastructure linking places, allowing factor exchanges and urban expansion, gained prominence. As the list of these ‘valued attributes’ tends to change with time, the location of the wealth loci may also change. In this presentation, this concept is supported by empirical data processed using geoinformation tools, applied to European and worldwide data.

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Autonomous vehicles in urban planning documents: perspectives from Hungarian cities

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G01-3 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 26, 2026, 17:00 - 19:00

Sustainable urban mobility, as part of sustainable transport, is a declared aim of both international (UN Sustainable Development Goals, New Mobility Paradigm) and European-level (European Green Deal, EU cohesion policy objectives) strategies. Cities, however, face significant challenges in transforming their transport systems to make them sustainable. Autonomous vehicles are expected to revolutionise urban transport in the coming decades and can also contribute significantly to solving urban problems, provided their integration is carried out in line with cities' interests. This is a complex process that requires thorough preparation and planning and fundamentally affects urban transport, infrastructure, land use, urban budgeting, and regulatory systems.
Drawing on an in-depth analysis of the international state-of-the-art literature, the presentation outlines different perspectives on where cities currently stand in their preparations for the arrival of autonomous vehicles, focusing on their appearance and integration in urban planning documents. Beyond the international examples found in the literature, the presentation also reveals the appearance of autonomous vehicles in the planning documents of eight large Hungarian cities. In addition to urban passenger transport, the presentation will also address the urban planning challenges of autonomous vehicles in urban freight transport, exploring innovative logistics solutions, technologies, and measures that cities anticipate will promote more sustainable freight transport.

Earthquake Vulnerability and Small-Scale Production Ecosystems in Istanbul

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G01-4 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 27, 2026, 09:00 - 10:30

Within the metropolitan landscape of Istanbul, specialized clusters of small-scale production areas remain tightly integrated into residential neighborhoods. This complex urban spatial structure faces profound threats from seismic risk and compounding fragilities, compromising the resilience of both the city's inhabitants and its economic core. This study seek for traces of the "invisible" spatial intersection of small-scale production ecosystems and seismic vulnerability in Istanbul, a dimension often overlooked in traditional land-use planning. The aim is to show the relationship between small scale production density, socio-economic status, and predicted building damage to identify latent earthquake risk zones based on neighborhood level. Utilizing a "Geospatial Big Data" approach, the methodology employed to visualize in GIS around 48,000 Point of Interest (POI) data entries extracted by Python from Google Maps to serve as a proxy for small-scale production locations' intensity. The study employs K-Means Cluster Analysis on Istanbul's neighborhoods to identify non-linear spatial typologies. Most of the results reveal a significant "spatial mismatch": the highest structural vulnerability (Cluster 5) is found in residential zones with low production activity, driven by building fragility rather than function. However, a critical "mixed-use" typology (Cluster 3) was identified where high production intensity co-locates with high damage risk around urban residential areas, creating risks for secondary chain reaction hazards. The study concludes that urban risk mitigation must shift from broad policies to typology-specific interventions, specifically targeting these hidden, hybrid production behind residential clusters.

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The economic impact of the COVID-19 crisis on multiple levels – from European regions to Hungarian settlements

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G01-4 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 27, 2026, 09:00 - 10:30

The Coronavirus pandemic and the response (including both containment and proactive measures to mitigate the negative effects of the crisis) have had a wide range of economic impacts around the world, but the extent and modalities of these have varied. The crisis has both had short-term impacts and caused structural changes and has also affected many aspects of territorial structures: the economic structure, the enterprises and the labour market. The aim of this presentation is to highlight the territorial inequalities of the various economic impacts of the COVID-19 pandemic in multiple scales: at regional level in Europe, and at municipal and district level in Hungary.
To do this, I have collected and analysed NUTS3-level data (GDP, employment) for European regions, and settlement-level data (net sales revenue of economic organisations, SMEs, job seekers, employees by occupation) for Hungary. I have also collected literature to explore the processes that may have contributed to the economic and labour market downturn, restructure and bouncing-back. First, I have analysed the impact of the COVID-19 pandemic on economic and labour market trends based on the trends of the previous period (2015-2019), the pandemic period (2020-2021) and the following period. Second, I have examined the patterns of these indicators, categorising regions and settlements based on changes in economic and labor market curves. Third, I have run regression analyses to examine which social, economic, infrastructural, governance, and environmental factors may have influenced the extent of the shock effect. Finally, I compared the results of the two studies so that I could examine the economic impact of the pandemic from the European to the local level.
As a result, I have got that the different crisis effects showed various spatial patterns. In European context, the crisis hit mainly the economy and labour market of tourist regions (Southern Europe, Alpine region) and East-Central Europe, in relation to the economic structure of the regions, excess mortality caused by COVID-19, and the quality of governance. In Hungarian context, Budapest, tourist areas, and the relatively developed western border region with its manufacturing-based economy suffered the most in the short term. However, in the longer term, this more developed western border region and the least developed northeastern peripheries proved to be the most vulnerable in terms of the economy and the labour market.

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Accessibility, Capability Loss, and Territorial Resilience: Evidence from the Central Italy Earthquakes

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G01-4 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 27, 2026, 09:00 - 10:30

Natural hazards are external shocks, but disasters emerge when pre-existing social and territorial vulnerabilities amplify their impacts. Critical infrastructures such as transport networks and service facilities such as hospitals and schools, are central to this process because they shape access to essential services and, in turn, people's real opportunities to live, work, learn, and remain in place. When earthquakes disrupt roads and damage buildings, they do not only reduce network performance; they can reconfigure who is able to reach key destinations and effectively use services. This matters especially in peripheral regions where baseline service provision is limited and travel already relies on few routes. A capability-based view of territorial resilience therefore shifts attention from "how fast systems recover" to whether people retain substantive freedoms under disruption, and whether recovery restores those freedoms equitably. This study asks: to what extent do disaster-induced disruptions to critical infrastructure translate into accessibility-mediated capability loss, and how does this help explain uneven post-disaster depopulation? We examine the 2016-2017 Central Italy earthquake sequence, which affected four regions characterised by inner, mountainous municipalities with historically low accessibility. The event was followed by sustained population decline, particularly among working-age groups, deepening existing territorial inequalities.Using building-level post-earthquake surveys, damage-grade mapping, and mobility data, we model disruption to critical infrastructure and estimate changes in network-based accessibility to essential services before and after the earthquakes. Accessibility decline is operationalised as the increase in travel time caused by damaged assets and road disruptions. We then combine this accessibility shock with a social vulnerability index to measure capability loss as the interaction between pre-existing vulnerability and reduced access. Finally, we assess how estimated capability loss relates to subsequent depopulation patterns. We expect capability loss to concentrate in already peripheral locations where small disruptions generate large travel-time increases, and depopulation to be strongest where accessibility declines compound social vulnerability. Overall, the study offers a spatially explicit, people-centered measure of territorial resilience that links infrastructure disruption to the unequal distribution of post-disaster opportunities and demographic change.

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A local approach towards fishing governance

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G01-5 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 27, 2026, 15:00 - 17:00

This paper contributes to the literature on the local approach to fisheries governance with a comprehensive and integral procedure to address local fishing community profiles, using local level fishing, socioeconomic, tourism, demographic and geographical data from official statistics sources; and covering the entire process, from the identification of FC, going through the description of the full ecosystem of FC using key variables from the local fishing profiling, up to the prioritization of FC, so as to identify those with the strongest linkage to the fisheries and their increasing connection to tourism, whether as a complementary or as a substitute activity for fishing.
The paper pursues four interrelated objectives; 1) to identify and describe the ecosystem of Spanish fishing communities (FC); 2) to prioritize FC so as to determine how fishy they are; 3) to characterize the hard core or top FC by means of the ranking resulting from prioritization, and a local level set of geographic, demographic, socioeconomic and tourism indicators; 4) To measure the tourist appeal of FC (compared to a control group identified with coastal non-fishing communities.
(1) requires the adoption of a quantifiable definition of FC, the collection of a set of local level indicators and proper descriptive tools to describe the local fishing ecosystem. At this stage, we are taking advantage of concentration, leadership and inequality indices to analyse the distribution of key fishing related inputs and regional diversity among FC (Shorrocks, 1980; Shorrocks et al.,1984).
To address (2) we focus on composite indices (CI). We are adopting the benefit of the doubt approach (BoD) (Melyn and Moesen, 1991; Cherchye et al, 2007). Specifically, we are using the robust m-version of the directional distance function model (Zanella et al, 2015; Rogge et al, 2017; Fusco et al., 2021) to allow for the accommodation of desirable (DI) and undesirable inputs (UI) in the generation of CI, and their related scores. Once FC have been prioritized, (3) we will focus on the subsample of the Top FC to address how the true and unquestionable Spanish FC are. To address (4), and mainly due to its robustness to outliers, we will use quartile regression (QR) (Koenker y Bassett (1978), Koenker y Hallock (2001) Koenker (2005) and bootstrapping (He y Mu, 2002; Kocherginsky, et al., 2004).
The article focuses on Spanish fishing communities. The indicators and procedures can be easily exported to other ecosystems, regions, or countries in the world.

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Fostering local resilience through digital governance and budget strategies

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G01-5 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 27, 2026, 15:00 - 17:00

Local governments are central players in the entrepreneurial ecosystem. Through their policy practices, institutional support, and digitalization strategies, they will influence entrepreneurial endeavors. Development is inherently uneven across territories, and local authorities can combine budgeting and digitalization strategies to foster growth and raise local resilience. Digital governance plays a critical role in enhancing institutional transparency, efficiency, and responsiveness. The digital shift in governance fosters local resilience, thereby enhancing local communities' ability to absorb, adapt to, and recover from systemic shocks.
The intertwinement between locally grounded e-governance and budget strategies with resilience strategies creates adaptive governance structures; this proximity framework enables real-time responses, decentralized coordination, and equitable service delivery. This symbiosis is essential for managing the multidimensional challenges and complex problems that local communities are facing at present across ecological, digital, social, and economic dimensions.
Portugal faces an increasing rural-urban divide, manifested by uneven access to services, digital infrastructure, and economic opportunities, which exacerbates regional disparities and hinders inclusive development. The countryside is experiencing progressive desertification, driven by population decline, land abandonment, and climate stress, threatening ecological balance and regional sustainability. This fragmentation further erodes the ability to recover from exogenous shocks.
We propose a quantitative analysis of the importance of digital maturity along with public economic investments in improving local community resilience. The econometric estimations cover the 308 Portuguese municipalities, gathering indicators on municipal digital maturity, municipal spending, policy tools environmental performance, and the demographic and social dimensions of sustainability, as well as economic indicators on income generation and welfare. The effect of these actions towards the rural divide is also evaluated using the Governmental taxonomy of rural and urban municipalities to determine whether these dimensions operate similarly in both contexts.
Empirical results show that engagement in local government digital strategies benefits communities. Also, the results support the idea that rural communities can benefit even more from this new paradigm, which may help mitigate the divide. Also, the combination of budgeting strategies targeting investment with digitalization further enhances the ability to recover.
Local governance is proven to be a determinant player, which by policy mixes will promote resilience in their communities, accelerating the pace of recovery and promoting sustained paths of growth.

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The urban-agricultural interface in developing Arab localities: The perceptions of farmers and officials

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G01-5 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 27, 2026, 15:00 - 17:00

The ongoing process of urbanization in Arab localities—typically driven by self-built housing and the encroachment of expanding built-up areas into surrounding agricultural land—has substantially transformed these settlements demographically, physically, and economically. This process has also altered the local economic base, shifting it from agriculture toward non-agricultural employment. The objective of this study is to examine the perceptions of farmers and key stakeholders regarding the urban–agricultural interface, to identify the barriers they face, and to understand the survival strategies adopted by agricultural households. In addition, the study presents updated and reliable data on the current state of agriculture and agricultural households in the context of urban expansion in two case-study localities: Baka al-Gharbiyye and Jatt.
To address these issues, in-depth interviews were conducted with local officials and farm owners in the urbanizing localities. The interviews aimed to capture the pressures exerted by urban expansion on agricultural land, as well as the existence of economic, social, local, institutional, and national barriers to sustainable agricultural development. The interviews served two main purposes. First, they enabled the identification of general characteristics of agricultural households in the two study sites, including age, gender, education, secondary occupations, and average household income. Second, they provided insights into the key characteristics of agricultural activity, such as the type of farming, land resources, and patterns of agricultural land use. The underlying assumption of this study is that, from the farmers' perspective, agriculture remains an important source of income for the households they represent and that it may remain viable even under increasing urbanization pressures.

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Institutional Cultural Districts as an Approach to Regional and Rural Development: A Case of Mersin

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G01-5 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 27, 2026, 15:00 - 17:00

Mersin is a significant region in Turkey, noted for its rich natural resources and agricultural diversity. The region's favorable climatic and natural conditions facilitate the cultivation of a wide array of agricultural products. This study aims to support local agricultural production, strengthen rural development, and ensure economic sustainability by exploring the potential of "Institutional Cultural Districts." The research focuses on increasing agricultural production capacity and achieving economic sustainability within Mersin.

Cultural districts are socioeconomic experiences that blend localization with unique cultural products. Research indicates that such districts positively affect local economic development. The concept of "cultural districts" emerged in the 1980s and has been effective in enhancing local development and income growth while revitalizing artistic and cultural resources.

Walter Santagata categorizes local culture utilization into four groups: Industrial Cultural Districts, Institutional Cultural Districts, Museum Cultural Districts, and Metropolitan Cultural Districts. Institutional Cultural Districts improve their competitive advantage through government support and shared commercial branding, enabling local producers to protect their products and support production activities. These districts promote market-oriented incentives that sustain local development and provide legal protection for high-quality product development.

Mersin, recognized for its high agricultural potential, is also home to geographical indication products like Anamur Banana, which have the potential for national and international market recognition. This study employs a two-stage methodology. The first stage involves using geographical information systems to map and analyze the areas where these products are cultivated. The second stage consists of surveys and interviews with local farmers to gain insights into agricultural production processes.

This research will help identify Mersin's agricultural potential and the possible locations for Institutional Cultural Districts. Implementing these districts is expected to enhance local production and encourage rural development. The case of Mersin can serve as a model for other regions in Turkey, providing valuable data for economic development policies.

In conclusion, the findings from this study will significantly contribute to understanding the potential of Institutional Cultural Districts in Mersin, offering an innovative model for boosting agricultural production. Thus, Mersin's example not only inspires other regions but also provides essential input for developing national agricultural policies.

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From longstanding recognition to limited practice: Social Determinants of Health in National Spatial Planning Frameworks

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G01-6 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 27, 2026, 17:30 - 19:30

The links between spatial planning and health are not new. For decades, spatial planning has been recognised as a key policy domain shaping living conditions, environmental quality, access to services, and social opportunities - factors now widely conceptualised as Social Determinants of Health (SDH). International agendas, particularly those advocating a Health in All Policies approach, have repeatedly emphasised the need to address health through territorial interventions. Yet, despite this long-standing conceptual recognition, there is still limited empirical knowledge on how contemporary spatial planning systems translate these principles into concrete planning frameworks. This paper addresses this gap by examining how SDH are recognised within National Spatial Plans (NSPs) in four European countries: Portugal, Ireland, Estonia, and Lithuania. NSPs constitute the backbone of national planning systems, setting strategic orientations and guiding lower-tier spatial plans. The paper therefore asks a critical empirical question: to what extent do NSPs currently recognise and translate SDH into spatial development frameworks? Addressing this question is essential for understanding whether spatial planning functions merely as a discursive supporter of health objectives or as an active policy instrument shaping health-relevant conditions. The analysis is based on a systematic qualitative content analysis supported by MAXQDA. Planning documents were coded along two analytical dimensions. First, the presence of SDH was examined across the main stages of the planning cycle (diagnostic, strategic, and operational), reflecting whether health determinants are used to frame problems, define objectives, and guide implementation. References were classified to distinguish between direct, indirect, and missing engagement with SDH. Second, the analysis examined references to planning mechanisms relevant for acting on SDH, including spatial targeting, cross-sectoral articulation, and implementation instruments, as these are critical for translating policy recognition into territorial practice. The findings reveal marked cross-national variation. Portugal and Ireland display more visible acknowledgement of SDH, although integration remains uneven across planning stages. In contrast, Estonia and Lithuania show limited and largely implicit consideration of SDH. Across all cases, SDH are more frequently referenced at strategic or discursive levels than embedded in operational planning instruments, highlighting a persistent gap between recognition and implementation. These results suggest that, despite decades of conceptual alignment between spatial planning and health, NSPs still struggle to integrate SDH in ways that shape concrete spatial interventions. The paper provides comparative evidence on the extent to which national spatial planning frameworks are equipped to address structurally produced health inequalities in an era of growing socio-environmental uncertainty.

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Sustainable Development of Lisbon – An Essay on Territorial Medicine

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G01-6 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 27, 2026, 17:30 - 19:30

The aim of this paper is to propose a consistent set of ideas that promote the sustainable development of both people and places within a city, exemplifying with the governance of Lisbon. It illustrates the need for a systemic paradigm concerning the sustainable development of people and places and experimenting with the practice of territorial medicine—an approach grounded in regional science.
The systemic approach makes it possible to understand the mechanisms that foster the goals of sustainable development, by revealing the factors that municipal government can influence: the selective investment in gradually improving adapted spaces, and the careful management of institutions. This assumes that the environment, the economy, society, and well-being cannot be directly and effectively manipulated by the municipality or the state.
Applying the methodological approach to Lisbon the paper argues that the city greatest problem lies in the poor diagnosis and prognosis carried out by institutions and regulation, that blaming tourism, immigration, the airport, or the port are the main problems of the city. This perspective on the disturbances created by the existing activities leads to the failure to attract investment, weak economic performance, and generates poverty. The city's problems also stem from misguided public policies, often justified by partial and non-integrated disciplinary visions.
The paper argues for the financial viability of designing a competitive and sustainable city—one that values its unique airport and port, locates urban activities where they are most suitable, makes citizens accountable for the balance between the taxes they pay and the public goods and services they receive, attracts investors to basic industries, integrates immigrants and tourists, and provides residents, workers, and families with the means to create culture, well-being, and sustainable development. The paper concludes with a shift in the focus of research, from disciplinary questions to place-based research questions.

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Case Study on Cultivating Place Attachment in Communities Facing Population Decline and Aging

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G01-6 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 27, 2026, 17:30 - 19:30

Cultivating place attachment is essential for revitalizing communities. While various methodologies have been proposed, this study investigated the determinants of place attachment in two Japanese regions: a mountainous area facing population decline and a suburban community of a major city facing aging.

In the mountainous area Kamikita village in Nara prefecture, questionnaires were distributed to all households residing in the village (N=116). The survey was conducted by asking current village residents to forward the questionnaire to individuals who had already left the village. Responses from those who had left the village and returned the questionnaire (N=44) were used to examine their hometown attachment. Statistical analysis revealed a significant positive correlation with the frequency of contact with the sender. Furthermore, participation experience in hometown community development activities was shown to enhance hometown attachment. This suggests that for those who have left the village and reside relatively nearby, facilitating participation in local events may be effective. For those residing farther away, maintaining frequent contact may be effective in cultivating hometown attachment. The study also suggested that enhancing the hometown attachment of those who have left the village could be an effective way to encourage their support.

Meanwhile, in suburban areas of large cities, the aging of housing complexes developed decades ago is significant, and ensuring travel modes for residents unable to drive private cars is a challenge. In Matsudo City, Chiba Prefecture, a Neighborhood Electric Vehicle System (ELMS) has been established. Using city funds, golf cart-type electric vehicles are loaned to neighborhood associations and managed by residents. This system supplements the last-mile travel needs of residents. To understand the impact of this ELMS on place attachment, a questionnaire survey was conducted among residents (N=95). The results showed that ELMS users experienced increased place attachment through increased frequency of going out. Furthermore, it became clear that the community's autonomous operation of the ELMS positively influenced users' attitudes toward the system. For a sustainable ELMS, it is crucial that municipalities give each district discretion, allowing them to operate according to their specific characteristics and cultivating trust between municipality residents.

These cases suggest that the degree of residents' involvement in their community may positively influence the cultivation of community place attachment. As the challenges associated with declining birthrates, aging populations, and population decline vary by region, it is necessary to continue accumulating and sharing case studies going forward.

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Exploring the Economic Resilience of Export-Oriented Manufacturing Regions: Performance, Mechanisms and Dark Sides in Kunshan, China

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G01-6 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 27, 2026, 17:30 - 19:30

Following China's WTO accession, export-oriented manufacturing regions (EOMRs) became deeply embedded in global production networks, gaining rapid growth but also heightened vulnerability to external shocks. Since 2018, China's economic development has entered a period of polycrisis driven by the slowdown of globalization, intensified U.S.-China trade tensions, Covid-19 pandemic and changes in demographic structure. China's economy has experienced a slowdown due to its long-standing dependence on low-end manufacturing exports. EOMRs are undoubtedly the most noteworthy type of region in this context.

Regional economic resilience (RER) is a recursive and path-dependent process. Pre-crisis development paths are shaped by industrial structure, innovation, labor markets, and institutions. These features may act as vulnerabilities or capacities in times of heightened economic uncertainty. However, the resilience performance and capacity of EOMRs under these shocks remain insufficiently understood. In seeking to address this gap, this study employs a mixed-methods approach to focus on three key questions: 1) how have Chinese EOMRs responded to multiple crises since 2000; 2) how do different forms of agency interact with structural conditions, especially multi-scalar institutions, to shape the uneven economic resilience across Chinese EOMRs; 3) What are the developmental consequences of the resilience formation process in EOMRs, and how might the resilience formation process reinforce or mitigate uneven regional development and intra-urban inequality. It is argued that understanding RER, requires moving beyond structural functionalism and adopting a structure-agency analytical perspective, which allows us to deconstruct what constitutes and determines the region-specific effects.

Preliminary findings indicate that resilient regions are distinguished not only by their capacity to withstand shocks, but also by their ability to initiate a virtuous cycle of renewal and transformation. This requires more than short-term stimulus, but active structural and institutional adjustments. Kunshan, a county-level city, serves as a typical example of employing institutional entrepreneurship and place-based leadership in cultivating resilience.

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Regional Institutions and FDI Resilience: Evidence from the Brexit Uncertainty Period

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G01-7 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 28, 2026, 09:00 - 10:30

Economic uncertainty sparked by shocks negatively affects inward Foreign Direct Investment, as evidenced during the 2016–2019 Brexit negotiation period. In an era of geopolitical fragmentation and structural transitions, understanding how regions respond to global uncertainty shocks has become central to regional science. This paper examines whether regional Investment Promotion Agencies (IPAs) helped protect inward FDI during the Brexit negotiation period (2016-2019), exploiting heterogeneous pre-Brexit sector-targeting strategies across UK regions. I find that pre-2015 IPA targeting strategies increased inward FDI specifically in repeat investments within Knowledge Intensive Services (KIS) sectors —- those relatively under-exposed to Brexit uncertainty and more sensitive to ecosystem-building activities. Targeted region-sectors were 4.4 percentage points more likely to receive repeat KIS FDI, with 27.9% higher capital value. New FDI and manufacturing investments saw no impact. Effects concentrate outside South East England and among investments explicitly motivated by regional ecosystem factors, suggesting that IPAs' protective role during uncertainty operates primarily through ecosystembuilding rather than information-assistance mechanisms. By embedding MNEs into specialised regional ecosystems, IPAs provide operational benefits that prove decisive when facing uncertainty shocks. These findings highlight how place-based institutions shape differentiated regional responses to global transition-era disruptions, contributing to uneven but policy-contingent patterns of regional resilience.

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Resilience Beyond Regions: Cluster-Based Trajectories of Resistance and Recovery in Indonesia

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G01-7 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 28, 2026, 09:00 - 10:30

This paper examines the resilience of regional clusters in Indonesia during the COVID-19 crisis using a phase-specific and cluster-based perspective. Rather than treating regions as homogeneous units, the study conceptualises clusters as distinct resilience regimes shaped by differential exposure, institutional capacity, and industrial path dependence. Resilience is defined as a two-phase process, distinguishing resistance to the initial shock from subsequent recovery. Empirically, the paper applies Kml3d, a longitudinal clustering technique, to identify multidimensional resilience trajectories that combine resistance and recovery outcomes with Resilio capacity indicators. These indicators capture insight capacity, government capacity, knowledge and innovation, learning, networking and cooperation, and infrastructure, observed over the 2020–2023 period. This temporal design enables the analysis to capture both regional conditions and institutional dynamics during and after the shock. Robustness checks confirm stable cluster configurations, indicating structurally anchored resilience paths. Four cluster types are identified. Cluster 1 exhibits strong resistance but slow recovery, reflecting limited exposure combined with weak endogenous reconfiguration capacity. Cluster 2 shows weaker resistance but strong recovery, supported by functional institutions enabling incremental, path-dependent adaptation. Cluster 3 consists of institutionally thick clusters with strong knowledge, innovation, and network capacities; despite high exposure and weak resistance, these clusters recover rapidly through coordinated adjustment. Cluster 4 displays the weakest resistance but moderate recovery and comprises highly exposed metropolitan and tourism-based clusters, including Indonesia’s capital region and Bali, where recovery is driven by institutional upgrading and learning rather than low exposure. Overall, the findings demonstrate that cluster resilience operates through mechanisms distinct from aggregate regional resilience. By clustering resilience trajectories, the paper contributes to debates on cluster resilience and regional industrial paths, showing how shocks may reinforce, adapt, or reconfigure development trajectories rather than simply disrupt them.

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Does Vertical Density Affect Lung Cancer Mortality Differently for Men andWomen?

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G01-7 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 28, 2026, 09:00 - 10:30

This study examines the relationship between lung and bronchus cancer mortality, vertical urban density, and smoking prevalence across 48 U.S. states from 1999 to 2022. Using 2034 state-year observations, skyscraper counts are employed as a proxy for vertical urban density, together with sex-specific, age-adjusted mortality and smoking data. A fully interacted empirical model identifies a non-linear, inverted U-shaped relationship between vertical density and lung cancer mortality for both men and women: mortality initially increases with greater vertical density but declines at higher levels, consistent with offsetting effects of environmental exposure and improved access to healthcare in highly dense urban environments. Importantly, the shape and magnitude of this relationship differ by gender. While smoking prevalence is strongly associated with lung cancer mortality for both sexes, mortality rates are consistently higher among males, and the marginal effect of smoking on mortality is more pronounced for men than for women. These findings highlight the importance of accounting for both non-linearity and gender heterogeneity when assessing the public health implications of urban form

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Optimal Population Distribution When Regional Economies, Disasters, and Utility Levels are Intercorrelated: Applying Portfolio Theory

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G01-8 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 28, 2026, 11:00 - 13:00

Recent population decline in Japan as well as in some countries in eastern Europe is, combined with the growths in urban agglomerations, causing the concentration of the national population in some limited “central” regions; the concentration, which deteriorates the “periphery” regions in most cases, is sometimes considered economically efficient and even to be promoted.
However, when regions are facing disaster risks, traditional risk theories such as the one for portfolio management tell us too much concentration is not the best; businesses (and thus the populations) should be diversified and not to be located in a few places. According to the theory, the degree of concentration/dispersion depends on the relative magnitude of the returns (losses) to their correlation. Noting the levels of the disaster damages as well as the economies are correlated over regions, and moreover, according to the modern behavioral economic theory, the state-dependent “utility” levels can be intercorrelated, this study describes the theoretical model that determines the “optimal” distribution of the population over the regions and characterizes its “solutions.”
In addition, using Bulgarian regional disaster (e.g., flooding) and economic data as well as Japanese data, several numerical examples for the application of the model are indicated. In general, as people are more risk averse, the population needs to be dispersed. An increase in covariance results in either concentration or dispersion depending on the locations.

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Regional Economic Impacts of Large-Scale Tsunami Disasters in a Depopulating Society in Japan

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G01-8 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 28, 2026, 11:00 - 13:00

This study analyzes the regional economic impacts of large-scale tsunami disasters in Japan under conditions of long-term population decline, with a comparative focus on the Pacific and Japan Sea coastal regions. Japan is projected to experience continuous population shrinkage over the next three decades, and the pace of demographic decline varies significantly across regions. In many coastal areas, rapid aging and youth outmigration are occurring simultaneously, making demographic change a critical factor influencing disaster vulnerability and recovery capacity.
A dynamic interregional input–output (IRIO) model based on a 47-prefecture, four-sector framework is developed to capture spatial economic interactions across Japan. Regional population levels are incorporated as time-dependent variables affecting household final demand and labor supply constraints. Two simulation scenarios are constructed. In the first scenario, population levels are assumed to remain constant over time, and a large-scale tsunami shock is introduced to estimate disaster impacts under a stable demographic structure. In the second scenario, projected prefectural population decline is incorporated exogenously, and the same magnitude of tsunami shock is applied. Comparing these scenarios allows the isolation of demographic effects on disaster outcomes.
The simulations assume a large-scale tsunami affecting Pacific coastal prefectures, and an equivalent shock is hypothetically applied to Japan Sea coastal regions to examine how differences in demographic structure influence economic losses and recovery paths. Pacific regions generally contain larger population and economic concentrations, whereas Japan Sea regions tend to exhibit higher rates of population decline. The analysis evaluates differences in gross output losses, demand contraction speed, and long-term recovery trajectories across regions.

Short-term (immediate), medium-term (5–10 years), and long-term (20–30 years) horizons are considered to assess how ongoing demographic decline shifts post-disaster economic levels. The results suggest that regions experiencing rapid depopulation may face structurally lower post-disaster economic equilibria, while more populous regions may exhibit relatively faster recovery.
By integrating demographic trends into disaster impact assessment, this study moves beyond static loss estimation and provides policy insights for disaster risk evaluation and regional planning in shrinking and aging societies.

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Post-disaster resilience of peripheral areas: The importance of amenities and social capital

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G01-8 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 28, 2026, 11:00 - 13:00

For obvious reasons, disaster research's main focus is on forecasting and preventing disasters. However, when the most necessary functions in a disaster-stricken area are restored, are we then back in "business as usual"? The answer is of course no. An external chock like a disaster often means substantial material and economic losses, as well as psychological stress for entrepreneurs and households. For many, the question "should I stay or should I go?" arises. Which factors influence such decisions?

This presentation is based on the assumption that there is a fundamental difference between city-regions' and rural areas' resilience capacity after a disaster. City-regions have such a concentration of human and material resources that they, even after a disaster, have the ability to survive and "bounce back" (Borsekova & Nijkamp 2019, World Disaster Report 2010). Rural areas lack this concentration of resources, which means that their resilience capacity is much lower.

Can rural areas strengthen their resilience capacity? In this presentation we focus on two interrelated and partly overlapping factors that have received little attention in earlier research: amenities and local social capital. Starting from a taxonomy of various types of amenities and natural resources, we discuss how they separately or in combinations might strengthen the attractiveness of a rural area for a) residents and visitors, and b) from a producer and consumer perspective, respectively.

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Agricultural entrepreneurs and their stabilising role in regions in a transition era

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G01-8 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 28, 2026, 11:00 - 13:00

Rural areas occupy an ambivalent position in modern consciousness, often perceived as having a lower standard of living and a lower density of services, as well as conservatism, backwardness, and rigidity. In contrast, there is a romanticised ideal of a traditional community, positive norms, and security. One of the constitutive elements of the countryside is agriculture and farmers, who create a network of relationships, basic assistance, and rapid responses to unexpected events in the regions. Through a study of 288 medium-sized to large farms in the Czech Republic (averaging 2,608 hectares and 51 employees), the research identifies nonproductive activities that are considered publicly beneficial. The basic research question is: How is the social function of agriculture perceived by practitioners, and which forms of assistance are most prevalent? Findings indicate that farmers primarily stabilise regions through landscape maintenance, maintenance of public roads, and logistical support for municipalities and local associations. While direct social support for individuals remains secondary, the provision of local food and catering is limited to small-scale production and their own processing. The paper concludes that these "unsolicited but often expected" activities create a vital network of reciprocity. By fulfilling these roles, farmers transcend their economic identity to become influential political actors. Their involvement not only preserves social stability in a changing world but also actively shapes the character and future of rural resilience.

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Anthropogenic drivers of land take – a panel spatial analysis for Bavarian municipalities

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G01-9 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 28, 2026, 15:00 - 16:30

Land take constitutes a major driver of soil degradation and climate-related risks. While land-use decisions are mainly shaped at the municipal level, empirical evidence on the local and spatially interdependent drivers of land take remains limited. This study examines the anthropogenic determinants of land take using a spatially extended STIRPAT framework applied to panel data from 1,600 municipalities in Bavaria, Germany, covering the period from 2014–2022. A Spatial Durbin Error Model is employed to account for spatial dependence and spillover effects across neighboring municipalities. Moreover, literature defines affluence typically as income or GDP per capita indicating the level of affluence of private households or regions. In contrast to, the results of this paper demonstrate that (also) public affluence is a suitable indicator for explaining land take. The results show that population and public affluence exert positive local effects on land take, while urban density significantly restrains land take. Moreover, a non-linear Environmental Kuznets Curve relationship for public affluence is observed, which materializes also through spatial spillover effects. Building permissions emerge as a key policy-related driver, generating positive indirect effects that propagate land consumption across adjacent municipalities. These findings highlight that land take is not only shaped by local conditions but evolves as a spatially interconnected process driven by fiscal capacity and planning decisions. The study underscores the need for coordinated, multi-regional land-use policies and highlights the analytical value of small-scale spatial STIRPAT applications in capturing environmentally relevant development dynamics.

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Economic Evaluation of Urban Heatwave Adaptation Technologies based on SSP Scenarios

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G01-9 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 28, 2026, 15:00 - 16:30

Extreme weather events associated with climate change, particularly heatwaves, have become increasingly frequent and are characterized by heightened volatility and tail risk. As climate change amplifies heatwave exposure, governments have expanded adaptation efforts. However, the literature on heatwave adaptation policies and technologies exhibits two limitations. First, most studies rely on static, backward-looking analyses based on historical data, constraining their ability to manage evolving climate risks proactively. Because future heatwave exposure will differ across climate pathways, systematic scenario-based evaluation is essential. Second, despite the distributional features of climate risk, assessments remain largely mean-centered. Economic losses from extreme events often escalate nonlinearly, with a small number of large realizations accounting for a disproportionate share of aggregate damages. As loss distributions become increasingly fat-tailed, analyses focused solely on average risk understating both the magnitude and variability of climate-related damages. This study evaluates the economic performance of urban heatwave adaptation technologies under three Shared Socioeconomic Pathway (SSP) scenarios—SSP1-2.6, SSP2-4.5, and SSP3-7.0. Heatwave damages are monetized, and future loss trajectories are projected using a Heatwave Resilience Index (HWRI). To address uncertainty, we incorporate a risk premium reflecting reductions in damage variance, thereby establishing a decision criterion consistent with rational policy choice under uncertainty. The empirical analysis employs a balanced panel of 229 municipal districts in South Korea over 2016–2022. Key explanatory variables include the HWRI—capturing adaptive capacity and vulnerability reduction—and the installed capacity of major heatwave adaptation technologies (cooling fog systems, cool roofs, rooftop and wall greening, and shading infrastructure). The HWRI integrates economic, social, physical, governance, and demographic indicators to quantify local heat-response and recovery capacity. Climate variables include the 95th percentile of daily maximum Wet-Bulb Globe Temperature (WBGT) and the number of days exceeding 27°C WBGT, linked to SSP-based projections. Holding current socioeconomic structures, resilience levels, and adaptation technology stocks fixed at baseline values, we simulate prospective damages under alternative climate pathways. A panel regression–based forecasting model estimates technology-specific marginal benefits, from which scenario-specific Cost-Effectiveness Thresholds (CETs) and Benefit–Cost Ratios (BCRs) are derived. We further quantify variance reductions in projected damages to estimate the associated risk premium. The results show that economically viable conditions for urban adaptation technologies vary systematically across climate scenarios, generating shifts in optimal investment priorities. By integrating forward-looking climate pathways with uncertainty-adjusted evaluation, the framework provides an objective basis for climate-resilient urban policy and strengthens the credibility of long-term adaptation strategies.

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Persistent inequalities in industrial pollution exposure across neighbourhoods in England and Wales

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G01-9 Urban, Regional, Territorial and Local Resilience, The Egg Hall - Central corpus, agosto 28, 2026, 15:00 - 16:30

Industrial pollution has declined in many high-income countries, yet it remains unclear whether these gains have reduced local environmental inequalities. We analyse the distribution of industrial pollution across neighbourhoods in England and Wales using facility-level data from the United Kingdom Pollutant Release and Transfer Register between 2009 and 2019. Reported emissions of regulated pollutants released to air, land, and water are combined into a common human-toxicity metric and linked to neighbourhood socioeconomic characteristics. Despite substantial national emission reductions, the spatial distribution of pollution exposure remains highly persistent: neighbourhoods that were most exposed at the start of the period remain among the most exposed a decade later. Industrial pollution shows a non-linear relationship with income, with chemical toxicity peaking in middle-income neighbourhoods and particulate matter most concentrated in lower-income areas. Higher educational attainment is consistently associated with lower levels of pollution.

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The portrait of the regional development traps in Central and Eastern Europe

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G02-1 Regional Growth Models, Competitiveness, and Convergence in a Polycrisis Context, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 26, 2026, 11:00 - 13:00

Global economic development is increasingly shaped by the structural tensions between economic integration, national sovereignty, and democratic accountability, as conceptualized by Rodrik's trilemma (Rodrik 2000, 2011). These tensions are spatially uneven in their consequences, contributing to widening regional disparities across Europe. While some regions have successfully embedded themselves into global production networks, others face persistent stagnation or decline. Traditional core–periphery models provide important insights into structural disadvantages (Iammarino et al. 2019); however, the concept of the regional development trap (European Commission 2020; Diemer et al. 2022) offers a more dynamic and process-oriented framework to explain why certain middle-income regions struggle to sustain productivity growth and structural upgrading despite economic integration.

Although regional development traps and spatial inequalities have been analysed at the European scale, predominantly through an aggregate EU-wide lens, the recent macroeconomic convergence of Central and Eastern European (CEE) countries conceals significant and persistent intra-national disparities (Gál & Lux 2022; Vas et al. 2024). National-level catch-up trajectories obscure heterogeneous development paths at lower territorial scales. Beneath aggregate growth figures, many subnational regions remain locked in low-productivity, low-innovation equilibria.

This presentation therefore shifts the analytical focus to the NUTS3 level and addresses the following research question: What types of regional development traps exist in Central and Eastern Europe at the NUTS3 scale? By moving beyond conventional benchmarking against the EU average, we develop a modified regional development trap index tailored to the specific structural and historical conditions of CEE economies. This approach enables a more accurate identification of territorially embedded stagnation patterns.

Our findings suggest that the CEE development trap is rooted in the historical legacies of post-socialist transformation, uneven sectoral restructuring, and strong dependence on foreign direct investment. These factors have produced asymmetric spatial development structures, where globally integrated metropolitan cores coexist with structurally vulnerable rural and old industrial regions. The latter are characterized by labour market polarization, limited human capital accumulation, weak innovation ecosystems, and restricted social mobility. Consequently, despite the overall national and relative convergence to the core Europe, numerous NUTS3 regions continue to experience low productivity growth, modest employment expansion, fragile economic diversification, and in some cases deepening internal income inequalities.

By refining the development trap concept at a finer territorial scale, this analysis contributes to a more differentiated understanding of structural stagnation in middle-income European economies and underscores the importance of spatially sensitive, place-based policy interventions capable of breaking self-reinforcing cycles of regional divergence.

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Geographical Core-Periphery and Network Convergence: Which European Regions Converge Most in European Knowledge Networks?

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G02-1 Regional Growth Models, Competitiveness, and Convergence in a Polycrisis Context, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 26, 2026, 11:00 - 13:00

European integration and the expansion of cross-border R&D programs raise a network-theoretic question: are European regions converging in their positions within interregional knowledge networks, or does a persistent hierarchy endure? This study tests beta-convergence in regional network embeddedness using a multiplex representation of interregional knowledge ties, motivated by evidence that European collaboration networks exhibit strong core-periphery stratification and preferential-attachment dynamics that can limit catch-up for peripheral regions. Rather than evaluating integration through aggregate growth in participation, convergence is assessed as changes in relative network position and shifts in the concentration of network advantages over time.
A multiplex interregional network is constructed from three complementary relational layers, namely co-patenting, EU Framework Programme project collaboration, and scientific co-authorship. The network layers are aggregated consistently to the regional scale and combined under a uniform weighting logic to reduce single-layer bias. Convergence is estimated with cross-sectional OLS beta-convergence regressions linking the change in regional network position between 2001-2003 and 2017-2019 (multi-year averages) to the initial level of network position. Two outcomes capture distinct aspects of embeddedness: degree-based centrality (to measure connectedness) and alpha-coreness (classical core-periphery position measure ona continuous scale). The baseline models are then extended by incorporating geographical core-periphery topologies directly into the regressions: (i) an urban-rural settlement approach and (ii) a pre-/post-2000 EU-accession divide (old vs new member states), alongside continuous proxies for socio-economic development.
Results indicate statistically significant but substantively modest beta-convergence in both centrality and coreness: initially peripheral regions improve slightly more than initially central regions, yet the overall hierarchy remains sticky. Introducing geographical topologies reveals that convergence is not spatially neutral. Urban regions exhibit significantly stronger upgrading than rural regions, and the accession divide matters particularly for alpha-coreness, where post-2000 regions show larger gains. Joint specifications suggest that catch-up is concentrated among eastern urban (and partly intermediate) regions, while western rural regions display the weakest upgrading. These findings imply that policies targeting “network convergence” should prioritize connectivity- and role-upgrading instruments for peripheral and rural regions, and evaluate success using network-position outcomes alongside conventional innovation indicators.

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Per capita Income Convergence in Central Europe:

Does the 2004 Accession to the European Union matter?

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G02-1 Regional Growth Models, Competitiveness, and Convergence in a Polycrisis Context, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 26, 2026, 11:00 - 13:00

The regional per capita income convergence constitutes not only an important economic but also political and social problem. In the economic literature various theoretical and empirical approaches to studying the effects of European economic integration on regional growth and income convergence can be identified. However, these approached often yield controversial results. The main objective of this paper is to study regional per capita income convergence in Central Europe from 1993 to 2024 using an innovative approach proposed by Phillips and Sul (2007). We divide the study period into two sub-periods: 1993-2004 and 2005-2024, which allows us to compare income convergence before and after accession to the European Union. Our study uses data at different NUTS levels ranging from NUTS1 to NUTS3. Our results show that the hypothesis of income convergence between all regions of Central Europe is rejected at each NUTS level for both the pre- and post-accession periods. At the same time our results indicate the existence of different convergence clubs between regions of Central Europe. In particular, the number of convergence clubs depends on both the NUTS level used and the period of the study. The number of convergence clubs increases with the level of spatial data aggregation. Moreover, our results show that after joining the European Union, the number of identified convergence clubs at each NUTS level is lower than before joining the European Union. Therefore, our results suggest growing per capital income cohesion within Central Europe and effectiveness of the EU cohesion policy.

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The role of economic trends, institutional changes and macroeconomic policies in agglomeration and disparities: A multi-scale analysis

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G02-1 Regional Growth Models, Competitiveness, and Convergence in a Polycrisis Context, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 26, 2026, 11:00 - 13:00

The issue of the spatial concentration of economic activities has predominantly been addressed in recent literature through two principal lenses. The first concerns the efficiency or inefficiency of concentrated locations, particularly large cities, in generating income and growth.
The second focuses on the evolution of disparities between places, which in recent years have been characterised predominantly by divergence, due to agglomerations and large cities expanding and attracting activities to the detriment of weaker regions and towns.
The consequences of these processes have also been studied, and have been identified in growing discontent, especially in places that don't matter and regions in development traps, with disparities increasing their relevance as a political issue, for example, in the European Union.

The processes of agglomeration, however, need to be studied at different scales simultaneously in order to be properly understood, since distinct processes can characterise the concentration of economic activities at the regional scale within countries and at the urban scale within regions. Furthermore, the processes of concentration and dispersion, as well as the increase and decrease of disparities, cannot be assumed to be uniform; rather, they are clearly affected by technological trends, institutional changes, and policy developments.

In this conceptual context, the present paper investigates the determinants of economic disparities in the long run, considering both the regional and sub-regional scales. To this end, a panel database is constructed for all EU countries, comprising data on disparities at the NUTS2 level and at the NUTS3 level within NUTS2 of each country, taking advantage of Theil decompositions.
Subsequently, the evolution of disparities inside countries, at both regional and urban scales, is examined through econometric analysis to determine the extent to which it is influenced by exogenous trends, institutional changes, and national policies, both with direct spatial objectives and of pure macroeconomic nature.

The findings of this paper will provide policy guidance to the extent that they demonstrate that disparities do not solely depend on regional aspects, but are also influenced by macroeconomic determinants and policies. Furthermore, understanding which macroeconomic policies favour rich regions or cities will assist in identifying when such macro interventions should be accompanied by measures to counterbalance their centripetal effects at the relevant (regional or urban) scale.

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The spatial race between labour and capital: a route to Turing instability

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G02-2 Regional Growth Models, Competitiveness, and Convergence in a Polycrisis Context, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 26, 2026, 17:00 - 19:00

A central question in spatial and growth economics is whether the mobility of production factors across locations constitutes a force for convergence or divergence. The neoclassical tradition predicts equalisation of factor returns and income convergence through spatial reallocation, while the new economic geography literature shows that local increasing returns and agglomeration externalities can sustain persistent spatial inequality (Fujita, Krugman, and Venables, 1999; Krugman, 1996). Most existing contributions, however, analyse the spatial dynamics of only one factor at a time — typically labour — leaving the joint behaviour of labour and capital largely unexplored (Desmet and Rossi-Hansberg, 2014).

This paper develops a continuous-space, continuous-time model in which both physical capital and labour are mobile across a set of locations arranged on a circle. Workers relocate following utility gradients — net of location-specific housing and congestion costs — while firms reallocate capital in response to spatial differentials in profit rates. Both types of agents are myopic and face convex mobility costs, giving rise to a gradient-flow structure. Local capital accumulation follows a Solow-type saving rule, and local total factor productivity depends on the density of workers, capturing agglomeration externalities consistent with the evidence in Ciccone and Hall (1996). An idiosyncratic component in workers' location preferences provides a micro-founded diffusion term in the labour dynamics (Fiaschi and Ricci, 2025).

The paper's central result is that the joint interaction of these two mobile factors can generate Turing instability: a spatially uniform equilibrium that is initially stable becomes unstable as capital accumulates, triggering the spontaneous emergence of persistent spatial clusters — dense agglomerations of labour and capital separated by depopulated areas. While Turing-type mechanisms have been studied in economic-ecological systems (Brock and Xepapadeas, 2010) and in economic-demographic models (Zincenko et al., 2021), the present paper identifies a novel route driven not by differential diffusion rates, as in the original biological formulation (Murray, 2007), but by the interplay between capital accumulation — which progressively raises the instability threshold — and agglomeration forces embedded in the production technology. Formally, a threshold $L^*(K)$, increasing in the local capital stock, separates stable from unstable uniform configurations.

Numerical simulations confirm the theoretical predictions and illustrate the two-phase dynamics: an initial convergence toward uniformity followed by a sharp divergence into Turing spots. The findings suggest that policies aimed solely at promoting labour mobility may be insufficient to counteract spatial divergence if capital accumulation continuously shifts the economy into the unstable regime.

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Models of Sustainable Local Development: an Interdisciplinary Systematic Review

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G02-2 Regional Growth Models, Competitiveness, and Convergence in a Polycrisis Context, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 26, 2026, 17:00 - 19:00

Current unsustainability, both environmental and social, at the global and national levels (Fanning and Raworth, 2025; Fanning et al., 2022) drives further exploration of the potential at the local level to address the sustainability challenge. The local development approach, by focusing on the distinctive characteristics of territories and their inhabitants, has the capacity to adapt and leverage these specificities, thereby fostering the radical changes that the challenge requires. Nevertheless, current economic models that encompass social and environmental concerns rarely integrate this level of analysis (Hardt and O'Neill, 2017; Lauer et al., 2025).
This research therefore aims to conduct a systematic literature review on the models of sustainable local development, in order to provide a comprehensive overview of the state of knowledge on the subject. Both theoretical reflections and empirical applications are considered. The focus is on models, both quantitative and qualitative, to complement the analysis of the components of sustainable local development, with the examination of the factors that underpin its attainment.
The review is designed to integrate economic contributions with those from other social sciences. In fact, the complexity and multifaceted nature of the sustainability challenge call for interdisciplinarity (Wu, 2014). Both bibliometric and content analyses are performed, with the latter focusing on the various conceptualisations of sustainable local development proposed, the methodologies employed and the factors considered, and the empirical evidence gathered.
This is the first review on sustainable local development that is centred on models and combines a systematic methodology with an interdisciplinary approach. Ultimately, this review aims to offer a useful contribution to foster the role of the local scale in more sustainable development models.

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Regional Planning in Bulgaria: Emerging Development Challenges

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G02-2 Regional Growth Models, Competitiveness, and Convergence in a Polycrisis Context, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 26, 2026, 17:00 - 19:00

Regional planning within the European Union stands at the threshold of a new programming period (2028–2034), marking the continuation of the established cycle of defining strategic priorities at European level and their subsequent translation into national frameworks. These frameworks help guide how we allocate financial resources and design policies at regional and local levels over the next seven years.

Against this background, the paper identifies and analyses several key challenges confronting regional planning in Bulgaria. First, the country enters the new programming period with a revised territorial structure of planning regions (NUTS 2), raising questions regarding institutional capacity, administrative coordination, and statistical comparability. Second, the forthcoming National Concept for Regional and Spatial Development with a horizon to 2040 is expected to be adopted in a context of prolonged political instability, following a sequence of eight parliamentary elections within a six-year period. This political volatility constitutes a significant contextual factor influencing the coherence, continuity, and strategic orientation of regional policy and planning.

The analysis further highlights political and institutional determinants that directly affect the effectiveness of regional governance, including decision-making fragmentation, shifting policy priorities, and administrative discontinuities. Drawing on accumulated experience from the implementation of regional planning instruments at national, regional, and local levels, the paper formulates conclusions regarding structural weaknesses and adaptive capacities within the Bulgarian planning system. On this basis, it outlines prospective directions and critical considerations for the 2028–2034 programming period, emphasizing the need for enhanced strategic consistency, institutional stability, and multi-level coordination. Several conclusions have been drawn.

First of all, there is still no public (societal) understanding of what regional policy is. Society rarely directs electoral energy beyond local and national interest. Bulgaria does not have an administrative tradition at the regional level and this significantly complicates the work of local authorities which have to collaborate at the regional level. Local authorities are elected in municipalities, and the governors are appointable on NUTS 3 level. There is no administrative power in the regions (NUTS 2), but only interaction and partnership, which must be supported by a national intersectoral policy. In practice, however, sectoral policies are not implemented with a territorial approach. The future of the regional approach in the development of Bulgaria depends on a qualitative change in the paradigm of planning, first of all on political and policy level.

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From urban agglomeration to regional productivity: Human capital externalities across European regions

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G02-2 Regional Growth Models, Competitiveness, and Convergence in a Polycrisis Context, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 26, 2026, 17:00 - 19:00

The widening of regional disparities in income per capita and productivity has become a central concern in the European Union's policy agenda. While economic activity and prosperity are increasingly concentrated in a limited number of highly developed territories, many regions face persistent difficulties in sustaining long-term growth. This paper examines the role of urban agglomeration economies, and their interaction with human capital, as a key mechanism underlying the persistence and amplification of regional productivity gaps. Moving beyond a purely city-level perspective, we analyze how the productivity advantages associated with agglomeration extend across broader regional systems.

The European Union provides a particularly suitable context for this analysis, given its strong commitment to economic, social, and territorial cohesion under a shared institutional framework, alongside substantial regional heterogeneity in productive structures, demographic dynamics, and growth trajectories. Building on the neoclassical growth model extended by Mankiw, Romer, and Weil, and assuming exogenous technological progress, regional economies are expected to converge toward heterogeneous steady states determined by factor accumulation and saving behavior. To allow for nonlinearities and spatial heterogeneity in this process, we employ a non-parametric estimation strategy based on Locally Linear Least Squares to estimate a conditional convergence equation for a panel of NUTS-2 European regions using data from ARDECO and EUROSTAT.

Our analysis focuses on the contribution of regional human capital to labor productivity growth, proxied by the share of employment in ICT-intensive sectors with tertiary education. The results reveal a positive and statistically significant effect of human capital, but with substantial heterogeneity across regions. We show that these heterogeneous returns are systematically related to differences in agglomeration structures. In particular, regions characterized by stronger agglomeration exhibit markedly higher elasticities of productivity growth with respect to human capital.

To capture this mechanism, we construct multidimensional agglomeration indices that incorporate not only population and employment density, but also specialization patterns and the spatial concentration of innovative activities. These indices allow us to distinguish between regions dominated by idiosyncratic agglomeration—typically large European capitals—and those benefiting from spatial agglomeration through proximity to major urban centers. Our findings indicate that the impact of human capital on productivity growth in highly agglomerated regions is approximately twice as large as in less agglomerated ones. Overall, the results suggest that agglomeration economies amplify the returns to human capital, thereby reinforcing regional productivity disparities, with important implications for cohesion-oriented regional policy.

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Before The Crisis: Lessons from Iraq's Pre-ISIS Economy

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G02-3 Regional Growth Models, Competitiveness, and Convergence in a Polycrisis Context, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 27, 2026, 17:30 - 19:30

This paper draws on the construction and application of Iraq's 2013 Multiregional Social Accounting Matrix (MRSAM) to examine the structural features of the country's pre-ISIS, oil-driven economy and to derive lessons that remain relevant today. Benchmarking the economy at a moment when oil production and fiscal revenues were high but vulnerabilities had not yet been fully exposed, the MRSAM provides a comprehensive framework for tracing interregional linkages, household income distribution, and the diffusion of oil-export shocks across governorates. The analysis highlights three central findings. First, while Iraq's economy was overwhelmingly dependent on oil, accounting for nearly half of GDP, over 90% of exports, and almost all fiscal revenues in 2013, the transmission of oil shocks extended beyond Basra through household consumption linkages rather than production chains alone. Second, Baghdad functioned as the dominant economic hub, mediating flows between oil revenues, public spending, and regional demand. This centrality strengthened national integration but reinforced spatial polarization, as most governorates relied heavily on spillovers from the capital and exhibited weak local absorptive capacity. Third, the distributional effects of oil revenues were strongly regressive: capital owners, public enterprises, and high-income households captured the largest gains, while labor and lower-income households benefited only marginally. Taken together, the findings reveal a structural paradox. Iraq's oil wealth generated sizable multiplier effects, yet the benefits were unevenly distributed across space and social groups. The 2013 MRSAM thus serves not only as a historical benchmark but also as a diagnostic tool for contemporary policy. It reveals further the need to strengthen local productive capacity, diversify beyond hydrocarbons, adopt explicit redistributive mechanisms, and manage Baghdad's central role more strategically. Ultimately, converting oil rents into inclusive and resilient development requires not only technical reforms, but also political commitment to address entrenched inequalities and spatial imbalances.

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Unpacking Endogeneity: Growth, Discontent and Cohesion Policy in the EU Regions

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G02-3 Regional Growth Models, Competitiveness, and Convergence in a Polycrisis Context, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 27, 2026, 17:30 - 19:30

Over the past two decades, the European Union (EU) has confronted a set of intertwined challenges that sit at the heart of debates on regional growth, competitiveness and convergence: persistently weak aggregate growth relative to global competitors, widening territorial disparities, and rising political discontent that can undermine the legitimacy of integration and the stability of growth regimes. For large segments of the population, the EU no longer embodies an unequivocal promise of opportunity and upward convergence. Instead, the prevailing economic framework appears increasingly unable to deliver adequate growth and employment in the places that need it most, while successive shocks and structural transitions have heightened uncertainty and exposed long-standing vulnerabilities across regions.

This paper explores the complex interplay between regional economic growth, political discontent, and policy responsiveness within EU regions, focusing on increasing inequalities in the context of the EU's ongoing processes of deepening and widening integration. Drawing on panel data for the EU28 at the regional level (NUTS2) from 2010 to 2018, these interconnected dimensions are treated as endogenous within a Three-Stage Least Squares estimation framework, aiming to uncover both direct and indirect effects.

Our findings reveal the existence of feedback loops that link regional economic trajectories, rising public discontent, and the responsiveness (or lack thereof) of EU Cohesion Policy and underscore the necessity of a holistic and systemic approach to policy design.

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Social Trust in European Regionas: Dynamics & Determinants

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G02-3 Regional Growth Models, Competitiveness, and Convergence in a Polycrisis Context, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 27, 2026, 17:30 - 19:30

Social trust is increasingly seen as an important determinant of economic growth and social prosperity in regions and nations. Even in a comparatively homogeneous area such as Europe, there are stark sub-national differences in levels of generalized trust. It is thus of crucial importance to identify the driving forces of regional trust and analyze the dynamics of its formation. The present paper considers these issues based on four waves of the European Values Study collected in an almost 30 years timeframe from 1990 until 2017. Evidence is provided to demonstrate that values of regional trust remain substantially stable over the entire period and are modified only through spatially correlated random noise processes. This finding is consistent with additional analyses based on spatial regression models identifying slow-moving factors responsible for the geographic distribution of trust scores and buried deep in the cultural background of a society. Whereas the low values in post-communist countries are exhaustively explained based on their institutional and cultural setup, the high Nordic scores remain significant even after inclusion of control variables. The dominant driving force of regional trust is represented by an open society with emphasis on free expression rather than survival values rooted in a focus on economic physical security. Whereas both institutional and educational frameworks are only of minor importance, a high degree of social heterogeneity is clearly detrimental for trust after controlling for GDP per capita. Hence, in spite of its economic significance, social trust does not appear to be amenable to political intervention in the short to medium term but neither should it be responsive to sudden crisis effects.

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Decoding Regional Resilience: Vulnerability and Exposure of European Regions to the Impacts of War in Ukraine

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G02-3 Regional Growth Models, Competitiveness, and Convergence in a Polycrisis Context, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 27, 2026, 17:30 - 19:30

Recent crises including COVID-19 pandemic and wars in Ukraine and the Middle East have highlighted the importance of regional resilience in policy discussions. Current debates about regional economic resilience emphasize its multidimensional and dynamic nature—not only how regions absorb shocks, but also how they adapt and reshape their developmental paths. In the RECORU project, “Regional policy in Europe under development shocks – challenges for regional development arising from the socio-economic consequences of Russia’s aggression against Ukraine,” we analyze how European regions experience and transform in response to the war on the Eastern borders of the EU. Our presentation focuses on a quantitative study of these impacts seen through the lens of a purpose-designed but broadly applicable vulnerability–exposure–consequences (VEC) framework. In this model, vulnerability refers to a region’s general susceptibility to crises, which we break down into economic, social, institutional, and environmental-infrastructural dimensions. Exposure concerns event-specific factors that affect the region’s response to a particular shock, while consequences encompass the diverse and multifaceted outcomes that can be interpreted both as short-term effects and indications of long-term transformations. By classifying regions along a vulnerability–exposure spectrum, we demonstrate how specific configurations influence the severity of different crisis impacts. Ultimately, our findings show that the complexity of these issues makes simple measurement inadequate, and that measuring quantifiable impacts should be the starting point for case-specific analysis of regional adaptation and transformation paths during a crisis.

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Impacts of Technological Progress, Climate Adaptation, Energy Consumption and Institutional Quality on Environmental Sustainability in Nigeria

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G03-1 Innovation, Entrepreneurship and Entrepreneurial Ecosystems for Green and Digital Transitions, Conference hall 2 - North Building, agosto 26, 2026, 09:00 - 10:30

Achieving environmental sustainability remains a major challenge for Nigeria amid rising energy demand, weak institutional effectiveness, and limited progress in climate-related technologies. Motivated by Nigeria's continued dependence on fossil fuels and its low adaptive capacity to climate change, this study investigates how technological progress, climate adaptation, energy consumption, and institutional quality jointly influence environmental sustainability, measured by ecological footprint. Using annual time-series data from 1996 to 2022 and applying the autoregressive distributed lag (ARDL) approach, the study estimates both short- and long-run relationships among the variables. The results reveal that trade in low-carbon technology products, renewable energy consumption, and climate adaptation significantly reduce Nigeria's ecological footprint, thereby enhancing environmental sustainability. In contrast, fossil fuel consumption, economic growth, institutional quality, and medium- and high-tech exports increase ecological footprint, indicating heightened environmental pressure. These findings suggest that current growth and institutional frameworks in Nigeria are not sufficiently aligned with environmental protection goals. The study highlights the need for policies that accelerate the transition from fossil fuels to renewable energy, strengthen climate adaptation capacity, and promote environmentally efficient technological progress. Strengthening institutional accountability and aligning industrial and trade policies with low-carbon objectives are critical for reducing environmental degradation and advancing sustainable development in Nigeria.

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Territorial governance and business model dynamics of innovation intermediaries - Evolution of pôles and filières in Normandy, France

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G03-1 Innovation, Entrepreneurship and Entrepreneurial Ecosystems for Green and Digital Transitions, Conference hall 2 - North Building, agosto 26, 2026, 09:00 - 10:30

This study explores how territorial governance antecedents affect the business model dynamics of innovation intermediaries as brokers, facilitators, mediators, orchestrators, and innovators in the regional innovation ecosystem. Specifically, we explore how territorial governance antecedents - captured here through (1) geographical location and (2) organizational logic grounded in similarity and belonging - shape changes in innovation intermediaries' (1) value proposition, (2) value architecture, and (3) value capture, as intermediaries that enact brokerage, facilitation, mediation, orchestration, and innovation roles. For this purpose, we conduct a qualitative analysis of the determinants of the shifting business model change in two types of public innovation intermediaries (PIIs) in Normandy (France): nationally funded pôles de compétitivés (pôles) and regionally supported filières d'excellence (filières). Based on interviews, we aggregated four themes to bridge these subjects, including (1) Determination of geographical location; (2) Offset effect of organizational logic; (3) Presence and connection of influential stakeholders; (4) Diversification of financial sourcing. These themes show that proximities matter, but they matter through governance coalitions and role enactment: intermediaries adjust "what they offer," "how they deliver," and "how they sustain it financially" as territorial conditions and coalition composition evolve. We find that geographical proximity among members substantially affects the value proposition of innovation intermediaries. However, organizational logic based on similarity and belonging prevails as a more decisive factor in orchestrating large-scale cross-border collaboration networks. The social connection between innovation intermediaries and locally presented influential stakeholders plays a distinct role in value proposition and value architecture. At the same time, diversifying financial souring with alternative funders buffers the risk of reduced public financing and re-location of influential stakeholders in value capture of leading innovation projects.

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Twin Transition Inequalities: A Cross-Country Comparative Assessment of Türkiye's Position

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G03-1 Innovation, Entrepreneurship and Entrepreneurial Ecosystems for Green and Digital Transitions, Conference hall 2 - North Building, agosto 26, 2026, 09:00 - 10:30

The twin transition, referring to the simultaneous green and digital transformation, has become a central policy priority shaping contemporary urban and regional development pathways. While these transitions are widely promoted as drivers of sustainability, innovation, and competitiveness, they also risk generating new forms of socio-economic and spatial inequality across and within countries. Addressing these tensions is crucial in a transition era characterized by global uncertainty and uneven regional development.

This study investigates the relationship between twin transition dynamics and inequalities through a cross-country comparative framework, with particular attention to Türkiye's relative position. The research is guided by three core questions: (i) To what extent do green and digital transitions influence cross-country inequalities? (ii) How do pre-existing structural inequalities shape national performance in the twin transition? and (iii) How does Türkiye perform compared to other countries in terms of twin transition-related inequality patterns?

To address these questions, the study develops an original composite Twin Transition Inequality Index, integrating indicators that capture both digital and green transition outcomes and the distributional inequalities embedded within these processes. The index is constructed using internationally comparable indicators drawn from OECD, World Bank, EU, UN, and related datasets, and is analyzed through quantitative methods supported by SPSS.

Methodologically, the research adopts a dual-direction analytical framework. It examines both the impact of twin transition dynamics on inequality and the constraining effects of inequality on countries' twin transition capacities. This approach contributes to regional science debates by linking global transformation processes with persistent territorial disparities.

By situating Türkiye within a comparative international perspective, the study highlights the uneven geographies of twin transitions and identifies critical structural challenges shaping national and regional development trajectories. The findings provide policy-relevant insights for designing more inclusive, balanced, and territorially sensitive green and digital transition strategies. In doing so, the paper contributes to discussions on how countries respond to global twin transition processes.

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Patterns of Innovation across EU

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G03-2 Innovation, Entrepreneurship and Entrepreneurial Ecosystems for Green and Digital Transitions, Conference hall 2 - North Building, agosto 26, 2026, 11:00 - 13:00

The EU is investing millions of euros into improving competitiveness. One of the EU's key priorities for boosting competitiveness is strengthening its innovation. This has translated to a large number of ongoing programs that aim to connect different regions in an attempt to trigger inter-regional collaboration and the EU's overall innovation performance.
Balland & Boschma (2021) have developed a framework to support the partnership between regions. Their framework is based on relatedness and complexity. Theoretically, it introduces the idea that both relatedness and unrelatedness between the technologies in breakthrough inventions and the regional portfolio of technologies can positively influence the appearance of these breakthroughs, but especially relatedness. This framework arrives at the best possible partners (for example technology complementarities).
This framework has shown a "wicked problem for innovation policy", as noted by Pinheiro et al. 2025, that the strategy needed to improve the innovativeness of the European knowledge system might disproportionately benefit regions that are already developed and foster disparities. (Pinheiro et al., 2025)
This brings us to the question of the patterns of innovation in the EU.
Firstly, how are the potential collaborations (as found by Balland & Boschma) perpetuating patterns of divergence across regions? What pattern of innovation is created by the potential collaborations (Balland & Boschma, 2021) framework? By using different indicators like GDP and/or institutional readiness we can better assess if the potential collaborations are creating a specific pattern of innovation across EU regions. Secondly, to what extent is the Balland & Boschma framework overlapping with reality? By checking the existing programs across regions (ex. Interreg and Horizon) we assess what is happening in reality.
Answering these two questions will allow for an understanding of not only the EU collaboration patterns, but also where the EU stands in relation to the EU cohesion policy goals.

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The Hidden Innovators: Uncovering Innovation Capabilities and Industrial Dynamics in European Rural Areas

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G03-2 Innovation, Entrepreneurship and Entrepreneurial Ecosystems for Green and Digital Transitions, Conference hall 2 - North Building, agosto 26, 2026, 11:00 - 13:00

Regional disparities, and particularly the innovation gap between urban and rural regions, remain a central challenge for competitiveness and cohesion in Europe. Policy frameworks such as Smart Specialisation Strategies often rely on conventional indicators—such as patents and R&D expenditure—that primarily capture urban innovation and risk underestimating forms of innovation typical of rural economies (Balland et al., 2020; Eder, 2019). This may lead to a partial view of innovation capabilities outside metropolitan areas.
This paper addresses this gap by analysing the skill portfolios and capabilities that characterise European regions and how they co-evolve with firm dynamics to shape regional development. Building on the idea that regional innovation emerges from coevolutionary dynamics between skills, entrepreneurship and local conditions (Pugliese et al., 2019; Coad et al., 2021), we focus on innovation potential rather than traditional outputs. We identify "hidden innovators" by examining the structure of regional skill demand, entrepreneurial activity and firm dynamics over time.
Empirically, we construct a granular panel dataset for European regions at NUTS3 level by combining multiple data sources. We use millions of Online Job Vacancies (OJV) to measure firms' skill demand and apply name-entity recognition to match vacancies to firms in Orbis and Dealroom, linking skills to firm dynamics. Regional characteristics are integrated from Eurostat, ARDECO and the JRC Rural Observatory.
To characterise innovation capabilities, we develop skill-based indicators inspired by the economic complexity literature (Neffke and Henning, 2013; Tacchella et al., 2012; Hidalgo and Hausmann, 2009; Aufiero et al., 2024). Using OJV data, we compute measures of skill diversity, coherence and sophistication. We also identify occupations and skills associated with innovative activity through three complementary approaches: (i) linking occupational structures to patent intensity (Dotzel and Wojan, 2022); (ii) analysing skill co-occurrence within innovative firms; and (iii) applying transformer-based NLP models to detect emerging digital technologies in job-ad texts. We then assess how these capability measures relate to firm entry, survival and broader industrial dynamics.
Preliminary results highlight strong spatial heterogeneity and the importance of geographic proximity, with neighbouring regions displaying more similar skill structures. Coherent skill portfolios are positively associated with startup creation in rural and intermediate regions, whereas fragmented skill structures correlate negatively with entrepreneurship across territorial types.
Overall, the paper proposes a new geography of innovation potential in Europe, revealing rural regions with latent capabilities that remain invisible in traditional metrics and offering an empirical basis for place-based innovation policies.

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Multinationals, Capabilities and Regional Structural Change: The Role of Inward FDI in Technological Specialisation

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G03-2 Innovation, Entrepreneurship and Entrepreneurial Ecosystems for Green and Digital Transitions, Conference hall 2 - North Building, agosto 26, 2026, 11:00 - 13:00

Developing countries and lagging-behind regions often face persistent shortages of technological capabilities and skills. In this context, local actors increasingly rely on external sources of knowledge to foster innovation and structural change. Foreign Direct Investment (FDI) by multinational companies (MNCs) is widely recognised as a key channel through which advanced knowledge can be transferred to host economies, potentially generating learning processes and technological spillovers at the regional level. While previous studies have shown that inward FDI can stimulate innovation in both developed and developing countries, less is known about its role in shaping regional patterns of technological diversification and specialisation over time.

This paper examines whether and how inward FDI contributes to technological diversification and the emergence of new regional specialisations in an emerging economy context. Building on the literature on regional capabilities, relatedness, and knowledge recombination, we argue that external knowledge brought by MNCs can foster new technological combinations when integrated with existing regional capabilities, thereby supporting processes of industrial and technological upgrading.

Empirically, we combine data on greenfield investments by multinational companies from the fDi Markets database with regional patent data from the Brazilian National Institute of Industrial Property (INPI). Our analysis covers 133 Brazilian intermediate regions (comparable to EU NUTS-2) and spans the period 2003–2020. We geolocate inventors' addresses to construct fractional patent counts and to measure regional technological specialisation and diversification dynamics.

Preliminary results suggest that inward FDI plays a significant role in shaping regional technological trajectories, being positively associated with the emergence of new technological specialisations and diversification patterns. These findings contribute to the literature on FDI, regional innovation systems, and place-based development by highlighting the role of multinational investment as a catalyst for capability building and structural transformation in lagging-behind regions. From a policy perspective, the results underscore the importance of aligning investment attraction strategies with regional innovation and industrial policies to maximise long-term developmental impacts.

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Entrepreneurial ecosystems in riverine economies under seasonal disruption: A multi-sited study of Marajó Island (Pará, Brazil)

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G03-2 Innovation, Entrepreneurship and Entrepreneurial Ecosystems for Green and Digital Transitions, Conference hall 2 - North Building, agosto 26, 2026, 11:00 - 13:00

Entrepreneurial ecosystems research remains disproportionately informed by well-connected regions and tends to under-specify how ecosystem functioning changes when mobility, basic services, and liquidity infrastructures are seasonally disrupted. This limitation is consequential for riverine and island economies, where market access is mediated by transport interfaces, hydrological variability, and institutional arrangements that shape transaction costs and opportunities for local value capture. This paper develops a mechanism-based, municipality-comparative research design to explain how entrepreneurial ecosystems operate under seasonal disruption on Marajó Archipelago at the estuary of the Amazon River.

The study focuses on three municipalities with contrasting accessibility and intermediary density: Soure, Breves, and Afuá. It conceptualises ecosystem functioning as an observable configuration of actors, intermediaries, institutions, market channels, and enabling infrastructures, and evaluates performance through four outcomes: enterprise entry, upgrading attempts, local value retention versus leakage, and resilience to seasonal discontinuities. The explanatory core links ecosystem structure to three mechanisms that are expected to be decisive under riverine constraints: transaction frictions (time and cost burdens in accessing inputs and buyers), liquidity and cashflow constraints (payment delays, savings and credit limits), and coordination capacity (information sharing, collective action, and routine dispute resolution).

Empirically, the project implements a mixed-methods, multi-sited comparative design combining qualitative ecosystem reconstruction with contextual secondary indicators. Approximately 45–60 semi-structured interviews are planned with entrepreneurs and producer households, transport and trading intermediaries, cooperatives and associations, and relevant municipal actors. Interviews reconstruct transactions step by step from production and collection to transport, sale, and payment to identify bottlenecks, delays, and brokerage roles. Focused structured observation in local markets and at key transport interfaces complements interview evidence on coordination practices and constraints. Municipality-level indicators drawn from IBGE contextualise mobility, service reliability, connectivity, and sectoral structure to support transparent cross-site comparison.

The expected contribution is twofold. First, the study advances entrepreneurial ecosystem theory by translating infrastructural scarcity and seasonal disruption into measurable mechanisms and outcome pathways in a peripheral, climate-exposed riverine setting. Second, it offers policy-relevant implications on how intermediary and liquidity infrastructures, including community-based arrangements and public procurement interfaces, can strengthen inclusive upgrading and local value retention while reducing frictions that reproduce exclusion.

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Regional Innovation Systems and societal outcomes: a configurational assessment

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G03-2 Innovation, Entrepreneurship and Entrepreneurial Ecosystems for Green and Digital Transitions, Conference hall 2 - North Building, agosto 26, 2026, 11:00 - 13:00

Regional Innovation Systems (RIS) have become the dominant framework through which regional development and competitiveness are understood in Europe. Built around the coordination of knowledge actors and the mobilization of innovation inputs, the framework has proven influential in explaining regional differences in innovation inputs, outputs, processes, and knowledge production. Yet a growing body of scholarship questions whether innovation systems, as currently theorized, are equipped to address contemporary grand societal challenges, including environmental sustainability, social cohesion, and inequality. Whether the traditional RIS framework can account for these broader development outcomes remains an open empirical question.

This study revisits RIS by systematically examining its explanatory power across multiple outcome domains. Using Fuzzy-set Qualitative Comparative Analysis (FsQCA) on a comprehensive sample of European regions, we first test the conventional RIS framework against both innovation and non-innovation outcomes capturing social and environmental performance. This enables us to assess whether the mechanisms historically associated with innovation performance extend beyond economic competitiveness. Responding to recent calls to reorient innovation systems towards societal problem-solving, we then introduce an augmented configurational framework that incorporates additional systemic dimensions reflecting wider territorial capacities and dynamics. We compare the empirical relevance and configurational logic of the conventional and expanded models across both outcome types, identifying where innovation-centered mechanisms remain sufficient and where complementary conditions become necessary.

By empirically exploring the boundaries of the RIS framework, the study contributes to the ongoing discourse on its future direction. Rather than assuming that innovation systems must be replaced or fundamentally transformed, we examine whether their analytical core travels to new domains of regional performance. The findings offer a more nuanced understanding of how regional systems may function not only as engines of innovation but also as potential vehicles for addressing broader societal challenges, with important implications for the direction of place-based policy in Europe.

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Exploring the use of Artificial Intelligence by SMEs in EU countries. A comparative analysis

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G03-3 Innovation, Entrepreneurship and Entrepreneurial Ecosystems for Green and Digital Transitions, Conference hall 2 - North Building, agosto 27, 2026, 09:00 - 10:30

In the era of digitalisation, the accelerated development of Artificial Intelligence (AI) is profoundly changing the way businesses operate, regardless of their size. While AI adoption offers substantial opportunities for improving operational efficiency, innovation capacity, and market competitiveness, small and medium-sized enterprises (SMEs) face considerably greater structural and resource-related constraints compared to large firms. This study aims to examine the extent to which small and medium-sized enterprises in EU member states use AI-based tools. More specifically, it provides a comparative analysis of the degree of use of AI by businesses, depending on their size and sector of activity, highlighting structural disparities both within and between countries. Based on information obtained from the Eurostat database, the paper uses a research methodology that combines analysis based on key indicators on the use of AI with cluster analysis to highlight progress in the use of AI, discrepancies in the use of AI by categories of enterprises, and to identify both similarities and differences between EU member states. In addition, through our analysis, we comparatively identify how EU countries position themselves from the perspective of the use of AI by SMEs. The findings reveal significant cross-country heterogeneity in AI uptake, alongside persistent gaps between SMEs and large enterprises within the same national contexts. The results demonstrate that AI diffusion in the EU remains uneven, reflecting differences in digital maturity, sectoral structure, and national innovation ecosystems. By systematically mapping these disparities, the study contributes to the literature on digital transformation by offering an updated, comparative, and data-driven perspective on SME AI adoption at the EU level. Given the central role of SMEs in the EU economy, the paper argues that targeted policy interventions at European, national, and regional levels are essential to reduce structural barriers and accelerate AI diffusion. Strengthening SME access to AI capabilities is critical not only for firm-level performance but also for enhancing overall EU competitiveness in the global digital economy.

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Rural Resilience and Economic Sustainability: A Comparative Analysis of Best Practices in Romania and Bulgaria

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G03-3 Innovation, Entrepreneurship and Entrepreneurial Ecosystems for Green and Digital Transitions, Conference hall 2 - North Building, agosto 27, 2026, 09:00 - 10:30

Context and Motivation:
Rural areas in Romania and Bulgaria are at a critical juncture, caught between the pressure of depopulation and the need to adapt to Green Deal standards. While agriculture remains the economic backbone, long-term sustainability requires diversification towards high value-added activities. This paper investigates the mechanisms that allow rural communities to remain economically viable without compromising natural resources, such as by transforming biomass and local resources into value-added chains.
Objective of the Study:
The research aims to identify and compare good practices of economic sustainability in rural communities in both countries.
This paper analyses economic sustainability strategies in rural areas of Romania and Bulgaria, assessing the impact of roadmaps developed within the framework of European initiatives. We aim to identify how the sustainable valorisation of specific resources (e.g. agricultural residues in the Vidin region-BG or biomass in the Centru Region-RO) contributes to local resilience.
Methodology:
The research uses an approach based on “Open Innovation Platforms” (OIP), a concept developed in the methodology of the BE-Rural project. We analyze good practices through:
- SWOT analysis of the bioeconomy potential in the selected regions.
- Assessment of local policy co-creation, involving actors from the quadruple helix (administration, academia, business, civil society).
- Benchmarking between bio-based business models implemented in both countries (e.g. pellet production, medicinal plant processing, etc.).
Expected Results:
We appreciate that the results indicate that rural economic sustainability in RO and BG does not depend only on subsidies, but on the creation of local innovation ecosystems. The paper tries to demonstrate that “bottom-up” strategies, which emphasize bioeconomy education and local processing, reduce dependence on external markets and increase the attractiveness of rural areas for young entrepreneurship. The paper provides a set of policy recommendations for regional authorities in order to replicate successful models in other similar areas of the EU.
Conclusions:
- In the studied regions of Bulgaria and Romania there is an untapped potential of biomass (agricultural and forestry residues).
- It is found that the "Triple Helix" Model is insufficient, and it is necessary to switch to the "Quadruple Helix", which involves the involvement of local actors in producing systemic change.
- In order to overcome the "Knowledge Gap" barrier, it is proven that investment in human capital (workshops, transfer of good practices) is more urgent than investment in the technological infrastructure itself.

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Boosting, sorting and urban scaling of university cities in Europe

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G03-3 Innovation, Entrepreneurship and Entrepreneurial Ecosystems for Green and Digital Transitions, Conference hall 2 - North Building, agosto 27, 2026, 09:00 - 10:30

A well-established empirical regularity in urban science is that innovation outputs such as patents scale superlinearly with city size. While this relationship is typically summarized by a single scaling exponent, its structural interpretation remains unclear. This paper examines whether urban scaling operates directly through population size or indirectly through mediating mechanisms.
Using data on 606 European Functional Urban Areas in 2020, we test whether inventor sorting and collaboration-network structure mediate the population–innovation relationship. Innovation is measured using fractional patent counts from the European Patent Office, and collaboration structure is captured by the External–Internal (E–I) index derived from co-inventor networks. We estimate a structural equation model to decompose total scaling effects into sorting and network components.
Results show strong mediation through the number of inventors, consistent with a sorting mechanism. Larger cities also exhibit more internally oriented collaboration structures. Once inventor concentration and collaboration orientation are accounted for, population size no longer has a statistically significant direct effect on patenting. These findings suggest that urban scaling of innovation reflects the joint effect of inventor accumulation and collaboration structure rather than a direct impact of population size.

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Foreign Direct Investments, Natural Resources and the Green Transition: Where do African Regions stand?

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G04-1 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

With a highly skewed distribution of population and resources, 54 countries, and truly diverse geographies, histories, and socio-economic, political and environmental challenges, the African continent displays huge disparities at the subnational/regional level (e.g., Boone & Simson, 2019; Iddawela et al., 2021). The regional/local dimension is crucial for understanding socio-economic, demographic and environmental development trajectories, particularly with reference to the rich endowments of natural resources of African regions, the potential opportunities provided by the green transition, and the implications of the geography of the continent for policies and strategies related to the Sustainable Development Goals (e.g., Smith & Rey, 2018; OECD, 2025). Yet, the lack of systematic and reliable data at the subnational level makes it difficult to study the relationships between different sources of structural change both in absolute and comparative terms (Nel, 2018; Boone & Simson, 2019; Luken et al., 2020).
Over the last two decades African economies have become increasingly attractive destinations for foreign investors seeking old and new resources and emerging markets. Particularly natural resource sectors (together with industries with high returns to investments, i.e., real estate and telecommunications) have experienced a surge in inward FDI flows (e.g., Qiang et al., 2021; UNCTAD, 2023; World Bank, 2024). This paper explores the geography of FDI in African subnational regions/cities by using data from fDiMarkets, the Financial Times database tracking global greenfield investments from 2003 to 2023. The study analyses inward and outward FDI in/from Africa (including intra-continent) at the subnational level to better grasp the emerging trends in the geography of FDI across the “Africa of regions”, with a special focus on Natural Resources – i.e. Coal, oil & natural gas, Metals & minerals – and Alternative/Renewable energy. To add a preliminary description of interregional linkages, network analysis techniques from the world city network literature (e.g., Alderson & Beckfield, 2004) are applied to identify the centrality, dominance, and connectivity patterns among African and world cities and regions.

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Anatomy of Chinese-owned firms. Evidence from Italy

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G04-1 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

This paper provides the first comprehensive regional and sectoral mapping of Chinese1controlled enterprises in Italy. Existing research on Chinese investment in Italy primar1ily focuses on individual M&A cases, specific manufacturing sectors, or ethnographic evidence from industrial areas such as Prato, lacking nationally representative micro
evidence to reveal the distribution of Chinese enterprises in Italy's economic geography and how they differ from the distribution of other foreign investors. We construct a
complete census of 17,369 Chinese controlled enterprises, comparing their location and sector profiles with all foreign invested enterprises operating in Italy. To quantify relative
specialization, we compute the Balassa index for sector and regional analysis, extending the analysis to a combined sector-regional dimension.
The findings reveal a highly asymmetric pattern in Chinese direct investment in Italy.
Chinese investors are concentrated in a few regions in central and northern Italy, partic1ularly Tuscany, Lombardy, and Veneto, while significantly fewer are found in the South
and surrounding areas. At the sectoral level, Chinese investors are highly concentrated in
labor intensive manufacturing and consumer oriented services, including textiles, cloth1ing, leather, wholesale and retail trade, and accommodation and catering services. In
contrast, their investments in construction, transportation, finance, advanced manufac1turing, and high-tech sectors are relatively smaller, areas where foreign investors are
typically more active.
In summary, these findings suggest that Chinese investment in Italy does not conform to
the average pattern of foreign investors, but rather occupies a unique market space influ1enced by industrial clusters, immigrant entrepreneur networks, and localized production
systems.

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Uncertainty Shocks, Firm Strategies, and the Regional Reconfiguration of Production Networks in Europe

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G04-1 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

In a context of rising uncertainty and geopolitical tensions, global production networks (GPNs) are undergoing profound spatial reconfigurations, driven by firms' adaptive strategies and heterogeneous territorial responses. While a growing body of micro-level evidence documents how firms respond to global uncertainty and geopolitical shocks, systematic evidence on country-specific uncertainty as a driver of GPN reconfiguration remains scarce. Existing contributions focus on specific local shocks in given countries, rather than providing general evidence on whether and how home uncertainty affects the geography of GPN reorganization. This paper contributes to filling this gap by examining how domestic uncertainty shocks reshape European GPNs by altering the spatial structure of corporate networks.

We address three research questions: How does domestic uncertainty affect the geography of GPNs in European regions? How and to what extent do these reconfigurations emerge across different spatial scales (intra-national vs. transnational) and in relation to different firm strategies and sectors? Which regional characteristics mediate the impact of uncertainty on the reconfiguration of GPNs? Empirically, we use firm-level information from the ORBIS database to identify Global Ultimate Owners (GUOs), distinguish between domestic and foreign multinational groups, and examine their networks of subsidiaries abroad. We build two complementary bipartite networks: an outward network linking European regions to the domestic and foreign locations where region-based firms own affiliates, and an inward network linking domestic and foreign GUOs to the European regions where their affiliates are located. From these structures, we derive weighted measures of inward and outward degree centrality capturing changes in the size and spatial reach of GPNs over time.

We combine these network measures with a macroeconomic uncertainty indicator to estimate the dynamic effects of country-specific uncertainty shocks, controlling for global uncertainty, using a local projections framework that distinguishes short-run adjustments from medium-run responses. We find that domestic shocks significantly reduce network size and the number of regions involved. This pattern reflects two complementary mechanisms: domestic multinationals respond to domestic uncertainty by contracting their international footprint and reconcentrating production at home, while foreign multinationals retrench by withdrawing affiliates from shock-hit regions, generating inward network contraction. Substantial heterogeneity across firms' strategies, sectors, and regional characteristics does exist. Overall, the paper provides new evidence on country-specific uncertainty as a key driver of spatially uneven GPN reconfigurations in Europe, highlighting the multi-scalar nature of firm adaptation and the role of regional positioning within global value chains in shaping network resilience.

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Internal Conflict and External Trade: Eviden from Kenya

Prof. Volker Nitsch

G04-1 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Following the disputed December 2007 presidential election and the announcement of Mwai Kibaki as the winner, Kenya experienced widespread violence that quickly evolved into ethnic conflict, particularly in the Rift Valley Province. This paper analyzes the consequences of this episode for Kenya's external trade using transaction-level customs data from the Kenya Revenue Authority. The daily frequency and geographic detail of the data enable precise identification of short-run disruptions and regional heterogeneity. Results show significant but
uneven declines in trade flows, with effects concentrated in conflict-affected areas and largely dissipating after the peace agreement.

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Foreign Direct Investment and location strategies: multinational firms in the automotive components industry in Piedmont and Northern Italy

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G04-1 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

This paper builds on a research project carried out by Ires Piemonte, the Regional Institute for Economic and Social Research of Piedmont (Italy), focusing on the automotive components industry in a context of technological transition and the downsizing of the local original equipment manufacturer (OEM), historically represented by FIAT and now part of the Stellantis group. Using a mixed qualitative-quantitative approach, the study analyses firms controlled by multinational groups (multinational enterprises, MNEs) located in Piedmont and in other major automotive regions of Northern Italy - Lombardia, Emilia-Romagna and Veneto - areas that historically concentrate a large share of Italy's automotive manufacturing capacity.
Over the past decades, the reorganisation of the automotive industry has reshaped production geographies along a core-periphery pattern, characterised by the international fragmentation of value chains. The empirical evidence points to a gradual shift of Italy, and of the Turin automotive cluster in particular, towards a "semi-peripheral" position: automotive production remains significant, but in the absence of national OEMs. As a result, territories increasingly compete with low-cost countries for the attraction of manufacturing activities and with core economies for higher value-added functions, such as R&D and advanced services.
The aim of the paper is to provide policy evidence for regional investment attraction strategies by assessing the advantages and constraints associated with the high presence of foreign-controlled MNEs in a mature cluster such as the Piedmont one. Analyses are conducted using firm-level balance-sheet data and a CRE-Mundlak panel model, comparing the performance of foreign MNEs with Italian MNEs and independent domestic groups. Estimates seem to highlight no overall "premium" for MNE, but results have to be interpreted at the regional level.
Nevertheless, MNEs remain key actors for the technological upgrading and skill reconversion of the cluster, given their investment capacity and their position within global value chains. From a policy perspective, this suggest the crucial issue is not the mere presence of multinational-controlled firms, but the quality and long-term commitment of their regional investments. The concluding stage of our research develops an analytical framework on the "disengagement risk" of foreign MNEs, based on a series of case studies. While this aspect will not constitute the main focus of this presentation, it represents our broader research trajectory and offers a structured approach to assessing firms' territorial embeddedness and its implications for regional industrial policy.

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Impact of Employment in Export Activities on the Economy of Aguascalientes, Mexico

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G04-2 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

This research examines the effect of employment in the manufacturing industry of Aguascalientes on the local economy, given that manufacturing constitutes the most significant economic activity in the state. It is essential to consider global value chains as a transversal axis that promotes foreign direct investment through the establishment of transnational corporations' production plants in various countries, with the purpose of reducing production costs and increasing organizational competitiveness in their productive activities. Accordingly, the calculation of the export-employment multiplier for the manufacturing sector is carried out using data from the 2024 Economic Censuses. The results demonstrate the impact of export activities on sectors engaged in non-export activities, along with their corresponding multipliers, which indicate the number of jobs generated in the local economy for each additional worker hired in the manufacturing sector in Aguascalientes. The study concludes by underscoring the importance of government participation in the development of public policies that foster foreign direct investment and stimulate the export sector.

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Structural vulnerabilities and regional persistence in an open economy: Classifying regional productive trajectories using SSA-A, with an interregional input–output extension. Evidence from Chile (2013–2023)

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G04-2 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

How do regional productive structures shape vulnerability when trade patterns and value chains are being reconfigured? A useful way to approach this question is to separate changes driven by sectoral composition from region-specific dynamics, and to interpret persistent specialization as a structural channel of exposure. The empirical setting considered here features strong metropolitan concentration, resource-based exporting regions, and heterogeneous service and manufacturing bases, providing a clear context to operationalize this perspective and connect it to broader debates on territorial resilience under external shocks.

Using an adjusted shift-share framework (SSA-A), regional structural change over 2013–2023 is decomposed into sector-mix (structural) effects and region-specific components. These elements are then used to construct a typology of structural trajectories for 16 regions, moving beyond binary winner/loser narratives and delivering a comparable classification of regional profiles as the paper's core output. The typology serves as an operational entry point to discuss vulnerability channels: trajectories dominated by persistent specialization in tradable activities and limited diversification are consistent with higher exposure to sectoral and trade-related shocks, whereas more diversified structures are consistent with greater adjustment capacity and potentially lower sensitivity to single-sector disruptions.

The contribution is twofold. First, the paper provides a transparent regional classification that supports policy-relevant discussion of territorial vulnerabilities in a context of production-network reconfiguration, without requiring strong assumptions about fully observed interregional flows at the submission stage. Second, it outlines a feasible extension linking SSA-A profiles to interregional input–output tools to characterize production linkages and, in later stages, approximate productive dependence and territorial value-added capture.

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The cost of instability: a synthetic counterfactual analysis of Madagascar's GVC integration and resilience (1990-2018)

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G04-2 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

Madagascar presents a development paradox: despite abundant natural resources, strategic geographic location, and a large labor force, the country experienced severe economic divergence from Sub-Saharan African peers after 2009 (Razafindrakoto et al., 2015). More troubling than the growth loss is the structural reversion: between 2003 and 2008, Madagascar integrated into Global Value Chains (GVCs) through manufacturing exports (textiles under AGOA); the 2009 constitutional coup triggered the collapse of these backward linkages (contract-intensive assembly) while forward linkages (resource extraction) persisted (Fontaine & Razafindravaosolonirina, 2022).

This paper argues that political instability acts as an "institutional filter," selectively eroding sectors according to their institutional requirements. Manufacturing requires credible contract enforcement (Levchenko, 2007; Nunn, 2007; Antràs & Chor, 2013), while resource extraction can operate through political capture (Tornell & Lane, 1999). We formalize this mechanism and quantify its structural cost using causal inference.

We contribute in three ways. First, we develop a theoretical model showing institutional collapse imposes differential costs by contract intensity, generating a threshold beyond which backward linkages exit while forward linkages persist. Second, we apply the Synthetic Control Method (SCM) to GVC participation indicators for the first time (Abadie et al., 2010, 2015), constructing a credible counterfactual Madagascar that isolates the 2009 rupture's causal effect. Third, we document asymmetric empirical response: backward linkage participation diverges sharply downward post-2009 while forward linkage participation remains stable, consistent with recent work showing institutional quality predicts GVC depth with larger backward-linkage effects (Fernandes et al., 2020; Adarov & Stehrer, 2021).

We employ SCM on annual UNCTAD-EORA Multi-Regional Input-Output data (1990–2018), matching Madagascar on pre-treatment covariates (GDP per capita, trade openness, FDI/GDP, World Governance Indicators). Treatment is the 2009 constitutional rupture. Outcomes are (1) Backward Linkage Integration (Foreign Value Added / total exports) and (2) Forward Linkage Integration (Domestic Value Added exported / total exports). Placebo tests validate effect uniqueness.

The expected results are that backward linkages may declined representing manufacturing capacity loss which is a structural cost that exceed aggregate GDP loss estimates. This potentiel result validates institutional filtration and demonstrates that institutional reform, not fiscal incentives alone, is necessary for manufacturing recovery. Implications inform Madagascar's 2025 political transition and African development strategy.

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Critical and Strategic Raw Materials and Mining Technologies in the European Regions

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G04-3 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

Under the ongoing technological paradigm shift, mineral resources have become essential inputs for emerging industries and technologies. As technological change accelerates, demand for some materials that once played a marginal role (e.g., lithium, graphite, or dysprosium), and for base metals already used in large volumes (e.g., copper and nickel), is expected to increase dramatically by 2050. The scale and speed of global demand growth have raised serious concerns about the ability of economic systems to respond timely and to overcome constraints and vulnerabilities along the entire raw-materials supply chain.
In this context, technological progress in mining plays a crucial role. Innovation in extraction methods, automation, digital monitoring systems, and advanced processing technologies are becoming essential to improve productivity, expand economically viable reserves, and reduce operational and environmental constraints - especially where profitable mineral resources are scarce, and extraction and processing costs are high. However, over the last decades, the European Union's response to these technological, productive, and geopolitical challenges has been slow and inconsistent, somehow moving in the opposite direction to major competitors, and positioning itself as a late follower in revitalising a sector that has undergone major technological and productive transformations elsewhere in the world.
With recent initiatives such as the Critical Raw Materials Act (CRMA), under the umbrella of the Open Strategic Autonomy (OSA), the EU has shown a regained interest in the sector. At the same time, the strategy appears more focused on attracting business investment to expand domestic supply than on rebuilding the upstream capabilities needed for primary raw-material extraction and production in a more sustainable fashion. The geography of mining technologies and the factors driving their development remain largely understudied at the European level, preventing a clear understanding of how the strategies can foster innovation and support the EU's potential to expand and diversify the supply of Strategic and Critical Raw Materials. In this paper we analyse the determinants of the development in mining technologies, considering them across distinct technological subcategories and adopting a geographical perspective on European regions.

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Assessing vulnerabilities in the European Union: A Territorial and Industrial Analysis of EU Trade Exposure using FIGARO-REG and CARMEN

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G04-3 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

In a geopolitical climate of escalating US-China trade tensions, the European Union faces substantial risks due to its deep integration with both actors. This study assesses EU's trade dependencies across three levels—EU-wide, national, and territorial at NUTS2 level in a globalised scenario—providing a granular industrial breakdown of how global trade shifts impact in the territory.
The analytical framework uses FIGARO-REG a comprehensive multiregional input-output table that covers 288 NUTS2 regions and 16 major non-EU trading partners across 56 industries. The methodology is powered by CARMEN, a modular model developed by the European Commission's Joint Research Centre (JRC) that integrates diverse input-output approaches in a modular way. Allowing, in this case the quantification of the Chinese valued added content in exports to the US through a Trade in Value added analysis, detecting the more impacted industries and regions.
At the EU level, industries such as motor vehicles, machinery, equipment, and computer and electronics are significantly reliant on Chinese value-added components. China's share of foreign value-added content in these sectors is substantial, making them potentially vulnerable to changes in US trade policy directed at goods with high Chinese content.
The national analysis reveals a striking dichotomy: while Germany and France account for over half of the total CVA in EU-to-US exports in absolute terms, Eastern European nations—including Estonia, Hungary, Poland, and Czechia—demonstrate the highest relative dependency. In these countries, over 20% of export value is generated in China, underscoring strategic vulnerabilities that may result in adverse economic outcomes in the event of escalating trade barriers.
On the regional front, our findings identify specific areas like Stuttgart and Upper Bavaria in Germany; Ile-de-France in France; and North Brabant in the Netherlands as holding a relevant amount of Chinese value-added content in exports. Additionally, regions in Ireland, such as the Southern, and Eastern and Midland regions, stand out, particularly in sectors like digital technologies and computer-related services.
Furthermore, this study reveals a better understanding of the territorial disparities. The granularity of the model highlights how international trade tensions are not distributed uniformly but rather concentrated in specific industrial clusters.

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Mobile Capital, Rent Shifting, and Inefficiency Source of Policy Equilibrium

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G04-3 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

As shown in recent comments of US President Donald Trump, tariffs are now seen as a policy tool for attracting capital, which is expected to lead to an increase in the number and size of firms, and therefore employment. The present study focuses the rent-shifting effect of trade taxes via attracting capital, and examines each country's taxing behavior, the equilibrium, and its efficiency. Specifically, by using a monopolistic-competition model with rent shifting via mobile capital, I examine effects and equilibrium of import, export, and capital taxes of two countries, and then clarify the inefficiency source of policy equilibrium. The results are as follows. First, capital taxes have both aspects of import and export taxes in the present model, and, hence, three tax instruments are redundant and any two of them are sufficient for each government to maximize welfare. Second, the Nash equilibrium is inefficient, and larger countries tend to taxes to raise world prices of their products, while smaller countries tend to impose taxes to raise local relative prices of imported varieties. Third, although rent-shifting externalities appear in the model, a first-best resource allocation can be achieved only without terms-of-trade (TOT) manipulations, because, for exporting countries without TOT motives, setting taxes such that world prices of their products are equal to marginal costs is optimal.

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Sustainability in CRM supply chains: Revising the post-Global Gateway agenda?

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G04-3 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

The search for and improvement of the European Union's terms of access to the supply chain of critical or strategic raw materials is already considered of key importance for the future steps of the EU economy. Global economic competition to gain access to productive sectors related to the CRM / SRM industry (e.g. mining, processing) increasingly shapes the EU policies, as long as the BRICS group controls the major share of the production processes. The European Union is called upon to set the rules and ensure, on the one hand, the smooth functioning of sustainable supply chains globally, and, on the other hand, to update foreign economic policies, such as the Global Gateway. The latter EU initiative aims, among others, at enhancing economic cooperation with African states, combined with investment projects and financial tools for several key interventions, mainly in the fields of green and digital transition, sustainable growth and job creation, as well as in human capital.
The aim of the present study is to delve into the divergent patterns of economic cooperation between African states and the major economies being economically active in the African continent during the recent years. An overview of the recent relevant literature seeks to assess whether foreign-based investment strategies are aligned, so far, with origin-based economic institutions, such as the ACFTA initiative, or even to introduce more local ownership business schemes. The study intends to highlight any best practices of "win-win" economic relationships between African states and foreign-based economic entities penetrating the African market, but also the extent to which foreign penetration is aligned to the continent's development challenges and the Sustainable Development Goals.
In this context, several questions may arise regarding the EU investment (re)orientation in Africa in light of this generalized geopolitical competition. Does the EU possess any comparative advantages in providing financing tools for infrastructure construction, compared to other global economic competitors, in specific sectors? At the policy level, is there a need for reconsidering the key objectives or the financing tools in the context of the Global Gateway, from 2027 onwards, in order to enhance cooperation in the context of the proper functioning of the CRM / SRM supply chains? Are there any prospects of promoting research cooperation schemes between African states and their EU partners, as long as investment is human capital is of major importance for both sides, given the demographic decline in the European Union?

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Australian regional exposure to United States tariffs: A multi-regional input-output approach

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G04-4 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

In recent years volatility in the trade policy of the United States Government has led to greater cause for the evaluation of the exposure of regions to trade disruptions. In 2026, the United States proposed a 10 then 15 per cent global tariff on imports to the country. This paper investigates the exposure of Australian states and territories to United States import tariffs based on trade, price elasticities and supply chain data.
This paper presents AusRIO a newly development multi-regional input-output model for Australia. The model is constructed through a CHARM-based regionalisation of the 2022-23 national input-output tables published by the Australian Bureau of Statistics The paper details the methodological steps taken to construct the AusRIO MRIO system including the interstate trade linkages. Preliminary findings on the impact of tariffs on Agricultural exports find that the tariff shock generates an estimated $2.3 billion reduction in national output and approximately 2,790 full-time equivalent (FTE) jobs lost across Australia. The impacts are unevenly distributed across states, reflecting differences in export composition and supply-chain exposure. Queensland experiences the largest output decline (approximately $645 million and 770 FTE jobs), followed by Victoria ($781 million and 950 FTE jobs) and New South Wales ($555 million and 610 FTE jobs).

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Breaking down sectors: A novel approach to disaggregating Input-Output Tables

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G04-4 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

This paper presents a new methodology for disaggregating input-output (IO) tables to uncover hidden heterogeneity in industry structures, trade patterns, and supply-chain dependencies. Conventional IO tables aggregate sectors at a high level, masking critical differences among sub-industries. Our three-step approach (i) compiles high-granularity production and trade data for disaggregated sectors, (ii) estimates and balances IO flows through econometric techniques, and (iii) validates the resulting tables against established industry benchmarks. The framework is illustrated with a case study of the European Union automotive sector, which we split into electric vehicles (EVs), internal-combustion-engine vehicles (ICEs), and vehicle-parts manufacturing. Results show that foreign-input dependence differs markedly across vehicle segments: EVs exhibit a 29 % foreign share, compared with 13 % for ICEs. Further decomposition attributes 80 % of this gap to global value-chain strategies and 20 % to technology gaps. Regional extensions reveal substantial heterogeneity across EU economies in their reliance on the Single Market versus non-EU partners. The study underscores the policy relevance of fine-grained IO analysis for enhancing competitiveness, supply-chain resilience, and targeted industrial strategy. The proposed methodology is flexible and can be transferred to other sectors, offering researchers and stakeholders a robust tool for detailed economic and trade assessments.

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The Windfall and Burden on Local Governments from Re-Shoring Manufacturing

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G04-4 International Trade, Global Value Chains and Regional Growth under Reconfiguration (De-risking, Reshoring, Strategic Autonomy), Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

This paper empirically estimates the fiscal response of local governments to a manufacturing boom. Some central governments, including the US, are pursuing policies to re-shore manufacturing from abroad. One of the potential effects that has not factored into the calculus of this policy choice is the impact on local governments. We use the oil fracking boom in Texas to specifically identify how local governments in a developed country respond to both the burden, and opportunity, of this potentially major change in their local fiscal environment. Specifically, we use difference in differences estimation to identify impacts for both local general purpose governments, as well as local single purpose school districts, and argue we expect these two types of local governments to significantly differ in how they are affected. In particular, general purpose cities are found to have enlarged revenues, but much of the larger revenues are absorbed at least in the short run by the burden from creating new infrastructure. Conversely, school districts only have the fiscal burden of an increase in school attendance from the small permanent workforce, while benefitting from the larger long run change in the tax base. The results emphasize the heterogenous effects on local governments, none of which are small

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Navigable rivers and transport infrastructure in the Democratic Republic of the Congo

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G05-1 Transportation, Energy and Communication Infrastructures: Criticality, Security and Regional Impacts in the Transition Era, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 09:00 - 10:30

This paper analyzes the effect played by the transport infrastructure in the development of the Democratic Republic of the Congo (DRC). Historically, water was the main mean of transport for the movement of goods and people. However, thanks to advances in technology, during the last two hundred years, railways, first, and highways, then, became the main means of transport in modern economies. In the developing and underdeveloped world, rivers hold their key historical role. States that benefit from the existence of navigable inland waterways (like rivers or canals) take advantage of their transport function. In these countries, the often poor, ruined, and fragmented rail and road networks represent the main obstacles that prevent the positive effect that transport infrastructure could have on economic growth, and the dependence on natural means of transport is higher compared to the developed world. The Congo River, which constitutes an intricate transport system of waterways of more than 15,000 km, represents the backbone of the transport infrastructure in the DRC, where the trimodal river-railway-road network is headed by the river. Rivers, if navigable, have a twofold `nature': they are a pure geographical condition (first-nature geography) and act as a transport infrastructure (second-nature geography). This `dual role' is still neglected and has not explicitly been considered in the literature. On the other hand, together with the man-made infrastructure, navigable rivers constitute an integrated system of complementary `goods': areas, where rivers are navigable, do not have railways or main roads. By using 10x10 km grid cells and geocoded data, this paper investigates, on the one hand, how beneficial is the Congo River for the economic development (mining activity, crop production, nightlight luminosity) of the DRC; on the other, it focuses on the relationship between natural and man-made transport infrastructure. Empirical results show that if both railways and roads, although in a dilapidated condition, positively affect contemporary economic development, the Congo River and the whole network of tributaries and small rivers fall short of the role they could have in the economic growth of the country. The inter-modal river-rail-road transport system is still far from being a real opportunity for the country: the waterway transport benefits from the existence of the man-made one, but the reverse does not apply.

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Price elasticities of air travel demand for direct and indirect travel: a meta-analysis

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G05-1 Transportation, Energy and Communication Infrastructures: Criticality, Security and Regional Impacts in the Transition Era, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 09:00 - 10:30

Regional air transport policy requires precise information on the price elasticity of air travel demand. This paper provides a systematic overview of the current literature on the price-elasticity of aviation demand.

First, a theoretical model describes how prices in direct and indirect markets may influence each other. Here, capacity on a given flight is limited, and seats are allocated according to demand characteristics in the different markets served with the flight under consideration. In the next step, the theoretical model is translated to an empirical model that is used to explain why and how price elasticities differ across markets.

Second, this meta-analysis provides a comparative and quantitative reevaluation of previous research on the price elasticity of passenger air transport. Following a systematic literature search, estimates of price elasticities as well as information on geographic, economic and demographic sample variables and moderator variables are recorded from the literature. A flexible and robust estimation method is used to predict how prices elasticities in direct and indirect markets vary around the sample mean, whilst controlling for study specific effects and heterogeneity.

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Effects of Metropolitan Rail Expansion on Commuting Time and Distance

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G05-1 Transportation, Energy and Communication Infrastructures: Criticality, Security and Regional Impacts in the Transition Era, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 09:00 - 10:30

Metropolitan rail systems play a pivotal role in urban transportation, offering not just a transport choice but also a critical influence on connectivity and mobility in metropolitan areas. Improvements in public transportation accessibility have shortened travel times, freeing people from time constraints. Yet, reduced commute time due to improved transit systems might not resolve the issue of lengthy commutes entirely. Commute quality can deteriorate during peak times if public transportation becomes congested. Additionally, enhanced transit accessibility might incentivize individuals to work in city centers, known for premium job opportunities, rather than seeking employment closer to their homes. This is particularly true as these improved connections decrease travel costs from more affordable suburban locales.

Thus, while a robust intercity transportation network in metropolitan regions can reduce traffic congestion, it might inadvertently intensify job-housing spatial disparities. This research emphasizes the need to assess changes in commuting time and distances following inauguration of new urban railways. Grasping how metropolitan rail expansion impacts commuting patterns in adjacent areas offers crucial insight into spatial imbalances emerging from suburbanization. A particular focus must be on interplay between job accessibility and proximity, a longstanding objective in urban planning.

This research employed the difference-in-differences method (DID), an econometric approach designed to discern the causal effects of rail expansion in the Seoul Metropolitan Area. We sourced data from transportation card systems, which offer more detailed spatial-temporal insight into starting points than prior O-D datasets. The study delves deeper into the intertwined relationship between transportation accessibility and job-housing balance, while shedding light on how commuting patterns shift with enhanced connectivity. In our preliminary analysis, we observed an uptick in commuting distances with introduction of new urban rail stations. Interestingly, while commuting distances shrank in administrative regions without a rail station, they expanded in areas gaining new stations. This implies that urban rail expansions bolstering accessibility to suburban locales might encourage people to choose farther residential and workplace locations. Consequently, this has amplified workplace mismatch as feasibility of suburban living and extended commutes rises. Additionally, the effect of new metro station inaugurations on commute distances varied by place. Notably, Incheon and Gyeonggi-do exhibited greater increases in commuting distance than Seoul. This pattern suggests that expanding metropolitan transport networks may intensify regional disparities in commuting lengths.

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A policy-driven multi-scale decision support framework for identifying and prioritising strategic transport and urban development corridors.

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G05-2 Transportation, Energy and Communication Infrastructures: Criticality, Security and Regional Impacts in the Transition Era, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 11:00 - 13:00

This study develops a policy-driven, multi-scale Decision Support Framework (DSF) for the identification, characterisation, and prioritisation of strategic transport and urban development corridors. The methodology operationalises a “policy-first” approach in which policy and strategic objectives are formalised into explicit technical requirements prior to data selection and modelling. This ensures traceability between policy goals, spatial indicators, analytical processes, and ranking outputs. The framework is structured through a domain model documented in Unified Modelling Language (UML) and aligned with ISO and INSPIRE interoperability standards. It integrates three layers: (1) a motivational layer defining policy objectives and scenarios; (2) a business layer describing analytical workflows and use cases; and (3) an application layer implementing spatial data structures and computational procedures. The methodological workflow comprises five sequential phases. First, corridor identification translates policy-defined thresholds – such as population coverage and connectivity requirements into spatially explicit corridor envelopes using network modelling, least-cost path analysis, and travel-time accessibility techniques. Second, spatial characterisation applies a structured indicator system derived strictly from policy objectives. Indicators span socio-economic performance, accessibility and logistics, environmental sustainability, demographic development, and security dimensions. Data harmonisation and geoprocessing procedures ensure cross-corridor comparability. Third, corridors are evaluated using multi-criteria decision analysis (MCDA). Each indicator is associated with a policy-based utility function, and weights are determined either through stakeholder elicitation or analytical weighting schemes. Two complementary ranking techniques are applied: Simple Additive Weighting (SAW) and the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS). Cross-validation between methods enhances the robustness and transparency of results across multiple policy scenarios. Fourth, stakeholder consultation is integrated to validate quantitative outcomes and refine weighting structures. Fifth, the framework applies a multi-scale refinement process, subdividing selected corridors into grid-based spatial units at a 5×5 km resolution to identify localised intervention priorities and development constraints. This recursive disaggregation is a defining feature of the framework's architecture, enabling targeted analysis below the corridor level. The methodology is demonstrated through a continental-scale application across Africa, identifying 55 candidate corridors and ranking them under multiple policy scenarios, yielding a prioritised set of 12 strategic investment corridors. Consistent with its UML-based domain model and adherence to ISO and INSPIRE standards, the proposed framework provides an interoperable, transparent, and transferable analytical architecture that bridges policy formulation and spatial modelling, enabling evidence-based corridor prioritisation across scales.

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Social Return on Investment (SROI) of SIT-Flexi in the Central Region of Portugal

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G05-2 Transportation, Energy and Communication Infrastructures: Criticality, Security and Regional Impacts in the Transition Era, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 11:00 - 13:00

Demand-responsive transport (DRT) systems constitute an increasingly relevant instrument for addressing structural mobility deficits in low-density territories, where fixed-route public transport frequently exhibits low load factors and high marginal operating costs. This study develops a rigorous Social Return on Investment (SROI) assessment of SIT Flexi, an on-demand transport service deployed across 18 municipalities in Portugal's Coimbra Region. The analysis operationalises a five metric SROI framework combining: (i) direct user cost differentials relative to market rate taxi fares, (ii) avoided missed medical appointments, (iii) avoided caregiver time costs, (iv) monetised social inclusion effects, and (v) environmental externalities derived from COPERT-based emission modelling. Social outcomes are monetised using financial proxies from international health economic and wellbeing valuation literature, subject to standard SROI corrections for deadweight, attribution and conservative parameterisation.
The results indicate an SROI ratio of 1:1.08, demonstrating that the service generates net positive social value even under stringent assumptions and restricted metrics. Emission modelling reveals that SIT Flexi reduces CO_2 emissions per passenger-trip by approximately 58% relative to the counterfactual travel pattern. Sensitivity tests confirm the robustness of the ratio to variations in proxy selection and attribution levels, while also illustrating that inclusion of psychological and long-term wellbeing effects—systematically omitted here to preserve methodological conservativeness—would increase the estimated social return. The findings substantiate the role of flexible mobility solutions as targeted policy instruments for enhancing territorial cohesion, mitigating social isolation and improving resource efficiency within rural and ageing regional systems.

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Demand–Coverage-Based Location Optimization of Data Centers in Southeast Korea: A Grid-Based Maximal Covering Location Problem (Mclp) Approach

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G05-2 Transportation, Energy and Communication Infrastructures: Criticality, Security and Regional Impacts in the Transition Era, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 11:00 - 13:00

In Southeast Korea (the Busan–Ulsan–Gyeongnam region), rapid diffusion of AI, cloud services, and broader digital transformation is expected to increase demand for data-center capacity. At the same time, site selection is constrained by power availability, land supply, disaster risks, and regulatory restrictions, which can reinforce both nationwide concentration in the Seoul Capital Area and intraregional spatial bias. This study aims to identify optimal data-center locations from a demand fulfillment perspective and to propose a practical framework for screening feasible candidate sites by incorporating multidimensional location conditions, including environmental, infrastructural, and socio-economic factors. Methodologically, the study applies a 1 km grid-based Maximal Covering Location Problem (MCLP). Demand weights are constructed using proxies for data-center usage intensity, including the concentration of firms and employment (e.g., establishments and workers), public-sector and urban-core demand, and related activity hubs. Candidate sites are pre-screened by excluding areas with existing data-center locations, land-use restrictions (zoning), designated hazard zones, and flood-risk areas. To reflect real-world feasibility beyond pure coverage maximization, we additionally examine an extended model that introduces a “soft-penalty” index capturing slope, climate conditions, accessibility to power and communications infrastructure, transportation accessibility (operations and workforce considerations), and employment-related socio-economic conditions (e.g., education and quality-of-life proxies). Because the true service area of large-scale data centers is uncertain, the coverage radius (S) and the number of new facilities (P) are evaluated through scenario-based sensitivity analyses. We expect high demand weights to emerge along major industrial and business corridors, while dense residential cores with elevated disaster exposure and stronger regulatory constraints are largely excluded from candidate sets, yielding optimal solutions that converge toward low-risk, regulation-light zones near (but typically outside) urban cores and around industrial hubs. The study provides empirical evidence for a regional dispersion strategy by reframing data-center planning as an integrated optimization problem combining demand coverage, regulation, and risk. Limitations include restricted access to direct measures of traffic and grid headroom, motivating the use of public-statistics-based proxies and future validation with more granular power and telecom data.

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Corridors and Urban Systems in Africa – overview, main findings and conclusions

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G05-2 Transportation, Energy and Communication Infrastructures: Criticality, Security and Regional Impacts in the Transition Era, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 11:00 - 13:00

In line with two flagship initiatives of the EU – “Comprehensive Strategy with Africa” and “Global Gateway” – since 2020 two departments of the European Commission – the Directorate-General for international Partnerships (INTPA) and the Joint Research Centre (JRC) have been jointly performing studies on “Corridors and Urban Systems in Africa” (CUSA).
This presentation summarises the consolidated comparative assessment of eleven EU Global Gateway-supported transport corridors in Africa, performed in the framework of the CUSA studies.
The assessment concludes that all these eleven corridors are attractive for investments.
The largest benefits are expected from interventions in transport infrastructure and accessibility.
The investments in reducing carbon footprint and preserving biodiversity also appear quite promising.
The most challenging area for intervention seems to be digitalisation. Synergies with investments in transport and accessibility could be exploited, to reduce the cost of digitalisation interventions.
The challenges in boosting productivity appear as the most diverse ones and need to be further assessed by corridors, areas and sectors. A potential high-productivity cluster is identified in Western Africa.
Large urban agglomerations and major transport and logistics infrastructure entities often demonstrate different intervention profiles from the remaining wide corridor area. Additional in-depth studies are needed to better understand their specific challenges, opportunities and trade-offs.
The provision of specific recommendations or the impact assessment of particular ongoing projects or potential future interventions is outside the scope of this study.

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The CoolST Project - Adapting to Climate Change Impact: Crafting South Tyrol's Cooling Future for Energy Resilience

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G05-3 Transportation, Energy and Communication Infrastructures: Criticality, Security and Regional Impacts in the Transition Era, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 15:00 - 16:30

Rising cooling demand poses critical challenges for regional energy systems, infrastructure resilience, and climate adaptation. The CoolST project provides the first comprehensive, interdisciplinary assessment of South Tyrol's cooling market, spanning residential, tertiary, industrial, and transportation sectors. By intersecting engineering, economics, user behavior, biology, health, and policy—domains that have not previously been studied together in this context—CoolST generates novel insights into cooling use patterns, energy consumption, costs (CAPEX and OPEX), health impacts from climate change, and biodiversity effects.

CoolST adopts a mixed-method, bottom-up approach to fill missing primary data across the region, complemented by expert consultation to validate reliability. Parametric simulations and scenario analysis enable projections of energy demand and cooling infrastructure needs through 2040. These outputs are made accessible through the CoolST Knowledge Hub, an online open-source repository, and the CoolST Tool, which transforms data into user-friendly visualizations and policy-relevant knowledge.

By providing the first holistic picture of South Tyrol's current and future cooling market, CoolST supports energy providers, TSO/DSOs, policymakers, and citizens in planning strategies to reduce energy use, CO_2 emissions, and costs. The methodology is designed to be replicable in other regions, offering a transferable framework for understanding local cooling markets under climate and energy transition pressures. CoolST represents a novel, interdisciplinary, and actionable approach to informing regional energy and infrastructure policy in the transition era.

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Spatial Determinants of Onshore Wind Energy Deployment: A Grid-Level Spatial Econometric Analysis of Aragón region (Spain)

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G05-3 Transportation, Energy and Communication Infrastructures: Criticality, Security and Regional Impacts in the Transition Era, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 15:00 - 16:30

Aragón, a largely rural NUTS2 region in Spain, has become one of Europe's leading regions for onshore wind energy, with about 5.2 GW of installed capacity. Despite this prominence, the determinants of wind farms sitting within the region remain underexplored. This study investigates the factors that determine why wind power is installed in some locations and not others.
To address potential spatial aggregation bias (the Modifiable Areal Unit Problem, MAUP), we analyze data at a fine grid-cell level rather than using large administrative units. Our approach integrates diverse data sources, including regional statistics and GIS-derived variables, to capture economic, technical, and natural resource availability factors influencing site selection. We employ spatial econometric models to capture observed spatial dependence: wind farms tend to cluster geographically.
Results reveal a clear agglomeration pattern. The presence of a wind installation in one grid cell significantly increases the likelihood of nearby installations. While wind resource availability (e.g. long-term average wind speed) emerges as a strong positive determinant of site selection, it is not the only factor. Economic and infrastructure variables (such as proximity to transmission lines or demand centers) also play important roles. The analysis highlights, for example, that some areas with high wind potential remain underexploited due to socio-economic or regulatory constraints.
This research emphasizes its methodological contribution: by combining grid-based analysis with spatial econometrics, we provide a more robust framework for examining wind energy sitting than traditional zone-based methods. Understanding these spatial determinants is crucial for informing equitable territorial planning. Our findings can guide policymakers in designing wind energy policies and spatial plans that balance natural resource potential with economic and social considerations, aiming for a territorially just development of onshore wind power.

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Territorial governance and the sustainability transition of logistics sectors in Groix and Ushant islands (France): the implementation of a sustainable logistics plan

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G05-3 Transportation, Energy and Communication Infrastructures: Criticality, Security and Regional Impacts in the Transition Era, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 15:00 - 16:30

This research investigates the adaptation of urban sustainable logistics frameworks to the 11 inhabited islands of Brittany (Ponant Archipelago), where geographic isolation, fragmented supply chains, and seasonal tourism create distinct logistical challenges. Unlike rigid regulations, French logistics charters, which are voluntary and collaborative instruments, enable flexible governance by aligning local practices with national decarbonization goals while accommodating territorial specificities. Led by the Bretagne Supply Chain cluster, a regional intermediary between public and private actors, this approach fosters stakeholder negotiation and shared responsibility, bypassing top-down technical governance. The islands vary drastically: surface areas range from <1 km² (Île de Sein) to >85 km² (Belle-Île-en-Mer); populations from <250 to >5,000. Their logistics systems lack standardization, demanding context-sensitive transitions. Our original three-pronged methodology examines planning documents (charter & roadmap), territorial governance dynamics, and island maritime service characteristics. Using a mixed-methods design, we combine participant observation of charter development with 10–20 semi-structured interviews on Ushant and Groix, selected for contrasting surface areas and second-home ratios but comparable logistics structures. Data is analysed via textometry (IRaMuTeQ) to identify spatial specificities in discourse, comparing island approaches to urban models. Findings reveal how island governance navigates institutional fragmentation, economic constraints, and stakeholder diversity to operationalize sustainability transition, offering spatial planning insights for peripheral and maritime territories. The study contributes to understanding how voluntary, collaborative tools can bridge urban-rural divides in sustainability policy, particularly in fragile, non-contiguous geographies where top-down regulation is ineffective. It underscores the necessity of integrating socio-spatial realities (population density, transport dependency, seasonal flux) into sustainable logistics planning. This work provides a transferable framework for adapting urban transition models to island contexts, emphasizing governance flexibility, stakeholder inclusion, and spatially tailored solutions - key for EU and national strategies targeting decarbonization in peripheral regions.

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The Flip Side of Digitalization: Digital Ecosystems and Cybersecurity

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G06-1 Space, Digital Transformation and AI for Regional Implications, Auditorium 68 - South Building - Faculty of Philosophy, agosto 26, 2026, 11:00 - 13:00

Digitalization has in the literature most often been considered from the perspective of potential social or economic benefits. This contribution considers one of the potential drawbacks of digitalisation: data and cybersecurity issues in establishments. While literature on this issue is scarce, particularly with regard to regional perspectives, it is important to gain a better understanding of the potential issues raised by digitalisation. Specifically, two mechanisms are investigated that form part of the digital ecosystem in which establishments operate. The first is the use of suppliers in digitalisation, often labelled ITOs in the literature. These suppliers are part of the digital ecosystem and may provide establishments with a cost and competence advantage in digitalisation. However, the literature also highlights potential hazards associated with using such ITOs, as this involves integrating external partners into the establishment's digital infrastructure, which increases the risk of data and cybersecurity breaches. While digitalisation may increase productivity, it may also increase the risk of major adverse shocks to production. Secondly, a small body of literature highlights the importance of technological know-how, information sharing and knowledge in mitigating such data and cybersecurity risks. It has been argued that such sharing is driven by the availability of digital infrastructure, which may depend on the location of the establishment. These are therefore aspects of the digital ecosystem of firms to consider when investigating data and cybersecurity problems.

These mechanisms associated with the digital ecosystem are investigated in terms of the likelihood of establishments experiencing data and cybersecurity problems, based on three waves of the German SOEP-LEE2 representative establishment survey for the years 2021, 2023 and 2024, comprising a total of 2519 establishments. Probability modelling is used for this analysis, including an inverse Mills ratio for selection into the final sample, taking into account selection due to item non-response in the surveys. Fixed effects are included for time, business sector, and establishment location to account for unobservable heterogeneity. The findings show that establishments that depend heavily on external partners for digitalisation are more vulnerable to data and cybersecurity problems, while high-speed local digital infrastructure in the establishment location has the opposite effect. Furthermore, high-speed local digital infrastructure that facilitates knowledge sharing mitigates the effects of external partnerships on digitalisation. This arguably point to an IV estimation strategy in support of external partners increasing likelihood of data and cybersecurity problems. The flip side of digitalization relates to such aspects of digital ecosystem.

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Data centers as the critical urban infrastructure in the AI era: Evaluating economic impacts in US metropolitan areas

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G06-1 Space, Digital Transformation and AI for Regional Implications, Auditorium 68 - South Building - Faculty of Philosophy, agosto 26, 2026, 11:00 - 13:00

Data centers have become essential urban infrastructure in the era of digital and artificial intelligence (AI) transformation, yet systematic assessments of their urban and regional economic impacts remain limited. Existing policy discussions tend to focus narrowly on burdens related to land, energy, and grid capacity, rather than the economic implications of data centers. Even if they do not generate large-scale direct employment, data centers have substantial potential to function as foundational infrastructure that triggers indirect and structural industrial effects.

This study aims to empirically identify the ways in which data centers influence the growth of high-income jobs and high-tech industries. We used the Data Center KnowledgeBase provided by S&P Global 451 Research, containing information on the location, history, and facility characteristics of data centers across the US. The analysis focuses on the period 2010–2024 and employs US metropolitan statistical areas as the unit of analysis. To estimate the economic effects of data center development within urban areas, we apply the synthetic difference-in-differences method. We used growth in AI-exposed high-tech jobs and increases in related start-up activity as the key outcome variables.

Preliminary findings indicate that while the direct employment effects of data centers are very limited, regions with strong productivity and technological capacity experience significant gains in job upgrading and digital specialization. Conversely, regions with weaker human-capital foundations show little evidence of spillover effects, suggesting that the digital economy may exacerbate existing spatial inequalities. The estimated effects emerge within a few years of data center entry and are concentrated in AI-exposed and knowledge-intensive sectors. These patterns indicate that digital infrastructure tends to reinforce pre-existing regional advantages rather than produce economy-wide local spillovers.

Our findings challenge the conventional view of data centers as resource-heavy, low-value land uses. Instead, we argue that when paired with the right regional conditions, these centers serve as vital catalysts for AI-driven urban growth and industrial transformation. Therefore, regional planning should shift its focus from the binary choice of hosting to the strategic alignment of complementary innovation assets. Without these supporting capacities, digital infrastructure risks exacerbating spatial disparities rather than fostering balanced development.

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The Impacts of Urban Sprawl on Soil Resources in Tours Metropolitan area: Integrating Artificial Intelligence with the Conventional Mitigation Strategies

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G06-1 Space, Digital Transformation and AI for Regional Implications, Auditorium 68 - South Building - Faculty of Philosophy, agosto 26, 2026, 11:00 - 13:00

This research aims to study the impacts of urban sprawl on soil resources in the Tours metropolitan area and the possibility of integrating artificial intelligence with the conventional mitigation methods to reduce its impact. The research will focus on the long-term study of improving the urban planning, with the objective of understanding the important role of applying AI applications in reducing the major impacts of urban sprawl, especially on the soil resources. The study involves a combination of AI applications; for example, it analyzes various factors by using AI algorithms, such as soil quality, land topography, and ecological sensitivity, to optimize land-use planning. It also uses AI-powered predictive modelling to assess the potential impact of urban development on soil resources. This involves considering factors like population growth, economic trends, and environmental conditions to predict where sprawl might occur and identifying areas with vulnerable soil resources, moreover implementing AI-driven systems to assist in designing smart zoning regulations that prioritize the conservation of valuable soil resources. AI can help identify areas suitable for development while safeguarding critical soil and environmental assets. The collected data will be analyzed using analytical and descriptive methods and models. The expected outcomes of the research are significant contributions to the field of urban planning in general and urban sprawl in particular, including a deeper understanding of the benefits and the important role of applying AI in minimizing soil degradation, monitoring and predicting soil erosion, and developing new AI applications that can be a part of Tours' urban sprawl. This research addresses important questions that are currently crucial for the Tours metropolitan area, such as soil mitigation and environmental surveys, and addresses several scientific questions related to the study of reducing urban sprawl impacts and improving soil resources using AI technologies. AI technologies will be used to produce a dynamic mapping, which will help local authorities to implement sustainable land management.

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structural digital dependence in urban systems: a probability-based measurement approach

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G06-1 Space, Digital Transformation and AI for Regional Implications, Auditorium 68 - South Building - Faculty of Philosophy, agosto 26, 2026, 11:00 - 13:00

Large-scale digital infrastructure disruptions have revealed the depth of contemporary urban dependence on centralized digital layers. When core data facilities malfunction, cascading interruptions across administrative platforms, mobility management systems, financial transactions, and public services make visible the systemic dependencies underlying urban operations. These events raise a fundamental question: to what extent have regional urban systems become structurally dependent on digital infrastructures? This study conceptualizes urban systems as regionally defined functional configurations composed of interrelated social, economic, and infrastructural subsystems. Digital infrastructures operate as coordination and control layers that mediate transactions, governance processes, mobility flows, and service provision. Digital dependence is defined as the structural dependence of core regional services on digital infrastructures.

The empirical analysis draws on multi-source regional operational data collected between 2016 and 2025, including ICT network failure logs, administrative system interruptions, mobility management disruptions, energy supply incidents, and platform-service outages. These datasets enable identification of simultaneous digital-system interruptions and service-level malfunction events across sectors within regions. Methodologically, the study adapts probabilistic dependency metrics developed in engineering research on complex technical infrastructures to regional systems analysis. Regional service sectors are modeled as system nodes, and operational time-series records are converted into binary state matrices representing normal operation and disruption events. Functional dependence is computed using conditional co-occurrence probabilities between digital-system interruptions and service disruptions, normalized by marginal occurrence rates to distinguish structural dependence from stochastic coincidence. This produces a digital structural dependence measure derived from probabilistic dependency metrics, calculated at the regional level.

The results show that sector-specific configurations of structural dependence are observed across regional systems. Transport control and administrative information platforms exhibit particularly strong functional dependence on digital infrastructures, while energy management systems show intermediate levels and certain localized services remain comparatively less dependent. Asymmetric dependence structures are observed: service sectors rely heavily on digital infrastructures, whereas digital infrastructures do not rely to the same extent on individual service domains. Notably, the intensity and configuration of digital dependence vary across regions, indicating territorially differentiated patterns of structural reliance. These findings demonstrate that regional urban systems have become structurally digital-dependent. As digital transformation advances, operational reliance becomes increasingly centralized within digital coordination layers, intensifying cross-sector vulnerability to digital disruption. By introducing a probability-based dependency measurement framework into regional analysis, this study provides a structural foundation for assessing digital resilience across regions and for identifying territorially differentiated concentrations of digital vulnerability.

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Economic Disparities in Greek Regions in the Era of Technological Transition

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G06-2 Space, Digital Transformation and AI for Regional Implications, Auditorium 68 - South Building - Faculty of Philosophy, agosto 26, 2026, 17:00 - 19:00

Technological innovation constitutes a central driver of economic growth, productivity, and structural transformation in contemporary economies. In the context of the global digital transition, regions are confronted with both new development opportunities and intensified risks of spatial inequality. In Greece, digital transformation has accelerated in recent years, supported by national recovery strategies and European Union initiatives. However, its uneven regional diffusion has contributed to widening economic disparities, reflected in productivity levels, employment structures, and income distribution.

Despite notable policy efforts, Greece continues to lag behind the EU average in key digital performance indicators. Only 52.4% of the population possesses at least basic digital skills (EU average: 55.6%), while ICT specialists represent just 2.4% of total employment, compared to 4.8% at the EU level. In 2023, only 43.3% of Greek SMEs achieved basic digital intensity (EU average: 57.7%), and the adoption of advanced technologies such as artificial intelligence and cloud computing remains limited (Digital Decade 2024 Report). These shortcomings are geographically uneven and disproportionately affect rural and less densely populated regions, where infrastructure deficits and lower levels of human capital constrain participation in the digital economy.

Urban centers, particularly, the metropolitan Attica and the region of Thessaloniki, attract the majority of digital investment, innovation activity, skilled labour, reinforcing agglomeration economies and higher productivity growth (Digital Transformation in Greece 2024-2025). Conversely, peripheral regions characterized by weaker digital infrastructure, limited SME digitalisation, and structural economic vulnerabilities struggle to integrate into emerging digital value chains. As a result, technological transition risks reinforcing a dual spatial structure: dynamic metropolitan cores and lagging rural peripheries.

The study adopts a mixed analytical approach combining EU Digital Decade indicators, national digital performance reports, and regional economic data (GDP per capita, employment composition, sectoral structure) to examine the spatial dimensions of digital inequality in Greece. Comparative regional analysis highlights how variations in digital readiness interact with pre-existing economic structures to shape divergent development trajectories.

By situating the Greek case within the broader global challenge of digital transformation, this paper contributes to debates on territorial resilience and place-based policy in a transition era. It argues that technological innovation, while growth-enhancing, may exacerbate spatial inequalities unless accompanied by targeted regional strategies that strengthen digital infrastructure, expand digital skills, support SME digital upgrading, and foster inclusive innovation ecosystems.

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Industrial Clusters, Digital Transformation, and Returns to Labour: A Spatial Perspective

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G06-2 Space, Digital Transformation and AI for Regional Implications, Auditorium 68 - South Building - Faculty of Philosophy, agosto 26, 2026, 17:00 - 19:00

Digital transformation is increasingly reshaping regional economic performance, yet its effects remain spatially uneven and strongly conditioned by regional industrial structures. While firm-level studies often document productivity gains associated with technology adoption, less is known about how these processes translate into regional returns to labour. This paper examines how industrial clusters, digital transformation, and regional competitiveness interact to shape labour returns from a spatial perspective.

The analysis adopts a quantitative, descriptive, and exploratory approach based on a cross-sectional design. First, a cluster-mapping exercise is conducted using establishment-level data to identify the spatial distribution and intensity of industrial clusters across regions. This mapping reveals pronounced territorial heterogeneity in cluster presence and specialisation, indicating that agglomeration advantages are highly uneven across space.

Second, the paper combines cluster indicators with regional measures of digital transformation, competitiveness, and innovation to explore their relationship with returns to labour. The empirical analysis uses regional and NUTS-3 level data for Spain, combining establishment-based information on industrial activity with regional indicators of digital transformation, competitiveness, and labour outcomes. A multivariate modelling approach is employed to assess how digital adoption and regional competitiveness operate as complementary mechanisms linking industrial clustering to labour outcomes. The modelling strategy is intended to structure observed spatial relationships rather than to establish causal identification.

The findings suggest that industrial clusters are positively associated with regional returns to labour, but only where digital transformation and competitive conditions jointly enable the translation of agglomeration advantages into labour-market outcomes. Clustered regions lacking these complementary capacities exhibit substantially weaker returns to labour, despite comparable levels of industrial concentration.

The paper contributes to regional science by providing spatially explicit evidence on how industrial structure, digital transformation, and competitiveness jointly shape regional labour outcomes. From a policy perspective, the findings underscore the importance of place-based digital and industrial strategies that move beyond cluster promotion alone and address the complementary regional capacities required to generate inclusive economic returns.

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A Spatial Analysis of Personalized Pricing, Privacy Protection, and Market Competition

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G06-2 Space, Digital Transformation and AI for Regional Implications, Auditorium 68 - South Building - Faculty of Philosophy, agosto 26, 2026, 17:00 - 19:00

This study investigates how personalized pricing and privacy protection jointly influence spatial competition, welfare distribution, and market structure in data-driven oligopolistic markets. As digital technologies have reduced the cost of collecting and tracking consumer data, firms are increasingly able to tailor prices based on consumer characteristics or purchasing histories. At the same time, privacy regulations such as the EU's GDPR have begun to restrict the scope of data use, making the interaction between personalized pricing and privacy protection a central issue in both policy and industry practice.

We develop a spatial competition model featuring one firm with a data or brand advantage and multiple disadvantaged rivals. Only a subset of consumers are subject to personalized pricing, while others face uniform prices. This framework allows us to examine how the relaxation of privacy protection affects spatial competition equilibria, incentives for personalized pricing, social welfare, and the possibility of excess entry. The analysis is expected to reveal nonlinear competitive effects of privacy relaxation. The model will further be extended to allow disadvantaged firms to adopt personalized pricing, to endogenize the degree of personalization, to incorporate consumer privacy choices, network externalities, and elastic demand. The anticipated findings will contribute to the literatures on personalized pricing and spatial competition, highlight the implications of personalized pricing for consumer surplus, industry structure, and social welfare, and provide theoretical and policy insights for data-economy governance.

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The Impact of ICT on the Inclusiveness of Russian Regions (results of the project “Mirror Laboratories of HSE University”).

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G06-2 Space, Digital Transformation and AI for Regional Implications, Auditorium 68 - South Building - Faculty of Philosophy, agosto 26, 2026, 17:00 - 19:00

The identification of factors influencing inclusive economic growth is gaining prominence. This concept implies that the benefits of economic development are distributed more evenly among all segments of the population, reducing inequality and poverty. Information and communication technologies (ICT) are among such factors and are currently among the most rapidly developing ones. There are few studies devoted to identifying factors influencing the inclusive development of Russian regions (Barinova, Zemtsov, 2019; Mikheeva, 2022), and these studies do not focus on ICT.
The aim of this study is to determine the impact of ICT on the inclusiveness of Russian regions. We used data from 2014 to 2023 for 80 Russian regions. The inclusiveness indicator for Russian regions was calculated based on the following metrics: median household income, the Gini index, and the poverty rate.
The model incorporated variables representing the development of ICT in the region:
Computer — the share of households with a personal computer;
Internet — the share of households with internet access;
BroadInternet — the share of households with broadband internet access;
PopulInternet — the share of the population using the internet;
EverydayInternet — the share of the population using the internet daily or almost daily.
The models also included control variables characterizing the socio-economic status of the regions.
According to the results of global panel data models with fixed effects, the more developed a region's ICT is, the higher its level of inclusiveness; however, the proportion of households with a personal computer does not affect the level of inclusiveness. Because the influence of factors affecting inclusiveness may vary across regions, we also estimated a geographically weighted panel data regression.
The coefficients for all variables characterizing ICT, except for the Computer variable, were significant and positive. However, the estimates of local coefficients varied; thus, ICT increases the degree of inclusiveness of Russian regions, but not equally.
At the same time, the proportion of households with a personal computer can have both a positive and negative impact on the degree of inclusiveness. This issue requires further research. Perhaps personal computers are concentrated in the hands of the wealthy and educated, while socially vulnerable groups (rural populations, people with disabilities, the elderly) remain digital outsiders. In this case, despite a formally "high share," actual inclusivity does not increase and may even decline due to the widening gap between groups.

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Multi-criteria sustainability-based approach to optimising a high school location

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G07-1 Spatial Dimensions of Demographic Transition: (De)Population, Ageing, Loneliness and Wellbeing, Hall 1 - South Building, agosto 27, 2026, 09:00 - 10:30

The proper selection of a suitable school site is critical to ensure accessibility, social equity, and alignment with general sustainability objectives. This study uses the Spatial Navigation, Analysis, & Identification of Location (SNAIL) approach to analyse alternative sites for a new school and select the best one. The approach is a multicriteria framework that integrates geographic, environmental, and socioeconomic variables relevant to the placement of an educational facility. The analysis focuses on high schools in Karmiel, a medium-sized city in northern Israel. The findings of the study demonstrate that the SNAIL model helps identify a preferred location for a new school among several available alternatives, jointly considering accessibility, environmental quality, and societal equity, while providing a systematic and transparent assessment of available school sites.

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Associations Between Internet Use, Social Integration, and Emotional Well-Being in Older Adults: Evidence from SHARE

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G07-1 Spatial Dimensions of Demographic Transition: (De)Population, Ageing, Loneliness and Wellbeing, Hall 1 - South Building, agosto 27, 2026, 09:00 - 10:30

Background. Population ageing raises concerns about emotional well-being in later life, particularly loneliness and depressive symptoms. Digital connectivity and social integration may act as protective resources, but their associations can differ across older age groups. This study examines how recent internet use and levels of social integration relate to loneliness and clinically relevant depressive symptomatology among older adults.
Methods. We use the SHARE survey and analyse older adults wellbeing in three age groups (65–70, 71–80, and 80+). Emotional distress is measured through (i) depressive symptoms using EURO-D (EURO-D ≥ 4) and (ii) self-reported loneliness (binary). Logistic regressions are estimated separately by age group, reporting odds ratios (OR) with robust standard errors and 95% confidence intervals. Models adjust for gender, household income (log), and multimorbidity (≥2 chronic conditions), and include a four-level social integration index.
Results. In the analytical sample (≈65,000–69,000 observations depending on variable availability), 27.4% meet the EURO-D threshold for depressive symptoms and 47.5% report loneliness. Not using the internet in the last 7 days is associated with higher odds of depression, with stronger associations at older ages: OR=1.17 (65–70), OR=1.54 (71–80), and OR=1.43 (80+). For loneliness, non-use of the internet is also associated with higher odds: OR=1.26 (65–70), OR=1.15 (71–80), and OR=1.15 (80+). Social integration shows a strong gradient: compared with the lowest integration group, the highest integration level (4) is associated with substantially lower odds of loneliness—OR=0.38 (65–70), OR=0.38 (71–80), OR=0.33 (80+). For depression, higher integration is also protective (e.g., integration level 3: OR=0.65, 0.64, 0.53 across age groups). Multimorbidity is consistently associated with higher emotional distress (depression OR ≈ 2.11–2.29; loneliness OR ≈ 1.42–1.44).
Conclusions. Results indicate that both digital connectivity and social integration are robustly associated with lower emotional distress in later life, with particularly strong protective gradients for social integration and age-differentiated associations for internet use. Policies aimed at reducing the digital divide and strengthening meaningful social participation may contribute to healthier and more emotionally active ageing, especially among the oldest old and those with high morbidity burden.

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Generations in Search of a Home: Demographic Shifts and the Housing Gap Across Europe

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G07-1 Spatial Dimensions of Demographic Transition: (De)Population, Ageing, Loneliness and Wellbeing, Hall 1 - South Building, agosto 27, 2026, 09:00 - 10:30

The European housing crisis is increasingly becoming a driver of intergenerational inequality. As demographic shifts reshape the continent, the "housing gap" manifests differently across various age cohorts. This research provides a comparative analysis of housing accessibility and affordability for young adults (aged 18–34) versus the older population (65+). By examining the "Housing Cost Overburden Rate" and the "average age of leaving the parental household" across different European welfare regimes, the study identifies a growing divergence in housing security. While older generations often benefit from high homeownership rates and lower housing costs, younger cohorts are relegated to an increasingly expensive and precarious private rental sector. The results indicate that the housing gap acts as a demographic bottleneck, delaying family formation and labour mobility. The paper argues for a generational lens in housing policy to address the disproportionate burden carried by younger citizens in the face of structural housing shortages.

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The (low) productivity roots of Italy's fertility crisis

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G07-2 Spatial Dimensions of Demographic Transition: (De)Population, Ageing, Loneliness and Wellbeing, Hall 1 - South Building, agosto 27, 2026, 15:00 - 17:00

This study examines the relationship between local firm productivity and fertility outcomes in Italy, advancing the hypothesis that productivity is a key structural determinant of household economic security and, in turn, fertility decisions. Although the demographic literature extensively documents the role of economic uncertainty in explaining persistently low fertility rates (Comolli, 2017; Matysiak et al., 2021; Vignoli et al., 2020), the contribution of productivity to income adequacy, employment stability, and future expectations remains largely understudied. Leveraging a highly granular panel dataset of Italian municipalities over the period 2015–2022, the analysis investigates the association between local firm productivity and fertility rates, controlling for a comprehensive set of socio-economic, demographic, and territorial factors, including educational attainment, migration balances, housing costs, firm size distribution, sectoral specialization, and urban–peripheral gradients. To address endogeneity concerns and identify causal effects, the study adopts an instrumental variable strategy. Historical land suitability for wheat cultivation is exploited as an exogenous source of variation in contemporary productivity, reflecting long-run geographic and agronomic characteristics that shaped capital accumulation and local economic development, while remaining plausibly unrelated to current fertility behavior except through productivity. The results provide robust evidence that higher local productivity leads to significantly higher fertility rates. These findings challenge the conventional view of a trade-off between economic growth and social well-being, whereby resources devoted to competitiveness are assumed to detract from social protection, and vice versa. Instead, the analysis suggests that productivity-enhancing policies should be regarded as a core component of demographic and family policy, alongside more traditional welfare interventions.

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Ageing, human capital and growth

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G07-2 Spatial Dimensions of Demographic Transition: (De)Population, Ageing, Loneliness and Wellbeing, Hall 1 - South Building, agosto 27, 2026, 15:00 - 17:00

In this contribution, we propose a theoretical framework that highlights the role of human capital in mitigating the negative effects of an ageing population on long-run economic growth, particularly when a region is also experiencing significant immigration inflows. The analysis is conducted at the sub-national level to account for the spatial dimension of one of the keys (and expected) determinants of economic growth: migration. Available evidence confirms that migration inflows are territorially unequal, with immigrants tending to concentrate in specific areas due to network effects. Our theoretical model reinforces the idea that investment in human capital is a key driver of economic growth. However, it also suggests that large inflows of migrants into a region can reduce per capita investment in human capital, thereby negatively affecting that region's growth rate. An empirical application of this theoretical framework is presented for Spain at the NUTS2/NUTS3 level. Spain provides a relevant case study, as it has been one of the main recipients of immigrants since the 2000s and is also one of the European countries most affected by significant regional disparities in ageing.

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Subnational natural decrease across New Zealand territorial authorities and local boards, 1998-2043

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G07-2 Spatial Dimensions of Demographic Transition: (De)Population, Ageing, Loneliness and Wellbeing, Hall 1 - South Building, agosto 27, 2026, 15:00 - 17:00

Demographic trends in developed (and developing) countries have increasing tended towards higher life expectancy and lower fertility. A consequence of those long-run trends has been a rise in natural decrease (more deaths than births), which is increasingly a feature of national population change. However, trends at the national level can mask substantial subnational variation. In this paper, we investigate subnational trends in natural decrease for New Zealand, a country where national-level natural decrease has yet to commence. Specifically, we summarise past, present, and future natural decrease at the territorial authority and local board (TALB) level (n=87), covering the period from 1998 to 2023 and ahead to 2048. Over this fifty-year period, natural decrease becomes apparent in an increasing number and proportion of TALBs, initially concentrating in areas that are more remote and peripheral, but becoming a majority of al TALBs by the end of the period considered. Unsurprisingly, the prevalence of natural decrease is highly correlated with the degree of structural ageing of the population, with areas that have older populations systematically facing natural decrease. Despite these overall trends, some TALBs, particularly those that are urban and have large tertiary education institutions, maintain a structurally younger population and avoid natural decrease until at least 2048. These results demonstrate the importance of earlier work on subnational structural ageing, and reinforce that policymakers and other decision-makers should remain cognisant of the importance of subnational population ageing and subnational demographic trends more generally.

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Study on the Impact of Human Settlement Environment on Aging Health in Rural Areas Based on Gender Differences

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G07-2 Spatial Dimensions of Demographic Transition: (De)Population, Ageing, Loneliness and Wellbeing, Hall 1 - South Building, agosto 27, 2026, 15:00 - 17:00

Under the background of deepening aging in rural areas in China, how to realize healthy aging and promote healthy equity in rural areas are important issues that need to be paid attention to in the national strategy of responding to population aging actively in China. Based on the five rounds of China Family Panel Studies from 2010 to 2018, this paper empirically analyzes the impact of rural settlement environment on aging health in rural china from the perspective of gender differences by three-level linear development model. Overall, the health disadvantage of rural female elderly continues to accumulate over time. The rural settlement environment has a significant positive effect on the health of the elderly, which further demonstrates the important role of the environment in the theoretical framework of health promotion. It provides empirical evidence for promoting the improvement of rural infrastructure and ecological environment to improve the health level of the elderly in rural areas, so as to respond to the increasingly serious problem of population aging in rural areas with active and healthy rural actions. Additionally, due to physiological differences, gender division of labor, and aging-appropriate facilities without considering gender difference, the positive health effect of rural settlement environment has significant gender heterogeneity, which is specifically manifested in that the positive effect of rural settlement environment on the health of male elderly people is more significant than that of female elderly people. From the perspective of cross-layer interaction of multidimensional factors, the rural settlement environment can significantly narrow the gender difference in health of rural elderly. This finding not only indicates that elderly health in rural areas is the result of both internal individual factors and various macro external environmental elements working together, but also suggests that the rural living environment has the potential to mitigate gender inequalities in elderly health caused by differences in socioeconomic factors among individuals. And thus provides valuable insights for how to solve the problem of health inequality among the elderly from the perspective of public policies. The above findings of this paper provide empirical evidences and policy implications for improving the supply of health public services and products such as rural living environment and gender-friendly and aging-friendly environmental facilities, so as to realize healthy aging in rural areas and narrow health inequality among the elderly.

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Dynamic Urbanistics Research Field: Trends in Population Change and Status of Urban Settlements in Russia (results of the project “International Academic Cooperation of HSE University”)

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G07-2 Spatial Dimensions of Demographic Transition: (De)Population, Ageing, Loneliness and Wellbeing, Hall 1 - South Building, agosto 27, 2026, 15:00 - 17:00

This paper introduces dynamic urbanistics as a distinct field of inquiry focused on the analysis of sudden, spatially differentiated shifts in urban population size and administrative status. Drawing on a newly compiled dataset that integrates all Soviet and Russian population censuses from 1970 to 2021, the study tracks inter-censal growth and decline rates for every urban settlement—cities, urban-type settlements (PGT), and workers’ settlements—while documenting changes in their legal status. Percentage changes were calculated for each inter-censal interval, revealing both long-term trajectories and abrupt turning points.

Theoretically, the research engages with and critiques the differential urbanization model developed by Gibbs, Geyer, and Kontuly. While that framework usefully describes successive stages of concentration, suburbanisation, and reurbanisation in mature market economies, it proves inadequate for the Russian case. The Soviet legacy of centrally directed industrialisation, combined with the abrupt imposition of market logic after 1991, produced patterns that do not align with Western sequences. The paper therefore proposes dynamic urbanistics as a more context-sensitive approach that foregrounds institutional rupture, state-orchestrated frontier development, and the selective operation of market signals.

Empirical analysis distinguishes two broad periods. In the 1970s, virtually all urban settlements expanded, driven by the third stage of the demographic transition and massive state investment in Siberian and Far Eastern “frontier” towns such as Nadym and Neryungri. By the 2010s–2020s, growth had become sharply polarised. Agglomerative expansion around Moscow and St Petersburg transformed former rural villages into urban satellites (for example, Murino’s population surged past 116,000). Climate-driven migration swelled settlements in Krasnodar Krai and Kaliningrad Oblast, while hydrocarbon regions in Yamalo-Nenets and Khanty-Mansi autonomous okrugs continued to attract labour. Innovative private initiatives, such as the IT-focused Innopolis and the fully market-driven Dobrograd, illustrate new forms of urban creation.

Conversely, hundreds of mono-industrial PGTs (urban-type settelments) and northern towns experienced catastrophic contraction. The “vacuum cleaner” effect drained labour from the near periphery of the two capitals, while the end of northern benefits and the shift to fly-in/fly-out operations emptied settlements across Magadan Oblast and Chukotka. The study concludes that Russia’s post-Soviet transition did not merely accelerate existing cycles; it generated a structurally new geography of urban viability. By highlighting the decisive role of institutional legacies and market selectivity, the paper lays the groundwork for a revised theoretical model better suited to transitional and post-socialist contexts.

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Mobility, Well-Being and Active Ageing: The Role of Local Public Transport for Older Adults in Italy

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G07-3 Spatial Dimensions of Demographic Transition: (De)Population, Ageing, Loneliness and Wellbeing, Hall 1 - South Building, agosto 27, 2026, 17:30 - 19:30

The progressive ageing of the global population has led to a growing interest in the mobility and transport needs of older adults within academic research (de Magalhães, 2025). Since mobility and social interaction are key determinants of psychological well-being in later life, transport planning should increasingly focus on services and environments that align with elderly people's travel behaviours and capabilities (Mariotti et al., 2021). Empirical studies confirm that maintaining an active lifestyle is associated with higher levels of well-being among older adults compared to more sedentary individuals (Thaithatkul et al., 2022). A substantial body of literature has investigated the factors shaping elderly users' satisfaction with local public transport (LPT). Service-related aspects such as punctuality, driver behaviour, complaint management, and the provision of audio information at stops have been identified as particularly relevant (Lan et al., 2022). In addition, several studies underline the importance of the surrounding walking environment, highlighting barriers such as poor sidewalk conditions (Močnik et al., 2022), the presence of roadworks along access routes to stops (Sun and Lau, 2021), and insufficient last-mile connectivity between homes and public transport services (Jahangir et al., 2022). Despite these contributions, the emotional and psychological dimensions of public transport use among older adults remain largely overlooked. This paper seeks to address this gap by exploring the relationship between LPT, mobility constraints, and life satisfaction. To this end, a questionnaire survey was administered to elderly residents living in four selected neighbourhoods in Milan and Genoa, with the objective of identifying perceived obstacles to public transport use and assessing their impact on overall well-being. The analysis combines descriptive statistics with non-linear econometric models. The expected results aim to provide policymakers and transport authorities with more detailed and targeted evidence, encouraging a shift away from aggregate approaches to public transport planning. Recognising the heterogeneity of mobility needs across age groups is particularly crucial for older adults, who require improved access to LPT and urban services in order to support active ageing and social inclusion.

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Enhancing Subjective Well-being in a Super-aging and Solitary Society: Insights from Household and Mobility Analysis

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G07-3 Spatial Dimensions of Demographic Transition: (De)Population, Ageing, Loneliness and Wellbeing, Hall 1 - South Building, agosto 27, 2026, 17:30 - 19:30

Phrases “increase in unmarried rate” and “high mortality society” have got attention in recent years in Japan. These trends mean that the number of older individuals living in single-person households will grow and will be increased vulnerability from the viewpoint of lose means of transportation in the future. These situations indicate that Japan is moving from a “super-aging society” to a “super-aging and solitary society”. Even under such difficult circumstances, it is necessary to implement sustainable regional development. Based on these backgrounds, this study especially focused on the issue of "means of transportation" which is already one of a major issue in the super-aging society among the issues predicted to arise in a super-aging and solitary society. This study clarifies the issues of “super-aging and solitary society” based on the analysis that subjective well-being (SWB) as an objective variable and focused on household structure and transportation attributes. The subject of this study set Abashiri city in Hokkaido prefecture where is a region with challenges related to aging and population decline. This study used datasets based on questionnaire survey for Abashiri city inhabitants in 2022. The analysis results revealed that the SWB of older individuals living in single-person households is statistically significantly lower than couple household and household with children. The analysis result also revealed that the SWB of lose means of transportation household is statistically significantly lower than other households. Moreover, this study utilized quantification theory type I to set SWB as the objective variable and to analyzed the category scores of household composition and transportation attributes. Based on these category scores, this study carried out a simulation analysis on SWB. In addition, this study conducted a future simulation analysis of total amount of SWB in Abashiri city based on the category scores as well as future estimated results of the lifetime unmarried rate and mortality rate. The simulation analysis result revealed that decline SWB overall Abashiri city caused by an increase in older individuals living in single-person households with poor means of transportation. On the other hand, it was suggested that in cases of public transportation and other services were increased, it may be possible to maintain or increase the SWB of overall Abashiri city.

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Age-Friendly City Typologies and Trajectories based on Older Adults' Migration Types

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G07-3 Spatial Dimensions of Demographic Transition: (De)Population, Ageing, Loneliness and Wellbeing, Hall 1 - South Building, agosto 27, 2026, 17:30 - 19:30

As population ageing intensifies, age-friendly cities and Ageing-in-Place (AIP) have become central to regional policy and urban planning. Yet treating AIP as a simple goal of preventing migration risks overlooks how older adults' migration and non-migration reflect needs, choices, constraints, and place-based differences in social connectedness, service accessibility, and heat risk. This study classifies 229 si-gun-gu in South Korea using the composition of older adults' migration types as a core structural indicator and identifies how regional functions evolve over time. Using the 20 percent sample of the Population and Housing Census, we compute, for each si-gun-gu, the shares of older adults by five migration types derived from residential histories across four time points: non-migration, initial migration, return to birthplace, return to a non-birthplace previously lived in, and onward migration. We integrate these shares with three policy-relevant context dimensions: Economic, Environmental and Built (including heatwave days and tropical-night days), and Social and Service. A Self-Organizing Map (SOM) is employed to classify multi-dimensional regional profiles and trace cluster transitions as regional trajectories. To support the interpretation of current context combinations, we additionally construct a 2020 RGB indicator that maps the three dimensions to R, G, and B channels. Results show five stable regional types and four representative trajectories: Stable AIP Lock-in, Urban Absorber with Initial Migration, Return Migration Reinforcement, and Circular or Transient Gateway. The types differ not only in migration-type composition but also in how heat exposure and service foundations co-occur. The RGB profiles highlight, for example, that Stable AIP Lock-in regions tend to combine relatively weak Social and Service foundations with relatively high Environmental and Built contributions, whereas Urban Absorbers exhibit strong Economic and Social and Service capacity, with heat exposure often coexisting. These findings imply differentiated policy priorities: integrated neighborhood-based interventions for lock-in regions, proactive heat adaptation and service capacity for absorbers, strengthened re-settlement absorptive capacity for return regions, and continuity-oriented service design for gateway regions.

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Do nature environments reduce mental health inequality in a super-aging society? Evidence from South Korea

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G07-3 Spatial Dimensions of Demographic Transition: (De)Population, Ageing, Loneliness and Wellbeing, Hall 1 - South Building, agosto 27, 2026, 17:30 - 19:30

South Korea is experiencing one of the most rapid demographic transitions globally, characterized by accelerated population aging and persistently low fertility rates. As a result, the proportion of older adults is increasing sharply, particularly in rural and shrinking regions that are transitioning into super-aged societies. Alongside these demographic shifts, a growing body of research has documented elevated risks of depression, social isolation, and poor mental health outcomes among older populations. At the same time, strong capital-area concentration has intensified spatial inequalities in access to services, infrastructure, and environmental resources, further shaping regional health disparities. Within this context, nature environments have been consistently shown to produce positive mental health outcomes. Importantly, the concept of the equigenesis effect suggests that such benefits may be disproportionately concentrated among socioeconomically vulnerable populations, thereby reducing health inequalities rather than simply improving average health levels.

This study aims to examine whether the equigenesis effect of nature environments on mental health operates differently between super-aged regions and non-super-aged regions in South Korea. Specifically, we investigate whether nature environments mitigate mental health inequalities among older adults through distinct mechanisms depending on regional demographic and spatial contexts. Using nationally representative regional data, we apply quantile regression models to assess how nature environment exposure influences different points of the mental health distribution, with a focus on lower quantiles representing more vulnerable populations.

We hypothesize that in super-aged regions, nature environments primarily reduce mental health inequality by enhancing social connectedness and compensating for service accessibility limitations, whereas in non-super-aged or metropolitan regions, their effects may operate more through environmental stress reduction pathways such as heat mitigation, air quality improvement, and opportunities for physical activity. We expect to find stronger equigenesis effects at lower mental health quantiles in super-aged regions, indicating greater benefits among the most vulnerable older adults. By integrating demographic transition, spatial inequality, and environmental health perspectives, this study provides policy-relevant evidence for designing targeted nature-based interventions to reduce mental health inequalities in rapidly aging societies.

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The effects of air pollution on educational outcomes: A natural experiment from the GDR

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G08-1 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 26, 2026, 11:00 - 13:00

This paper studies the short-run and early-career effects of sustained air-pollution exposure during a critical phase of human-capital formation. I exploit a natural experiment generated by the 1982 Soviet oil supply cut to the German Democratic Republic (GDR), which forced the East German regime to substitute imported oil with heavily polluting domestic lignite. The resulting increase in sulfur dioxide (SO_2) pollution was spatially concentrated around lignite-mining and lignite-based energy regions. At the same time, the GDR's authoritarian institutions strongly limited residential mobility, school choice, and private avoidance behavior, substantially reducing concerns about endogenous sorting.

The empirical analysis proceeds in three steps. First, I document the environmental first stage using newly digitized historical air-quality monitoring data and a county-level panel. Counties located within 60 km of active lignite mining sites experienced a sharp and persistent increase in ambient SO_2 concentrations after 1982. Difference-in-differences estimates imply an increase of about 28.8 $\mu g/m^3$ (roughly 20 percent relative to pre-shock levels), with no evidence of differential pre-trends. Placebo tests and alternative treatment thresholds confirm the robustness of the pollution effect.

Second, I examine short-run educational outcomes using individual-level university application records from the GDR's centralized admissions system, which include transcript grades and study preferences. Linking applicants' school locations to regional pollution exposure, I estimate a difference-in-differences model with rich fixed effects and student controls. Students in more exposed regions experienced a statistically significant deterioration in transcript grades after 1982. The preferred estimate corresponds to about 0.03 grade points (approximately 0.05 standard deviations), with stronger effects in cognitively demanding subjects—especially mathematics and the natural sciences—and larger impacts for male students.

Third, I study early labor-market and tertiary-track outcomes using administrative employment records from the GDR's GAV register. Cohort-based difference-in-differences estimates show that exposed Abitur cohorts were less likely to enter or complete tertiary education and less likely to enter occupations associated with academic qualifications. The estimated reductions are economically meaningful (about 2.6–2.7 percentage points for tertiary-track outcomes and about 1 percentage point for academic occupations).

Overall, the findings show that a policy-induced pollution shock during late adolescence can generate persistent losses in educational performance and early occupational sorting, highlighting the long-run human-capital costs of environmental degradation in settings with limited scope for behavioral adjustment.

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Disentangling the Heterogeneous Effects of Climate Shocks and Conflict Exposure on Child Malnutrition

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G08-1 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 26, 2026, 11:00 - 13:00

Child malnutrition remains a persistent public health challenge in low-and middle-income countries, driven by complex and spatially uneven environmental and socio-political stressors. This study examines the spatially heterogeneous effects of climate variability and conflict exposure on childhood malnutrition in Pakistan focusing primarily on stunting using high-resolution gridded data from 2001 to 2019. By integrating satellite-derived climate indicators, geolocated conflict events, and socioeconomic covariates, we employ a suite of spatially explicit modelling approaches including Geographically Weighted Regression (GWR), Multiscale GWR (MGWR), and Mixed GWR. Results indicate that the impacts of climatic shocks especially drought intensity and extreme precipitation are highly location-dependent and operate at different spatial scales. Conflict exposure further intensifies these adverse effects in vulnerable and socioeconomically deprived regions, with MGWR revealing stronger fine-scale variations compared to traditional GWR. Mixed GWR identifies a combination of global drivers (e.g., long-term socioeconomic deprivation) and locally varying predictors (e.g., seasonal drought anomalies and conflict proximity). Collectively, the findings highlight substantial spatial heterogeneity in the determinants of child malnutrition and demonstrate that ignoring local variations can mask critical pockets of vulnerability. This study provides a nuanced understanding of how climate and conflict interact across space to influence child health outcomes. The results underscore the need for spatially tailored and multisectoral policy interventions that address both environmental and political fragility to effectively reduce child malnutrition.

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Adolescent Flood Exposure and Life-Course Cognitive Adaptation: Implications for Climate Resilience in China

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G08-1 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 26, 2026, 11:00 - 13:00

Objective: As climate-related disasters become more frequent and severe, understanding their long-term implications for adaptive capacity is increasingly important. This study examines whether adolescent exposure to flood events is associated with life-course cognitive adaptation in later adulthood and considers the broader implications for climate resilience in China, where flood risks are spatially uneven and regionally concentrated.
Methods: We used five waves (2011–2020) of the China Health and Retirement Longitudinal Study (N = 10,321; age 45+). Retrospective reports of adolescent flood exposure were linked to subsequent cognitive performance. Group-based trajectory modeling identified heterogeneous cognitive trajectories over time. Multinomial logistic regression estimated associations between flood exposure and trajectory membership, adjusting for sociodemographic and baseline health characteristics. Inverse probability weighting addressed potential bias from differential survival and attrition. Mediation analyses assessed adult social participation, health behaviors, and intergenerational ties.
Results: Three cognitive trajectories were identified: low-stable (22.6%), moderate-decline (43.0%), and high-stable (34.4%). Light and moderate adolescent flood exposure were associated with a higher likelihood of membership in the moderate-decline and high-stable trajectories relative to the low-stable group. Inverse probability–weighted estimates were consistent. Adult social participation accounted for a modest share of the association (approximately 5–8%), whereas health behaviors and intergenerational ties showed no significant mediation.
Conclusions: Findings suggest that manageable early-life environmental adversity may be associated with stronger long-term cognitive adaptation. Given the geographically concentrated nature of flood exposure in China, these results underscore how spatially differentiated climate risks may contribute to uneven distributions of adaptive human capacities across regions. Understanding such life-course consequences is essential for informing place-based climate resilience strategies.
Keywords: flood exposure; cognitive adaptation; life-course trajectories; climate resilience; regional heterogeneity; China

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Hydrological Disasters and Learning Losses in Brazil

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G08-1 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 26, 2026, 11:00 - 13:00

This study provides the first comprehensive evidence on how hydrological disasters in recent years have affected elementary education outcomes in Brazil, combining innovative data construction with modern causal inference techniques. Using nationally representative administrative records, the analysis links municipal disaster notifications from the Integrated Disaster Information System (S2ID) to both aggregate and individual-level performance data from the Basic Education Assessment System (SAEB) for the period 2013–2017. Two complementary empirical strategies are employed: a municipality-level panel estimated with the staggered difference-in-differences methodology of Callaway and Sant'Anna (2021), and a novel individual-level pseudo-panel built through probabilistic matching and corrected for attrition using inverse probability weighting.
The results show that hydrological disasters significantly reduce student proficiency in Portuguese and Mathematics for 5th-grade students, with effects that persist over the medium run. The impacts are particularly pronounced in the South and Southeast regions, where the frequency and intensity of hydrological events are highest. Crucially, the individual-level analysis reveals learning losses that are substantially larger than those suggested by municipality-level averages, indicating that aggregate models underestimate the true magnitude of disaster-induced educational harm.
The study also uncovers important heterogeneous effects. Boys experience greater losses in Mathematics, girls in Portuguese, and white students show the largest absolute declines across both subjects. Despite these substantial drops, the relative performance gaps between social groups remain largely unchanged. This pattern is consistent with evidence that students with higher baseline achievement levels may experience larger absolute learning losses when exposed to educational shocks, while structurally disadvantaged groups—already constrained by chronic inequalities—exhibit more limited margins for further deterioration.
By combining high-frequency disaster data with standardized learning measurements and rigorous quasi-experimental methods, this research advances the literature on climate shocks and human capital in several ways. It is the first study in Brazil to estimate heterogeneous disaster effects using individual-level educational data and demonstrates the value of integrating staggered DiD estimators with pseudo-panel methods to uncover impacts that would otherwise remain concealed. The findings highlight hydrological disasters as significant drivers of learning inequalities and reinforce the urgency of targeted policies—such as remedial instruction, psychosocial support, and resilient school infrastructure—to protect educational trajectories in a context of increasing climate-related risk.
By documenting how exposure to hydrological events impairs learning and disproportionately affects specific demographic groups, the research provides actionable evidence to inform more equitable and climate-resilient education policies.

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Greenhouse Gas Emissions In European Regions: Spatial Spillovers Within The Environmental Kuznets Curve

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G08-2 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 26, 2026, 17:00 - 19:00

Empirical research on the Environmental Kuznets Curve (EKC), which points at a systematic relationship between economic activity and environmental degradation, often characterized by an inverted U shape, still leaves important gaps, particularly regarding spatial interdependence and within-country heterogeneity. In this conxtex, the main objective of this paper is to find evidence of the existence and evolution of an ECK relartionship and its spatial effects for the regions of the European Union, (NUTS 2), assessing the extent to which emissions display spatial spillovers across neighboring territories in the period 2014-2023.The level of disaggregation of the NUTS 2 region allows for a more efficient capture of regional characteristics compared to models that use data for countries. By incorporating spatial effects into the estimated econometric models, it is possible to observe the neighborhood effects of pollution and the socioeconomic characteristics of the regions. Thus, it is important to add to the econometric models of the EKC the effects of the spread of environmental impacts in areas close to the polluting region using spatial econometrics to try to capture the spillovers of environmental damage by including spatial dependencies and relaxing the assumption of homogeneity of the EKC. So, the methodology used was panel data with spatial effects. The dependent variable is greenhouse gas emissions measured in CO_2 equivalents. Explanatory variables include, among others, the usual GDP per capita and population, but also considers the role of agriculture, industry, and construction, as well as the regional orientation to high-technological sectors. The results support the presence of an inverted U-shaped EKC and reveal statistically significant spatial effects, indicating a positive relationship between the level of GHG emissions in neighboring regions and a positive spatial effect of technology on pollution reduction in these areas. Some policy-relevant extensions of the model have been also explored. For instance, the study of policy and energy variables such as exposure to regional and national environmental regulation, renewable penetration, energy intensity, and the regional electricity mix could help to identify specific policy drivers of decarbonisation rather than only relying on income correlations. Moreover, introducing heterogeneity through regional “clubs” will test whether the EKC shape and the turning point differ across industrial, rural, and highly urbanised regions, supporting differentiated, place-based policies.

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The Ripple Effects of Drought: How Climate Change is Transforming Brazil’s Wheat Production, Imports and Food Security

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G08-2 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 26, 2026, 17:00 - 19:00

Climate change is intensifying extreme weather events globally, with Brazil experiencing its worst drought since 1950. Nearly 60\% of its territory is affected, creating major challenges for agriculture and trade. This paper examines the impact of past droughts on Brazil’s wheat production and global imports. While wheat is less dominant than soybeans or corn, it is essential for food security, hence it is largely imported and increasingly cultivated in Paraná, Rio Grande do Sul, and Santa Catarina. Yet, it remains understudied compared to the other two crops. The research employs the innovative endogenous network difference-in-differences (DID) method developed by the PIs, which captures both direct and indirect drought effects on trade networks. Unlike conventional DID approaches, this method accounts for spillover impacts on trade partners, providing deeper insights into global trade dynamics and adaptation. In line with the IPCC’s call for research on climate-driven agricultural changes, the paper fosters international collaboration between Prof. Dall’erba and Prof. Chagas and supports interdisciplinary graduate training. Findings will inform adaptation policies, strengthen food security, and highlight the need for global cooperation in addressing climate impacts. All data and codes will be openly shared to ensure transparency and reproducibility, contributing to sustainable agricultural solutions worldwide.

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An analysis of interactions between polluting and non-polluting sectors for the Brazilian economy

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G08-2 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 26, 2026, 17:00 - 19:00

Brazil is among the world's largest producers and exporters of agricultural commodities—such as soybeans, corn, cotton, coffee, sugar, orange juice, beef, and poultry—as well as forest products, especially pulp. These activities are key drivers of economic and social development across multiple regions, and the sectors of Agriculture, Livestock, Forestry Production, Fishing, and Aquaculture are central to the Brazilian economy. They are estimated to contribute directly about 7% of Brazil's Gross Domestic Product (GDP) and to account for approximately R$72 billion in exports (IBGE, 2024; Brazil, MDIC, 2024). Despite their economic relevance, these sectors are also responsible for a substantial share of Brazil's greenhouse gas (GHG) emissions, largely due to deforestation, land conversion, and burning of native vegetation. In recent years, agricultural activities have accounted for around 30% of national GHG emissions, while land use, land-use change, and forestry (LULUCF) have represented roughly 40% of national emissions—much of which is associated with agriculture-related activities (SIRENE/MCTI, 2025).

Brazil's manufacturing industry also plays a pivotal role in the national economy, representing about 15.3% of GDP (CNI, 2024a) and contributing 46% of Brazil's exports of goods and services. It is a major employer, accounting for approximately 14.7% of formal jobs (CNI, 2024a), and is therefore critical both for job creation and for sustaining long-term economic growth. The diversity and complexity of Brazilian manufacturing strengthen Brazil's relevance in global supply chains. Activities classified under CNAE Section C have traditionally relied heavily on fossil fuels, implying substantial decarbonization potential. This potential can be realized through fuel switching toward renewable energy sources—such as bioenergy and biofuels—as well as through the adoption of new technologies and the electrification of production processes.

Drawing on the Green Taxonomy framework, which classifies Brazilian productive sectors according to climate vulnerability and adaptive capacity, this study combines the sectoral relevance of Brazil's economy with an input–output matrix calibrated to 2019 and emissions-intensity vectors for 68 productive sectors. This approach highlights the interdependence between high- and low-emitting sectors and enables an assessment—through intersectoral linkages—of the direct and indirect impacts, as well as external effects, associated with sectoral emissions in the Brazilian economy.

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Exploring the Impacts of Climate Change and Biocapacity on Agriculture Value Added: Novel Evidence from Africa

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G08-2 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 26, 2026, 17:00 - 19:00

Economies in Africa are often characterized as natural-resource dependent and most susceptible to climate change; they also face drastic depletion of their biocapacity. Climate change and biocapacity depletion jointly affects the level of value added to agriculture, fishing and forestry. However, studies documenting the impact of climate change and biocapacity on agriculture value added are rare. In this study, we assessed the impact of climate change and biocapacity on agriculture fishing and forestry value-added in 38 African countries over 15-years span. We applied several estimation techniques including the pooled group mean and dynamic fixed effects panel autoregressive distributed lag (PARDL) simulations, with data from 2006 to 2020. Results show that precipitation, temperature, agricultural employment, and gross fixed capital formation significantly increase value added in the long and short term, whereas biocapacity exhibits a negative relationship, implying unsustainable use of natural capital. The result indicates stronger long-term impacts of rainfall and temperature since production could be well planned with better weather predictability in the long run. The findings highlight the intricate balance between economic growth and ecological limits in Africa's primary sectors. By integrating biocapacity into the climate–growth nexus, the study provides novel empirical evidence that strengthens the ecological economics discourse and offers practical guidance for promoting climate-resilient and environmentally sustainable agricultural development in Africa.

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To Participate or Not to Participate in Air Pollution Decision-Making? A study on the factors underlying the willingness to be engaged among the residents of Porto, Port

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G08-3 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 27, 2026, 15:00 - 17:00

Air pollution is widely recognised as one of the most pressing environmental and public health challenges of our time. It contributes significantly to premature mortality, chronic disease, and reduced quality of life, particularly in urban areas. Globally, air pollution is responsible for approximately seven million deaths each year and is considered the most significant environmental health risk in Europe. The intensification of air pollution is associated with a broad set of structural and socioeconomic factors, including patterns of production and consumption, urbanisation processes, mobility systems, and industrial activity, all of which contribute to increased pollutant concentrations, especially in densely populated areas. Although the relationship between air pollution and contemporary lifestyles is well documented, alongside substantial advances in air pollution monitoring technologies, modelling techniques, and regulatory frameworks, limited attention has been devoted to social perceptions, everyday practices, and citizens' willingness to participate in air-quality-related decision-making, particularly at the local level.
Against this backdrop, this study aims to analyse residents' willingness to participate in local decision-making processes on air pollution in two parishes of the Metropolitan Area of Porto (MAP), Portugal: Campanhã (municipality of Porto) and Rio Mau (municipality of Penafiel. Drawing on survey data collected from 1,205 residents, the study examines how social perceptions of air pollution, socioeconomic vulnerabilities, sociodemographic characteristics, and health exposure inequalities shape respondents' willingness to engage in participatory governance.
Results demonstrate that willingness to participate in air pollution-related decision-making is not evenly distributed across the population but is strongly shaped by socioeconomic condition, age, place of residence, and perceptions of pollution. Individuals who express greater awareness of health impacts, environmental inequalities, and the broader societal consequences of air pollution are significantly more inclined to engage in governance processes. In contrast, those who perceive pollution as distant, stable, or primarily the responsibility of governmental authorities, tend to remain disengaged. These findings highlight the central role of social perceptions and lived experiences in shaping civic engagement, reinforcing the argument that environmental governance cannot be detached from questions of social vulnerability, knowledge access, and everyday practices.

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Can EU Cohesion Policy Prevent Climate-Induced Regional Divergence? Evaluating Climate-Adjusted Fiscal Transfers in a Dynamic Multi-Regional CGE Model.

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G08-3 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 27, 2026, 15:00 - 17:00

Climate change is increasingly recognised not only as an environmental threat but as a structural risk to macroeconomic development. Recent research shows that physical climate damages propagate through highly interconnected inter-sectoral and inter-regional trade networks, generating indirect effects that substantially exceed localised asset losses. Nowhere is this risk more institutionally consequential than in the European Union (EU), which combines deep economic integration with an explicit commitment to territorial cohesion. Yet climate hazards across Europe are spatially concentrated, raising a fundamental question: can Europe's fiscal architecture prevent physical climate risk from becoming a persistent driver of regional divergence?

In prior work, we developed a dynamic multi-regional computable general equilibrium (CGE) model disaggregated to 234 NUTS-2 regions to quantify the economy-wide effects of sea-level rise and river flooding. Bottom-up estimates of direct capital destruction were propagated through interregional trade, capital mobility, and sectoral linkages to generate projections to 2100. We found that climate-induced flooding acts as a strongly divergent force: under a 3°C warming scenario, GDP losses in the most affected regions approach 51% by century's end. Lower-income regions are disproportionately exposed, leading to rising inequality both within and between member states.

These findings challenge the EU's regional convergence objectives. Although substantial cross-regional transfers are embedded within the EU budget framework, allocations remain largely income-based and only indirectly responsive to physical climate exposure.

This paper extends our CGE framework to explicitly model EU fiscal transfers under escalating climate hazards. We compare the current income-based allocation structure with alternative transfer rules that condition support on realised climate damages or forward-looking exposure indicators. Our central contribution is to quantify how alternative fiscal architectures shape the long-run distributional and macroeconomic consequences of climate risk across European regions.

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Mechanisms of widening inequality in regional carbon neutrality planning: focusing on planners' bounded rationality

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G08-3 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 27, 2026, 15:00 - 17:00

The mismatch between carbon emissions and mitigation responsibility impedes carbon neutrality and sustainable development. This study defines regional carbon inequality as a spatial mismatch between emissions and burdens, where specific regions monopolize economic benefits from emissions while others bear disproportionate mitigation burdens. Such inequality hinders long-term national carbon neutrality by causing resource misallocation, negative externalities, and carbon lock-in. Although regional planners recognize this inequality and attempt to resolve it, they face bounded rationality constraints, including information asymmetry, cognitive limitations, and organizational inertia. Consequently, these decision-making patterns risk solidifying or intensifying carbon inequality rather than resolving it. However, existing studies focus primarily on quantitative emission gaps, neglecting the underlying cognitive and behavioral mechanisms from a bounded rationality perspective. Accordingly, this study empirically analyzes regional carbon inequality and identifies underlying mechanisms using a mixed-methods approach. The analysis covers 229 South Korean municipalities from 2010 to 2023. First, the quantitative phase employs panel stochastic frontier analysis (SFA) to measure carbon emission efficiency. The model incorporates labor, capital, and energy consumption as inputs, with gross regional product and carbon emissions as outputs. Subsequently, Blinder-Oaxaca decomposition identifies the drivers of the carbon intensity gap between the top 20% (high-efficiency) and bottom 20% (low-efficiency) groups. The qualitative phase aims to figure out the mechanisms of widening carbon inequality based on the theory of planners' bounded rationality. To this end, 90 carbon neutrality-related planning documents were selected from the high-efficiency and low-efficiency groups. SFA results indicate an approximate 63% gap in average carbon emission efficiency between the two groups. Blinder-Oaxaca decomposition reveals that the unexplained component accounts for approximately 43% of the carbon intensity gap, suggesting disparities in regional policy levels and planning capabilities. Grounded theory analysis shows that low-efficiency regions adopt satisficing strategies, failing to devise independent solutions to external constraints. Specifically, these regions uncritically imitate high-tech technologies from leading cities without considering local contexts or fill plans with rhetorical declarations lacking concrete implementation measures. In conclusion, regional carbon inequality stems not only from exogenous resource deficits but also from endogenous factors, including planning capacity. Achieving carbon neutrality therefore requires policy support to supplement the insufficient planning capacity of lagging regions.

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Climate Change, Event Geography and Regional Impacts: Evidence from Professional Cycling

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G08-3 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 27, 2026, 15:00 - 17:00

This paper examines how climate change affects the geography of professional road cycling events in France. Using an original dataset combining annual climate indicators and the historical distribution of stage starts and finishes for the Tour de France, Paris–Nice, Paris–Roubaix, and the Critérium du Dauphiné between 2000 and 2025, the study evaluates whether long-term climatic conditions or short-term temperature extremes influence the selection of host cities. Descriptive analyses reveal a clear upward trend in average and maximum temperatures, alongside an intensification of heatwave episodes. However, cross-sectional regressions show that long-term climate variables do not explain the spatial distribution of starts and finishes, which remains strongly shaped by historical, institutional, and logistical factors. Poisson models confirm that annual temperature variations and extreme heat events have not yet significantly altered the geography of major races. These findings suggest that, while climate change is already transforming the environmental context of professional cycling, it has not yet reconfigured the territorial structure of events. Nevertheless, the increasing frequency of extreme temperatures poses significant challenges for local authorities, organizers, and tourism stakeholders. They will increasingly need to integrate climate adaptation into event planning, infrastructure investment, and territorial development strategies.

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Distributional impacts of climate change between and within EU regions

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G08-3 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 27, 2026, 15:00 - 17:00

Climate change is expected to generate substantial economic damages, but these impacts are highly uneven across space and agents, raising concerns about the amplification of economic inequality. While existing Integrated Assessment Models (IAMs) capture aggregate and regional average effects, they largely abstract from within-region heterogeneity and from key adaptation mechanisms such as trade, migration, and sectoral reallocation.
This paper investigates the aggregate and distributional impacts of climate change across European regions, focusing on the interaction between localized climate damages and endogenous economic adjustment. We extend a multi-regional agent-based Integrated Assessment Model of the MATRIX family to include four European macro-regions calibrated on national data, linked through endogenous trade and migration flows within a common currency area. Climate damages enter through region- and sector-specific micro-level shocks derived from the JRC-PESETA IV database under alternative IPCC AR6 temperature scenarios. Weather-related shocks affect households' human capital, firms' productivity, and physical capital stocks via stochastic exposure and damage processes, generating heterogeneous impacts at the agent level.
We conduct three sets of simulation experiments. First, we quantify regional GDP and inequality effects under five warming scenarios ranging from +1.6°C to +4.4°C. Second, we decompose aggregate losses into contributions from human capital, productivity, and physical capital damage channels. Third, we assess the role of endogenous adaptation by comparing the baseline economy with counterfactual scenarios in which inter-regional trade or migration is shut down.
Our results show that climate change substantially amplifies regional inequality within the European Union. Under a +4.4°C scenario, GDP losses range from approximately −3.6% in Central Europe to nearly −9% in Eastern Europe. Damage transmission mechanisms differ markedly across regions: capital destruction from floods dominates in the East, heat-related human capital losses are most severe in the South, and productivity disruptions from droughts and storms are most relevant in the North. Trade acts as a key stabilizing mechanism, particularly for Northern and Central regions, whereas migration tends to amplify regional disparities by reinforcing labour outflows from already vulnerable areas. We also document a sectoral paradox whereby capital-goods producers benefit from reconstruction demand following climate disasters despite overall welfare losses, a "broken window" effect.
These findings underscore the need for region-specific climate adaptation policies and caution against uniform mitigation and resilience strategies in economically integrated areas.

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Extreme Weather Events and Local Credit Market Dynamics: The Italian Case

Professor Concetta Carnevale[1], Professor Danilo Drago[1], Dr. Sandro Rondinella[1], Professor Francesco Trivieri[1]
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G08-4 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 27, 2026, 17:30 - 19:30

This paper analyses the relationship between extreme weather events and local credit market outcomes, with a specific focus on territorial heterogeneity across Italian provinces over the period 2002–2022. The study explores whether and how climate-related shocks affect credit risk, lending conditions, and financial dynamics across different segments of the local economy in a bank-based system characterized by strong regional disparities.
The empirical strategy relies on provincial panel data models with fixed effects, exploiting both time and cross-sectional variation to isolate the impact of extreme weather exposure while controlling for local economic conditions and structural characteristics. Credit risk is measured through non-performing loans, disaggregated by micro-firms, non-financial companies, and households. Additional indicators capture lending rates, guarantee intensity on outstanding loans, deposit dynamics, and medium- and long-term loan growth, allowing for a comprehensive assessment of financial adjustments.
The results show that extreme weather events are associated with a deterioration in local credit quality, particularly among micro-firms and non-financial companies. These effects are accompanied by tighter lending conditions, stronger collateral intensity, and a slowdown in investment-related lending. Overall, the evidence suggests that climate shocks reshape local financial conditions through multiple transmission channels and that their impact is spatially differentiated, highlighting the relevance of incorporating climate exposure into regional financial stability assessments.

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Integrating Climate Risk and Spatial Econometrics into Mass Appraisal Models: A GIS-Based Framework for Property Valuation

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G08-4 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 27, 2026, 17:30 - 19:30

Growing environmental risk exposure and increasing spatial heterogeneity across property markets challenge conventional valuation methodologies. While hedonic and mass appraisal models are widely applied in both public and private valuation systems, they often insufficiently account for spatial dependence, localized environmental risk, and high-resolution locational attributes derived from geospatial data.
This paper proposes a GIS-based valuation framework that integrates environmental risk indicators and spatial econometric techniques into mass appraisal modelling. The approach extends traditional hedonic specifications by incorporating:
(1) detailed locational variables extracted from Geographic Information Systems (GIS),
(2) environmental exposure metrics such as flood susceptibility, heat intensity, or land-use transitions, and
(3) formal spatial dependence structures through spatial lag and spatial error models.
By embedding environmental risk layers directly into automated valuation models (AVMs), the framework addresses omitted variable bias and spatial autocorrelation effects that frequently distort price estimation. The study also examines how spatially explicit modelling alters marginal price gradients and improves predictive performance compared to non-spatial benchmarks.
The proposed methodology is particularly relevant in markets characterized by uneven data quality and information asymmetry, where traditional comparability approaches may be limited. Empirical evidence illustrates how the integration of geospatial risk attributes modifies valuation outcomes and enhances model transparency.
The paper contributes to regional science by demonstrating how spatial econometric tools and GIS-driven data integration can refine property valuation systems and strengthen the analytical linkage between environmental exposure and market pricing mechanisms. It highlights the role of advanced spatial modelling as a bridge between real estate economics, environmental risk assessment, and quantitative regional analysis.

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Climate change and multidimensional poverty: global, subnational and household-level evidence

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G08-4 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 27, 2026, 17:30 - 19:30

Climate change is one of the most pressing challenges of this century. This is more so for developing and least developed countries, which have limited means of adaptation and a high proportion of vulnerable populations. In this paper, we empirically study the interconnection between climate and multidimensional poverty. To do so, we rely on gridded climatic data matched with multidimensional poverty data, both aggregated at different spatial levels. We first provide evidence at the cross-country level (for over 70 countries worldwide) as well as the subnational level (for 343 subnational regions in Asia). We then focus on India, looking at regions, districts, and households. We implement several econometric techniques (including alternative fixed-effects specifications, as well as long-differences and difference-in-difference specifications, plus a battery of robustness checks). Our findings indicate that rising (and more variable) temperatures, as well as increased incidences of drought, are associated with higher levels of multidimensional poverty across all analyzed levels. Benefiting from rich micro data at the household level in India, we find that climate-effects are mainly driven by deprivations in living conditions and nutrition. Finally, supporting evidence, exploiting detailed remote-sensing data, suggests that these effects may be (partly) driven by decreases in vegetation (proxied by greenness) and lower economic activity (as proxied by nightlight
intensity).

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Earthquake Shocks and the Erosion of Local Comparative Advantage: Evidence from Italy's Industrial Districts

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G08-4 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 27, 2026, 17:30 - 19:30

Disasters such as earthquakes are hinge events that can produce lasting effects on local economic structures. They disrupt production and employment but may also transform local comparative advantages that support regional medium and long-term competitiveness. In the disaster literature, attention often focuses on short-term performance indicators. Less consideration is given to whether and how such shocks alter long-term regional specialisation. Within this context, specialisation may strengthen competitiveness and recovery capacity thanks to agglomeration economies and dense production networks, but it may also amplify vulnerability when the shock directly affects dominant sectors and local interdependencies propagate the disturbance.

This paper analyses the long-term structural consequences of the 2012 Emilia-Romagna earthquake, asking whether pre-existing industrial specialisation amplified vulnerability compared to more diversified local economies. Emilia-Romagna is an informative case due to the dense manufacturing fabric of SMEs and industrial districts, characterised by localised value chains and consolidated specialisations. The coexistence within the seismic "crater" of strongly specialised district areas and more diversified non-district areas allows us to examine how different productive configurations condition the long-term effects of the shock.

The empirical design is based on a panel of 29 Labour Market Areas (LMAs) included in the official 2012 seismic crater, observed over 2004–2021. According to the ISTAT, 15 affected LMAs are industrial districts and 14 are non-district areas. Causal effects are identified through a systematic application of microsynth across a broad portfolio of structural indicators, providing a comprehensive view of disaster impacts by capturing both immediate disruptions and medium-term adjustments across interconnected dimensions of the local productive structure. Outcomes include two-digit sectoral Revealed Comparative Advantage and aggregate indicators (Economic Complexity Index, Herfindahl–Hirschman Index, Krugman Specialisation Index, and diversity measures), estimated using both local units and employment.

Results show that in industrial districts comparative advantages in key manufacturing sectors decline and remain lower for several years, alongside a shift towards a production structure closer to the national average. In non-district LMAs, deviations are smaller and less persistent. The evidence suggests that highly specialised production systems may display structural fragility when shocks affect sector-specific assets and dense local production networks, highlighting a trade-off between efficiency in stable periods and robustness under systemic disruption, with implications for post-disaster industrial and regional policy.

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Climate pressure and the fiscal sustainability of Dutch municipalities

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G08-5 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 28, 2026, 09:00 - 10:30

The costs of climate inaction pose increasing risk to public finances. Yet there is limited evidence on the indirect economic and financial effects of climate change in The Netherlands. Moreover, fiscal sustainability analyses of public finances are usually conducted on a national level, while climate impacts materialize primarily at a local scale. As a result, regional differences in financial vulnerability remain underexplored.
This study examines the financial vulnerability of Dutch municipalities to climate change in the year 2050. We combine existing estimates of direct economic damages with projections of municipal budgets based on current fiscal data and population forecasts. Adaptation costs are estimated using neighborhood level cost data differentiated by urban typology. We then compare the projected distribution of climate damages and adaptation expenditures relative to municipal budgets.
The findings reveal large differences between municipalities. In several cases, projected climate damages and adaptation costs are likely to place increasing pressure on local fiscal positions. Climate change affects municipal budgets through two main channels. Firstly, the municipal income depends heavily on property taxes, damage to building foundations and declining property values may therefore erode the local tax base. Secondly, municipalities face rising expenditures related to damage repair and climate adaptation. Together, these dynamics create a systematic risk: municipalities that lack resources to invest in adaptation may see their tax base erode more rapidly, further constraining their fiscal capacity. The estimates presented in this study should be interpreted as a lower bound. Indirect economic effects are not included, and adaptation costs are limited to the built environment, omitting nature and agricultural areas.
Despite these conservative assumptions, this study provides novel insights into the distributional consequences of climate change for local public finances in The Netherlands. In order to reduce the pressure on local governments and level the playing field, we recommend a recalibration of national finance transfers, based on local risk profiles. In addition, we vouch for the introduction of a climate damage ladder to clarify the allocation of public and private responsibilities for climate relates costs across levels of government.

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Using Annual Climate Type according Köppen-Geiger Climate Classification to quantify climate variations and opportunities to define risk of disasters

Dana Maria Constantin, Daiana Giorgiana Lüftner, Dr. Hristo Popov, Jelena Svetozarevic, Konstantia Tolika

G08-5 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 28, 2026, 09:00 - 10:30

Description of climate variability has received increased interest over recent years. Köppen climate classification is based on quantitative which makes it easy to use. In the same time classification is based on needed of heat and humid for growing vegetation which is useful for agriculture forecasts and some other applications. Köppen climate classification defines climates zones using average monthly temperatures and annual precipitation regime. In recent paper we use data from meteorological stations possessed in Bulgaria, Romania, Greece, Serbia and North Macedonia.
Data are provided by Nationals Meteorological Institutes of these countries. The period of observation is at least 30 years for most of the used stations which make data statistically significant.
Annual Climate Type (ACT) is method which shows details stayed hide when we use monthly average for long periods.
Also, we have described better the areas with droughts and possible water deficits. According to future climate scenarios these areas are at serious risk of every type of droughts, water deficits and possible wildfires. The new point of view present risk of floods in study areas.

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Climate change and migration intentions in rural Southeast Europe: The moderating role of place attachment

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G08-5 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 28, 2026, 09:00 - 10:30

This paper examines how climate dynamics and place attachment jointly shape migration intentions in Southeast Europe's temperate rural regions. We combine ~2,400 individual survey interviews collected in 2024 across Albania, Kosovo, Moldova, and Romania with high-resolution ERA5-Land indicators (1994–2023) of precipitation and temperature (long-run trends variability). Using two-level probit models with village random intercepts and country fixed effects, we estimate the probability of intending to migrate abroad. In baseline specifications, place attachment (PA) is a strong negative predictor of migration intentions, while the predictive power of our climate indicators is modest on average. Allowing climate effects to vary by PA reveals clear heterogeneity: (i) positive precipitation trends are associated with higher migration intentions at low PA, but this effect is strongly attenuated at high PA; and (ii) precipitation variability exhibits a sign flip—negative at low PA, positive at high PA—consistent with differential appraisal and coping. Temperature trend effects are weak, and temperature variability shows only a small association. Overall, climate dynamics do not uniformly raise migration intentions; rather, social rootedness conditions whether and how climate stress translates into an intention to leave.

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Evaluating External Shock Impacts through a Simulation Approach: An IRIO Framework for Asia

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G08-5 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 28, 2026, 09:00 - 10:30

This study evaluates the economic impacts of external shocks through a simulation approach based on an inter-regional input–output (IRIO) modeling framework, with a particular focus on Asia. In recent years, Asian economies have become increasingly vulnerable to large external shocks such as natural disasters, global supply chain disruptions, pandemics, and geopolitical risks. Shocks originating in a single country can propagate widely across the region through tightly connected production networks and trade linkages. Despite this growing exposure, there remains a shortage of practical analytical frameworks that combine interregional economic modeling with systematic simulation approaches to quantify cross-border shock transmission.

To address this gap, the study develops an IRIO-based simulation framework for international and interregional shock assessment, focusing on shocks originating in Japan and their propagation across Asian economies. The empirical database is constructed using the ADB MRIO dataset and reorganized into an inter-regional structure with a limited number of regions and sectors to support scenario-based simulations while preserving key supply-chain linkages. Within this framework, simulation modules are designed to represent supply constraints, demand reductions, and staged recovery processes. Interregional multipliers, spillover effects, and feedback effects are estimated and compared across regions and industries.

To demonstrate the applicability of the simulation approach, the study conducts shock scenario experiments centered on Japan, including production disruptions and export supply constraints associated with large-scale disasters. The simulations quantify both direct and indirect economic impacts across Asian partner economies and sectors, illustrating how shocks propagate through interregional trade and intermediate input networks. Recovery paths are also evaluated by modeling gradual restoration of production capacity and trade flows, enabling comparative assessment of regional vulnerability and resilience within Asia.

This study contributes in three main ways. First, it provides empirical evidence on interregional economic interdependence in Asia using a harmonized multi-regional dataset. Second, it advances methodological practice by integrating IRIO modeling with a structured simulation approach for shock analysis. Third, it offers practical insights for disaster risk management, supply-chain resilience planning, and regional economic cooperation in Asia.

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Research on the Application of Ecosystem-based Disaster Risk Reduction (Eco-DRR) in Resilience Assessment for Industrial Parks in Taiwan

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G08-6 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 28, 2026, 11:00 - 13:00

Conducted for the purposes of disaster prevention and mitigation, this study focuses on Taiwan's industrial sector, specifically targeting industrial parks under the jurisdiction of manufacturing authorities. The research clarifies existing autonomous adaptation plans implemented by individual enterprises or parks as a whole. By integrating indicators established in previous disaster resilience research, this study develops a feasible set of Eco-DRR (Ecosystem-based Disaster Risk Reduction) indicators for Taiwan's industrial parks to achieve the goals of environmental, social, and economic sustainability.

The research establishes an evaluation framework comprising five major dimensions: Economic Feasibility, Ecological Benefits, Disaster Risk, Human Well-being, and Social Participation. The Fuzzy Delphi method was employed to select suitable Eco-DRR indicators for industrial parks, while the Fuzzy AHP method was applied to determine the evaluation weights. Based on these methods, the study evaluates the climate change adaptation actions and infrastructure resources of various industrial parks in Taiwan. Finally, based on the evaluation results, a portfolio of disaster mitigation strategies using Nature-based Solutions (NbS) is proposed. These research findings serve as a reference for adaptation strategies rooted in ecological disaster mitigation for future industrial land development."

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Urban Greening Dynamics under Heat Adaptation and Socio-Economic Conditions – Evidence from Germany

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G08-6 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 28, 2026, 11:00 - 13:00

Urban heat intensification increases climate-related health risks, particularly in densely populated urban areas, while access to effective adaptation measures remains uneven across socio-economic groups. At the same time, many municipalities face financial constraints that limit their capacity to expand green infrastructure, and growing urban populations create development pressures that can lead to additional land sealing. Most studies concentrate on the distribution of existing green spaces or the consequences of elevated temperatures for socio-economic groups. The present study seeks to analyze the recent urban greening dynamics and their spatial distribution in 153 German cities between 2018 and 2023. Greening and sealing are measured using CORINE Land Cover Plus Backbone data at both city and 1 km grid levels, and compared with spatial indicators of heat exposure, socio-economic disadvantage, demographic structure, fiscal capacity, and local political characteristics to assess their spatial alignment. The descriptive analysis finds that, overall, German cities have experienced more sealing than greening between 2018 and 2023, with only seven cities showing a net increase in green space. Patterns at the city level further suggest that fiscal conditions are associated with greening dynamics, as municipalities characterized by higher debt levels, greater recourse to liquidity-alleviating loans, and lower net trade tax revenue per capita tend to exhibit stronger declines in green space. We do not find evidence that a city adopting a heat action or climate adaptation plan is linked to increased greening. We also do not find greening efforts to be concentrated in areas with higher heat exposure or greater socio-economic disadvantage at the spatial grid level, and thus cannot discern an alignment between observed greening patterns and indicators of vulnerability in our data.

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Drainage Planning and Design for Light Infrastructure Using Building Information Modelling: Integrating Hydrology, Topography, and Adaptive Engineering

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G08-6 Climate Change, Natural Hazards and Adaptation: Spatial Incidence and Impacts, Auditorium 218 - North Building - Juridical Faculty, agosto 28, 2026, 11:00 - 13:00

Climate variability and the increasing frequency of extreme rainfall events are intensifying flood risks and exposing structural vulnerabilities in infrastructure systems. Drainage constitutes a fundamental component of the design of engineering works, as it is directly linked to flood-risk management, highlighting its central role in resilient regional development. Yet, persistent discrepancies between preliminary drainage planning and final design—driven by incomplete topographic data, evolving project geometries, and regulatory inconsistencies—undermine the reliability of infrastructure delivery. These challenges become even more acute during construction, a phase described as one of particular vulnerability, where temporary drainage solutions often fail, leading to erosion, flooding, and costly delays.
This research proposes an integrated methodological framework that combines hydrological and hydraulic modelling with Building Information Modelling (BIM) to enhance the accuracy, adaptability, and resilience of drainage system design. By systematically comparing planning-phase assumptions with final design outcomes across multiple case studies, the study identifies the key drivers of redesign and quantifies their impact on project performance. BIM is evaluated as a digital environment capable of unifying geometric, hydrological, and construction-phase data, enabling dynamic updates, clash detection, and scenario-based simulations under climate-stress conditions.
The expected contribution lies in bridging the gap between theoretical and applied drainage design, improving infrastructure resilience to climate-induced hydrological extremes, and providing evidence-based guidelines for the institutional adoption of BIM in regional infrastructure planning. The findings aim to support regions in transitioning toward more adaptive, data-rich, and climate-responsive engineering practices—fully aligned with the focus on regional responses to global challenges.

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Cultural proximity and residential choices

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G09-1 Migration, Forced Displacement, Mobility Patterns and Impacts Across Space, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

In this paper, we aim to assess the extent to which cultural proximity—approximated by linguistic and religious distance—contributes to the selection of a place of residence. Our objective is to disentangle potential spillover (network) effects arising from the concentration of specific ethnic groups in particular locations.
Our empirical analysis focuses on different ethnic groups residing in Barcelona and on migration dyads observed in 2018. The analysis considers the city's neighborhood structure (73 spatial units). To model migration flows, we propose an innovative empirical strategy that captures both spatial and cultural proximity in migrants' location choices. Specifically, we employ spatial econometric interaction models (SDM) to estimate the effects of origin and destination characteristics on migration flow patterns and to identify spillover effects.
Our findings reveal significant network effects among migrants who share similar cultural characteristics. Moreover, linguistic proximity emerges as a key determinant of migration flow patterns toward neighborhoods located near areas with higher shares of children and elderly residents.
Finally, we discuss potential place-based policies that could foster deeper integration, particularly emphasizing the cohesive role that the labor market may play

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The impact of the recent wave of Ukrainian immigration on the social attitudes of residents of Polish cities. A case study of Poznań

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G09-1 Migration, Forced Displacement, Mobility Patterns and Impacts Across Space, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

Russia's invasion of Ukraine in 2022 initiated an unprecedented influx of refugees into Poland, which initially sparked enormous public engagement and solidarity among Poles. However, over time, as the conflict dragged on and the costs of social, healthcare, and educational support grew, negative sentiment toward Ukrainian migrants began to grow. Poznań, a large urban-industrial center in Western Poland, became one of the main refugee destinations, leading to an evolution in residents' attitudes—from initial, spontaneous mobilization and support to tensions and emerging challenges. This lecture will present the results of research on the perception of Ukrainian immigrants in Poland during the current phase of refugee hosting. The study used surveys among Poznań residents and interviews with representatives of municipal institutions supporting immigrants, and the results reveal both integration processes and emerging social tensions.
There is no doubt that the large wave of Ukrainian immigration has triggered lasting social change in Polish cities. The lecture will also attempt to answer the question whether the end of the war will open a new chapter in Polish-Ukrainian relations in the spirit of cooperation and integration, or whether it will deepen the trends of polarization of residents' attitudes towards the challenges of integration.

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Migration and regional development

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G09-1 Migration, Forced Displacement, Mobility Patterns and Impacts Across Space, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

Migrants move to improve their living conditions. In their search for a better place to stay and their final migration decision, migrants' trade-off between characteristics of the sending and receiving regions is crucial. However, regional profiles themselves also change due to migration flows. Some regions lose, and some win, because the number and type of incoming and outgoing migrants impact the development of both the sending and receiving region. While acknowledging the substantial heterogeneity of migrants, a topic covered in other contributions in this book, the current chapter mainly addresses the intriguing but complex interrelation between regional development and migration.

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Integration of newcomers in Germany: more successful after World War II than following reunification

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G09-2 Migration, Forced Displacement, Mobility Patterns and Impacts Across Space, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

German reunification represents a unique natural experiment in economic history. Because comparable events are rare, the extent to which East Germans have been successfully integrated into the West German economy remains a matter of debate. We use the integration of German refugees from the former eastern territories after World War II as a historical benchmark. An analysis of microcensus data shows that, 25 years after reunification, the relative income position of East Germans that stayed in East Germany after unification compared with the West German population was significantly weaker than that of refugees a quarter of a century after their arrival in West Germany. This is particularly striking given that, after 1990, a substantially larger share of GDP was devoted to rebuilding East Germany than had been spent on integrating the postwar refugees. The comparatively weak distributional position of East Germans may best be explained by the fact that the policies enacted after 1990 to facilitate the integration of East Germany as a region were less effective than the support for the refugees in the post-war period. Thus, the fact that most East Germans remained in their home region instead of integrating into the established West German economy likely hindered long-term income convergence.

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Can Scotland achieve a more balanced population distribution? Relocation preferences between service accessibility and place attractiveness

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G09-2 Migration, Forced Displacement, Mobility Patterns and Impacts Across Space, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

Rural depopulation is a long-term phenomenon that has been attracting increasing attention from researchers and policymakers due to its negative implications for the viability of the rural social fabric, often resulting in discontent and populist reactions. Within this context, achieving a more balanced population distribution across territories can preserve viable rural communities on the one hand, and alleviate pressure on urban services and housing markets on the other.
Among European countries, Scotland is noteworthy for its high population concentration, counterbalanced by large sparsely populated rural, remote, and island (RRI) areas. Consequently, the Scottish Government's 2021 National Population Strategy (NPS) identified the promotion of a more evenly distributed population as a key objective. Achieving this will require the voluntary relocation of people from urban to RRI areas. While often desirable from an environmental point of view, the latter are characterised by lower accessibility to services, forcing individuals to make difficult trade-offs. Understanding individuals' preferences and willingness to accept different place characteristics thus becomes crucial for designing appropriate incentives.
In this paper, we use discrete choice experiments to investigate Scottish residents' willingness to move (or not) to places that differ in terms of various attributes. An online survey was disseminated first (2023) to a sample of 250 rural dwellers generally concerned with the issue, and then (2025) to a sample of 1,007 respondents representative of the Scottish population by age and gender, covering the whole urban–rural continuum and a variety of household types. Half of the respondents in the second sample, randomly selected, were shown excerpts from the NPS as an information treatment prior to making their choices.
We found that, ceteris paribus, the quality of the natural environment and of digital connectivity had strong positive impacts on preferences. Distances from family, workplaces, schools, hospitals, and grocery shops yielded negative effects, although with different intensities, but were not statistically significant among the rural sample, suggesting habituation to longer distances. Controlling for these characteristics, a place's population size and remoteness mattered only for the rural sample. While an overwhelming majority of respondents stated that they agreed with the objectives of the NPS, the information treatment had no significant impact on preferences, although we would have expected reduced sensitivity to distance.
While our results suggest that there is scope to achieve a more balanced population distribution, an intention–behaviour gap persists, and substantial improvements in service accessibility are needed to enable its realisation.

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The Inclusive City – Local Strategies in Response to Migration Challenges. The Case of Poznań

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G09-2 Migration, Forced Displacement, Mobility Patterns and Impacts Across Space, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

The paper entitled “The Inclusive City – Local Strategies in Response to Migration Challenges. The Case of Poznań” focuses on analysing the role of municipal government in shaping integration policies in the context of increasing human mobility. It is based on the assumption that contemporary migration processes – economic, educational, and forced alike – significantly affect the functioning of cities by transforming their social structure, labour markets, education systems, and demand for public services.
The paper attempts to identify the key factors determining local approaches to migration, as well as the development of strategies that foster integration and social cohesion. Particular attention is paid to the changing nature of migration processes over time, which requires flexibility and adaptive capacity on the part of local authorities.
The case study is Poznań, which in recent years has been developing tools and programmes to support foreign residents, striving to build a model of an open and diverse city. An analysis of the measures undertaken in Poznań demonstrates how local strategies can respond effectively to migration challenges while simultaneously strengthening social capital and urban development.

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Intergenerational Social Mobility and Geographic Mobility in Europe: Evidence from Regional Migration Dynamics and Neighborhood Effectsg09

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G09-2 Migration, Forced Displacement, Mobility Patterns and Impacts Across Space, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

This paper examines the intersection between intergenerational social mobility and geographic mobility in Europe, focusing on how regional migration dynamics shape opportunities for economic advancement across generations. The research integrates two complementary perspectives: macro-level demographic and economic forces driving regional migration across the EU, and micro-level causal mechanisms through which neighborhoods and local contexts influence intergenerational income mobility.

The study is motivated by the European Commission's recognition of demographic transition as a structural threat to EU competitiveness and territorial cohesion. Using bilateral migration flow data between NUTS3 regions, gravity models reveal that emigration from poor to rich regions is substantially higher than flows in other directions, with economic responsiveness peaking among 25–29 year-olds. A 1% increase in the GDP ratio between destination and origin regions increases migration flows of this age group by approximately 0.42%, confirming that "brain drain" is most pronounced precisely when young adults would contribute most to local economic vitality.

To measure intergenerational income mobility, the study employs rank-rank specifications following Chetty et al. (2014) and applies Bayesian hierarchical modeling to the Spanish Opportunity Atlas 2.0, linking over 1.5 million parent-child pairs across 25 years. Results show strong geographic variation in upward mobility, with Northern Spain and major metropolitan areas like Madrid and Barcelona acting as "mobility engines," while Southern regions exhibit persistently low mobility. A mover's design identifies significant causal neighborhood effects on long-term economic outcomes.

The findings demonstrate that regional economic decline drives selective out-migration, depleting human capital and creating self-reinforcing cycles that constrain mobility for those who remain. The paper concludes that effective EU territorial policy must simultaneously address demographic decline, labor market conditions, education access, and housing affordability to break the vicious cycle linking geographic and intergenerational immobility.

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Main factors driving the decline of generational succession in the agricultural farming in Tolima, Colombia

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G09-3 Migration, Forced Displacement, Mobility Patterns and Impacts Across Space, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

The migration of young people from the countryside of the state of Tolima (Colombia) to urban areas, in a context of lack of productive linkages in agriculture, low profitability, and weak state support in rural areas, is a gradual trend responsible for the loss of generational succession, in agricultural farming, particularly among coffee producers. Tolima has 1,387,000 inhabitants, its capital is Ibague, and it is a leading agricultural producer of coffee, cocoa, rice, avocado, mango, and lemon.

According to Cordoba et al (2025) family succession in Colombia presents a significant challenge: despite 66% of current coffee farmers intending to transfer their farms, only 28,5% of newcomers enter agriculture through this route. In 2023, 1.77 million people lived in coffee households; producers averaged 54.5 years of age, 36% were older adults, and about 76% resided in rural areas. Once, youths move to study at the university in urban areas they have the tendency of not returning to their family farms for different reason such as: few job opportunities and prevalence of informal employment in the rural areas, low quality of life and lack of basic services, grim perception of the future and personal growth and the lack of Infrastructure and communications in the rural areas amongst others. A study found that population in coffee households in Colombia will drop 20% by 2050 (Leibovich et al 2022)

The main purpose of this research is to determine the key factors driving the decline of generational succession in agricultural farming in Tolima (Colombia). The theoretical framework of the research is based on literature on internal migration (Rérat, 2016) and social capital theory (Putnam, 1993; Coleman, 1988).

In regards to the methodology, the type of research is quantitative, the scope is descriptive, correlational, and analytical, the method is deductive, and the design is non-experimental. The study is based on a convenience sample of 50 students from the University of Tolima who are enrolled in both face-to-face and distance learning programs and are originally from the rural areas of the region. The main instrument to collect the primary information is a structured questionnaire with a Likert scale in which the participants of the survey are asked to state their level of agreement with each statement about factors that influence their decision to return to the countryside and take on the generational transition after graduating. Additionally, interviews will be conducted with key informants.

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Sustainable Development in the Mediterranean Area: Implications of EU-Africa Migration and Cooperation Policies

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G09-3 Migration, Forced Displacement, Mobility Patterns and Impacts Across Space, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

The Mediterranean geographical area is an interesting case study in terms of sustainable development. This region, with its rich historical past, is home to a variety of cultural traditions and political development models, with the result that the wealth gap between neighboring regions in the Mediterranean is one of the widest in the world.
EU cooperation and trade policies, currently the most industrialized side in this area, play a key role in the regional development. The launch of the Barcelona process in 1995 was intended to bridge the previous gap, which, unlikely, increased over the subsequent 15 years, posing a serious threat to the stability in the region. According to OECD figures at the time, the forecast was that “40 million jobs must be created over the next 15 years (i.e. until 2023) in order to simply maintain unemployment at the current levels in the southern Mediterranean countries” (as highlighted in the declaration of the “Union for the Mediterranean”
created in Paris 2008).
Furthermore, as environmental data dramatically shows, climate change is also heavily affecting this area of the world: the Maghreb, the Nile Valley, the Middle east, and southern Europe countries. The increasing migration trends from southern tonorthern Mediterranean countries is a collateral phenomenon.
Is latest statistical evidence confirming the challenges to the sustainability of development in this critical area? Has the EU’s policy response been effective to date? This paper seeks to provide some evidencebased
answers to these questions.

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The labor market areas of Greece estimated from the 2021 commuting patterns

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G09-3 Migration, Forced Displacement, Mobility Patterns and Impacts Across Space, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

The paper delineates the functional economic areas (FEAs) of Greece after people's commuting patterns by algorithmically grouping localities on the basis of people's travel-to-work flows.
It also estimates the country's spatial fragmentation on the basis of the recovered formations; and compares the shapes of these formations to the regional/subregional division of Greece. To the extent the two grids diverge, there is room for better targeted policy interventions. On the whole, the paper advances our understanding regarding the diffusion of labour marker phenomena and interventions across the terrain, thus contributing to the analysis and formulation of relevant policies.

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Family, school, and place: Explaining regional differences in student achievement in Portugal before and after COVID-19

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G10-1 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

Regional disparities in educational outcomes represent one of the most persistent and policy-relevant dimensions of socio-spatial inequality within European countries. Beyond their social significance, such disparities have long-run implications for regional economic convergence, labour productivity, and the intergenerational transmission of inequality. In Portugal, a country characterised by pronounced territorial imbalances between coastal and interior areas and between metropolitan and rural regions, understanding the geographic dimension of educational achievement is particularly urgent. Despite sustained public investment in education and the adoption of EU cohesion objectives, regional gaps in student performance remain substantial. The COVID-19 pandemic added a further layer of urgency, as school closures and the abrupt shift to distance learning are widely expected to have amplified pre-existing socioeconomic and spatial inequalities in learning outcomes, though rigorous microeconometric evidence for the Portuguese case remains scarce.

This paper investigates the determinants of academic achievement among Portuguese students aged 15–16, with particular emphasis on regional heterogeneity and its evolution over time. Building on Pereira and Reis (2012), it provides an updated and extended analysis using microdata from the OECD's Programme for International Student Assessment (PISA) for 2018 and 2022, complemented by regional statistics from INE. The dual time dimension enables a direct comparison of regional disparities before and after the pandemic, shedding new light on how this exogenous shock reshaped educational inequalities across Portuguese territory.

The analysis covers 11 aggregated regions derived from NUTS III classifications, focusing on Mathematics and Reading scores. The empirical strategy follows an education production function framework estimated via OLS with school fixed effects. A second-stage regression decomposes residual school-level fixed effects into observable school characteristics and regional fixed effects. Variance decomposition further disentangles the relative contributions of family background, school resources, and the socio-spatial sorting of disadvantaged families into worse schools to overall within-region performance inequality.

Results confirm that family socioeconomic status dominates school-level characteristics across all regions and time periods. Marked territorial heterogeneity persists, with regional development indicators significantly correlated with unconditional performance gaps. Regional disparities widened in 2022, with schools proving less effective at compensating for family disadvantage in the post-pandemic period and, in several regions, actively exacerbating pre-existing inequalities through socio-spatial sorting mechanisms. These findings point to the structural limitations of a centralised education system in addressing place-specific needs, and carry direct implications for the design of place-sensitive educational and cohesion policies.

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Unequal reporting: trust in the police and racial disparities in property crime reporting in Brazil

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G10-1 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

Trust in the police is widely regarded as central to citizens' willingness to engage with law enforcement, yet its association with crime reporting varies across offenses and social contexts. This paper examines how trust in the police shapes reporting decisions for property crimes in Brazil and how this relationship interacts with race and crime characteristics. Using nationally representative data from the 2021 Brazilian victimization survey, the analysis focuses on victims of theft and robbery and conceptualizes reporting as a post-victimization decision made under conditions of institutional uncertainty, in which individuals weigh expected benefits, anticipated costs, and the practical consequences of contacting law enforcement. Based on a sample of N = 3,417 theft victims and N = 677 robbery victims, separate probit models are estimated for each crime type and results are presented as average marginal effects. Trust in the police is positively associated with reporting in all specifications, but its magnitude differs substantially across offenses. The association is modest for theft and considerably stronger for robbery, indicating that trust becomes more consequential in confrontational and high-uncertainty contexts where discretion and expectations about police behavior are more salient. Racial disparities persist across all models: nonwhite victims are consistently less likely to report both theft and robbery, even after controlling for trust, socioeconomic characteristics, prior victimization, neighborhood context, and regional location, with larger gaps observed for robbery. These patterns suggest that racial inequality shapes engagement with the criminal justice system beyond differences in expressed trust. Crime attributes linked to administrative or economic stakes, particularly vehicle-related incidents and cases involving documents or mobile phones, substantially increase reporting probabilities, in some cases exceeding the effect associated with trust in the police. Reporting therefore reflects not only attitudes toward law enforcement but also procedural requirements embedded in insurance and bureaucratic systems. Overall, the findings show that crime reporting in Brazil reflects structured differences in institutional engagement shaped by trust, inequality, crime type, and practical necessity, rather than a uniform expression of police legitimacy.

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Insecure Neighbourhoods, Lower Achievement: Crime and Educational Outcomes in Ecuador

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G10-1 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

In Latin America, violence has increased markedly in recent years, raising concerns about its broader social and economic consequences. Among these, the potential impact on students' academic performance is particularly alarming, given its implications for human capital accumulation and long-term development. Using detailed annual school-level data from Ecuador—a country that has experienced a dramatic rise in crime over the past decade—we examine whether and to what extent crime in the neighbourhoods surrounding schools affects academic outcomes. We focus on standardized test scores administered annually, exploiting repeated cross-sectional data covering the period 2014–2024 and comprising approximately 100,000 student-level observations.
Our results indicate that crime and violence in the vicinity of schools have a statistically and economically significant negative effect on students' performance. While we do not find substantial differences between male and female students or consistent heterogeneity across broad regions, the adverse impact is significantly stronger for schools located in urban areas, which exhibit a much sharper decline in performance compared to rural schools.
These findings highlight that educational policy cannot be designed independently of public security conditions. In high-crime contexts, improving learning outcomes requires coordinated interventions that enhance neighbourhood safety and protect school environments. Targeted security measures around schools, additional resources for urban schools in violent areas, and investments in psychological support and compensatory educational programs may help mitigate the negative externalities of crime. More broadly, reducing violence should be viewed not only as a public safety priority but also as a central component of human capital policy, as persistent exposure to crime risks undermining educational achievement, increasing inequality, and constraining long-term economic development in the region.

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Regional differences in the polarization of household incomes in Germany

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G10-2 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

While regional income disparities are often assessed in terms of overall inequality, less attention has been paid to income polarization, i.e. the erosion of the middle-income group and the growing distance between lower- and upper-income households. This paper analyzes the long-term development and spatial differentiation of household income polarization in Germany, with a particular focus on urban–rural and East–West divides.
We draw on data from the German Socio-Economic Panel (SOEP), covering more than 25,000 households over several decades, and apply the Esteban-Ray-Gradín polarization index, which explicitly captures changes in the relative size and separation of income groups. Polarization is examined across different regional types, distinguishing between urban and rural regions as well as between eastern and western Germany.
The results reveal three main findings. First, income polarization increased sharply in the early 2000s, followed by a phase of relative stability and a slight decline after 2015, before recent developments again indicate rising polarization. Second, substantial regional disparities persist, with higher polarization levels in western compared to eastern Germany and noticeable differences between northern and southern regions of the former Federal Republic. Third, and most importantly, urban-rural differences dominate the spatial pattern of income polarization. Polarization is consistently higher in urban regions and has increased significantly more strongly since the 1990s. Currently, polarization indices in urban areas exceed those in rural regions by almost one-sixth.
A closer comparison shows that once these urban–rural differences are considered, East-West differences largely disappear. Urban regions in eastern and western Germany exhibit very similar levels of income polarization, as do rural regions. These findings suggest that urbanization-related processes rather than historical East-West legacies are the main drivers of regional income polarization in Germany. The paper contributes to the regional science literature by highlighting the importance of polarization measures for understanding spatial income dynamics and by providing evidence with broader relevance for regions facing increasing urban-rural divides across Europe.

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Challenges of Sustainable Development in Europe in the Context of Income Distribution and Social Cohesion

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G10-2 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

Sustainable development in Europe increasingly depends on the capacity of regions to maintain social cohesion while facing persistent and, in some cases, widening income disparities. Although the European Union has long pursued territorial and social convergence, recent megatrends — including technological change, demographic shifts, labour-market restructuring and the green transition — have introduced new pressures that challenge the inclusiveness of growth. This paper examines how income distribution patterns interact with regional development trajectories and assesses the extent to which inequality undermines or reinforces the goals of sustainable and cohesive development.

Using harmonised datasets such as EU-SILC, Eurostat regional indicators and OECD well-being metrics, the study maps multidimensional inequality across European regions and identifies structural factors that shape divergent outcomes. Particular attention is given to the interplay between income inequality, access to public services, labour-market opportunities and institutional capacity. The analysis explores whether current EU policies — including cohesion policy, the European Pillar of Social Rights and the Green Deal — are sufficient to mitigate emerging socio-economic divides.

The paper also contributes a critical voice to the ongoing debate on the short- and medium-term risks that sustainable development agendas pose for structurally weaker regions, especially those with limited institutional capacity and constrained labour-market adaptability. By highlighting these vulnerabilities, the study aims to inform more resilient, inclusive and territorially balanced development strategies for Europe.

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Financial Inclusion and Income Inequality: Evidence from Italy

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G10-2 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

Income inequality represents a central challenge for both advanced and developing economies, with increasing attention devoted to the role of financial systems in shaping distributive outcomes. In particular, financial inclusion, defined as the availability and accessibility of financial services, has been identified as a potential mechanism influencing income distribution through its effects on households' and firms' economic opportunities. While existing empirical evidence suggests that broader access to financial services may contribute to reducing inequality, findings remain mixed and highly context-dependent. This paper analyses the relationship between financial inclusion and income inequality in Italy from a territorial perspective. Italy provides a particularly relevant setting due to its persistent regional disparities, heterogeneous economic structures, and significant variation in the local availability of banking services. The study investigates whether differences in access to financial services are associated with heterogeneous patterns of income distribution across municipalities. The empirical analysis relies on a territorial panel dataset covering Italian municipalities over the period 2010–2022. Income inequality is measured using standard distributional indicators, including the Gini coefficient derived from fiscal data. Financial inclusion is proxied by indicators capturing the availability of banking services. Given the bounded nature of the inequality measures, the econometric strategy employs Beta regression models within a multilevel framework, allowing for the modelling of fractional response variables and the consideration of hierarchical territorial structures. Preliminary results indicate a statistically significant association between financial inclusion and income inequality. Municipalities characterised by greater availability of banking services tend to exhibit lower levels of income dispersion. The findings also reveal territorial heterogeneity, with stronger effects observed in economically weaker or more peripheral areas. These results suggest that access to financial services constitutes a relevant dimension of local welfare conditions. From a policy perspective, the evidence highlights the importance of considering the territorial distribution of financial services as a complementary tool to social and cohesion policies aimed at reducing income inequality.

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Gender Inequalities and Territorial Polarisation: Sectoral Employment Structures in Italy

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G10-2 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

Socio-spatial inequalities in labour markets have intensified across European regions, reflecting deep territorial polarisation in economic structures and employment opportunities. In Italy, persistent disparities between macro-regions are closely linked to sectoral specialisation patterns that shape both the quality of employment and the distribution of social groups across economic activities. This paper examines how socio-spatial polarisation is manifested through sectoral employment structures, focusing on segregation by gender and migration status across macro-regions.
Using microdata from the Italian Labour Force Survey, the analysis exploits detailed sectoral classifications of economic activity (CAT12, CAT5 and CAT3) to capture employment distribution across highly disaggregated sectors, aggregated at the macro-regional level. This approach allows for a fine-grained examination of how different territories specialize in specific segments of the economy and how such specialization processes are associated with labor market segmentation and social exclusion risks.
The study combines descriptive measures of sectoral concentration and segregation with econometric analysis of employment allocation across sectors. Particular attention is given to the probability of employment in low-productivity and precarious sectors, which are typically associated with lower wages, limited career mobility, and higher vulnerability to economic shocks. These outcomes are analyzed in relation to territorial location, gender, and migrant status, highlighting intersectional mechanisms of disadvantage.
Preliminary results point to strong socio-spatial polarization in Italy, with Northern regions displaying higher concentrations of employment in manufacturing and advanced services, while Southern regions are disproportionately specialized in low-value-added services and agriculture. Women and migrants are significantly overrepresented in sectors characterized by lower job quality, particularly in economically weaker territories. These patterns reveal how sectoral structures operate as a key transmission channel through which territorial inequalities translate into social exclusion and labour market vulnerability.
By linking detailed sectoral employment structures with socio-spatial disparities, this paper contributes to the regional science literature on polarization and segregation. It underscores the importance of territorially targeted and inclusive labor market policies aimed at reducing structural inequalities, improving job quality, and fostering balanced regional development.

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Social position-based transport-related social exclusion: a literature framework

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G10-3 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

The presentation interprets transport-related social exclusion (TRSE) from the perspective of the capabilities approach and, drawing on the research literature, highlights the phenomenon of TRSE by social position.
TRSE occurs when "spatial resources" (land use patterns; transport system and its temporal constraints) and "individual conversion functions" (perceptions, skills, and cognitive and time constraints) interact in the broader political, social, and economic environment in such a way that the individual's set of capabilities is permanently narrowed and reaches the threshold of "accessibility poverty." As a result of this process, ten TRSE dimensions can be distinguished: (1) exclusion from services/facilities, (2) geographical exclusion, (3) spatial exclusion, (4) physical and cognitive exclusion, (5) time-based exclusion, (6) fear/prejudice/emotion-based exclusion, (7) information exclusion, (8) economic exclusion, (9) digital divide-based exclusion, and (10) social position-based exclusion. The latter refers to the restriction of movement in public spaces through social control, stigmatization, or status-related restrictions.
Based on the above dimensions, the presentation examines social position-based exclusion (e.g. gender, race, nationality, age, ethnicity, religion) based on research in the literature, highlighting that migrants and refugees find it more challenging to understand public transport information and timetables due to language barriers and literacy difficulties, while young people may be restricted in their actual access due to the safety and autonomy risks of traveling alone; In the absence of adequate transport or safe alternatives, these groups may miss out on opportunities and services available to their peers.
One of the conclusions of the presentation is that inclusive transport planning should not only provide infrastructure but also increase accessibility as a capability, especially for those who face cumulative disadvantages across various dimensions of exclusion.

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How Do Spatial and Structural Determinants Influence Unmet Healthcare Needs? Evidence from Busan, South Korea

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G10-3 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

This study aims to explain the spatial differences in Unmet Healthcare Needs (UHN) observed at the si·gun·gu (local district) level. Rather than interpreting UHN as merely the result of individual choice, this research is grounded in a conceptual framework that understands UHN as an outcome of spatial, economic, and social structures. Specifically, it examines the roles of three structural constraints: (1) Geographic/Travel Accessibility, (2) Daily-life Constraints, and (3) Socioeconomic Structural Barriers. The analysis is based on annual UHN rates at the local district from 2010 to 2024.
Geographic/Travel Accessibility was measured using the Enhanced Two-Step Floating Catchment Area (E2SFCA) method. This approach captures the level of opportunity to access healthcare services in spatial terms by comprehensively considering hospital service capacity (e.g., number of beds and hospital size), diversity in the supply structure, and spatial equity. The model incorporates actual travel time calculated from the road network, distance-decay effects, and competition for medical resources from surrounding populations. The final accessibility scores were normalized to a 0–1 scale to indicate the relative advantage or disadvantage in healthcare access across regions.
Daily-life Constraints were assessed through the Daily-life Constraints Index. This composite index consists of three components: time constraints arising from occupational structure, caregiving burdens within households, and constraints related to healthcare facility operating hours. Each indicator was standardized and aggregated to measure the extent to which structural conditions of everyday life limit healthcare utilization at the regional level, even when medical needs exist.
Socioeconomic Structural Barriers were measured using a composite index reflecting the structural socioeconomic vulnerability of each region. The index includes three components: income (affordability), education (human-capital), and occupational risk, defined as employment instability and high opportunity-cost job structures. Each component was standardized using z-scores and averaged to create the overall index. Higher values indicate greater structural constraints on healthcare access at the regional level.
Empirical analysis was conducted using a Two-Way Fixed Effects panel regression model to estimate the effects of the three structural constraints on UHN rates. This approach controls for unobserved regional characteristics and time-specific effects. The findings are expected to identify which structural constraints primarily drive UHN in different regions and to provide empirical evidence for designing place-based healthcare policies aimed at reducing spatial inequalities in healthcare access.

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Financialized Real Estate and Urban Hierarchies: FIBRAs in Mexico's Metropolitan System

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G10-3 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

This paper examines the role of FIBRAs, Mexico's Real Estate Investment Trusts, in the financialization of the country's real estate sector, and their spatial implications for metropolitan development. Introduced in the early 2000s, FIBRAs transform stabilized rental income from commercial property into exchange-listed assets. Their investment strategies are not neutral but highly selective, concentrating capital in major metropolitan regions and within them, in municipalities that function as economic centralities with strong infrastructure, governance, and socio-economic status.
The study argues that FIBRAs actively reinforce urban hierarchies. While peripheral municipalities are experiencing the fastest population growth, they are largely excluded from FIBRA investment due to weaker institutional capacity and planning. This creates a territorial mismatch between where people live and where capital flows, deepening socio-spatial inequality.
Methodologically, the paper combines georeferenced data from over 200 FIBRA properties, demographic analysis from INEGI (1990–2020), socio-economic stratification using the AMAI index, and qualitative interviews with fund managers and developers in Monterrey. Results show that FIBRA capital systematically favors affluent, accessible municipalities and avoids fast-growing peripheries, despite their demographic dynamism.
However, selective investment is beginning to reach non-elite but well-connected municipalities under specific conditions, such as corridor-based development or strategic infrastructure, suggesting a potential,though limited, expansion of "investable" geographies.
Theoretically, the paper positions financialization as a spatial process that shapes, and is shaped by, metropolitan restructuring. It contributes to international debates on real estate finance and urban inequality, showing that the effects are particularly acute in contexts of rapid, under-resourced urban expansion like Mexico's peripheries.
The conclusion emphasizes the need for public policy to realign capital flows with inclusive urban development. Proposed tools include land value capture, inclusionary zoning, corridor-based planning, spatial investment incentives, and stronger transparency requirements. Listed real estate investment, while financial in form, must be treated as a territorial governance challenge with broad implications for equity and spatial justice.

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The Double Exclusion Effect of Platform Urbanism on Unmet Medical Needs and Mental Health among Digitally Excluded Groups

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G10-3 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Despite universal health coverage, significant disparities in mental health service utilization persist across Europe. As urban infrastructures undergo rapid digital transformation—termed "Platform Urbanism"—traditional analog access channels are increasingly replaced by digital platforms. This shift risks creating a "Digital Wall" for the aging and digitally vulnerable. This study investigates the "Double Exclusion" hypothesis, positing that digitally vulnerable individuals living in highly platformized regions face a compounded penalty: individual skill deficits (primary exclusion) exacerbated by the structural dismantling of analog services (secondary exclusion).

Utilizing microdata from the European Health Interview Survey (EHIS) Wave 3 (2019) linked with Eurostat NUTS 2 regional statistics, we employ multilevel logistic regression models. We operationalize digital capability using survey data collection modes (web-based vs. face-to-face) and construct a regional "Platform Urbanism Index" aggregating indicators of the collaborative economy and digital infrastructure. The study analyzes the cross-level interaction between individual digital capability and regional platform density on unmet medical needs and depression (PHQ-8). Furthermore, we examine whether social capital serves as a buffering mechanism against this technological exclusion.

We anticipate finding that the association between digital exclusion and unmet medical needs is significantly stronger in regions with high platform urbanism, confirming the paradox that "Smart Cities" may function as exclusionary spaces. However, high social support is expected to mitigate this penalty through "human intermediaries." This research challenges techno-optimist narratives, providing empirical evidence that without inclusive policies, digital urbanism may widen health inequalities.

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Why Place Matters for Electric Mobility: Socio-Spatial Inequalities and Justice in Vulnerable Urban Neighbourhoods

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G10-3 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

The transition to electric mobility is increasingly framed as a cornerstone of sustainable urban development and climate action. However, growing evidence suggests that its benefits and costs are unevenly distributed across space, raising important concerns about socio-spatial inequalities, territorial exclusion, and justice. In socioeconomically vulnerable neighbourhoods, across both urban and peri-urban contexts, where housing conditions, tenure regimes, infrastructural provision, and governance arrangements diverge from those assumed in mainstream mobility and energy policies, electric vehicles (EVs) and Vehicle-to-Grid (V2G) technologies risk reinforcing existing forms of spatial and social polarisation.

This paper examines how place-specific socio-technical and institutional conditions shape perceptions of EV and V2G technologies in three vulnerable neighbourhoods: Aradas (Aveiro), Kanaleneiland (Utrecht), and Annelinn (Tartu). Grounded in an analytical framework combining socio-technical transitions and energy justice, the study explores how distributive, procedural, and recognitional inequalities are produced and experienced at the neighbourhood scale. Empirically, it adopts a comparative qualitative design based on resident focus groups, complemented by a pre-discussion questionnaire capturing everyday mobility practices, attitudes towards electric mobility, and socio-demographic characteristics.

The findings reveal that attitudes towards EVs and V2G are strongly place-dependent and shaped less by individual preferences than by structurally embedded territorial conditions. At the local level, limited exposure to EVs and low awareness of V2G contribute to uncertainty and perceived exclusion from innovation pathways. At the institutional level, constraints related to housing typologies, collective or fragmented ownership arrangements, insufficient charging infrastructure, grid capacity limitations, and complex multi-actor decision-making processes systematically reduce perceived accessibility. These barriers intersect with affordability concerns, limited procedural transparency, and uncertainty regarding compensation and benefit-sharing mechanisms, reinforcing perceptions of unfairness and marginalisation. At the broader societal level, while climate change awareness and rising energy prices foster conditional openness towards sustainable mobility, such openness remains contingent on credible assurances of fairness, access, and inclusion.

By foregrounding electric mobility as a site where socio-spatial inequalities are reproduced and contested, this paper contributes to debates on just transitions and territorial cohesion. It argues that without place-based and justice-sensitive governance approaches, electric mobility risks becoming another vector of spatial polarisation rather than a driver of inclusive sustainability.

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Urban Expansion and Socio-Spatial Differentiation: A Spatial Analysis of New Residential Areas

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G10-4 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

Over recent decades, medium-sized cities in the State of São Paulo, such as Ribeirão Preto and Jundiaí, have experienced sustained territorial expansion, reshaping peri-urban and formerly rural areas into new residential zones. While existing studies have extensively documented the physical enlargement of urban footprints—often supported by land-use datasets such as MapBiomas—most analyses remain focused on morphological patterns of sprawl. Comparatively less attention has been devoted to identifying the socio-demographic characteristics of the populations occupying these newly urbanized areas. As a result, research frequently measures how cities grow spatially without adequately addressing who inhabits expansion zones and how these processes reshape socio-spatial structures.

This study aims to bridge this gap by analyzing recent urban expansion and examining the socio-economic profiles of households residing in newly developed areas. The research integrates land-use and land-cover data with microdata from the Demographic Census conducted by IBGE. Urban growth over the past decades is mapped through geoprocessing techniques, enabling the identification of expansion polygons. These areas are then analyzed using spatial statistical methods, including measures of spatial autocorrelation and cluster detection, to assess patterns of income distribution, household composition, gender of household head, and race/color.

The findings reveal that expansion in medium-sized cities often occurs at rates exceeding demographic growth, contributing to declining densities and fragmented urban fabrics. More importantly, newly urbanized areas exhibit statistically significant socio-spatial differentiation. Higher-income households tend to cluster in specific expansion corridors, frequently associated with gated or high-standard developments, while lower-income groups are disproportionately located in peripheral social housing zones with weaker infrastructure. These patterns suggest that urban expansion reinforces spatial inequality and contributes to emerging forms of segregation, echoing broader processes of uneven development identified in urban and regional theory.

The study demonstrates that incorporating socio-demographic characterization into analyses of urban expansion is essential for effective planning. Understanding who occupies the urban fringe enables municipalities to anticipate infrastructure needs, allocate public services more equitably, and design policies aimed at preventing entrenched segregation. In an era of structural regional transition, managing urban growth with analytical rigor becomes central to fostering territorial cohesion and promoting more inclusive development trajectories in Brazilian cities.

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Mapping the desirability of Scotland's rural, remote, and island regions: what role of place-based assets and public services? A mixed spatial analysis and choice experimental approach

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G10-4 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

Many rural territories across Europe are experiencing vicious circles of depopulation and declining public services, despite possessing valuable economic and environmental assets. Among European countries, Scotland is noteworthy for its high population concentration, counterbalanced by many sparsely populated rural, remote, and island (RRI) regions. Consequently, the Scottish Government's 2021 National Population Strategy (NPS) made the promotion of a more evenly distributed population a key goal, and the subsequent Action Plan to Address Depopulation (2024) has acknowledged the place-based complexity of demographic challenges. Achieving a more balanced population would require the voluntary relocation of residents from urban to RRI areas, but from a foundational economy perspective, activating this virtuous circle requires an increased accessibility of keystone services. We contribute to this debate by assessing the changing desirability of Scotland's territory and evaluating the correlation between desirability and local outcomes. We adopt a novel approach merging original datasets of place characteristics calculated from open sources and results of choice experiments from a sample of 1,007 respondents representative of the Scottish population. The spatial dataset contains information on attributes of places (operationalised as 5km wide hexagons) including population levels; the locations of schools, healthcare facilities and grocery shops; the quality of digital connectivity and of the natural environment; and the urban-rural nature of the locality. The choice experiment used the same attributes to derive preferences and willingness-to-accept coefficients which, once multiplied by the characteristics of each place, provide a proxy for the "utility" that people derive from moving there or, equally, for their monetary willingness to accept. The diversity of our sample allows us to map desirability across different socio-demographic groups, including retired people and young families. Changing place characteristics over time (2019-c.2025) allow us to determine how desirability has changed, and thus which areas have experienced decline or improvement. Willingness-to-accept values provide a tangible figure of the compensation one would require, in terms of a higher salary, to move to a less desirable place, or the income one would forego to move to a more desirable place. Finally, the discrepancy between actual population dynamics and desirability provides an indication of local constraints to relocation, primarily in terms of housing availability – a key factor in rural Scotland. Our analysis can support the design of efficient incentives – in terms of service provision – to move towards the goal of the NPS, mimicking the "20-minute neighbourhood" concept for RRI areas.

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Untangling Urban Transformation: Assessment of Land Value Changes in Golden Horn / Haliç - İstanbul

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G10-4 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

This study provides a comprehensive examination of the socio-spatial, economic, and demographic transformations within the Golden Horn (Haliç) region of Istanbul, driven by urban regeneration policies starting from 1990s and accelerating drastically in the 2010s. In Golden Horn—a highly stratified historic, cultural, and geographical focal point of Istanbul—urban interventions function as mechanisms for spatial value production, rent generation, and the redefinition of public space, frequently resulting in profound social differentiation and exclusion. Having adopted a quantitative, relational methodology, the research covers a compiled dataset of street-level unit land value prices between 2000 and 2026. The analysis is based on the Multiple Correspondence Analysis (MCA), where Golden Horn neighborhoods are clustered based on their value categories of social characteristics and degrees of transformation. By plotting these socio-economic shifts spatially and temporally, the MCA reveals the hidden trajectories of transformation. The results show that neighborhoods subjected to large-scale, state-backed transformation projects exhibit unit price increases that radically outpace regional averages, acting as catalysts for broader transformation. Ultimately, post-2000 urban policies in Istanbul have utilized legislative instruments to commodify historical and cultural heritage, fundamentally fracturing the Golden Horn's socio-spatial landscape. The resulting geography is one of deepened inequality, where the success of "transformation" is measured by maximized land values and the inevitable displacement of traditional, lower-income communities.

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Gendered Territorial Regimes of Work and Everyday Provisioning: Regional Responses to Uneven Development in Coastal Vietnam

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G10-5 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

Regional science has documented that development trajectories unfold unevenly across space, concentrating opportunities, infrastructures, and labor market dynamics in some territories while leaving others structured by endogenous economies and differentiated access to resources. Yet the gendered dimensions of these spatial inequalities, and more specifically the ways in which contrasting sub-national development trajectories reorganize women's work, care, mobility, and temporal regimes, remain underexplored. This paper addresses this gap by proposing the concept of gendered territorial regimes of work, understood as the set of economic, domestic, and institutional arrangements that, within a given space, organize access to activities, the distribution of paid work and care time, modes of remuneration and recognition, and the possibilities of mobility available to women and men.

The analysis draws on a comparative ethnography conducted in Kiên Giang province, southern Vietnam, spanning nearly ten months across two contrasting sites: Hà Tiên, a small coastal town organized around fishing, local commerce, and diffuse tourism; and Phú Quốc, an island that within a decade became a major tourism hub marked by rapid urbanization and large-scale external investment. This controlled territorial variation treats development trajectories not as context but as a central differentiating mechanism in gendered relations of work. The corpus comprises 126 semi-structured interviews conducted in Vietnamese, complemented by extended fieldwork observations across both sites.

The findings identify two distinct gendered territorial regimes of work. In Hà Tiên, women's trajectories remain deeply embedded in domestic economies, affording relative control over daily rhythms but at the cost of limited monetary remuneration and weak institutional recognition. In Phú Quốc, tourism-led integration diversifies opportunities but institutionalizes demanding expectations of temporal availability and emotional performance, while maintaining gendered occupational hierarchies. Across both sites, the analysis reveals a pattern of temporal extraction through which territorial development sustains local economic dynamism by drawing on women's time, availability, and coordination work, contributions that remain largely invisible in conventional regional indicators. This dynamic has direct implications for how regional responses to global challenges are evaluated. When care infrastructures are absent and labor market protections remain inadequate, transition costs are silently displaced onto households and, within them, onto women. By foregrounding gendered territorial regimes of work, this paper argues that evaluating the social inclusiveness of territorial transitions requires attending to the temporal, reproductive, and relational conditions under which participation in development is made possible, and to who bears its invisible cost.

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The distance-time-speed trilogy: why such differences between immigrants' and natives' commutes?

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G10-5 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

The integration of immigrants is multidimensional, yet their daily mobility remains an underexplored aspect. In France, as in other countries, immigrants exhibit transportation behaviors that differ from native-born. Understanding the reasons for these differences is essential to reducing risks of social exclusion and designing more equitable mobility policies.

Drawing on a national transportation survey conducted in metropolitan France in 2019, we compare the commutes of immigrants and native-born workers by analyzing distance, travel time, and travel speed. Descriptive statistics indicate that immigrants spend more time commuting and travel more slowly, despite similar distances. We examine the contribution to these raw differences using an Oaxaca-Blinder decomposition, distinguishing four dimensions: personal attributes, household characteristics, location specificities, and travel conditions.

Our results show that differences stem from unequal endowments between the two groups, particularly in terms of location. If there were no territorial disparities among natives and immigrants, the commute time for immigrants could be reduced by 17.1%, out of a raw gap of 30.9%. Individual or family attributes, on the other hand, play a more limited role, while travel conditions, particularly the choice of transport mode, also contribute to the differences, reflecting travel behaviors acquired before migration. However, when we remove the mode of transport from the estimates, we observe what we label a "concealed effect" of location: approximately 3% of the real impact of spatial characteristics is captured by this variable.

We also highlight the existence of an ethnic "commuting penalty" due to residential segregation, i.e., due to the immigrants' preference for living in ethnic enclaves, rather than a penalty due to discrimination in the labor or housing market, as theorized by some authors.

Subgroup analysis confirms the robustness of our findings for different population categories. However, variations appear depending on the urban area of residency, suggesting specific local dynamics. Finally, in addition to discrepancies in endowments, immigrants are sometimes more sensitive to certain determinants of mobility, which also leads to differences in mobility. For example, a deterioration in health is likely to increase immigrants' travel time by 32.8%, but not that of natives.

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Automation and migrant vulnerability: A spatial perspective from Denmark

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G10-5 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

This article examines the relationship between migration, automation, and spatial segregation in Denmark by analyzing patterns of residential clustering relate to migrants' risk of technology-induced job loss. Automation reduces demand for routine, automatable tasks while increasing demand for both high-skill and low-skill service occupations. Migrant workers are disproportionately affected, as they are overrepresented in sectors highly exposed to automation risk, such as manufacturing and agriculture, while also concentrated in expanding care and domestic work sectors. Using longitudinal, geo-coded Danish register data (2007–2023), we investigate whether migrants are spatially clustered not only by socioeconomic status but also by their risk of technology-induced job loss. To measure occupational exposure to automation, we employ the Routine Task Intensity (RTI) index developed by Autor et al. (2003) and updated for ISCO-2 digit occupations by Lewandowski et al. (2022). Spatial analysis is conducted using a Geographic Information System (GIS) approach that constructs individualized, scalable neighborhoods, thereby avoiding the modifiable areal unit problem (MAUP). This enables the identification of areas where migrants with high RTI scores are concentrated and where communities may be most vulnerable to automation-driven labor shifts. Focusing on Denmark's four largest cities—Copenhagen, Aarhus, Aalborg, and Odense—we explore long-term changes in spatial clustering across skill levels and household compositions. We hypothesize that migrants, particularly low-skilled individuals and households, will exhibit stronger clustering patterns by automation risk than by traditional socioeconomic indicators, revealing new dimensions of inequality in the era of technological change.

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The Relationship Between Innovation, Regional Inequality, and Migration: A Case Study of Israel

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G10-5 Socio-Spatial Inequalities and Polarisation: Segregation, Migration, Gender, Discrimination and Social Exclusion, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

The Relationship Between Innovation, Regional Inequality, and Migration: A Case Study of Israel
Background and Objective While innovation is a primary driver of national economic prosperity, its benefits are often spatially concentrated, potentially exacerbating socio-spatial inequalities. This study examines the Israeli context, where regional disparities rank among the highest in the OECD, with over 60% of high-tech employment concentrated in the national core. We investigate how the centralized concentration of innovation correlates with regional polarization across three dimensions: labor mobility, internal migration, and living standards.
Methodology The research utilizes a longitudinal multivariate analytical framework with data from 2000 to 2020 provided by the Israeli Central Bureau of Statistics. We employ multivariate OLS regressions to analyze trends in commuting patterns, net internal migration, and a multidimensional Socio-Economic Index (SL). The SL index serves as a proxy for socio-spatial quality of life, incorporating 14 variables across education, employment, and asset accumulation.
Findings The empirical results reveal a significant structural shift in peripheral labor markets. We find a growing trend of peripheral residents commuting to central innovation hubs, particularly for medium-distance regional mobility. Commuting has emerged as a "default" employment strategy, showing resilience to short-term market fluctuations. However, this mobility has not translated into permanent population de-concentration; net internal migration remains stagnant, largely due to prohibitive housing costs in the core acting as a barrier to relocation.
Crucially, the study identifies a systematic widening of the socio-economic gap. The decline in living standards in the periphery is notably steeper than in the core, driven by a "household sorting" mechanism where high-skill human capital and assets remain concentrated in central regions. Segmented analysis further reveals a "distance-decay" effect, with regions lacking rapid transit infrastructure experiencing the most pronounced relative decline.
Conclusions and Policy Implications The findings suggest that current innovation-led growth models facilitate a "backwash effect" rather than regional wealth convergence. Commuter-based integration provides employment access but fails to improve local quality of life or foster regional independence. To mitigate this polarization, we propose differentiated place-based policies: strengthening internal regional connectivity for the far periphery and incentivizing remote work to stabilize peripheral populations.

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Mafia Networks

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G11-1 Public Policy Assessment in the Transition Era: Inclusiveness, Poverty Alleviation, Equal Opportunities and Territorial Justice, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 27, 2026, 09:00 - 10:30

This paper develops a novel early-warning system to predict firm confiscation due to mafia infiltration in Italy. To do this, we construct a unique, dynamic corporate ownership network by tracing the first- and second-degree connections of all Italian firms confiscated over the last two decades. Using this dataset, we train a series of machine learning models that integrate firm-level financial data with a comprehensive set of network topology measures, successfully forecasting confiscation up to three years in advance. Our out-of-sample results demonstrate exceptionally high predictive power, with the integrated model significantly outperforming those relying on a single data source. We find that network features are crucial for comprehensive detection (high recall), while firm financials provide accuracy (high precision); our framework effectively balances this critical trade-off. A feature-contribution analysis using SHAP values reveals that firm size is the single most important predictor, showing that smaller and financially distressed firms face the highest confiscation risk. Network topology features collectively emerge as the second most important group of indicators. Taken together, our findings underscore the value of integrating ownership network intelligence with firm fundamentals to create a powerful and interpretable tool for risk-based supervision and enforcement against organized crime.

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Leaving Scylla to meet Charybdis? Choosing entrepreneurship over salaried work when in poverty

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G11-1 Public Policy Assessment in the Transition Era: Inclusiveness, Poverty Alleviation, Equal Opportunities and Territorial Justice, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 27, 2026, 09:00 - 10:30

Could long-term entrepreneurship provide positive payoff for the wage-earning poor? According to the literature, most entrepreneurs will receive negative financial payoffs when leaving salaried jobs to engage in self-employment. Their preference for entrepreneurship could, however, be related to non-monetary gains and improvement of their wellbeing. Limited research indicates that these results may not apply to the working poor. Indeed, they usually cannot afford to earn less and are likely to suffer high failure costs – financial, psychological and social – if self-employment doesn't work out for them.
Coming from poverty is generally considered as a liability to start a successful business. However, the poor encounter barriers to success in both work-for-wages and self-employment and are likely to face low-wage issues. Thus, self-employment might still deliver a relatively positive outcome when business matures.
We hypothesize that the wage-earning poor who manage to stay in self-employment for a long time have overcome some poverty liabilities and that entrepreneurship can financially pay off for this specific population.
To explore this question, we utilize data from the PSID on American households from 2002 to 2021. Using difference-in-differences associated with propensity score matching, we analyze income evolution of the working poor engaging in self-employment. If short-term self-employment doesn't pay off, periods of entrepreneurship of six years give ambiguous results showing that the entrepreneurial poor could at least catch up with their salaried counterparts.
These results help us conclude on entrepreneurship as a strategy to leave poverty. It especially reinforces the interest in tailored entrepreneurial programs targeting the poor.

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Spatial origins of multidimensional poverty and industrial development in Turkey

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G11-1 Public Policy Assessment in the Transition Era: Inclusiveness, Poverty Alleviation, Equal Opportunities and Territorial Justice, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 27, 2026, 09:00 - 10:30

Poverty has been extensively analyzed on monetary grounds. However, neglecting non-monetary dimensions of poverty can result in under-estimation of the actual poverty problem. Human capital, living standards, housing conditions and environmental concerns are the primary candidates to describe the non-monetary dimensions of poverty measurement. Meanwhile, there is a consensus that structure of production and industrialization have massive influence on income distribution and the poverty problem. In this research, we explore the 2014-2024 period and construct a unified multidimensional poverty index (MPI) for Turkish regions by using the Survey on Income and Living Conditions. Next, we analyze whether regional and temporal evolution of industrial development have influence on the distribution of multidimensional poverty. Our empirical design has two core steps: (i) We follow the AF methodology and construct the aggregate MPI and sub-MPI for different segments (based on gender, age, employment status, sector of employment and skill level) at the regional level (NUTS-2), (ii) Next, we explore the spatial distribution of MPI and its connection with regional industrialization patterns by using spatial panel models (SAR, SEM, SAC, SDM).
Our preliminary results suggest a declining trend for the MPI at the national level. However spatial differences follow the known west-east duality in Turkey. We also find out that different segments of the population suffer differently from the non-monetary poverty problem. Our results also show that regional MPI figures are subject to significant spatial autocorrelation, suggesting the existence of local externalities in terms of non-monetary deprivation. We also trace the local decomposition of spatial autocorrelation and detect limited mobility across different spatial clusters, suggesting strong spatial inertia in the MPI's distribution. Our spatial modelling exercises show that industrial production has stronger poverty alleviation effects at the regional level. Moreover, we find out visible spatial networks for the MPI's regional variation. Those regions which are clustered with high (low) MPI levels witness higher (lower) non-monetary deprivation. Finally, our sub-MPI analyses show stronger effects for industrial production as those regions with denser industrial production have lower propensity to suffer from the multidimensional poverty problem.
Our results show that, policies that focus on the structure of production can be more operative to combat with the poverty problem. Territorial disparities, deindustrialization trends and spatial externalities are the main pillars of our analyses carried out for Turkey. Therefore, findings from Turkey can be reference points for the construction of policies in developing countries with similar fundamental problems.

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Governing the Just Energy Transition in Bulgaria: Stakeholder Perspectives, Institutional Barriers and Regional Implications

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G11-2 Public Policy Assessment in the Transition Era: Inclusiveness, Poverty Alleviation, Equal Opportunities and Territorial Justice, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 27, 2026, 15:00 - 17:00

This article examines the governance of the just energy transition in Bulgaria through qualitative interviews with stakeholders from public authorities, business, academia and civil society, including representatives of socially vulnerable minority communities in coal-dependent regions. The findings reveal that policy uncertainty, fragmented governance and limited coordination capacity constrain transition implementation. Evidence also highlights a transition literacy divide and the risk that decarbonisation policies may disproportionately affect low-qualified workers and marginalised communities exposed to energy poverty. The study argues that effective just transition governance in peripheral contexts requires integrated approaches combining industrial restructuring, social inclusion and targeted energy poverty mitigation. By providing new empirical insights from an under-researched EU member state, the article contributes to debates on socially differentiated transition policy design.

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The Welfare Analysis of the Distribution Effect on Carbon Taxation

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G11-2 Public Policy Assessment in the Transition Era: Inclusiveness, Poverty Alleviation, Equal Opportunities and Territorial Justice, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 27, 2026, 15:00 - 17:00

In general, the manufacturing firms produce the goods, they will emerge the carbon emission, which in turn induce the negative externality on the household in the neighborhood community. And in order to compensate the households' negative externality, the government usually either needs to provide some clean- air infrastructures or green facilities such as parks to households in terms of a local public goods which in general have a positive externality to benefit residents and then smooth the negative externality from carbon emissions, or using the taxation revenue to subsidy the households as an income transfer, thus the local government has the authority to levy the carbon pollution tax on the firms based on the amount of firms' emission, and also the government want to determine how to employ optimal fiscal policy on the using pollution taxation revenue.

In this paper, we complement the literature by focusing on the examination and analysis the optimal tax rate as well as the optimal allocation schemes of the carbon taxation revenue with respects to the household welfare within a theoretical framework. We discuss three alternative schemes of fiscal policies associated with carbon taxation, respectively. First, if the share of taxation revenue to finance the local public goods is exogenously given by a specific political policy consideration, the optimal tax rate is increasing in pollution externality, but decreasing in either in the consumption weight of the aggregate manufacturing good or local public good. Second, we determine the optimal distribution share of the taxation revenue to finance the local public goods when the carbon tax rate is given by the government with a specific political policy consideration. It is shown that the optimal distribution share is decreasing in the share of carbon emissions in the production process of manufacturing goods. Finally, we examine the more general scheme when both the share and tax rate endogenous determining by the government simultaneously. It documents that the optimal tax rate is independent of the share of carbon emissions in the production process, and is increasing in the negative externality of pollution and the elasticity of consumption manufacturing goods, and decreasing in the weight of public good consumption. As the optimal distribution share is decreasing either in weight or elasticity of consumption manufacturing goods, or the share of carbon emissions in the production process of manufacturing goods.

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Evaluating Labour Policies for Justice-Involved People. Exploring Key Implementation Factors from a regional policy in Piedmont, Italy

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G11-2 Public Policy Assessment in the Transition Era: Inclusiveness, Poverty Alleviation, Equal Opportunities and Territorial Justice, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 27, 2026, 15:00 - 17:00

In the complex transitions interesting modern societies, security, employment, and welfare are among the key themes driving political change and policy reforms. Labour policies targeting justice-involved individuals span across all these themes, aiming to combine inclusiveness and effectiveness in the justice systems.

As per other labour market interventions, these policies are characterized by a strong emphasis on performance measurement and evaluation. The legitimacy of labour market interventions, in fact, strongly depends on their cost-effectiveness, stimulating the policymaker's demand for clear and actionable evaluation insights.

Against this background, evidence about policies for the general unemployed population has matured a shared consensus over "what works". However, the same cannot be said about the programmes for more vulnerable target populations, including justice-involved people.

Existent studies report contrasting findings on key outcome indicators such as recidivism, type and quality of post-release employment, and skill development. Complicating this picture, this policy domain poses specific methodological challenges involving availability, collection, and analysis of empirical data, making comparative and systematic large-N studies harder to pursue.

This paper adopts a qualitative case study approach to analyse the implementation of a labour market policy targeting justice-involved individuals. Drawing on semi-structured interviews with implementers, the research explores the central factors characterizing the implementation process. Engaging with the existing literature, the research inquires three key aspects that are currently underdeveloped in most evaluation studies: a) the coexistence of multiple and sometimes conflicting rationales within the implementation structures; b) heterogeneity within the target population and its implications for service provision; and c) the gap between program participation and effective access to employment.

The findings identify key causal factors influencing implementation dynamics and shed light on how these factors mediate the outcomes of labour policies targeting justice-involved individuals. More broadly, the paper also argues for the importance of an evaluation approach based on methodological pluralism capable of complementing outcome-oriented evaluations with a deeper understanding of the complex social processes that public policies aim to govern. Such reflections have a central importance in societies characterized by complex transitions and an ever-growing demand for policy evaluation.

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Territorial Justice in the Coal Transition: Spatial Spillovers in Medicaid Pressure Across Appalachia

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G11-2 Public Policy Assessment in the Transition Era: Inclusiveness, Poverty Alleviation, Equal Opportunities and Territorial Justice, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 27, 2026, 15:00 - 17:00

The coal-to-clean transition in the United States has generated geographically concentrated adjustment costs that challenge the inclusiveness of decarbonisation policy. Yet empirical evidence on how transition stress translates into spatially uneven pressure on the social safety net—and how far those pressures spill across administrative borders—remains limited. Focusing on Appalachia, a typical "left-behind" coal region, this paper assesses the territorial justice implications of transition-era policy by quantifying the spatial–temporal dynamics of "Medicaid pressure" over 2009–2019. Because a complete county–year Medicaid enrolment series is not available for the full period, we operationalise Medicaid pressure using county poverty rates as an institutionally motivated proxy, capturing the economic foundation of programme reliance.

We construct a county–year panel for all Appalachian counties by integrating coal production, socioeconomic indicators, and air-pollution exposure measures. We first establish that vulnerability is spatially structured, consistent with interdependent labour markets, shared service geographies, and correlated exposure environments. We then estimate spatial panel fixed-effects models under a Queen-contiguity weights matrix and select a Spatial Durbin specification to identify both endogenous spatial dependence and spillovers from neighbouring counties' conditions. To link these patterns to a salient decarbonisation policy era, we complement the spatial analysis with a two-way fixed-effects difference-in-differences and event-study design around the 2015 Clean Power Plan, comparing coal-reliant counties (defined by pre-policy coal exposure) with non-coal counties.

Findings indicate that labour-market distress and human-capital endowments are the most robust correlates of rising medicaid pressure, with economically distressed counties also affected by neighbouring counties' conditions. Environmental burdens appear tightly coupled to regional vulnerability through spillover channels. Coal dependence is not a stable direct predictor once spatial dependence and socioeconomic conditions are modelled, implying that transition exposure is mediated through broader adjustment mechanisms. Policy-era estimates show a post-2015 divergence between coal-reliant and non-coal counties consistent with transition stress, interpreted cautiously given overlapping structural decline and institutional heterogeneity in Medicaid eligibility.

Overall, the results argue that territorially just decarbonisation requires multi-county policy design that integrates labour-market support with health and social protection planning, rather than narrowly local interventions that ignore spatial spillovers.

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Progress Toward Universal Health Coverage in the Transformed Health System of Türkiye in 2001-2021 as a Sustainable Development Goal (SDG 3) with a Global Landscape

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G11-2 Public Policy Assessment in the Transition Era: Inclusiveness, Poverty Alleviation, Equal Opportunities and Territorial Justice, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 27, 2026, 15:00 - 17:00

Purpose: This article aims to comparatively evaluate the development of universal health coverage in Türkiye over the years, which is targeted to be achieved with the completion of health reforms carried out under the Health Transformation Program between 2003 and 2013. Aiming to inform health policy processes, the descriptive comparative analyses shed light on the developments over the past two decades in achieving health service coverage and financial protection, both in Türkiye and globally.
Method: Using the country-level data published by the WHO covering the years 2000-2021, the development of universal health care coverage in the Turkish health system over the years, compared to global trends, was examined through international comparative descriptive analyses. Data from 2000 to 2021, published by WHO on SDG 3.8.1 Service Coverage Index, UHC SCI, related to health service provision and SDG 3.8.2 on catastrophic out-of-pocket health expenditures concerning financial protection in access to health services are used.
Findings: The findings reveal significant progress in universal health coverage during Türkiye's Health Transformation Program (2003-2013), which comprehensively restructured the country's health system and specifically aimed to achieve universal health coverage nationwide. However, progress stalled in the later years following this reform program. The notable progress, especially between 2000 and 2015, was driven by all UHC SCI subindices of health service coverage. The lack of further improvement in the index scores in the post-reforms years serves as a warning. Globally, there have been significant improvements in the expansion of health care coverage compared to the deterioration of financial protection over the years; however, the progress in health service coverage has stagnated in recent years as well. In light of the SDG UHC indicators on universal health coverage of the Sustainable Development Goals, it is clear that the recent trends in global values of the indicators regarding both health service coverage and 'catastrophic' out-of-pocket health expenditure are alarming.
Originality and Significance: As a result of the comparative descriptive analyses in the article, the changes in health service coverage and financial protection in the country's health system over the years are illuminated in comparison with country groups globally. The findings of the study have the potential to serve as an input to health policy design processes nationwide and globally.

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Rental Market Dynamics as a Regional Health Determinant: Evidence from Spain's Autonomous Communities

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G11-3 Public Policy Assessment in the Transition Era: Inclusiveness, Poverty Alleviation, Equal Opportunities and Territorial Justice, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 27, 2026, 17:30 - 19:30

Background. Housing affordability pressure is increasingly recognised as a structural driver of health inequalities, yet its territorial impacts may be highly uneven. In segmented rental markets, rent shocks can concentrate in specific dwelling types, generating unequal exposure to affordability stress and potentially widening regional gaps in mental health over time. This paper examines whether rental price dynamics are associated with changes in mental health prevalence across Spanish Autonomous Communities (CCAA), and whether these associations differ across market segments and territories.
Methods. We assemble a longitudinal panel for Spain's CCAA covering 2011–2023, combining housing price indices from INE with region-level measures of mental health prevalence from administrative records from the Spanish National Health System. The main explanatory variables are annual changes in rental price indices, modelled contemporaneously and with lags to capture delayed effects. To proxy unequal exposure within regional rental markets, rent changes are analysed separately by dwelling size (small, medium and large units). Our empirical strategy includes socioeconomic and demographic controls, region and time effects, and specifications that account for regional heterogeneity and interregional dependence.
Results. Rental price increases are associated with modest but statistically significant rises in mental health prevalence, with effects emerging mainly with a delay. The association is substantially stronger for small and medium-sized dwellings, while rent changes for larger dwellings show no robust relationship. Estimated effects also vary across regions, pointing to marked territorial heterogeneity in vulnerability to rental price shocks.
Conclusions. The findings suggest that regional mental health is shaped not only by overall rental market trends but also by the segment-specific incidence of rent inflation, reinforcing housing affordability as a determinant of territorial health inequalities. From a policy perspective, results support more integrated regional strategies that coordinate housing affordability instruments with mental health prevention and service planning, with particular attention to regions and market segments most exposed to rent shocks.

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Valuing broader welfare across regions: Evidence from the Netherlands

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G11-3 Public Policy Assessment in the Transition Era: Inclusiveness, Poverty Alleviation, Equal Opportunities and Territorial Justice, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 27, 2026, 17:30 - 19:30

Economic debates on societal progress increasingly move beyond GDP toward broader welfare frameworks that incorporate economic, social, and environmental dimensions of well-being. While these frameworks provide rich descriptive insights, much less is known about how households value different welfare dimensions and whether these valuations vary across space. This paper investigates which welfare dimensions people value most and how these preferences differ regionally, using detailed spatial data for the Netherlands. We combine a comprehensive set of welfare indicators, covering income, employment, health, accessibility, safety, and environmental quality, with newly developed indicators capturing climate-related exposure such as floods, land subsidence, and heat stress. These environmental dimensions are often underrepresented in existing welfare-beyond-GDP frameworks. Our empirical analysis exploits spatial variation in land values to infer households' implicit willingness to pay for different welfare dimensions. In line with spatial equilibrium theory, land values capitalize local amenities and disamenities, reflecting aggregated residential preferences. First, we map the spatial distribution of broader welfare indicators across regions, revealing substantial regional heterogeneity. Environmental and climate exposure indicators display particularly strong spatial variation. Second, we estimate hedonic regressions of land values on welfare indicators to identify which dimensions are most strongly capitalized into prices. Our results show that economic dimensions are valued most strongly on average. By linking broader welfare indicators to revealed preferences in housing markets, this paper contributes to the measurement of regional welfare and offers new insights into the spatial trade-offs underlying residential location preferences. The findings have direct implications for regional policy and climate adaptation, as welfare-beyond-GDP frameworks increasingly inform spatial decision-making. Yet without evidence on which dimensions households actually value, such policies risk misallocating resources across regions with fundamentally different welfare trade-offs.

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Health and Financial Literacy: Does the socioeconomic status of the city affect the volume of requests for municipal tax discounts?

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G11-3 Public Policy Assessment in the Transition Era: Inclusiveness, Poverty Alleviation, Equal Opportunities and Territorial Justice, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 27, 2026, 17:30 - 19:30

This study examines the correlation between municipal tax discount applications and the socio-economic status (SES) of 28 settlements in northern Israel, utilizing household data from 2011 to 2023. Employing quadratic regression to allow for non-linear relationships, the findings indicate that in settlements with low to medium SES rankings (3-5), municipalities should enhance support and education to improve residents' medical and financial literacy, addressing the underutilization of available benefits. However, these municipalities often face resource constraints that limit their capacity to assist. In contrast, higher SES settlements benefit from residents' increased literacy, facilitating successful applications. The study suggests government intervention, such as engaging student volunteers, to bolster medical literacy and support in lower SES areas, ensuring broader access to rights and services.

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Transformation Toward a Region-Based Integrated Healthcare System in Türkiye from the 2010s onwards: Health Service Areas Planning Approach together with City Hospitals Model

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G11-3 Public Policy Assessment in the Transition Era: Inclusiveness, Poverty Alleviation, Equal Opportunities and Territorial Justice, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 27, 2026, 17:30 - 19:30

This article aims to provide an examination of the two region-based health policies together in Türkiye's transformed healthcare delivery system from the 2010s onwards, with the completion of Türkiye's Health Transformation Program 2003-2013. The article reviews these two current nationwide health policy implementations together to highlight their long-term and complementary roles in transforming Türkiye's healthcare system into a sustainable and integrated healthcare delivery model.

Türkiye's nationwide implementations of region-based planning-driven health policy have the potential to reinforce and strengthen universal healthcare coverage by improving geographic coverage in addition to financial coverage that has achieved through the implementation of universal public insurance coverage with Türkiye's Health Transformation Program (HTP) reforms in the 2010s. With a reflective description of the transformation of Türkiye's health system towards an integrated healthcare system over the past two decades, this article contributes to the health policy discussions in the literature about integrated health services from the health service supply side.

The practice of Health Service Areas and City Hospitals projects can help ensure equal access to quality healthcare for all citizens and reduce regional inequalities in access and availability of healthcare resources, under the condition of well-coordination and integration across the levels of care and intersectoral collaboration. Beyond integration in terms of organization, a holistic 'whole person health' approach, with continuity of care, effective referral, and patient data management, can guarantee a healthy population in a sustained way. This perspective is a strong candidate to lead the next generation of Türkiye's health system reforms focused on long-term, sustainable health-for-everyone policies.

As implications for policymakers and the public perspective, the article offers insightful reflections about issues relevant to every country's health system and health policy. Although the analysis is grounded in the specific country experience of Türkiye, the conceptual framework and policy implications extend beyond national borders to contribute to fruitful reflections and discussions about various issues in healthcare policies that are applicable to any particular national health system across the globe. The article has the potential stimulate further discussion and policy actions in the implementation of a holistic integrated care approach.

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Soybean Expansion and Local Development in Brazil

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G12-1 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

Brazil's soybean boom has profoundly reshaped large parts of the country's territory. Soybean area expanded by more than 330% between 1988 and 2024, accounting for most of the increase in cultivated land and a substantial share of growth in agricultural output. This expansion occurred both through intensification in consolidated regions and through the spatial diffusion of highly intensive production systems into new frontier areas – initially across central regions and, more recently, toward the northern Cerrado savanna. For these reasons, soybeans have become a focal point in debates on agricultural-led regional development in Brazil.

This study examines the socioeconomic impacts of Brazil's soybean production chain, asking whether its expansion has generated net positive or negative effects on local economic development. While direct agricultural effects – such as farm employment, wages, and tax revenues – are often emphasized, less attention has been paid to indirect and spatial spillovers. In modern, capital-intensive agricultural systems such as soybean production, the literature suggests that development effects are less likely to arise from farm-level employment itself and more likely to operate through value-chain linkages and territorial spillovers. This perspective motivates our focus on the soybean production chain as a whole.

The paper also addresses the heterogeneity of these impacts, examining how they vary across space and local productive structures and identifying the conditions under which soybean expansion is associated with positive development outcomes. In particular, we investigate whether effects differ according to municipal size, pre-existing economic structure, and the presence of upstream and downstream agro-industrial activities.

Empirically, we proceed in two steps. First, we estimate the reduced-form relationship between municipal exposure to soybean expansion and a set of development outcomes, including non-agricultural employment, wage levels, sectoral diversification, and indicators of economic activity. We then examine whether these patterns are consistent with a labor-market channel, focusing on employment in soybean-related agriculture and agro-industry. The analysis uses a panel of Brazilian municipalities. Taken together, the results shed light on when and where large-scale agricultural expansion contributes to local economic transformation.

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Saline agriculture and Sustainable Development Goals: A regional perspective

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G12-1 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

Soil salinisation is an emerging problem, often ignored by stakeholders because, in some cases, it is not yet visible. From this perspective, there is an urgent need to find solutions and place these issues even higher on the agenda of national, European and international policy makers. Only with appropriate policies and stakeholders who are aware of the real consequences of soil salinisation will it be possible to deal effectively with the situation associated with this context, especially with the challenges inherent in climate change. From this point of view, this study aims to highlight contributions from the literature on the relationship between soil salinisation and the Sustainable Development Goals, with a special emphasis on the regional dimensions of these topics. Taking these objectives into account, metrics from the literature were analysed and a survey of scientific documents was conducted. The results obtained show the asymmetric impacts of soil salinisation, depending on geographical location, the characteristics of economic activities and soil conditions.

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Spatial Analysis of Recent Trends in Soybean and Second Season Corn Production in Brazil

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G12-1 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

In Brazil, the adoption of second-season corn during the period 2005-2020 led to a significant increase in planted area, driven by the expansion of the land input. This practice, previously feasible only in the South and Southeast regions, became feasible with the development of earlier-maturing soybean cultivars, resulting from genetic improvement and improvements in crop management. In the last two decades, there was a significant shift in corn production volumes, with second season corn surpassing first season production. Since then, second-season corn has remained the main corn crop in the country.
This change in production has been accompanied by a simultaneous increase in soybean output in the main producing states, pointing to a transition from a single-cropping system to a double-cropping system. Therefore, the economic literature has examined this temporal evolution between crops by investigating patterns of concentration or dispersion across agricultural areas using Exploratory Spatial Data Analysis (ESDA).
This study investigates the spatial associations using ESDA considering areas cultivated with soybeans and second-season corn and identifying the production relationship between soybean and second-season corn. The analysis aims to determine whether the expansion of soybean-cultivated areas exhibits a direct spatial correlation with second-season corn–planted areas at the municipal level. The results reveal significant spatial correlations characterized by “High–High” clusters in selected municipalities of the states of Mato Grosso (MT), Mato Grosso do Sul (MS), and Goiás (GO). These findings indicate a strong interdependence between the expansion of soybean cultivation and second season corn production in neighboring areas within these states, as well as providing insights into production volumes.

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Agrivoltaics affect on Water–Energy–Food Systems nexus: agriculture and rural entrepreneurship

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G12-2 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

Reducing greenhouse gas emissions is a global challenge. Innovative agrivoltaic systems that combine agriculture and solar energy production is one set of the solutions to reduce these emissions and contribute towards food-system transition and enhancing rural entrepreneurship. Current research on agrivoltaics reveals a lack of knowledge regarding their effects on agriculture and Food-System Transitions. While agrivoltaics have been recognized for their potential to reduce water consumption through microclimatic modification and shading, and positively affect rural entrepreneurship, empirical evidence quantifying these impacts remains scarce. Such studies are essential to advance food-system transition. This research aims to study the potential of agrivoltaics and its affects on agricultural production, water-use efficiency, food-system transitions and rural entrepreneurship. The study focuses on agricultural region of Goriška Brda, known for quality viticulture. We used Geographical Information System datasets (e.g. land use, digital elevation models, solar radiation), remote sensing data, irrigation requirements per crop type, and energy production, to assess affects of agrivoltaics on crop production. Literature review on scientific and grey literature was used to assess the affect of agrivoltaics on rural
entrepreneurship. These datasets enabled a spatially explicit assessment of agricultural and energy system interactions within the study area. We created a model of agrivoltaics integrated in vineyards in the study area. The model included 10% coverage of all vineyards using solar panels over vine with east-west orientation and 60% transparency.
Preliminary results suggest reduction of crop water demand (up to 20%) and energy production of 1.064 GWh / year, roughly covering energy demand for 302 households in Slovenia. The yield quantity is expected to increase up to 20%. Moreover, agrivoltaics affect also quality of grape, by prolonging growing season and consequentially increasing grape components (e.g. acidity, anthocyanins). The study also revealed positive increase of rural entrepreneurship by increasing regional economy and vitality of the rural area.
Agrivoltaics is an emerging approach showing promise for energy and food production while mitigating conflicts between them. It enhances crop quantity and quality, water efficiency, contributing towards food-system transitions and enhancing rural entrepreneurship. Overall, agrivoltaics showed the potential to advance sustainable, climate-resilient farming and positively impact on food-system transitions.

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Stakeholder mapping and analysis: Perceptions and attitudes towards wastewater reuse

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G12-2 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

In the current context of scarce resources to meet the growing demand for satisfying the diverse needs of populations, it is imperative to promote sustainable practices and the reuse of certain types of waste as resources for economic activities and domestic use. The question that often arises concerns the willingness of stakeholders to use reused resources in their daily tasks. This willingness to reuse is often linked to the attitudes and perceptions of stakeholders in these contexts. From this perspective, the objective of this study is to contribute further to the understanding of stakeholders' willingness to use treated wastewater, with a special focus on attitudes and perceptions. To achieve these objectives, special emphasis was placed on the results highlighted in the scientific literature. The results obtained highlight the main drivers and barriers to the effective reuse of treated wastewater. In addition, gaps in the literature, trends, and suggestions for future research are presented.

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Revisiting the von Thünen model: Urban Expansion and Reorganization of Agricultural Land Use. Evidence from an Italian Case Study

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G12-2 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

The literature on urban expansion has mainly focused on its direct effects (e.g., soil conversion, pressure on ecosystem services, biodiversity loss), while largely overlooking indirect impacts on surrounding agricultural areas. In particular, little attention has been paid to how urbanization influences agricultural intensity, investment decisions, and the spatial reorganization of farming activities. This paper investigates how urban expansion affects the composition and intensity of agricultural land use in neighboring rural areas, drawing on von Thünen's land-rent theory. The analysis focuses on the Emilia-Romagna Region (Northern Italy) and combines two datasets: ISPRA data on urban expansion and the iColt data on agricultural land use, classified into low-, medium-, and high–value-added categories. A regular 1 km × 1 km grid is used to harmonize spatial units, resulting in a panel of 12,443 cells observed in 2015 and 2022. The econometric approach relies on first-difference panel models with spatial specifications of urban areas, based on a queen contiguity matrix including first- and second-order neighbors. Results are consistent with von Thünen's predictions: proximity to an increased extent of urban areas reduces low–value-added uses, increases medium–value-added uses, and favors high–value-added uses. Overall, urban expansion reshapes agricultural land use rather than simply reducing it.

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What Lies Behind European Diets? A Multi-Regional Input-Output Analysis of Processed Food Consumption and the Water Footprint in the European Union

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G12-2 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

Increasing awareness of climate change impacts on natural resources has strengthened public concern and authorities' commitment to environmental sustainability and climate neutrality in Europe.
Recent literature has focused on the role of households in the European Union as drivers of environmental impact, identifying them as central actors in environmental policy design. In this context, shifts in demand, particularly those related to food consumption, contribute significantly to reducing environmental footprints and fostering the development of sustainable and resilient economies.
This provides the context for our research, which seeks to analyze the water footprint associated with food consumption in European Union households in 2018, distinguishing between processed and unprocessed foods. To achieve this, we develop an environmentally extended multi-regional and multi-sectoral input-output model for all the countries of the European Union. The study introduces a methodological contribution by disaggregating agri-food sectors into processed and unprocessed within input–output tables. This refinement allows for a more accurate assessment of the environmental impacts of consumption patterns.
The analysis examines the environmental impacts of three alternative dietary scenarios: (i) a reduction in processed and ultra-processed food consumption, replacing these products with nutritionally comparable non-processed alternatives; (ii) a transition towards the Mediterranean diet; and (iii) the adoption of nationally recommended dietary guidelines. The analysis evaluates the heterogeneous regional effects of dietary transitions on water use across EU member states.
Preliminary results suggest that reducing processed food consumption can significantly lower the overall water footprint of European diets, although impacts vary substantially across regions due to differences in production structures, trade dependencies, and consumption patterns.

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Regional Issues About the Southern Brazil´s Agriculture and Livestock Evolution

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G12-2 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

Agriculture and livestock are not distributed homogeneously across the Brazilian territory. Among Brazil's 27 states, the Southern Region, comprised of three states, layout over only 6.8% of the Brazil´s territory but accounted for 26.4% of the national Gross Value of Agricultural Production (GVAP) in 2017. Nevertheless, even within this region, agricultural and livestock production does not grow uniformly among or within its three states. For instance, between 1995/96 and 2017, the Southern Region faced a real increase of 71.6% in its GVAP, with growth rates of 90.4% in Paraná, 83.4% in Rio Grande do Sul, and only 20% in Santa Catarina. Several studies have examined the concentration and inequality of agricultural production distribution in the southern Brazilian states, but little attention has been paid to their spatial agglomeration and association. In this context, the objective of this article is to analyze the evolution of concentration, inequality, agglomeration, and spatial autocorrelation of the Gross Value of Agricultural Production, using municipalities in Southern Brazil as the unit of analysis for the years 1995/96, 2006, and 2017, corresponding to the three most recent Agricultural Censuses. To carry out this analysis, sixteen key indicators were employed to measure these effects, three of them refer to agglomeration, in addition to Moran's I, used to assess the spatial association among GVAP of Southern municipalities. Results indicate that the intensity and trends of concentration, inequality, agglomeration, and spatial association of GVAP between 1995 and 2017 are not necessarily similar across different indicators. Nevertheless, the existence of concentration and inequality in the distribution of agricultural production within Southern Brazil during the analyzed period is unequivocal. The spatial distribution of GVAP per hectare reveals a persistent pattern of concentration, forming a high-productivity "arc" encompassing northern, western, and southeastern Paraná, western Santa Catarina, and northern and northwestern Rio Grande do Sul, creating a "strip" whose spatial extent changed between 1995/96, 2006, and 2017. However, some municipalities in Southern Brazil remain in lower productivity ranges, highlighting the uneven growth of this sector, measured by the Gini and Theil indices. The location quotient (LQ), the diversified agglomeration measure (ID, the inverse of the Herfindahl–Hirschman Index), and the agglomeration measure proposed in this study (referred to as IAD) confirm the existence of agglomeration phenomena as well as the LISA analysis has identified persistent clusters of high and low GVAP performance per hectare, reinforcing the existence of relevant spatial patterns in this variable.

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Operationalising Responsible Innovation in Smart Specialisation: A Place-Based Approach to Food System Transformation

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G12-3 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Food systems exhibit increased complexity by lying at the intersection of a region's economic, societal and environmental structural conditions, struggling to balance economic development with increased needs for sustainability and social justice. In this context, Responsible Research and Innovation (RRI) has been highlighted as a tool helping regions build legitimacy and ensure fair food system transformation across regional ecosystems. However, little attention has been paid to developing a place-based perspective of RRI towards integrating regional specificities during its operationalisation. The paper builds on the idea of developing a place-based RRI by exploring how it can be tailored to meet the needs of local food-system challenges identified through Smart Specialisation Strategies (S3) for five pilot regions. By combining qualitative analysis of S3 documents and stakeholder interviews for the five pilot regions, the study identifies tailored pathways of integrating RRI into context-specific regional priorities. The findings indicate that a place-based perspective on RRI is essential for addressing responsibility gaps in food-system transformation related to inclusivity, trust, coordination, and institutional capacity, as these dimensions are fundamentally shaped by how innovation is governed and accessed by different stakeholders within regional contexts. The results suggest that localised forms of RRI can be developed through in-depth analysis of regional contexts, enabling fairer food-system transformation by structurally embedding region-specific constraints that would otherwise remain unaddressed within S3 policies alone.

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A critical overview of the multi-level policy framework in the Greek fisheries industry: Any points of misalignment or conflict?

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The growing significance of the fisheries industry for the European economy and food security can be documented by several recent EU-level policies or financial instruments, such as the Common Fisheries Policy (CFP) or the European Maritime, Fisheries and Aquaculture Fund (EMFAF). Greece possesses several comparative advantages in this specific industry, being a leading producer and holding a dominant position in the EU market of Mediterranean fish, namely seabass and seabream. At the Mediterranean level, Greece implements the Mediterranean Management Plans of the General Fisheries Commission for the Mediterranean (GFCM), including fisheries restricted areas, focus on critical stocks and monitoring and control measures. Finally, at the national level, several policies for the development of aquaculture have been put in place, such as the “Fish from Greece” certification or the expansion of marine protected areas, but also non-governmental organizations’ initiatives. The purpose of the present study is to enrich the existing literature related to the way the above sustainability-driven policies affect the development prospects of the fisheries industry in Greece. The methodological aspect of this qualitative study essentially constitutes an in-depth overview of the goal setting and related measures of the above multilevel policies carried out or even announced in the Greek case, combined with a cross-comparison with other European Mediterranean countries. The overview of the related multi-level policy framework is expected to provide insights for policymakers by highlighting eventual points of misalignment or even of conflict between policy goals of different nature in the Greek case. The added value of the present research aims finally at a better understanding of the sectoral-level effects of EU- or nation-led policies on fisheries output and, therefore, exports, based on the 3-digit Standard International Trade Classification (SITC).

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Co-designing coupled innovations to strengthen territorialized agri-food system sustainability : the case of fruit and vegetable production in Martinique

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G12-3 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

The current context, shaped by multiple crises (environmental, health-related, and socio-economic), calls for a profound transformation of agricultural and food systems toward more sustainable models. Transforming these systems entails complex and wicked challenges and requires overcoming the systemic lock-ins that characterize them. (Rip and Kemp, 1998 ; Meynard and al., 2017). In this context, adopting territorialized approaches appears relevant to support the transition, because they foster coordination among stakeholders and the local embeddedness of solutions. The literature highlights the value of designing coupled innovations, that is, the coherent combinations of innovations of different types (technical, organizational, institutional and/or social) to address complex problems (Leclère et al., 2025). By definition, coupled innovations articulate several components of agri-food systems that are often managed by different stakeholders (Meynard et al., 2017) and operate at different scales. However, research on the conditions for designing and implementing such innovations remains limited, especially in overseas territories.

This paper analyses a coupled innovation design process initiated by researchers and aiming to secure and reinforce the local fruit and vegetable supply in Martinique. To explore collective solutions and overcome identified lock-ins, a participatory methodology relying on the principles of innovative design theory (C-K theory, Hatchuel and Weil, 2009) was proposed. On this basis, two workshops were organized. They gathered a various range of stakeholders, with representative or decision-making authority.

The results highlight the emergence of several prototypes of coupled innovations, combining multiple dimensions. On one hand, organizational innovations aim to increase supply volumes, pool skills and expertise, and optimise access to financial support. On the other hand, technical innovations focus on crop diversification to improve the management of climatic and plant health hazards, as well as promoting traditional crops. These proposals combine technological innovations, to design processing tools suited to the specificities of local products and contribute to value creation. The analysis underlines that the co-design of innovations between researchers and stakeholders fosters coordination among actors and the production of local knowledge. This enables the emergence of systemic innovations that are embedded in the territory. Coupled innovations appear as a promising lever for supporting the reterritorialization and ecologisation of agri-food systems. These findings invite further reflection on issues of scaling up and on the governance of these innovations. They raise the question of how the facilitation and coordination activities initially carried out by researchers might be taken over by other stakeholders.

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Intermediary actors: driving forces for the ecologisation of agri-food systems

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G12-3 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Contestations of the dominant agricultural and food model emphasise the necessity of transforming agri-food systems. These transformations can be explained in terms of an agroecological transition (Gliessman, 2016). Implementing such dynamics of change requires a global, systemic, multi-actor and multi-scale approach. From this perspective, agri-food systems can be considered as spaces of interaction between different stakeholders with asymmetric power. In particular, intermediary actors can have a significant influence as their decisions affect both upstream and downstream practices in agri-food systems (Brocard, 2023).

Nevertheless, scholars rarely analyse these actors. When they are studied, their actions are generally criticised for negatively impacting the sustainability of agri-food systems (Gottlieb & Joshie, 2010; Patturel & Ramel, 2017; Lepillier & Yount-André, 2019). Given their importance and their structuring role, we wonder about their ability to ecologise agri-food systems. To what extent do the strategies of intermediary actors facilitate the circulation of food products resulting from agricultural systems with low pesticide use? Who are these actors, and what resources do they use to integrate such products into food circuits?

We refer to the sociology of market agencement literature, which recognises that intermediary actors perform three primary functions: market mediation, market agencement, and regulation (Le Velly & Dufeu, 2016). We hypothesise that, to fulfil these three functions, these actors mobilize different forms of proximity, and that strong proximity ties encourage their involvement in the enhancement of food products with low pesticide use.

Our empirical analysis focuses on the fresh food and vegetable value chain. We compare two contrasting French case studies: Martinique and Pyrénées-Orientales. Data was collected through the analysis of grey literature, as well as through participatory and non-participatory observations and surveys of various intermediary actors (retailers, wholesalers and distributors). In Martinique, 24 surveys were conducted between 2022 and 2026, and 12 were conducted in Pyrénées Orientales in 2022.

The results allow us to:
(i) identify the intermediary actors who are invested in ecologisation strategies, and to characterize the functionnal trading circuits in which they operate;
(ii) document an indicator grid on the forms of proximity activated (spatial, relational, functional and economic) and how they are articulated.
This empirical material enables us to produce specific and cross-road results, allowing us to develop a generic understanding of the ecologisation process in trading circuits and, consequently, agri-food systems.

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Factors constraining the expansion of organic olive growing in Andalusia (Spain): a qualitative analysis

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G12-4 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

Statistics available estimate that the area of organic olive groves worldwide exceeds 850,000 hectares, almost 31% (262,379 ha) was located in Spain. As far as Andalusia is concerned, the figure given is 117,380 ha, of which only 15,659 are located in Jaén, which is the world's leading producer of olive groves and olive oils. Given the low participation of the province of Jaén in organic farming, which only represents 2.93% of the total, compared to 8.52% for Andalusia as a whole, we wondered whether there were objective reasons to explain the lower participation of the province of Jaén in the organic olive and olive oil business. However, we found no physical, productive, or technological reasons to explain the low participation of the province of Jaén. Furthermore, there are localities where, despite the importance of olive groves, the percentages of organic participation are less than 1%, and even some where organic farming is non-existent, despite being mountain municipalities, where organic production is usually more common. In contrast to these data, there are also mountainous areas in the provinces of Seville and Córdoba with percentages of organic production. Contrasting, there are also mountainous areas in the provinces of Seville and Cordoba with organic production rates of around 80%, such as Constantina, Cazalla de la Sierra, and Pozoblanco.

Given this situation, the objective of this research is to determine the institutional causes that maintain a low level of organic olive cultivation in the province of Jaén. The initial hypothesis is that these could be related to productive behaviors, informal institutions, myths, beliefs, and other elements that condition the strategic decision-making processes of producers.

The method used is qualitative, with in-depth interviews with farmers who produce organically, are in transition, or do not produce organically, as well as with technicians and cooperative managers. Twenty interviews were conducted in different provinces of Andalusia to compare information from municipalities with high levels of organic olive cultivation and others with very low rates of organic agriculture or even no plots dedicated to this type of production. The results show that the keys to understanding the limitations of the expansion of organic production in the province of Jaén are training, information, and the lack of participation in the final markets. Measures are proposed to improve the transmission of information among farmers in the province of Jaén and mechanisms for accessing niche markets that will enable to upgrading.

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Resilient Functions and Roles of Small-Scale Agriculture in Rural Romania

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G12-4 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

A brief overview of rural Romanian phenomena and processes in modern history reveals that rural areas and small rural households were highly stable systems, providing social and economic security. In all history, except during the communist period (1945-1989), small-scale agriculture was and continues to be the main component in the rural labour market in the quasi-absence of other non-agricultural employment opportunities. In all times, food self-consumption, supported by small farms, has had a leverage effect against poverty. More than that, the statistical information shows that small farms achieve higher levels of economic performance compared to large farms by diversifying their production structure and, through that, they make an important contribution to national food security. In the post-communist period (i.e. after 1989), in Romania, these functions and roles of the small farms have been restored and are widely recognised. If the meaning of 'socio-economic resilience' is the ability of an individual, of a household, community, region or country to resist, to adapt, and to fast recover after a crisis, shock or change, the economic and social functions and roles assumed in the transition period by small Romanian rural farms gives them the attributes of a resilient answer of the entire Romania to the post-communist changes and shocks.
Methodological approach is a descriptive one describing major socio-demographic trends that impacted Romanian rural society (rural-urban migration), economic dynamics (occupational structure, income structures and poverty) and farm system transformations (farm structure of farms by size, economic output, contribution to the agricultural production) in order to capture the ability of small-scale agriculture to preserve their role and function during the last 30 years.
New data revealed that small-scale agriculture still preserving its ability to absorb shocks and changes, but the dimension of this safety net is diminishing over time.

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Food, Fuel, and Feed: Asymmetric Price Transmission in the Soybean Value Chain

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G12-4 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

Biofuel policies have intensified the integration between energy and agricultural markets, reshaping price dynamics within commodity value chains. This integration has also heightened concerns about unintended consequences of biofuel support policies for food systems, including potential implications for food security. In oilseed-based biodiesel systems, joint production plays a central role: soybean crushing, for instance, yields roughly 20% oil and 80% meal. As a result, policies that promote biodiesel demand for soybean oil simultaneously expand the supply of soybean meal. This coproduction structure creates an indirect but economically meaningful channel linking energy policies to livestock production costs and, potentially, to food prices and food security. Focusing on Brazil – where biofuels mandates have driven a rapid expansion of soy-based biodiesel production and where soybean meal is a key input in animal feed – this paper examines price transmission within this food-fuel-feed nexus. It addresses three questions regarding the relationship between soybean meal and animal feed prices: the magnitude of cost pass-through, how this transmission unfolds over time, and whether positive and negative meal price shocks generate asymmetric feed price responses. The empirical strategy combines two complementary time-series approaches. First, a Structural Vector Error Correction (SVEC) model captures system-wide dynamics among soybean meal, soybean oil, corn, feed prices, and aggregate demand conditions. Second, a Nonlinear Autoregressive Distributed Lag model in error-correction form (NARDL–ECM) is employed to test for short- and long-run asymmetries in the conditional pass-through from soybean meal to feed prices. Using monthly Brazilian data from January 2010 to December 2024, the results indicate the presence of stable long-run relationships among the variables. SVEC estimates show that soybean meal price shocks exert persistent effects on feed prices and contribute substantially to feed price variability over time, alongside corn price effects. NARDL results reveal significant asymmetries: feed prices respond more strongly and more rapidly to increases in soybean meal prices than to decreases, indicating incomplete and asymmetric cost pass-through.

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The EU's Livestock Impact on the Environment: A Cluster Analysis

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G12-4 Agriculture, Rurality and Food-System Transitions: Agrifood and Rural Entrepreneurship, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

Livestock management is an important component of agriculture, being one of the biggest supporters of the rural economy. However, it should be noted that this activity has negative effects on the environment. The current research aims to identify the level at which the 27 EU member states are found with regard to a series of indicators intended to define the impact on the environment, but also the weights of different types of livestock, or the farms that house them. Although all 27 countries that make up the EU were taken into account, the acceptance will be placed on nine countries that make up the ManuRefinery project consortium. The ManuRefinery project involves the creation of a bio-refinery designed to convert livestock manure into bio-based fertilizer, thus reducing the impact on the environment by reducing ammonia emissions. In this regard, a cluster analysis on panel data was implemented; by investigating the Eurostat database, it was found that, for some of the indicators, the data are reported at unequal time intervals, taking into account the three most recent periods, 2016, 2020, and 2023 respectively.

%CO2 animal production* from agriculture % **Air emissions accounts
%bovine from total livestock % Animal production-Livestock
%poultry from total livestock % Animal production-Livestock
%bovine farms from total agricultural holdings with livestock % Farm structural indicators
%pig farms from total agricultural holdings with livestock % Farm structural indicators
%AMMONIA % Agri-environmental indicators
%Organic animal farming - BOVINE % Farm structure
%GHG Enteric fermentation of cattle % Agriculture and environment-
Special sector topics

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Keeping the village school open: community-run public education in rural Poland

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G13 Social and Territorial Capital, Institutions and the Commons transition, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

In many European rural regions, demographic decline and fiscal constraints are increasingly challenging the viability of small local schools. In Poland, a legal mechanism introduced in 2009 allows municipalities to transfer small public primary schools — typically enrolling fewer than 70 pupils — to non-governmental operators, such as associations, foundations, or private individuals, rather than closing them. In practice, these transfers often occur when rural schools face potential liquidation or organisational downgrading, making community involvement a key factor in maintaining local educational provision.

This paper examines publicly funded schools operated by non-local government entities in rural Poland between 2010 and 2025. It asks how widespread this organisational model has become and whether community-run schools can maintain stable educational provision over time. The study approaches school transfers as locally embedded institutional responses shaped by demographic pressures, municipal decision-making and community mobilisation.

The research combines quantitative analysis of nationwide datasets derived from public statistics and the Polish Ministry of Education with qualitative case studies of selected association-run schools. Statistical analysis identifies temporal developments and spatial differentiation in the emergence of 'transferred' schools, while semi-structured interviews with representatives of associations and foundations provide insight into governance practices, financial arrangements and relations between schools and local communities.

The discussion draws on concepts of social and territorial capital to interpret how local organisational capacity and collective action influence the persistence of educational institutions in peripheral areas. By focusing on efforts to keep village schools open, the paper evaluates whether community-run public education constitutes a durable institutional arrangement or a context-dependent response to rural demographic shrinkage.

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Beyond Borders: Spatial Diffusion of Constitutional Compliance across Regimes and Income Groups

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G13 Social and Territorial Capital, Institutions and the Commons transition, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

Our paper relates to constitutional compliance, focusing on the so-called de jure–de facto gaps, defined as "non-congruence between provisions explicitly written down in the document called the constitution and the behavior of the top representatives of the various government branches such as cabinet members, legislators, and members of the country's top court(s)" (Voigt 2021). The literature identifies three main groups of determinants of constitutional compliance: (1) design factors, such as constitutional provisions that envisage sanctions for violations (Gutmann et al. 2023); (2) environmental factors, including cultural background, political conflict, and socio-economic characteristics (Law & Versteeg 2013; Gutmann et al. 2023; Lewkowicz et al. 2023); and (3) non-state actors, particularly citizens, who may constrain government behavior (Lewkowicz & Lewczuk 2023; Kantorowicz & Metelska-Szaniawska 2023).
We extend this literature by investigating the potential spatial diffusion of constitutional compliance and its relationship with economic development. Specifically, we ask whether spatial waves of constitutional compliance can be identified among countries grouped by geographic proximity, income level, or political regime.
To address this question, we estimate a spatial panel econometric model for a sample of 122 countries covering the period 1995–2023 (preliminary specification: SAC model):
constitutional compliance_it=ρWconstitutional compliance_it+ β_1 democracy_it+β_2 low income_it+β_3 middle income_it+β_4 Wconstitutional compliance_it* democracy_it+β_5 Wspatial lag ofconstitutional compliance_it*low income_it+β_6 Wspatial lag ofconstitutional compliance_it*middle income_it+〖β_7 X〗_it+u_it
u_it=λWu_it+ε_it
where:
- W is either inverse squared distance or cultural distance matrix (currently based on Eff 2008),
democracy is a binary variable indicating whether country is a democracy (Bjørnskov & Rode 2020),
- low income is a binary variable indicating whether a given country belongs to a low income group as defined by the World Bank (2024 Atlas GNI per capita ≤ $1,135),
- middle income is a binary variable indicating whether a given country belongs to a middle income group as defined by the World Bank (2024 Atlas GNI per capita between $1,136 and $13,935),
- X_it represents one of the following control variables: leader characteristics, civil society participation, polarization of society, fractionalization of government and opposition, regime type, length of constitution.
Preliminary results indicate a statistically significant and positive spatial spillover of constitutional compliance across countries. The magnitude of this effect is stronger in non-democratic states and in low- and middle-income countries. These findings are robust across alternative spatial matrices and model specifications.

Overall, the results suggest that constitutional compliance is not solely a domestic phenomenon but also exhibits meaningful spatial interdependence.

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Institutions, Education, and Religious Change:

Evidence from Colombia

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G13 Social and Territorial Capital, Institutions and the Commons transition, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

How do religious identities change? We study the effects of civic education reforms on religious identification using Colombia's 1991 Constitution, which dismantled the country's confessional regime and mandated constitutional instruction in high schools. Exploiting cohort-based variation in exposure to the reform and nationally representative survey data, we implement a difference-in-differences design. We find that exposure to the constitutional curriculum reduced Catholic self-identification by about three percentage points. This decline reflects a reallocation of religious identities rather than a generalized decline in religiosity. In regions where Catholic institutional presence was historically weaker, Catholic losses translate into switching toward non-Catholic Christian denominations and higher religious attendance. In contrast, in regions where Catholic dominance was stronger, the decline is associated with increased secular identification and lower attendance. These patterns hold across ethnic and non-ethnic groups and are shaped primarily by regional religious supply rather than ethnicity per se. Overall, the results show that civic education can reconfigure religious identities by reshaping the relative legitimacy of competing affiliations.

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Social trust and online banking in the era of the digital transition: Evidence for the European regions.

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G13 Social and Territorial Capital, Institutions and the Commons transition, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

In the era of the digital transition, online banking has become an essential channel for accessing financial services. Social trust is key for financial development, but its specific impact on online banking remains largely unexplored, particularly at the subnational level. This paper analyses the influence of social trust on the adoption of online banking among a sample of 235 European Union regions between 2011 and 2024. The results suggest that social trust is a strong predictor of online banking adoption, and are robust to the inclusion of multiple control variables, fixed effects and endogeneity. These findings offer valuable insights for regional policies related to the digital transition within the European Union member states. The results have relevant implications for EU policies aimed at closing territorial gaps in digitalization. Strengthening trust-related institutional and community factors may accelerate the diffusion of online financial services, support financial access in lagging regions, and contribute to a more balanced territorial development across the EU.

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Endogenous Development in Hungarian Districts: Examining Elements of Territorial Capital Between Stable Growth and the Post-Crisis Period

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G13 Social and Territorial Capital, Institutions and the Commons transition, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

Endogenous development has become a central concept in regional science, shifting attention from exogenous transfers toward the strategic mobilization of local resources. Building on the territorial capital perspective, this study examines how different forms of capital interact and jointly shape regional development outcomes. Rather than analyzing capital types in isolation, the research focuses explicitly on their interactions and cumulative effects.
The empirical analysis investigates Hungarian districts and compares two benchmark years, 2017 and 2023, capturing a period that spans relative economic stability and subsequent global crises. Given the size of the country, districts were selected as the unit of analysis, as the examination of smaller territorial units allows for a more detailed analysis and reveals clearer regional differences. By incorporating a temporal dimension, the study identifies structural shifts in development trajectories and examines how patterns of capital accumulation and inter-capital relationships have evolved. This approach allows for a dynamic assessment of endogenous development processes under changing macroeconomic conditions.
Using multivariate statistical methods combined with spatial visualization, the study identifies the key drivers of spatial disparities and regional performance. Its main contribution lies in revealing which configurations and interactions of endogenous capital most effectively support regional development and mitigate spatial inequalities. By doing so, the research advances the operationalization of endogenous development theory in empirical regional analysis.

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Using deep learning and long-run reconstructed luminosity data to study declining towns

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G14-1 Left-Behind Areas, Inner Territories and Border Regions: Place-Based Responses in the Transition Era, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

Concerns about declining towns and uneven regional development are central to regional science, yet remain difficult to study empirically over long horizons. Population change is often gradual and spatially uneven, unfolding within towns as well as across larger administrative units. Conventional data, such as censuses, are infrequent and tied to fixed boundaries, limiting their usefulness for detecting long-run contraction or expansion in the spatial footprint of local economic activity. Satellite-detected luminosity offers a spatially continuous alternative, but use of these data has involved a fundamental trade-off between temporal coverage and spatial resolution.

Early work relied on data from the Defense Meteorological Satellite Program (DMSP), which allows analysis back to the early 1990s but suffers from coarse effective sensor resolution, spatial blurring, and other well-documented measurement issues. Newer systems, such as VIIRS, provide far more accurate observations at finer resolution, but only from around 2012 onwards. As a result, researchers face a choice between a long time series with substantial spatial distortion, or a short but more reliable series.

This paper advances how declining towns can be measured by applying a deep learning reconstruction of night-time lights that bridges this gap. Using information learned from modern high resolution VIIRS data, we generate a consistent annual series of luminosity from 1992 to 2021 on a fine spatial grid (cells of 0.7 km2). Unlike most existing harmonisation approaches, which rely on cross-sectional overlap between sensors, the model explicitly incorporates temporal change during training, allowing it to recover long-run dynamics while substantially reducing the spatial blurring characteristic of DMSP data. This sharpens inference about contraction and expansion at the extensive margin of towns.

We apply the reconstructed data to New Zealand, where there is ongoing policy concern about the uneven growth experiences across the urban hierarchy, with claims of ‘zombie towns’ facing long-run contraction. With the reconstructed night-time lights data we examine whether some towns exhibit persistent declines in their extensive margins of luminosity over three decades, how widespread such declines are, and whether sharp rises in energy costs have exacerbated any such decline, especially for ‘mill towns’. While the application focuses on New Zealand, the contribution is methodologically portable. By combining deep learning with satellite data to recover long-run spatial detail, the paper advances the measurement of urban decline in settings where traditional data are limited, with direct relevance for regional science research on shrinking towns and long-run uneven development.

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Spatial inequalities in the context of success in Hungary

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G14-1 Left-Behind Areas, Inner Territories and Border Regions: Place-Based Responses in the Transition Era, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

Our analysis focused on the municipal-level dynamics of spatial inequalities in Hungary. It was based on local GDP estimations compared to the EU average. This approach can be explained by the importance of GDP as the main indicator of European cohesion policy and our aim to evaluate the Hungarian spatial development processes in a European context. As main contribution, a more refined picture compared to the NUTS-2 or NUTS-3 level analyses should be emphasized. In European context all the 19 NUTS-3 level regional units outside the capital city can be regarded as underdeveloped or peripheral: their GDP per capita values are under the EU average (mostly under 75% of it) during the examined period. But our analysis demonstrated that there are some higher developed islands beyond the administrative borders of Budapest as well. It also revealed a colourful patchwork of GDP convergence with the predominance of municipalities getting really closer to the EU average. However, particularly the convergence pattern of higher developed larger cities shows that the success of the chosen economic development model is largely depending on the global turbulences (many cities showed convergence only in the second decade, after the economic crisis). On the other hand, the case of Győr (having convergence only in the first period) regarded as one of the most successful cities of Hungary might demonstrate the limitations of this model often connected with the so-called middle-income trap of the factory economies.
Current analysis discovered a definite convergence on the municipal level inequalities of economic power (decomposed and estimated GDP). This convergence process is indicated according to the European averages. However, the trend of convergence has tended to slow down within the country and inequalities have begun to slightly increase again. Besides of this, the spatial development structure of Hungary is expressively fixed with segregated central and peripheral zones.
The conceptualisation might serve as a basis for identifying new growth paths in peripheral regions (both in growing urban and rural areas) in the post-pandemic world used for challenge-oriented local development.

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Emerging circular bioclusters: A comparison of two forest-based bioclusters in southern France

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G14-2 Left-Behind Areas, Inner Territories and Border Regions: Place-Based Responses in the Transition Era, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

Circular bioclusters appear to be territorialized organizational models capable of combining economic development and environmental preservation. However, their emergence remains uncertain, particularly in rural areas where cooperation around bioresources remains fragile. This article analyzes the social, symbolic, and institutional conditions that enable actors to start a collective action around a bioresource in order to initiate a circular biocluster. The goal is to focus on the often understudied emergence phase, during which collective dynamics remain informal and unstable.
The study draws on work on clusters (Porter), circular bioclusters (Labrouche et al.), the theory of the commons (Ostrom), communities in transition (Christiansen et al.), the economy of proximity (Boschma; Torre & Rallet), and multi-level governance (Bache & Flinders; Hooghe & Marks). It conceives emergence as a process of communalization articulating shared representations, coordinated actions, and feelings of belonging. Bioresources, viewed as malleable resources, may give rise to controversies or synergies depending on the socio-technical and institutional mediations at play.
The analysis is based on a comparative study of two forest bioresources in the Cévennes: the chestnut tree (Castanea sativa) and the maritime pine (Pinus pinaster). A qualitative approach was adopted. Based on 24 interviews (15 individual, 4 collective), we interviewed forest owners, professional organizations, public institutions, processing companies, and researchers. The thematic analysis combines deductive coding (three community dimensions) and inductive coding (proximities, governance) in order to identify the social and institutional mechanisms influencing the emergence of a biocluster.
The comparison reveals that similar structural configurations can produce divergent dynamics. The chestnut tree remains trapped in ambivalent representations—heritage, decline, or marginally ecological—that fail to stabilize into a common mobilizing narrative. Cooperation remains local and fragmented, without articulation towards an operational value chain. Geographical and identity proximities remain dormant, while poorly articulated multi-level governance maintains the dispersion of responsibilities.
Conversely, the maritime pine benefits from a stabilized productive narrative, supported by socio-technical demonstrators (resin experiments, local furniture) that transform representations into tangible evidence. These mediations activate existing proximities, strengthen trust, and structure visible interdependencies. The presence of key players and a functional link between local initiatives and institutional mechanisms thus enable the gradual emergence of a coherent collective dynamic.

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Innovation in the periphery: How firms tackle the innovation-inhibiting impact of lacking agglomeration advantages

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G14-2 Left-Behind Areas, Inner Territories and Border Regions: Place-Based Responses in the Transition Era, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

Dominant theories argue that innovative firms typically locate in large cities (metropolitan areas) and rely on the argument that large cities provide innovation-facilitating agglomeration advantages that are not present in peripheral regions such as a rich endowment of R&D facilities (e.g., universities), spatial proximity in large cities providing knowledge spillovers, abundant markets providing an efficient match of production factors, and a higher attractiveness than nonmetropolitan areas for creative people. Despite the lack of agglomeration advantages, there is case study evidence that there
can be conditions for successful innovation in the periphery. Examples are the Gnosjö region in Sweden, consisting of many different industries and known for its innovative spirit and the Valencia region in Spain, known for its biotechnology industry. Patent data across OECD countries confirm this picture, showing that it is possible for peripheral regions to be as innovative as metropolitan regions. How can the success of peripheral regions such as Gnosjö and Valencia be reproduced elsewhere? Previous research on innovation in peripheral regions identified that firms in peripheral regions reveal a stronger engagement in collaborative innovation to compensate for a lack of agglomeration advantages. One issue with previous research is that it mostly focussed on single regions or countries which make it difficult to draw general conclusions, while a systematic assessment of innovation networking in peripheral regions is missing. This lack of knowledge hampers effective strategies to support regional development. Further research is also necessary from a practitioner standpoint, because innovation-oriented policy initiatives like the EU smart specialization strategy and the Green Deal require a better understanding of innovation in peripheral places that fits empirical observations. Finally, many peripheral places are particularly vulnerable to structural change and subsequent economic decline. Therefore, understanding the determinants of innovation in peripheral regions is of utmost importance to combat the backlash that many peripheral regions are facing.

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Sustainability and competitiveness in nature tourism: analysis of business management at the local level.

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G15-1 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

Nature tourism has positioned itself as one of the most dynamic alternatives within the global tourism industry, stimulated by interest in authentic and responsible experiences in the face of environmental challenges. In this context, the city of Ibague (Colombia) is emerging as a territory with high potential, thanks to its rich landscape, culture, and ecology, represented in areas such as the Combeima Canyon and a wide range of adventure and ecotourism activities
However, this potential faces challenges associated with poor institutional coordination, weak long-term planning, and the limited capacity for innovation of local businesses, which are mostly micro-enterprises with financial and organizational constraints. These conditions have hindered Ibague's consolidation as a competitive destination in national and international markets, where demand is increasingly oriented toward personalized, sustainable, and high-quality experiences.
This study analyzes the relationship between sustainability, business management, and competitiveness in organizations dedicated to nature tourism in Ibague. It adopts Ritchie & Crouch's destination management model as a reference, which integrates key factors such as the strategic use of resources, marketing, information management, and service quality. It is argued that the competitiveness of a tourism company does not depend exclusively on internal factors over which it has control, but is also influenced by the actors and forces characteristic of both its industry and the general environment at the local-regional, national, and international levels. From a methodological point of view, based on a descriptive-correlational approach, interviews were conducted with institutional actors and development plans and public policies were reviewed in order to identify strengths, weaknesses, and opportunities in the sector.
Ibague has the potential to establish itself as a benchmark for nature tourism in Colombia. Microenterprises were found to be the predominant organizational structure, with around 75% of respondents belonging to this segment. The most representative providers of nature tourism in Ibague belong to the rural accommodation (farms) category, which also offers restaurant services, followed by travel agencies. The main distinctive activities in nature tourism are hiking and bird watching; among travel agencies, adventure tourism stands out. Finally, it is concluded that there is a lack of knowledge about the actions carried out in the sector and weak coordination between public and private actors. Therefore, it is necessary to strengthen the destination in a comprehensive manner, since both cultural and nature tourism products are essential and complementary to positioning Ibague as a tourist destination (Orozco, González, & Blandón, 2025).

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Exploring Data Gaps in Blue and Circular Economy Implementation in Mediterranean Tourism Destinations: Insights from the RECIRCLE MED Blueprint

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G15-1 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

Tourism development in the Mediterranean basin has historically followed linear, mass tourism models, concentrating visitors in environmentally sensitive coastal areas and relying heavily on intensive resource use. This has exacerbated environmental degradation, increased pressure on coastal ecosystems and heightened the vulnerability of tourism-dependent regions to climate and economic instabilities. While tourism remains a major economic pillar, its long-term sustainability increasingly depends not only on policy ambition but also on destinations' capacity to monitor, evaluate, and adapt interventions. Research emphasizes that implementation failures often arise from insufficient information systems capable of supporting adaptive decision-making.
In tourism destinations, where multiple actors operate across sectors and governance levels, information gaps are amplified by fragmented responsibilities, inconsistent reporting practices and uneven technical capacities. These challenges constrain the effectiveness of sustainability initiatives and the integration of cross-sectoral data systems, hindering the ability to anticipate and respond to emerging pressures like climate change, biodiversity loss and seasonal over-tourism.
In rexponse, the RECIRCLE MED project aims to integrate blue and circular economy principles into coastal tourism by conceptualizing tourism as a regenerative socio-ecological system. The project conducted a structured assessment across four Mediterranean destinations—Cefalù (Italy), Bar (Montenegro), Ohrid (North Macedonia), and Pomorie (Bulgaria)—to evaluate the availability of information required for decision-making and identify data gaps. The analysis shows that many measures exist but lack accessible data, revealing implementation constraints. This lack of data limits verification, monitoring and learning, highlighting the need for improved data infrastructure to enhance the transparency and adaptability of sustainability initiatives.
By focusing on data gaps, the paper reframes the interpretation of policy presence, stressing that robust data systems are key to effective sustainability governance. The existence of policies alone does not guarantee successful implementation or progress. Without reliable data, it’s difficult to monitor, evaluate, or adapt strategies. Strengthening data collection, monitoring systems, and improving institutional coordination are crucial for overcoming these challenges. This would allow for more informed decision-making, better tracking of policy outcomes, and ultimately, the development of more resilient and adaptive tourism strategies in the Mediterranean.

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Understanding the Demand and Supply of Fisheries-Linked Tourism in Brittany: A mixed-methods study of diversification pathways and visitor preferences

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G15-1 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

The fishing industry is rethinking its economic activities in the face of difficulties accessing fishery resources linked to Brexit, the deterioration of certain fish stocks and contamination affecting shellfish farming. The EU-funded FISATUR project is examining how tourism could provide new income streams and support the blue economy within the fishing and aquaculture sectors.

This article contributes to fisheries-related tourism and diversification research by: (1) empirically demonstrating how actor configurations shape the emergence of tourism as a diversification tool in fisheries-dependent coastal areas, and (2) showing how discrete-choice and latent class approaches can inform policy and business decisions in emerging blue economy niches.

Drawing on a Brittany case study — a key fisheries region accounting for around 45% of French landings and experiencing significant tourism growth — this paper employs a mixed-methods design combining a qualitative multiple case study of supply with a stated-preference choice experiment on demand. First, a two-step inventory is used to characterise initiatives related to fishing, aquaculture, and maritime heritage, and to develop a typology of organisations and their tourism products and services. This is based on online and field identification, as well as 36 qualitative interviews. Second, a choice experiment built around bundles of activities and price levels is conducted with a survey of 336 Brittany residents and tourists. Discrete choice models are then used to estimate demand and willingness to pay for activities linked to fisheries and maritime heritage, taking into account visitor heterogeneity.

The results reveal that, although maritime tourism is crucial for coastal economies and identities, its foundations are fragile. It mediates between visitors, marine environments and maritime professions, but it is highly sensitive to seasonality, weather, environmental quality and purchasing power. Furthermore, despite low visibility and unstable business models, stakeholders must professionalise and comply with stricter regulations while 'greening' their practices. Analysis of demand shows a strong willingness to engage in sea-based environmental activities, whereas products that are more cultural or heritage-oriented mainly appeal to niche markets. Three segments have been identified — committed ecotourists, moderate explorers and traditional tourists — that can inform the design and marketing of fisheries-related tourism products.

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Capitalising Culture? The Impact of European Capitals of Culture on Tourism and Urban Land Prices

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G15-2 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

The European Capital of Culture (ECoC) programme has become one of the European Union's flagship cultural initiatives, aiming to foster urban regeneration, economic development and social cohesion through culture-led interventions. While a growing body of literature has examined the economic effects of ECoC designation—primarily focusing on indicators such as GDP growth, employment or tourism flows—less attention has been paid to its potential long-term impact on urban spatial dynamics and local housing markets.
This paper investigates whether hosting the European Capital of Culture has measurable post-event effects on urban land and real estate prices in designated cities. Moving beyond traditional macroeconomic outcomes, we examine whether culture-led policy interventions are associated with structural transformations in urban development trajectories, as reflected in property values and tourism-related indicators in the years following the event.

Methodologically, the study employs a quasi-experimental econometric design to estimate the causal impact of ECoC designation on urban outcomes over the medium term (three to five years after the event year). Using a panel dataset of European cities covering multiple designation cycles, we compare host cities with an appropriately constructed control group of non-host urban areas with similar pre-treatment characteristics. The empirical strategy allows us to isolate the potential legacy effects of the programme from broader urban and national trends.

By incorporating real estate market indicators and tourism dynamics as outcome variables, the analysis aims to contribute to ongoing interdisciplinary debates on culture-led urban development, place-based policy interventions and the long-term socio-economic legacies of major cultural events. The findings are expected to offer insights relevant to scholars of urban studies, cultural economics and regional policy, as well as to policymakers involved in the planning and evaluation of cultural mega-events.

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Inbound Tourism and Tourists' Preferences for Accommodation Quality

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G15-2 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

The global expansion of international tourism demand has increasingly led to overtourism, prompting many destinations to shift their policy focus from increasing the number of inbound tourists to enhancing the quality of tourism experiences. The effectiveness of such quality-oriented strategies critically depends on the extent to which foreign tourists value the quality of tourism services. Despite its importance, however, existing studies have neither rigorously quantified tourists' preferences for quality nor systematically examined the determinants of cross-country heterogeneity in these preferences.

Using detailed microdata from the Japanese accommodation sector, this study quantifies foreign tourists' preferences for accommodation quality by country of origin and investigates the factors underlying cross-country differences in these preferences. We estimate a logit demand model in which the estimated residuals capture tourists' perceived quality of individual accommodations. By dividing these residuals by the estimated price coefficient, we derive tourists' willingness to pay (WTP) for accommodation quality. While conventional quality indicators, such as star ratings, are not consistently available across countries or regions, our approach can be applied whenever accommodation demand data are available, making it broadly applicable across diverse settings.

By examining the relationship between the constructed WTP measure and observable accommodation attributes commonly associated with quality, we show that the estimated WTP serves as a reasonable and informative measure of accommodation quality. We then compare WTP for accommodation quality between foreign and domestic tourists. The results indicate that although foreign tourists exhibit a degree of price sensitivity similar to that of domestic tourists, they place significantly greater value on accommodation quality. In other words, foreign tourists are more willing to accept higher prices in exchange for higher-quality accommodations, as the associated utility gains outweigh the additional costs. This tendency is particularly pronounced among tourists from countries with higher per capita income levels but diminishes as the geographic distance from Japan increases.

These findings suggest that a shift in tourism policy from quantity-based to quality-based strategies may be less effective for destinations that primarily attract tourists from high-income but geographically distant countries. Instead, targeting tourists from geographically closer countries, even those with relatively lower income levels, may be a more effective approach. Overall, our results provide policy-relevant insights for governments and tourism-related businesses by identifying source countries whose tourists exhibit stronger preferences for accommodation quality.

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Residents' Perceptions and Experiences of Creative Tourism in a UNESCO Creative City

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G15-2 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

Creative Tourism emerged in the early 2000s. It is characterized by the emphasis on creativity, active participation of visitors, and interaction between local communities and visitors. The municipality of Barcelos was designated a UNESCO Creative City in 2017, in the category of Crafts and Folk Art, in recognition of the diversity of artisanal practices, among which Bordado de Crivo (Drawn Thread Embroidery), a Portuguese intangible cultural heritage, stands out alongside pottery, woodworking, ironwork, and basketry.
For more than a decade, the municipality has consistently invested in Creative Tourism as an opportunity to generate supplementary income for local artisans and to enhance the city's cultural identity.
Our study adopted a quantitative research approach, based on 619 questionnaires applied to residents of Barcelos between August 2024 and September 2025. Data were analysed using SPSS, through descriptive statistical analysis and chi-square tests.
The sample was predominantly female (55.3%) and the most representative age group was 65 years or older (34.4%). Regarding educational attainment, 26.2% have completed secondary education. Of the total respondents, 30.7% were retired, 91.6% were native to the municipality, and most of them lived in parishes within the urban perimeter.
Regarding attraction factors, residents most frequently mentioned the Galo de Barcelos (Rooster of Barcelos) (72.4%), the weekly market (52.8%), and the Festa das Cruzes (49.9%). Creative Tourism and the UNESCO Creative City designation were less mentioned, by only 1.5% and 2.9%, respectively, reflecting the fact that residents are more familiar with and regularly engage with traditional attractions such as the Galo de Barcelos and the weekly market.
Concerning participation, 28.1% reported having taken part in creative activities, while 71.9% never participated. The most common experiences were pottery (14.7%), gastronomy-related activities (7.9%), and painting (6.9%). Despite the low participation rate, 48.8% are aware of the existence of creative activities, while 51.2% are not.
For future development, residents highlighted pottery and clay-based activities (56.2%), gastronomy (51.1%), and handicrafts in general (32.5%).
The results show a mismatch between the institutional strategy for Creative Tourism and its recognition by residents. Despite the UNESCO Creative City status, participation is low, and more than half of residents are unaware of the activities, indicating weaknesses in communication and community engagement. The appreciation of pottery, gastronomy, and handicrafts demonstrates culturally recognized resources and underlines the need to integrate residents as active agents, reinforcing sustainability, identity, and local economic potential.

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The Timing of Spatial Competition: Price Reaction Functions Across Booking Horizons

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G15-2 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

This paper examines the interplay between spatial and temporal dimensions of price competition in the hotel industry, where services are non-storable and consumers must book in advance. We study how spatial price competition among hotels evolves across different booking horizons. Using a panel dataset of hotels in Venice covering daily asking prices, we estimate spatial price reaction functions for multiple booking lead times using Spatial Durbin Models. Our results provide evidence of heterogeneous spatial price mimicking across booking horizons: spatial dependence peaks at mid-range lead times. Furthermore, hotels with greater room variety are able to charge higher prices, while greater variety among nearby rivals exerts downward pressure on prices. These findings reveal that the strength of spatial competition is not constant but jointly shaped by timing of booking and seasonal demand, offering new insights into intertemporal pricing and strategic interactions in perishable service markets.

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Digital Text Analysis Of Tourists' Sentiments And Spatial Choices In Global Cities

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G15-2 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

Peer-to-peer accommodation platforms have become a central component of global urban tourism. Beyond facilitating transactions between hosts and visitors, these digital platforms generate large-scale textual data that capture tourists' place-based evaluations and experiential perceptions. This study examines how structured information derived from Airbnb review texts can be used to identify drivers of visitor satisfaction across 34 major global tourist cities.

Using a harmonized cross-city dataset combining listing characteristics (e.g., price, minimum stay requirements, review intensity, entry timing, distance to city centre) with user-generated review narratives, we transform unstructured textual content into measurable indicators through lexicon-based sentiment scoring and dictionary-based thematic extraction. Thematic frequencies capture core experiential dimensions, including safety and cleanliness, tourism appeal, transport accessibility, cost perceptions, and work-related suitability. Principal Component Analysis is applied to uncover latent perception structures, while K-means clustering identifies typologies of short-term rental environments across cities. A multilevel mixed-effects model is then estimated to explain variation in listing-level sentiment, accounting for neighbourhood and city-level contextual effects. The results show that perceived safety, cleanliness, tourism appeal, and transport accessibility are the strongest correlates of visitor satisfaction across destinations. Platform-related dynamics such as reputational accumulation and lifecycle position also significantly influence sentiment. In contrast, geographic centrality alone does not systematically determine satisfaction once experiential dimensions are controlled for. Distinct typologies of listing environments emerge across cities, indicating heterogeneous tourism configurations and varying spatial patterns of perceived attractiveness. By integrating structured text analysis with hierarchical modelling in a multi-city comparative framework, the study provides evidence on how listing-level management factors and broader urban contexts jointly shape visitor evaluations. The findings offer actionable insights for hosts, platform operators, and urban destination managers seeking to enhance tourism quality and support balanced urban tourism development across multiple spatial scales.

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Overtourism in small emerging island destinations: The ambivalent role of residential tourism

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G15-3 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Small island destinations are exposed to multiple vulnerabilities (climatic, health, economic) related to their location (isolation, exposure to cyclonic risks) and to their geographical characteristics (limited land area, demographic pressure). The uncontrolled development of tourism, on which the growth of many island territories depends, tends to reinforce these fragilities. Among the dynamics contributing to this tourism entropy is overtourism, which weakens the robustness of destinations that have experienced success. Although widely studied, overtourism is approached through quantitative indicators based on international tourist flows.

These indicators are poorly suited to emerging destinations where overtourism may arise despite moderate external flows. In certain isolated continental territories or small island destinations undergoing tourism structuring, domestic tourism, particularly through disorderly residential mobility, may generate localized forms of saturation, independently of growth in international arrivals. This internal dimension of overtourism remains underexplored.

This internal origin raises three major issues. First, how can overtourism be analyzed without relying on conventional indicators based on incoming flows ? Second, what are the effects of domestic overtourism when residents are both generators and victims ? Third, how can emerging destinations anticipate and regulate this latent form of tourism pressure before it becomes established ?

To address these questions, this research proposes an analytical model grounded in the well-being economy framework and positioned within the Beyond GDP perspective. Overtourism is conceptualized not as a simple exceeding of visitor thresholds, but as a process of progressive degradation of individual and collective well-being resulting from a perceived imbalance between tourism costs and benefits. Particular attention is given to residential mobility channels likely to generate congestion, use conflicts, and environmental pressures without any increase in external flows.

Residents are considered dual economic agents, contributing to tourism while experiencing its negative externalities. The empirical field is the island of La Réunion, characterized by moderate international flows and strong internal mobility. A quantitative survey of residents is analyzed using factor analysis and structural equation modeling in order to examine the relationships between well-being, territorial attachment, perceptions, and attitudes. The expected results aim to highlight the mediating role of well-being in the early identification of perceptual saturation thresholds and to propose regulatory levers suited to island territories.

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Measuring Well-being at the municipal level: The Case of Italy

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G15-3 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

The growing relevance of multi-level governance arrangements and the expanding role of local authorities in the implementation of public policies has given increasing prominence to the analyses conducted at the municipal-level. This is particularly evident in the context of post–Covid-19 recovery plans under the Next Generation EU programme, as well as in recent place-based development strategies that explicitly build on municipal characteristics, such as the National Strategy for Inner Areas introduced in Italy during the 2014–2020 programming period of the EU cohesion policy.
The availability of fine-grained, municipal-level indicators is therefore crucial for both ex-ante policy design and ex-post evaluation. Despite the ultimate objective of public development policy being the enhancement of territorial and people well-being, systematic measures of socio-economic progress at the local level remain limited, especially with respect to their inherently multidimensional nature, widely emphasised in the “beyond GDP” literature.
This paper defines the Municipal Well-being Index (MWBI), a synthetic measure of socio-economic progress for Italian municipalities, computed over the period 2018–2022 using an original dataset gathered from Istat. The MWBI is constructed by aggregating composite sub-indices across eight dimensions of quality of life: demographic profile; cultural and natural attractiveness; inclusiveness and employment stability; human capital; productive structure and entrepreneurship; material living conditions; essential public services; and labour market participation. Each dimension aggregates information extracted from multiple variables that are selected according to the existing literature and validated through multivariate statistical analysis.
The synthetic indicators are constructed by combining several statistical aggregation methods, including Principal Component Analysis, the Adjusted Mazziotta-Pareto Index (AMPI) method, and non-compensatory approaches commonly adopted in applied regional analysis. The results reveal substantial heterogeneity in well-being across municipalities, extending beyond traditional “vertical” dichotomies (e.g. North–South, urban–rural, mountains–flat areas) and uncovering significant “horizontal” disparities within groups of municipalities belonging to the same category.
This lays the groundwork for further empirical analyses exploiting the MWBI to investigate territorial inequalities at a more local scale, within the context of a recent place-based policy.

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Place Leadership in Culture-Led Development: Four European Trajectories

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G15-3 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Endogenous growth theories have increasingly emphasised the importance of place-based development strategies that mobilise the distinctive assets, capabilities, and institutional arrangements of specific localities (Barca et al., 2012). Within this paradigm, the agency of local and regional actors and their ability to co-produce a shared territorial vision have emerged as central components of development trajectories (Beer & Clower, 2014; Sotarauta & Beer, 2021). This has contributed to a growing scholarly interest in the notion of place leadership, understood as the capacity of diverse actors to influence collective action in ways that align with local needs, identities, and aspirations (Collinge & Gibney, 2010; Beer et al., 2019).

Parallel to this shift, many territories have pursued culture-led development strategies (Sacco et al., 2014). These typically involve the symbolic and productive reactivation of context-specific heritage assets and know-how to revitalise local economies, enhance territorial identity, and reposition places within urban hierarchies (Pratt, 2009; Scott, 2010). Global initiatives such as the UNESCO Creative Cities Network and the expanding World Crafts Cities programme further reflect a growing policy interest in specific cultural domains to act as engines of place renewal.

Yet, while major metropolitan centres have been extensively studied, much less attention has been devoted to non-core places that increasingly seek to recover and valorise a specific cultural fields and connected know-how to interrupt trajectories of economic marginalisation (MacKinnon et al., 2022; Rodríguez-Pose, 2017). In particular, the literature has not fully addressed the role of place leadership in sustaining such forms of culture-led development.

This article addresses this gap by examining how and why culture-led development succeeds—or fails—in revitalising non-core places, with a specific focus on the role of place-based leadership and the geography of opportunities within which such strategies unfold. We adopt an explicitly process-oriented approach, asking what sequence of events and interventions shapes the re-emergence of culture-led specialisation; who exercises place leadership, and how it evolves; and what outcomes—symbolic or material—are ultimately achieved.

Empirically, the paper investigates four non-capital European cities that have experienced deep structural decline yet sought to reposition themselves by creatively re-legitimizing and re-imagining a cultural field linked to the history and economy of the place: Angoulême (comics), Antwerp (fashion), Limoges (porcelain), and Stoke-on-Trent (ceramics). The article contributes to debates on place leadership and culture-led development by demonstrating how agency interacts with temporally and spatially situated opportunity spaces, and by explaining divergent outcomes among territories with similar know-how and aspirations.

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SDG alignment in SEZs: a place-based perspective from national regulatory design to local practice in the Mandalika Tourism SEZ, Indonesia

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G15-3 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Special Economic Zones (SEZs) are globally used economic development instruments, based on exceptional regulations and institutions. They are widely criticised for operating as enclaves, while research emphasises that SEZ outcomes depend on how zones are embedded in host regions' conditions. The complexity of SEZs' enclave features and the need for integration with host-region conditions highlight the need to move beyond treating SEZs as isolated enclaves or embedded development instruments. Under the SDG agenda, SEZs need to not only attract investment but also support inclusive and territorially integrated development, particularly through SDG 8 (decent work and economic growth) and SDG 11 (sustainable cities and communities). Tourism SEZs offer an interesting analytical case because tourism depends on place-specific assets and reshapes local labour markets, services, and land use.

This paper examines how enclave and embeddedness logics are configured from the national SEZ regulatory framework to local implementation in a tourism SEZ context, using Mandalika (Indonesia) as a case. We adopt a place-based approach and operationalise enclave-embeddedness logic across 3 dimensions: policy alignment, institutional relationships, and spatial-economic linkages; through a two-level qualitative design combining document analysis of national and regional SEZ regulations with interviews, Q-methodology (stakeholder Q-sorts), and field observation in Mandalika to capture formal design and implementation practices.

Findings show that Indonesia's SEZ regulatory framework provides an adaptive umbrella combining national steering with space for local conditions. At the local level, enclave and embeddedness logics coexist but are unevenly configured across dimensions: policy alignment is strong at national and sectoral (tourism) but conditional at subnational levels; institutional arrangements retain enclave features alongside coordination that is strongest with national and grassroots actors but episodic with subnational actors; spatial–economic linkages show strong functional connectivity yet unstable in spatial governance. Q-method results indicate a shared rejection of the enclave model but competing priorities of embeddedness; one viewpoint prioritises spatial economic integration, while another prioritises institutional coordination and local inclusion. Major events in Mandalika create temporal pulses that temporarily accelerate embeddedness.

The paper contributes to SEZ-SDG debates by showing that SDG alignment in tourism SEZs depends on how multidimensional and contested embeddedness is translated from formal regulatory design to local practice, offering lessons for SEZs in decentralised developing countries.

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Ethical and sustainability issues coming with large inner city festivals: a residents' perspective. case 'Gentse Feesten', historical center of Ghent, Belgium

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G15-4 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

Our study examines the social and environmental impacts and sustainability issues of an inner city festival, mainly from a residents' perspective. Focus is on the 'Gentse Feesten' in Belgium, being one of the largest inner city festivals in Europe which attracted 1,7 million visitors in 10 days in 2024. Guiding this research is the question: How do the Gentse Feesten impact on the residents living in Ghent, and can a discrepancy in perception regarding residential well-being be detected among different stakeholders? A mixed-methods approach was used to explore the perceptions of attendees, festival organizers, and residents in connection with the attitude of visitors during the festival, management of the festival and the participation of residents in decision-making. The residents of the historical centre of Ghent remain the primary focus of this study; through surveys and interviews, they are given a platform to share their personal experiences and reflections. Findings highlight the complex nature of balancing diverse stakeholder concerns and needs, even within the affected resident community, e.g. differentiated by age and length of the residence. Sense of place, community connection, and local pride are identified as key to residents' well-being during the festival, while visitors' attitudes play a frequently cited role. Overall, while most respondents view the festival positively at present and praise its sustainability, but the festival is still growing and internationalizing, while the challenges are feared to increase and disrupt a delicate balance Organizers and local authorities are expected to address these concerns together with the residents of the city centre, but more respect of visitors for local ownership of the urban environment seems a decisive issue.

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Cities for Tourists: The Demographic Consequences of Urban Land Rents

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G15-4 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

Tourism is widely recognized as a driver of local economic development (attracting investments, creating jobs, and expanding business opportunities), an effect commonly referred to as “tourism-led growth” (Balaguer & Cantavella-Jordá, 2002). However, it is also a determinant of social, cultural, environmental, and economic costs (e.g., gentrification and the displacement of local communities, Adie et al., 2020; Boussa, 2021) especially in situations of overtourism. This work investigates the interrelationships between tourism attractiveness, housing prices, and population dynamics across Italian provincial capitals. Specifically, it aims at testing the hypothesis that higher levels of tourist flows, in association with housing prices, influence local population trends. As tourism increasingly shapes urban economies, it also transforms real estate markets and potentially raises living costs, thereby affecting residential choices across demographic groups. For the purpose of testing these relationships, we develop a Structural Equation Model empirical framework that examines the effects of tourism intensity and housing prices on population turnover and on its mobility share. The results contribute to the urban economics and tourism literature by shedding light on the demographic implications of tourism and real estate market related dynamics and offer relevant insights for urban planning and housing policy, especially in tourism-oriented cities.

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Olympic and paralympic games and image change of Paris and Seine-Saint-Denis

Towards a place-based approach

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G15-4 Tourism and Culture in the Transition Era, Carrying Capacity, Creative Industries, Wellbeing and Quality of Life, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

Olympic Games (OG) can transform the host city and in particular its image. In the bid stage, OG highlight the fact that the city is a city which can compete to attract investment (Müller and Steyaert 2013). Moreover, OG are sometimes linked to a global urban project as in Barcelone (Gravari-Barbas et Jacquot, 2007) in London (Beucher, 2009, Poynter, 2012) or in Beijing (Augustin, 2009, Kaplanidou, 2009), which can contribute to a new city' image.
During the event, due to an extensive media coverage (Essex and Chalkley, 1998, Kenyon & Bodet, 2018), OG convey to the world the image that the local actors want to give to the territory and its possible future (Marais et Arnaud, 2013, Thanh, Kirova & Dareous, 2014, Pappas, 2004). But they can also have a negative image effect: delays in delivery, budget overruns, strikes, and sometimes even suspicions of corruption (as in Montréal, Khomsi, 2015). Being in the international spotlight can be problematic for the city if there are security problems, congestion as it was the case in Atlanta (Essex & Brian, 1998), London (Thanh, Kirova & Dareous, 2014).
The 2024 Paris Olympic Games took place in Paris but also in in Seine Saint-Denis department which hosted most of the new Olympic venues. Seine Saint-Denis department is the poorest department of metropolitan France and its image had been severely damaged. Conversely, Paris, where many competitions and the opening ceremony took place in temporary venues, is the richest department in France and enjoys a very strong image. What are the effects of OG on this both territories? How to evaluate a possible image change? Are the image effects different?
Based on surveys conducted with 1124 visitors in Paris (Eiffel Tower, Arc de Triomphe/Champs Elysées, Notre-Dame de Paris and Sacré Coeur) and 976 in Seine Saint-Denis (Puces de Saint-Ouen, Stade de France, Basilique Saint-Denis during the Games (2024) we will show that the image effects are in the same time very similar and very different.
Seine-Saint-Denis, which had a negative image, has benefited from a significant improvement in image, particularly at the Stade de France, and for the domestic tourists (outside the IDF region) while Paris's image, which was already very good, has also improved, albeit to a smaller extent and particularly for international tourists. We further explore the drivers of the image change by examining the patterns in the words used to characterize the host territories.

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Cluster-wise spatiotemporal panel models for global and local spillovers identification

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G16-1 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 09:00 - 10:30

This paper proposes a heterogeneous spatiotemporal panel data model designed to capture three pervasive features of regional and socio-economic data: spatial spillovers, dynamic persistence, and structural heterogeneity. The starting point is that spatial units are rarely homogeneous, and that interdependence is often shaped not only by geographic proximity but also by the characteristics of the interacting units. To reflect these mechanisms, we introduce a dynamic Spatial Durbin-type specification in which both the marginal effects of covariates and the strength of spatial feedback can vary across latent clusters of units. In particular, the model allows for group-specific temporal dependence and heterogeneous spatial interactions that may differ within clusters and across clusters, accommodating symmetric or asymmetric cross-group spillovers. This structure yields a flexible representation of diffusion patterns that standard homogeneous spatial panel models cannot reproduce.
Within this framework, we derive the full matrix of partial derivatives that maps changes in covariates into changes in outcomes, and we decompose it into direct and indirect (spillover) effects. Unlike conventional spatial models, these effects naturally exhibit a block structure, enabling separate summaries for within-cluster direct effects, within-cluster spillovers, and cross-cluster spillovers, thus providing an interpretable characterization of heterogeneous propagation mechanisms.
For estimation, we develop a two-step quasi maximum likelihood (QML) procedure that jointly recovers the heterogeneous parameters and the latent group memberships without requiring the researcher to pre-specify a clustering partition. The algorithm alternates between parameter estimation conditional on group assignments and group reassignment that explicitly accounts for spatial dependence, thereby avoiding procedures that treat units as conditionally independent when updating clusters. We evaluate the finite-sample performance of the proposed estimator through an extensive Monte Carlo study across alternative model restrictions and heterogeneity patterns, assessing both parameter recovery and the accuracy of the implied direct and indirect effects. The proposed framework is particularly suited to environmental applications, such as regional greenhouse gas emissions, where socio-economic drivers and spillover intensities may differ systematically across groups of regions with different development levels and institutional capacity.

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Matrix-Free Spatial Autoregressive Modeling Using the EquiPop Neighborhood Structure: A Computational Alternative to Sparse-Matrix Estimation

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G16-1 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 09:00 - 10:30

This study develops and evaluates a matrix-free spatial econometric framework built upon the EquiPop neighborhood structure introduced by John Östh (2016). The objective is to examine whether spatial autoregressive models can be estimated without constructing explicit sparse spatial weight matrices, while preserving the theoretical foundations of spatial dependence modeling.
We begin by validating the framework using Anselin's Columbus dataset, a benchmark dataset in spatial econometrics, and subsequently extend the analysis to large-scale Airbnb listing data. Neighborhood relationships are derived directly from the EquiPop structure, and spatial lags of both the dependent variable and explanatory variables are computed without forming a full spatial weights matrix. For SAR and SDM specifications, the spatial autoregressive parameter is estimated via grid search, and the log-determinant term is approximated using the Pace–Barry (1999) stochastic trace method. This allows likelihood evaluation in a fully matrix-free manner.
Comparisons with traditional implementations using sparse-matrix routines show that coefficient estimates and spatial parameters are broadly consistent across approaches. At the same time, the matrix-free EquiPop implementation substantially reduces computational burden when spatial lags are precomputed. Residual spatial autocorrelation diagnostics highlight the importance of properly capturing global feedback effects in autoregressive specifications.
The results demonstrate that matrix-free spatial econometric estimation is feasible, computationally efficient, and scalable. Future research will focus on improving Neumann-series approximations within the EquiPop framework, exploring Bayesian estimation strategies, and extending the approach to origin–destination flow models where high-dimensional spatial structures present significant computational challenges.

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Spatial Spillovers in Forecasting Market Diffusion of Electric Mobility

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G16-1 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 09:00 - 10:30

In reduction of CO2 emissions, the transition to environmentally friendly transport modes has a high significance. In Germany the Climate Action Programme 2030 includes various measures for promoting electric mobility. Although electric cars hold a market share of just 3.3% by the end of 2025, its stock is more than doubled in the past three years. Their share of new cars reaches almost 20%. Special measures like tax incentives, charging benefits and purchase subsidies have been put in place to promote the shift towards electric cars and boost their diffusion.
Knowledge on the future expansion of electric cars is required for planning purposes and adaptation measures. With view of the spatial dimension of electric mobility, regions are expected to differently contribute to national goal achievements. In as much as neighboring regions interact with one another, spatial spillovers come into the fore. To cover the national and regional dimension in the diffusion of electric mobility, both time series and panel data models are designed for forecasting the development of electric vehicles. In particular, we make use of spatial panel data models that is grounded on the partial adjustment mechanism and peculiarly adapted for forecasting purposes in presence of regional spillovers.
Regional data on the stocks of electric cars and motor vehicles at the national, state and district level is available from the Federal Motor Transport Authority . While the national time series is provided since 2009, district and state data are only available for the period 2016 - 2025. Using additional information of Statistical offices of the Federal States panel data at the state level can be constructed for the period 2013 – 2025. Data on regional characteristics is from the Federal Employment Agency and the Federal Statistical Office.
To account for spatial and temporal effects in market diffusion of electric mobility, we utilize dynamic spatial panel data models. Regional characteristics are involved as control variables. Additionally, the effect of the environmental bonus on newly registered electric cars is tested. Econometric estimation reveals the importance of autoregressive processes in the dissemination of electric vehicles. The inclusion of spatial spillovers can improve the forecasting performance more at the district level than at the state level. The environmental bonus exerts a relevant but limited influence on the electric car sales. By aggregating regional predictions, regional forecasting errors are partially balanced out in the prediction of the electric vehicle fleet at the national scale.

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Regional Shape Implications for Equity, Fairness and Sustainability

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G16-2 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

Local and regional patterns of shape have received much attention and focus because of the implications for equity, fairness and sustainability. A major challenge in regional science has been the measurement and interpretation of shape. This paper examines the theoretical foundations of compactness metrics, and their implications for addressing questions of land use allocation, fair representation in political redistricting, trade area efficiency, environmental support and sustainability more broadly. The roles of geographic information systems and regional analytics are highlighted in the examination of recent legislative districting as well as land use mitigation efforts.

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Filling Data Gaps in the Measurement of Income Inequality.

A Complete Dataset of National Gini Coefficents 1995-2019

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G16-2 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

Filling Data Gaps in the Measurement of Income Inequality.
A Complete Dataset of National Gini Coefficents 1995-2019

Income inequalities are a major societal challenge and research on their causes, consequences, and policy solutions has become central to social science (Grusky 2018; Polacko 2021). Despite criticism, the Gini coefficient – especially income-based Ginis – remain the most important indicators for measuring the extent and development of income inequality within a country. Common sources include the OECD, World Bank, Luxembourg Income Study (LIS), and World Income Inequality Database (WIID). Unfortunately, Gini coefficients based on comparable methodologies are only available to a very limited extent. To remedy this lack of data, we create a complete dataset of Gini coefficients from 1995 to 2019 for 160 countries through the combination of machine learning methods and a large dataset of social-policy indicators.

From a geographical perspective, data gaps are especially prevalent for countries in the Global South. Furthermore, pre-2005 data are often incomplete or missing even for the Global North. The most comprehensive data set available with consistent definitions for net income is the WIID Gini. With around 900 data points, this data set covers only 22% of the possible country-year combinations for the selected sample of 160 countries in the chosen observation period.

Therefore, we pursue two objectives: (1) to close existing data gaps through statistical imputation thereby creating a consistent and plausible dataset of Gini coefficients for 160 countries with over 1 Mio. inhabitants from 1995 to 2019 and (2) to identify the socioeconomic and political indicators that most strongly influence these imputations. To achieve this, missing data are estimated using a gradient boosting machine (GBM) drawing on over 1400 socioeconomic and political indicators from the WeSIS database (www.wesis.org; Mossig and Obinger 2023). The results are contextualized on the basis of an extensive literature review on the causes of income inequality.

According to our methodology, the following indicators are particularly suitable for predicting income inequality: (a) Gender Inequality Index, (b) Proportion of people living below 50% of median income, (c) Total population ages 65 and above, (d) Codetermination and information/consultation of workers, (e) De facto coverage of children by the child benefit for citizens/residents as well as (f) Capital city coordinates (Latitude).
With this novel dataset, we enable researchers to broaden their inquiry into causes and effects of socio-economic inequality on a formerly unachievable scale.

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A Spatially Weighted Relative Deprivation Index: Identifying the Spatial Comparison Structure of Regional Inequality

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G16-2 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

This study proposes a Spatially Weighted Relative Deprivation index (SWRD) that redefines the reference structure of relative deprivation in spatial terms. Conventional inequality measures summarize disparities into a single scalar and therefore do not assign region-specific deprivation values. Standard relative deprivation (RD) indices overcome this limitation by providing unit-level measures, but they retain an implicitly aspatial reference structure in which comparison sets are defined over the full distribution. As a result, neither approach captures the spatially structured nature of regional hierarchies. Building on Yitzhaki's formulation, SWRD incorporates a spatial weight matrix so that upward comparisons are weighted by geographic proximity, allowing each region's deprivation to be evaluated within a spatially constrained comparison environment. Using GRDP for 229 Korean districts from 2015 to 2021, the study first diagnoses the empirical spatial structure of regional economic performance through variogram analysis. A data-driven procedure based on spatial panel models and Akaike Information Criterion identifies a 65 km inverse-distance cutoff as the comparison range that best captures observed spatial dependence. The resulting SWRD reveals spatial patterns distinct from RD, highlighting locally intensified gaps around growth poles that are not detectable under global ranking. A cross-classification of RD and SWRD uncovers heterogeneous spatial typologies of regional disparity. Panel analyses of youth net migration further show that national and local deprivation interact: local comparison pressure amplifies the migration response to national disadvantage. The findings demonstrate that regional inequality is structured not only by aggregate rank but also by spatially bounded comparison processes.

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Mapping Global and Regional Inequalities Through the SDGs

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G16-2 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

Inequality remains one of the most persistent barriers to achieving sustainable development, manifesting not only within countries but also across regions and at the global level. While the Sustainable Development Goals (SDGs) provide one of the most comprehensive frameworks for monitoring development progress, their potential to illuminate structural inequalities across countries and world regions remains underexplored. This paper maps global and macro-regional inequalities through the lens of the SDG indicator framework, examining how disparities in performance cluster across economic, social, and environmental dimensions of sustainability. Drawing on harmonized SDG data, the study analyzes patterns of divergence and convergence across world regions, highlighting how inequality is embedded in multidimensional development trajectories. Beyond assessing average performance, the paper investigates distributional spreads, cross-regional gaps, and interlinkages among goals to identify systemic imbalances and structural constraints.

Methodologically, the analysis combines descriptive mapping with inequality metrics and comparative regional profiling. By situating SDG performance within a broader inequality perspective, the study moves beyond aggregate rankings to reveal uneven progress, regional clusters of deprivation and advancement, and persistent structural divides. The findings demonstrate that global development under the SDG framework is characterized not merely by varying speeds of progress, but by qualitatively distinct regional pathways shaped by historical, economic, and environmental asymmetries.

The paper argues that understanding sustainable development requires explicit attention to its spatial and distributional dimensions. Mapping inequalities through the SDGs thus provides critical insights for more targeted, region-sensitive policy strategies and for strengthening the equity-oriented ambitions of "leaving no one behind“ implied in the UN 2030 Agenda.

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Research on the Evolution Characteristics and Driving Mechanisms of Land Use Patterns in the Changsha-Zhuzhou-Xiangtan (CZT) Metropolitan Area

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G16-3 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

In recent years, the conflict between ensuring food security, maintaining ecological functions, and promoting industrial upgrading has become increasingly prominent in the Changsha-Zhuzhou-Xiangtan (CZT) metropolitan area. Based on land-use data from 2015 to 2023, this study utilizes spatial analysis of land-use transitions and Geographical Detectors to analyze the evolution of land-use patterns in terms of structure, quantity, and spatial morphology, while exploring the underlying driving mechanisms. The results indicate that: (1) The overall land-use structure of the CZT metropolitan area maintains a fundamental pattern of "ecological dominance, agricultural foundation, and rapid expansion of construction land." (2) Ecological and agricultural spaces remain dominant, forming the essential base for regional ecological security and food production, while the proportion of construction land continues to rise driven by urbanization. (3) Land use exhibits a typical "two-decrease, three-increase, one-stable" pattern: cropland and forest land have overall declined; construction land, water bodies, and unused land have grown steadily; and grassland has remained largely stable. (4) The expansion trajectory of construction land has evolved from early "point-like growth" to "block-like clustering," gradually forming a "belt-like continuous" structure centered on main transportation axes and the boundary areas of the three cities, with land elements continuously converging toward the metropolitan core and axial zones. (5) The evolutionary dynamics consist of external pushes from national strategies and policy systems, internal pulls from market mechanisms, industrial clusters, and population mobility, as well as the constraints and guidance provided by ecological red lines, "Green Heart" management, and spatial structural evolution.

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Nighttime Lights as a Proxy for Economic Development on a Local Level - The Case of the US

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G16-3 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

This paper examines whether nighttime lights imagery (NTLI) can reliably explain and predict regional economic well-being in a highly developed country using only remotely sensed data. Building on prior work that has largely focused on cross-sections, developing economies, single predictors, and short time spans, we construct a multi-year, multi-scale framework for the United States using the Harmonized Global Nighttime Lights series, which combines DMSP-OLS and VIIRS into a consistent 1992–2022 panel. We derive a rich set of NTLI-based indicators at state and county level, capturing not only total brightness but also distributional and spatial characteristics of lights within each area.

We link these features to official data on real GDP and personal income, and estimate models separately for explanatory (same-year) fit and predictive performance (one-year-ahead forecasts). Methodologically, we compare a baseline log-log OLS specification with several non-linear machine-learning algorithms, including LASSO, Support Vector Regression, k-Nearest Neighbours, Random Forest, and XGBoost. Model performance is assessed using out-of-sample R2, and we employ permutation-based feature importance to identify which NTLI-derived predictors contribute most to explanatory and predictive accuracy.

The results confirm that the NTLI-economy relationship is substantially stronger at the regional (state) than at the local (county) level, both for GDP and income. Augmenting the sum of lights with additional distributional and spatial metrics yields sizeable gains in explanatory power, especially for states, indicating that how light is distributed across space carries information beyond aggregate brightness. Non-linear ML models, particularly tree-based methods, systematically outperform OLS in both explanatory and nowcasting exercises, with the largest improvements again observed at the state level. Our results suggest that harmonized nighttime lights can serve as a practical early indicator of regional economic conditions in advanced economies.

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The role of agglomeration dynamics in the (extensive-form) growth process: Evidence from China.

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G16-3 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

The paper discusses whether – and to what extent – sub-national population change responds positively or negatively to agglomeration dynamics (i.e., population density), in ways that reinforce or, instead, equalize population concentrations across space. Examining processes of concentration and de-concentration of population goes beyond the demographic interest per se, as it may, also, shed light on questions concerning economic convergence and divergence in the more general sense of understanding wider economic processes. To this end, the paper presents evidence from China. Under the conditions of the rapid market liberalization process that China has been experiencing, questions of spatial cohesion – and thus of convergence and divergence – even though are still, rather, neglected, become increasingly salient. This is so as the elimination of spatial imbalances is both a pre-condition and a core objective of the reforms aiming at market liberalization. Scholars both in the urban economics and the growth economics tradition have well-recognized that studying population growth offers a window through which to study the process of economic growth as the latter is systematically related to population growth through the trade-off between agglomeration economies and urban costs (i.e., commuting, housing, land use, environmental, inter alia). This is especially so in China given that productivity levels, capital deepening and levels of technology are rather low, compared to the corresponding levels of the EU and the USA), and thus economic growth is still very much of the extensive (i.e. increase in inputs, including labor) than the intensive form (i.e. increase in the productivity of each input and in total factor productivity). Moreover, given that China is still at low levels of economic development, spatial productivity differentials are predominantly along the lines of urban-rural (i.e. core–periphery) dichotomy, and thus very much related to patterns of population agglomeration (i.e. urbanization). In these conditions, measures of spatial disparity in population concentration act as a lower bound indicator of spatial disparities in terms of economic development, and this may be of acute analytical and policy interest. If patterns of population growth are found to be cumulative across space, this could be taken as a signal of a wider spatial disequilibrium, representing spatial inequalities in economic opportunities more generally. This may, ultimately, raise concerns as regards the success of the market liberalization process in itself.

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When Lights Tell Stories:

What can We learn from Sectoral Output and Spatial Inequality in Urban-Rural Indonesia?

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G16-3 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

Night-time light (NTL) has emerged as an increasingly prominent source in socioeconomic research over the past decades, widely recognised as a reliable proxy for regional economic activity. Across developing and emerging economies, official statistics, such as, Gross Regional Domestic Product can be prone to time delays in dissemination. Using NTL captured by satellite sensors, we provide spatial and time sectoral output dynamics, across a decade to 2024, examining the interplay between urban-rural luminosity and sectoral output in agriculture, industry, and services in Indonesia. We apply Visible Infrared Imaging Radiometer Suite (VIIRS) NTL which offers advantages on higher spatial resolution and finer detail of geographical areas compared to previous Defense Meteorological Satellite Program (DMSP) data. To decompose night-time light into urban-rural specification, we apply Moderate Resolution Spectroradiometer Land Cover data (MODIS/061/MCD12Q1) and overlay with Global Human Settlement Layer from Google Earth Engine. We also apply GRDP data across 514 districts of Indonesia, over the 2014-2024 period, incorporated with other remote-sensing driven, population, and investment variables to conceptualise the framework of Solow (1956) and Romer (1986) model. Our empirical strategy employs four robustness checks: between and within regression approaches to assess cross-sectional and temporal variation; comparative analysis across pre-COVID-19 (2014-2019), during COVID-19 (2020-2021), and full period; compare predictive power and fit both at aggregate and growth level; and exploratory spatio-temporal analysis examining spatial patterns and co-evolution across Indonesia's eight major islands using Rose Diagram and Directional LISA.
Results reveal three key findings. First, NTL data demonstrates significant predictive power for both cross-sectional and temporal economic variation, with coefficients remaining robust across different periods and after controlling for socioeconomic variables, except during COVID-19 period. Specifically, elasticities of NTL to predict sectoral economies is higher during pre-COVID 19 period compared to COVID-19 period. Second, urban NTL exhibits better predictive fit for industry and services output, while rural NTL better captures agricultural output. Spatial disaggregation across full periods (2014-2024) reveals pronounced sectoral heterogeneity in NTL elasticities, in which 10 percent increase in urban NTL corresponds to output increases of 6.04 percent in the industrial sector and 3.21 percent in the service sector, reflecting the urban concentration of high-productivity economic activities. Third, spatio-temporal analysis demonstrates positive co-evolution patterns between sectoral output and urban light, with Java-Bali and Sumatra showing the highest frequency, while Kalimantan and Papua exhibit the highest frequency on rural patterns. These findings demonstrate convergence in regional economic dynamics and reduced urban-rural spatial polarisation.

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Multiplex Networks in Regional Knowledge Production

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G16-4 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 09:00 - 10:30

This paper examines how interregional collaboration networks relate to regional knowledge production when collaboration is conceptualized as a multilayered phenomenon. Building on the regional knowledge production function framework, the study integrates three complementary collaboration channels (Framework Programme partnerships, scientific co-publication networks, and co-patenting relations) within an overlapping multiplex network structure. The empirical analysis is conducted at the NUTS3 level for European Union regions using panel data and spatial econometric models to jointly account for relational and geographical mechanisms of knowledge diffusion. By combining multiplex network representations with spatial error specifications, the framework captures both network-mediated knowledge inflows and spatially correlated innovation processes. The results show that the relationship between network position and regional innovation is neither uniform nor layer-invariant. Network effects differ across collaboration channels and across centrality dimensions. Connectivity- and embeddedness-oriented positions (particularly degree and closeness centrality, and alfa-coreness in some cases) are positively associated with regional patenting performance, suggesting that broad access to collaboration partners, the short network distances and membership to the tightly connected core facilitate knowledge diffusion. In contrast, brokerage-oriented roles measured by betweenness centrality are not consistently beneficial and may even be negatively related to innovation outcomes in technological collaboration networks, indicating potential coordination burdens or fragmented collaboration structures. Accounting for spatial dependence materially affects the magnitude and statistical significance of network coefficients, demonstrating that relational and spatial processes are intertwined. Moreover, multiplex aggregation reveals network-innovation relationships that are not detectable in single-layer analyses, highlighting that cross-layer consistency in regional embeddedness can matter even when individual collaboration layers show weak effects.
Overall, the findings contribute to a more comprehensive empirical understanding of how interregional collaboration structures shape regional innovation performance. Methodologically, the study demonstrates the added value of combining multiplex network analysis with spatial econometrics at a fine territorial scale. Substantively, it refines the common assumption that “more central is better” by showing that different network roles carry distinct implications for regional innovativity. The results underscore the importance of jointly accounting for relational and geographical dimensions in regional innovation research and offer a more nuanced basis for the design and evaluation of collaboration-oriented innovation policies.

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From Pixel to Policy: Remote Sensing, Spatial Spillovers, and Multidimensional Food Security-Price Stability Nexus In Sumatra Island, Indonesia

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G16-4 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 09:00 - 10:30

A two-way interdependence linkage between food security and price stability has been a concern for decades, highlighting the importance of these two indicators in economic stability. This study aims to assess the clustering pattern, space-time inter-correlation, and direct-indirect effects of food security on price stability. Combining official data and remote sensing data from 2021 to 2024, we construct a comprehensive Food Security Index by integrating official statistical data with remote sensing approaches, aggregating 15 indicators into four dimensions: economic security, quantity security, quality security, and resource security. The resource security dimension represents a methodological innovation, utilising MODIS Land Cover data for cropland classification, Normalized Difference Vegetation Index (NDVI) and Normalized Difference Water Index (NDWI) for vegetation and water monitoring, CHIRPS rainfall data and Global Surface Water datasets for flood risk assessment which derived from Google Earth Engine. This integration accommodates critical shortcoming in traditional food security measurements, particularly the temporal lag and spatial granularity constraints of official statistics, while enabling real-time monitoring of agricultural resources and early detection of supply shocks. To address data limitations in inflation measurement, we employ a sister city approach using hierarchical clustering methods to estimate inflation rates for non-Consumer Price Index (non-CPI) districts based on economic indicators and consumption patterns. Results from Rose Diagram and Directional LISA reveal that 3 of 4 dimensions are vulnerable to the external shocks from neighbourhood. The three security dimensions (quantity, economics, and resources) exhibit significant vulnerability to external shocks from neighbouring regions, with Central Sumatra exemplifying the highest sensitivity to spatial spillovers during the time period. Quality security emerges as the most persistent dimension, demonstrating consistent positive spatial associations across regions. In addition, Dynamic Spatial Durbin Model indicates pronounced indirect effects of economic security, quality security, and resource security on the inflation level. These findings necessitate integrated inter-regional policies that recognise spatial coordination, particularly incorporating sustainable food security management to monitor inflation rate and price stability.

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The evolution of agglomeration and co-agglomeration patterns in Italy in the last decades

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G16-4 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 09:00 - 10:30

In this paper, we primarily contribute to assessing the spatial concentration of economic activities in Italy since the Great Recession. To do so, we rely on an especially detailed and complete data set that features information on location, employment, and other economic variables for every plant in Italy across a wide range of 3-digit ATECO sectors. In order to capture the behaviour of interest at different spatial scales, we turn to the M function as defined by Marcon and Puech (2010). While allowing for a thorough evaluation of statistical significance, this approach also permits decomposing the aggregate measure of spatial concentration into its local components, as described by Marcon and Puech (2023). Hence, by computing the M function for 2007 and 2021, we can trace how the spatial concentration of economic activities has evolved across various geographic scales and how the different local economies have contributed to such change. In parallel, we use the M function also to provide a fine-grained measure of local productive variety, thus allowing us to evaluate in detail where and how variety has evolved in Italy after the Great Recession.
One particular novelty of this paper is the analysis of spatial concentration using the M function, extended to the inter-sectoral level. That is, instead of measuring how many other plants in the same sector are proportionately present within some distance from an establishment, we focus on plants in other sectors from the one in which the establishment operates. The resulting measure then allows for evaluating the co-location of industries, as described by Marcon and Puech (2010, pp. 751–52). When evaluated at the local level, this application allows identification of the spatial interaction locus between any two sectors.

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Hedonic price of perceived location: Application to flight to centrality and location premium

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G16-5 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

Based on the perceived-quality literature, we propose a new way of controlling location quality when constructing hedonic indices. The location indicator relies on qualitative interviews with market stakeholders and surveys to define weights, resulting in a unique perceived location score.
By shifting the complexity from the number of location variables in hedonic regressions to the determination of the market weights needed to estimate the perceived location quality score, it is possible to construct indices for smaller markets. It also makes possible analysis of the evolution of the marginal price of location and the average level of transaction quality, as well as estimation of specific indices according to various quality segments. In times of recession, the flight to centrality can easily be observed using this synthetic indicator.
Applied to the case study of the Paris office market, the leading European market in terms of surface area, the perceived location index shows the same trend and the same level of volatility as the traditional hedonic indices. However, their ability to detect market turning points seems better. By noting that the marginal price of location has risen more quickly than the index, it is also established that the best-perceived locations significantly outperform the less good ones.

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Endogenous vs exogenous factors in Smart City implementation/development: Asian and European cities compared

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G16-5 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

Efficient and sustainable cities are on the policy agenda of many public bodies, both at the national and supranational level. Focusing on the latter, the Smart City label is declined differently across the globe. This consideration, coupled with differing socio-economic and institutional environments, suggest that implementation and development of Smart City programs may imply different processes and impacts. Against this backdrop, our research aims to study the role of endogenous and exogenous factors in Smart Cities, highlighting common factors and differences. This question is empirically tested by comparing Asian and European Smart cities.

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Spatial dynamics of intra-European outward FDI: Analysis at the regional level

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G16-5 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

Europe is gradually moving from a “space of places” to a “space of flows” as the pure essence of the process of economic integration boils down to the gradual elimination of the pecuniary and non-pecuniary impediments to interaction. Indeed, as the process of European economic integration is in full swing, European regions have been experiencing a period of unprecedented change, being transformed into integral parts of the European economic space. Yet, the scarcity of data on economic flows at the regional level (i.e., interregional data) acts as a deterrent to the end of the thorough understanding of the spatial dynamics and externalities that are generated and / or reproduced. Hence, several important questions regarding the dynamics of the European economic integration process remain unsolved, for both scholars and policy makers. The paper offers a new understanding of the interrelations among regional economies in Europe, examining the spatial dynamics of intra-European outward foreign direct investment (FDI) across European NUTS-2 regions and over the period 2010-2018 (i.e., from the beginnings of the economic crisis to the outbreak of the COVID-19 pandemic). To this end, the paper integrates a Poisson Pseudo-Maximum Likelihood (PPML) gravity framework with spatial Markov chain analysis. Particularly, using high-dimensional fixed effects, the paper recovers region-specific outward FDI capacity (i.e., exporter fixed effects) and assesses both its spatial clustering and its mobility across relative performance states. Moving beyond static views of regional attractiveness, the paper models transitions across four pooled performance states and conditions them on local neighborhood regimes, thus capturing how spatial context shapes persistence, upgrading and downgrading. The results of the paper point to pronounced spatial dependence: regions embedded in high-performing neighborhoods display markedly higher state persistence, while upward mobility does not differ systematically across neighborhood regimes. These findings underscore the role of spatial context in shaping regional FDI trajectories and motivate place-based investment and cohesion policies that account for persistent neighborhood regimes. For the needs of the analysis, the paper utilizes a novel origin-destination (O-D) matrix for intra-European FDI flows at the regional level.

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The impact of public transport accessibility on the labour market in Poland - an econometric approach

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G16-5 Statistical And Econometric Methods of Urban and Regional Analysis, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

This study develops a transport accessibility index for municipalities in Poland and uses geographically weighted regression to examine the impact of transport accessibility on the registered unemployment rate. Based on the analysis of the developed econometric models, it was found that transport accessibility has a significant negative impact on the unemployment rate, which varies across regions. A stronger relationship with the unemployment rate was evident in the model using the average transport accessibility of municipalities in a given poviat. This suggests that accessibility at poviat level is more important than local (municipality) accessibility.

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Regional Strategies for Supply Chain Resilience: A Comparative Study of the European Union and Taiwan

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G17-1 Geopolitics, Geo-economics, Conflicts and Security, Spatial Impacts and Regional Responses, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

In the current "transition era" of global economic order, the liberal trade system is under intense pressure from geopolitical rivalries and protectionism. Vulnerabilities within global value chains (GVCs), particularly in high-tech sectors like semiconductors and critical raw materials, have transformed economic interdependencies into tools of political and economic coercion. The central problem addressed is how regional entities can effectively manage these systemic vulnerabilities and reduce undesirable external dependencies without forfeiting their competitive advantages. This paper aims to identify the specific resources, actions, and mechanisms utilized by the European Union and Taiwan to enhance systemic resilience. By comparing these two distinct entities, the study identifies policy solutions that mitigate the risks of "weaponized" trade and determines how regional context shapes the success of diversification strategies.

The study employs Program Theory to evaluate the cause-and-effect logic of resilience policies, tracing the path from allocated resources (inputs) through strategic activities (actions) to systemic results (outcomes). Furthermore, it uses the "most different systems" comparative approach. Comparing the EU a transcontinental regulatory power with Taiwan a technologically critical island state allows the research to eliminate confounding variables and identify universal patterns of resilience in the face of global shocks.

The analysis processes a wide array of qualitative and quantitative data, including, strategic and legislative documents (e.g. The EU's Critical Raw Materials Act, Chips Act, and the Internal Market Emergency and Resilience Act (IMERA)), institutional data (e.g. reports from Taiwan's Ministry of Economic Affairs and the Industrial Technology Research Institute), investment figures, trade statistics, individual in-depth interviews with supply chain stakeholders

The paper argues that while both entities use state interventionism to mitigate risk, they adopt diverging regional models. The EU is consolidating a "regulatory fortress," prioritizing near-shoring and internal autonomy to revitalize its industrial base. Conversely, Taiwan is weaving a "security net" through "friend-shoring" investments (outward FDI in the US, Japan, and Germany) while strictly retaining its most advanced technological core on the island. Intermediary findings suggest that success is not defined by the sheer volume of instruments, but by the ability to rapidly reconfigure supply chains during a crisis. This study provides added value by demonstrating how different regional frameworks can achieve systemic resilience, offering a blueprint for navigating the "de-risking" era.

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Resilience or Reinforcement of Dependency? Georgia’s Development Path Under Global Shocks

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G17-1 Geopolitics, Geo-economics, Conflicts and Security, Spatial Impacts and Regional Responses, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

In recent decades, global economies have increasingly experienced the negative effects of so-called global shocks. One of the most recent phenomena of this type, affecting countries' macroeconomic conditions and the functioning of international markets, was the outbreak of full-scale war in Ukraine. This conflict has revealed the specific nature of contemporary economic links, including the structure of global supply chains, which determine the scale of dependence and the strength of relations between the broadly defined highly developed countries of the West and the economies in transition.
The vast majority of European countries are feeling the negative consequences of the ongoing war. In the case of Georgia, however, the impact of this shock is more complex. External conditions, combined with the authorities' foreign policy decisions (including not joining the economic sanctions against Russia and de facto halting efforts to join the European Union), have contributed to several unexpected positive macroeconomic effects, including in foreign trade and direct investment inflows. From 2021, the year preceding the aforementioned shock, to 2024, GDP per capita in Georgia increased by over 80%.

In view of the above, this paper aims to analyse the impact of selected global shocks on Georgia's economic development process, using the concepts of path dependency and resilience as a theoretical framework. The condition of the Georgian economy during the period of shocks was assessed based on an analysis of the dynamics of selected macroeconomic indicators, including changes in gross domestic product, foreign direct investment, and foreign trade. To compare the specific impact of various shocks, the analysis covered both the COVID-19 pandemic and the period after the outbreak of full-scale war in Ukraine. To explain the identified processes and provide a broader historical context, important earlier events were also taken into account (including, for example, Georgia's breakout from the Soviet path of development in 1991).
The main conclusions include: (1) indicating the scale of the non-obvious positive effects of the recent global shock, and (2) identifying the nature of the reorientation of the directions and scale of Georgia's trade in the context of its international relations and internal conditions. The discussion of the results took into account the social context of the changes (protests and growing dissatisfaction among parts of society in the light of the growing authoritarian tendencies of the government).

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From Periphery to Node: Regions' Position, Function, and Dependence in the Era of the Triple Transition (Green, Digital, and Geopolitical)

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G17-1 Geopolitics, Geo-economics, Conflicts and Security, Spatial Impacts and Regional Responses, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

This paper proposes an economic-geographical framework for understanding regional performance in a transition era defined by a triple shift: green reindustrialization, digital phantomization, and geopolitical fragmentation. It argues that regions increasingly succeed not only through sectoral structure or cost advantages, but through their position in networks, the functions they perform within strategic flows, and the dependencies they accumulate or manage. Position is operationalised as network centrality and accessibility across transport, trade, innovation, and connectivity systems. Function is captured through role-based indicators that differentiate gateway regions, processing hubs, R&D nodes, and validation/compliance centres that mediate access to markets, standards, finance, and data. Dependence is measured as exposure to external energy inputs, critical technologies, finance and currency regimes, and regulatory or standard-setting power located outside the region.

Empirically, the study constructs a composite Position-Function-Dependence (PFD) profile for EU regions (NUTS2, with selected NUTS3 deep-dives) and tests its explanatory power against conventional predictors (GDP per capita, sectoral shares, investment intensity). The methodology combines index construction, network metrics, and spatial or panel regression to assess whether PFD configurations better account for differences in growth, resilience, and adjustment capacity during recent shocks. Two comparative "case windows" from Southeast Europe illustrate how regions can transition from production-based participation to node-like roles that capture higher value and greater strategic autonomy.

The results deliver a typology of regional roles in the triple transition and derive policy implications focused on upgrading functions, reducing harmful dependencies, and building institutional capacity to move from periphery to node.

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The impact of global changes on the structure of the world economy as an interconnected system

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G17-1 Geopolitics, Geo-economics, Conflicts and Security, Spatial Impacts and Regional Responses, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

Global challenges of recent years have fundamentally changed the perception of stability, reliability and predictability of international political and economic processes. The COVID-19 pandemic, unprecedented in its scale and impact, has caused a chain reaction in the world economic system, exposing the vulnerability of even the most developed countries to disruption of logistical chains, lack of strategic resources and health crises.
In the new reality, signs of the collapse of the classical model of globalization, which envisaged the free movement of capital, goods, services and ideas, are becoming increasingly evident. It is gradually being replaced by a fragmented, ideologically and economically segmented world, where states increasingly resort to protectionism. All this is accompanied by growing distrust, intensifying competition for resources, and a revision of international obligations. There is a danger of a new "normality" based on situational alliances, power pressure, economic blackmail, and ignoring the principles of sustainable development.
Key signals indicating a potential change in the global economic model include: weakening the influence of global institutions and leveling the established "rules of the game"; active use of protectionist instruments; changing ethical norms in the international business environment; fragmentation of global interaction not only in the economic sphere, but also in the political, diplomatic and security spheres; application of political, diplomatic and information pressure to obtain preferences in access to natural resources, logistics and infrastructure networks; actual abandonment of climate policy goals - the desire for short-term economic benefits prevails over commitments to the "green transition", which is accompanied by ignoring environmental consequences. At present, these processes have not yet formed a complete and stable system, but are significant indicators of a possible institutional shift.
The use of geoeconomic levers in competitive struggle is an important aspect of geoeconomics. Geoeconomic tools help to understand the relationship between the economic strategies of countries and their geographical location, resources and spatial aspect, as well as to assess the impact of these factors on economic competition. Competitive struggle between countries and the use of economic levers in the context of global economic integration and globalization are used by all countries of the world, regardless of the level of development, to attract investment. In today's world, a new paradigm of interaction between developing countries and the world economy is being formed.

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High-Skilled Emigration as a Macroeconomic Risk in the Context of Regional Developments: The Case of Armenia

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G17-2 Geopolitics, Geo-economics, Conflicts and Security, Spatial Impacts and Regional Responses, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

This paper conceptualizes high-skilled emigration (brain drain) as a macroeconomic risk in the context of ongoing regional developments, focusing on the case of the Republic of Armenia. As a small and open economy undergoing structural transformation and increasing regional integration, Armenia faces intensified labor mobility, capital flows, and geopolitical realignments that reshape its economic environment. While regional connectivity initiatives and economic liberalization create new growth opportunities, they simultaneously increase the risk of accelerated outflow of highly qualified human capital.

The study examines brain drain not merely as a demographic or social phenomenon, but as a structural macroeconomic risk affecting long-term productivity, innovation capacity, fiscal sustainability, and economic resilience. By analyzing data on the Brain Drain Index, remittances, foreign direct investment (FDI), wages, and unemployment for the period 2013–2024, the paper evaluates the scale, dynamics, and determinants of high-skilled emigration from Armenia. The findings suggest that skilled labor mobility is influenced less by domestic wage and unemployment fluctuations and more by geopolitical shocks, migration networks, institutional constraints, and structural vulnerabilities of the economy.

Although remittances and diaspora linkages contribute to short-term macroeconomic stabilization, excessive reliance on external inflows does not compensate for the long-term loss of human capital. The paper argues that in the context of regional transformation, brain drain must be incorporated into the national macroeconomic risk management framework. Sustainable development requires coordinated migration policies, improved migration data systems, institutional strengthening, and targeted measures aimed at retaining and attracting highly skilled professionals.

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Firm' financial performance in environmentally stressed territories: a spatial analysis at a micro-territorial level in SE Spain.

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G17-2 Geopolitics, Geo-economics, Conflicts and Security, Spatial Impacts and Regional Responses, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

Groundwater pollution is a growing hazard to human health and to the correct functioning of ecosystems. This study examines the impact of groundwater pollution on firm performance in an environmentally stressed area in SE Spain. This relationship has been previously analysed in environmental economics and financial studies from a variety of theoretical perspectives leading to very different conclusions. Although the most recent studies find a negative impact of local environmental pollution on firm performance there is still an open question about how to measure the environmental performance. In this sense, this paper introduces the actual groundwater pollution of the last assessment for Spain according to the EU Nitrates Directive 91/676/CEE to test an alternative version of the Porter hypothesis (PH) from a geographical perspective. According to the PH firms' financial performance can improve from a stricter environmental regulation. We postulate an alternative hypothesis around the nexus between environmental performance and financial performance. The main question to be tested in this study is whether the absence of effective regulation against pollution, proxied by the firms' exposure to high levels of pollution, is affecting firm' performance, measured with the probability of failure. To identify the direction and quantify the effect we use firm-level panel data from the SABI database for a five-year period. Then the existence of a spatial contagion effect among close firms is evaluated through a spatial econometric model. The last question is whether some firms are gaining and some others losing from the absence of effective regulation. The main conclusion is that exposure to environmental pollution is more detrimental for firms' survival than firms' size, age and profitability ratios like ROA and ROE, and this effect is bigger for service sector businesses. Finally, we find no evidence about firms of any economic sector gaining from the absence of effective regulation against nitrate pollution. Therefore, this paper empirically demonstrates the existence of significant environmental-financial nexus and give strong support to a stricter application of EU Directives against pollution.

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Is the Belt and Road Initiative a Further Belt on the European Innovation Ecosystem?

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G17-2 Geopolitics, Geo-economics, Conflicts and Security, Spatial Impacts and Regional Responses, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

This study investigates the influence of China's Belt and Road Initiative (BRI) on the European innovation ecosystem, specifically examining how this large-scale geopolitical strategy affects firm-level innovation decisions and performance. By utilizing firm-level data from the Community Innovation Survey (CIS) across 12 European countries for the 2012–2018 period, the research explores whether the BRI's impact possesses a significant spatial dimension and how these effects vary according to a firm's market orientation.
The methodological framework centers on an original application of the Mairesse-Mohnen-Kremp (MMK) model, which structures the relationship between innovation inputs (R&D), innovation outputs (innovative sales), and firm productivity. A primary contribution of the study is the pioneering integration of spatial dependence into every block of the MMK framework. By constructing spatial weight matrices based on both geographical proximity and economic linkages, the analysis identifies how innovation behavior is transmitted through regional and networked interdependencies. The study further develops a novel dataset by merging CIS microdata with World Bank data on BRI-related trade cost declines, employing an instrumental variable approach to isolate the impact of these exogenous shocks.
The empirical results demonstrate that the BRI significantly disrupts the European innovation landscape. In the first block of the MMK model, the BRI is associated with a general decline in R&D engagement. While domestic-oriented firms may increase R&D intensity—suggesting a survival-driven selection mechanism—firms oriented toward EU-EFTA or global markets exhibit marked declines. The inclusion of spatial terms reveals that proximity to internationally oriented peers, once a source of positive knowledge spillovers, becomes a liability under the BRI-induced realignment. In several instances, the introduction of the BRI reverses the sign of spatial coefficients, indicating a breakdown in the strategic cohesion and innovation synergies previously fostered by EU policy frameworks.
These findings suggest that traditional drivers of innovation, such as regional clustering and economic integration, may be undermined by external geopolitical shifts. The study concludes that EU innovation policies, such as the Smart Specialisation Strategy (S3), must be updated to include a global strategic dimension that accounts for external competitive threats. Ultimately, the study highlights the necessity for an adaptive, outward-looking policy framework that combines regional development with resilience planning to defend the integrity of the European innovation ecosystem in a volatile global landscape.

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Substitution of Critical Raw Materials in the EU: Economic Impacts on Internal Production Utilizing Input-Output Analysis

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G17-2 Geopolitics, Geo-economics, Conflicts and Security, Spatial Impacts and Regional Responses, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

We examine the substitution impact of critical raw materials in European Union regions on internal production capabilities, assessing its economic impact in terms of output, value added and employment. Utilising a regional input-output analysis modelling framework, we assess direct and spillover economic implications, feasibility, and potential benefits of substituting materials of the Critical Raw Material list with domestic EU production.
Results suggest a multifaceted impact of this substitution. In some EU regions, replacement can represent an opportunity for economic growth and diversification of activities. In other areas, negative impacts prevail.
Our analysis does not include an integration of the environmental externalities associated to increased mining activities. Results should be interpreted as the price of EU independence on critical raw materials.

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Being or Feeling Left Behind? Marginalisation, Abstention, and Protest Voting in Emilia-Romagna, Italy

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G18-1 Voting Patterns, Participation, Trust, Discontent and Representation in Times of Transition, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

Recent political events at the global level have shown a rapid growth of populist voting alongside declining electoral participation. The regional economic literature argues that a relevant driver of this phenomenon is the progressive marginalisation of many (mostly rural) places due to the effects of agglomeration economies. However, electoral behaviour shows path dependencies embedded in the history of a territory, and results from the interplay of complex territorial- and individual-level factors. Additionally, rather than being driven by marginalisation as measured through objective indicators, it may be driven by the perception of marginalisation, with the two not necessarily being aligned. In this article, we use data from an original survey conducted at the regional (NUTS2) level, merged with secondary data at the municipal (LAU2) and Local Labour System (LLS) levels, to investigate how individual and territorial characteristics impact voting behaviour. Questions about recent and past electoral behaviour allow us to determine voters' switching patterns, considering abstention as well as populist voting as potential alternative outcomes. Additionally, we test the impact of both individual perceptions and indicator-based measures of social and territorial marginalisation. Our survey was conducted immediately after the 2024 regional elections in Emilia-Romagna, Italy. This region represents a particularly interesting case study because of its high social capital, its tradition of socialist governments providing high-level public services, its polycentrism, and its territorially diffused economic activity, exemplified by the many industrial districts. Electoral abstention and political polarisation along the centre-periphery fault line are relatively new yet clearly emerging patterns. We estimate multilevel models with two potential outcomes: abstention or voting for populist parties. Preliminary results suggest that perceived marginalisation is a stronger explanatory variable than marginalisation as measured through objective indicators of socio-economic and demographic decline. Similarly, although both territorial- and individual-level characteristics show statistically significant associations with electoral behaviour, the latter explain a much larger share of the variation. Therefore, alongside redistributive policies across households and territories, policy practitioners aiming to address the 'revenge of the places that do not matter' and to generate diffuse social wellbeing should pay attention to prevailing narratives of marginalisation rather than targeting purely economic and geographical indicators.

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Electoral swings amidst globalization pressures. Insights from Greek regions

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G18-1 Voting Patterns, Participation, Trust, Discontent and Representation in Times of Transition, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

This paper investigates the relationship between globalization and the profound transformation of the Greek electoral landscape over the 1996-2023 period. Employing an estimation strategy that accounts for time-invariant unobserved factors across local labor markets differentially exposed to imports from China, we uncover that globalization is a key catalyst of the Greek electoral transformation. Specifically, we first document that regions more exposed to import competition exhibit increased voter turnout and support for radical left parties, coupled with decreased support for radical right ones. A more granular classification of the political parties according to their economic stance illustrates that import competition increases support for parties moderately in favor of market liberalization, as opposed to those favoring extensive welfare policies. The estimated effects are concentrated in regions with low-to-medium unemployment levels, underscoring the heterogeneous adjustment to global shocks, based on different levels of the local economic uncertainty.

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Voting against interest in the green transition? The geography of political incongruence in the Netherlands

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G18-1 Voting Patterns, Participation, Trust, Discontent and Representation in Times of Transition, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

Climate change and the green transition impose highly uneven costs and risks across households and places, yet political support for policies addressing these risks does not necessarily follow the same spatial logic. This paper examines how material exposure to climate- and energy-related risks aligns with political representation across Dutch neighborhoods. We combine fine-grained spatial indicators of energy burdens, housing quality, and exposure to environmental hazards, such as flooding and land subsidence, with neighborhood-level election outcomes from recent Dutch parliamentary elections. Political representation is captured using a newly constructed Policy Favorability Index (PFI), which measures how strongly political parties support housing-level climate adaptation and the redistribution of energy transition costs. To assess misalignment between exposure and representation, we introduce two complementary measures of political incongruence: a high-exposure–low-PFI quadrant classification and a continuous Interest–Vote Incongruence (IVI) index that captures the alignment between exposure and voting patterns supportive of one's material interests. The results reveal a sharply structured political geography of the green transition. While exposure to high energy costs, poor housing quality, and climate risks is widespread across both metropolitan and peripheral regions, political incongruence is overwhelmingly concentrated outside the urban core. Neighborhoods in less urban and lower–human-capital regions are significantly more likely to combine high exposure with support for parties offering limited or regressive housing-level climate and redistribution policies. By contrast, highly educated and densely urban neighborhoods tend to vote in line with their material interests, even at comparable exposure levels. Regression analyses show that education and urbanity are the strongest correlates of political alignment, outweighing income and wealth. These findings suggest that the green transition is mediated through an education- and urban–rural political divide, reflecting broader patterns of spatial inequality and political detachment. The paper contributes a scalable framework for studying the political foundations of climate policy and highlights a central challenge for building a socially just and politically sustainable green transition. The places most exposed to climate risks and energy costs are often those least politically aligned with protective policy responses.

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Regional aspects of electoral transformations in Bulgaria (2021-2026)

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G18-2 Voting Patterns, Participation, Trust, Discontent and Representation in Times of Transition, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

Electoral transformations in Bulgaria in recent decades have been determined by a complex interaction between demographic, economic, ethno-confessional, socio-political and party factors, which in their aggregate change both the structure of the electorate and the logic of political representation. These processes lead to tangible changes in voter turnout, the territorial distribution of the vote and the degree of institutionalization and sustainability of the party system.
Bulgaria is among the countries in the European Union with the highest mortality rate and the fastest declining population. Aging, negative natural growth and continued external migration reduce the absolute number of voters, while simultaneously increasing the relative share of elderly voters. This has a direct impact on electoral behavior - the importance of socially conservative attitudes, policies aimed at social security and income, as well as stability as a value in political choice is increasing. In addition, internal migration and the depopulation of peripheral and rural areas lead to an uneven electoral weight between large urban centers and small settlements.
A specific factor for the Bulgarian political dynamics is the traditional social divisions (cleaviges) - center-periphery, city-village, ethnic and religious differences, as well as socio-economic inequalities. After 2022, these divisions were further strengthened by external military-political events, which polarized public attitudes along lines such as Euro-Atlantic orientation versus Euroscepticism and geopolitical loyalty. Thus, a new dimension of value and foreign policy opposition was added to the traditional internal cleavages, which affected party competition and coalition formats.
After the democratic changes after 1989, relatively stable macro-electoral regions were formed, characterized by predictable party support, regardless of the personal and organizational transformations of the parties. For years, certain regions have identified themselves as “left”, “right” or dominated by ethno-confessional votes, which has created stable geographical voting patterns. However, these patterns have been called into question in the period of increased political fragmentation and institutional instability. The holding of eight parliamentary elections in the period 2021–2026 has accelerated the processes of electoral mobility and shaken traditional regional identifications. Some electoral regions have changed their political orientation, with a shift in support between ideologically and value-diverse parties being observed. Traditionally right-wing regions have registered stronger support for liberal and anti-system formations, while traditionally left-wing regions have provided higher results for ethno-confessional parties. This indicates a weakening of classic ideological divisions and a growing importance of pragmatic motives in voting.

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The Decline of Minority Representation in an Illiberal Context: The German Community in Poland

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G18-2 Voting Patterns, Participation, Trust, Discontent and Representation in Times of Transition, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

The German community constitutes the largest officially recognized national minority in Poland and has been continuously represented in the lower house of parliament, the Sejm, since the political transition of 1990. Although unfavorable demographic trends – most notably the declining size of the German minority and the gradual weakening of its territorial concentration – had long suggested the possibility of electoral vulnerability, the complete loss of parliamentary representation in the 2023 elections nevertheless marked a significant and unexpected turning point.
The events must be situated within the broader context of democratic backsliding in Central and Eastern Europe, accompanied by the rise of populism, political polarization, and illiberal governance practices. The 2023 parliamentary elections in Poland were characterized by intense competition between the authoritarian-populist Law and Justice party (PiS) and the pro-EU Civic Coalition (KO), resulting in unprecedented levels of political mobilization. The election produced a record-high voter turnout, which proved decisive in reshaping electoral dynamics and ultimately contributed to the loss of the German minority mandate.
Drawing on relevant scholarly literature, as well as census and electoral data, this study analyzes the structural, political, and mobilizational factors underlying the loss of parliamentary representation and the associated changes in voting behavior. The complex dynamics of minority political mobilization are further examined through the application of the Strijbis–Kotnarowski mobilization index, which allows for assessment of shifts in electoral participation and party competition over time.
The (potentially temporary) end of the era characterized by German parliamentary representation also provides an opportunity for retrospective evaluation. By analyzing the parliamentary activities of German minority representatives as recorded in plenary transcripts, the study assesses the substantive focus of their legislative work, identifies the policy areas in which they were most active, and evaluates the extent to which they effectively represented the interests of their ethnic community and electorate.

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Between the secondary and hybrid nature of the European Parliament elections – the Polish perspective

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G18-2 Voting Patterns, Participation, Trust, Discontent and Representation in Times of Transition, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

For many years, the European Parliament elections have been described as second-order elections. Although institutionally considered direct elections to an international parliament, they are perceived by citizens and political elites primarily through the prism of national politics. It has been recognized that as long as important political decisions are decided at the national level, European elections will remain additional, second-order national elections.
In recent years, these elections have been analyzed through the lens of the rise of populism and Euroscepticism, which have significantly changed the dynamics of political competition at the European level. However, the eurozone financial crisis, the migration crisis, the COVID-19 pandemic, and geopolitical tensions have contributed to the persistent politicization of European integration, making European elections a particularly fertile field for populist groups.
The need to combine second-order theories with theories of the politicization of European integration is emphasized. As a result, elections in the era of populism have a hybrid character: they retain the features of secondary elections but also serve as an arena for genuine ideological debates about the future of the European Union.
The study examines the mechanisms shaping the results of the European Parliament elections in Poland, taking into account the debate on second-order and hybridity, and their interpretation from the perspective of long-term political transformations. In addressing the relationship between the European Parliament elections and the parliamentary elections, the focus was primarily on voter turnout as a fundamental determinant of the election's significance. The issue of rewarding or punishing the country's ruling parties in European elections was considered important; therefore, the discussion included support for key parties and protest parties, or those on the periphery of the political scene. The study concludes with considerations of postal voting as a possible indicator of citizens' determination to participate despite logistical obstacles.
The study used electoral data published by the National Electoral Commission, covering five European Parliament elections (2004, 2009, 2014, 2019, 2024) and seven parliamentary elections (2001, 2005, 2007, 2011, 2015, 2019, 2023). The methodological framework was based on indicator analysis, including the measurement of voter turnout and its comparison, as well as party support. A key element was spatial analysis, which enabled assessment of the phenomenon across various spatial reference systems: 13 electoral districts for the European elections, 16 regions, and 41 electoral districts for the parliamentary elections. Cartographic methods were used to supplement the data, enabling the visualization of spatial turnout patterns.

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Non-native candidates as a strategic party resource: electoral effectiveness and spatial consequences

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G18-3 Voting Patterns, Participation, Trust, Discontent and Representation in Times of Transition, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

This paper examines non-native candidates as a strategic resource for political parties in Poland's European Parliament elections between 2004 and 2024. The aim of the study is to answer three questions: (1) what is the scale and effectiveness of non-native candidates in the 13 electoral districts; (2) what is their effectiveness relative to native candidates within electoral committees; (3) what are the spatial consequences of the dominance of imported candidates, using the example of the Wielkopolska region (district no. 7 – Poznań). In addition, the strategy of the Polexit Electoral Committee was analyzed, which in 2024 fielded candidates from outside the electoral districts on 77.4% of its lists, concentrating recruitment in southern Poland (Lesser Poland and Silesian regions). The study primarily used official electoral data published by the National Electoral Commission, covering five European Parliament elections in 2004, 2009, 2014, 2019, and 2024. The methodological framework was based on indicator analysis, measuring turnout, committee and candidate support, and the degree of electoral and party personalization. Proprietary indicators for non-native candidates (list participation, vote share, and relative effectiveness index) were also constructed, enabling the assessment of their over- or underrepresentation. Pearson's linear correlation and simple linear regression were used in the statistical framework to identify the relationships among the levels of personalization, list structure, and candidate effectiveness. A significant element was spatial analysis, including measures of territorial contrast and the geographic correlation coefficient, which enabled the assessment of similarity and concentration in support distributions. This was supplemented by cartographic methods, primarily choropleth maps, which enabled the visualization of spatial patterns in turnout, personalization, and the effectiveness of non-native candidates.

The findings indicate that non-native candidates, despite constituting a minority on the lists, achieved disproportionate results in some districts, serving as "electoral engines." Within the committees, their effectiveness was often higher than that of native candidates, especially at high levels on the list, which favored vote concentration at the expense of local structures. The example of District No. 7 (Poznań) demonstrates a clear spatial concentration of support and the consolidation of personal strongholds, while the Polexit Election Committee's 2024 strategy demonstrates that a highly centralized recruitment model, based primarily on candidates from outside the starting districts, does not guarantee proportional electoral effectiveness without territorial roots.

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The Economic Costs of Parliamentary Populism: Evidence from European Regions

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G18-3 Voting Patterns, Participation, Trust, Discontent and Representation in Times of Transition, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

Populist parties now hold parliamentary seats in nearly all EU member states; however, their economic impact remains underexplored. While existing research focuses on populist executives, we examine whether populist parliamentary presence affects regional economic performance. Using a panel of 239 European NUTS 2 regions (1996 – 2022) and System GMM estimators to address endogeneity, we find that a permanent 1 percentage point increase in populist vote share reduces GDP per capita by 0.74% in the long run. The results suggest a populist trap in left-behind regions, as parliamentary populism shifts the legislative agenda away from growth-oriented long-term reforms, creating institutional frictions and policy uncertainty. Counterintuitively, we find that populist support that remains outside parliamentary representation is no associated with lower growth rates. Our findings reveal that the economic costs of populism begin well before populists take office.

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Electoral Politics and Geographical Indication Adoption: Evidence from Turkey

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G18-3 Voting Patterns, Participation, Trust, Discontent and Representation in Times of Transition, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

This paper asks whether electoral alignment shapes the geographic distribution of geographical indication (GI) designations in Turkey. Combining GI registry data (2019–2023) with provincial electoral results and regional controls, I estimate negative binomial models on a province-level dataset . Coalition-governed provinces register approximately 47% more GIs than opposition-governed ones, and the effect scales continuously with vote margins, consistent with core-voter rather than swing-voter targeting. The findings suggest that discretionary certification systems can become instruments of distributive politics, with adverse equity implications for peripheral regions.

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The importance of a local learning centre in a local labour market – How to retain and develop talent and labour in a knowledge-intensive age?

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G19-1 Urban, Regional and Local Policy Evaluation, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 09:00 - 10:30

Campus Varberg in western Sweden was established in 2003 as a learning centre aimed at meeting local and regional needs for qualified labour. It serves as a meeting place, education broker, and engine for regional development. This study evaluates how well the learning centre has contributed to retaining people in the area, increasing the level of education, and attracting new residents. According to Human Capital Theory (see e.g. Becker 1962) individuals invest in their education based on the return of the investment. To maximize returns on human-capital investment, individuals may relocate to another region after graduation (see e.g. Faggian & McCann 2009). On the other hand, a learning centre may work as a node for a economic cluster. Firms in related sectors create environments that foster knowledge and skilled labour and proximity to education can further support cluster formation through spillovers such as networks, knowledge transfer, and access to graduates (see e.g. Porter 1998).
Two research questions will be addressed: 1) To what extent has Campus Varberg contributed to people who wish to pursue education staying in the region? 2) To what extent has Campus Varberg contributed to highly educated labour establishing themselves in the region?
The study employs quantitative methods based on data from Statistics Sweden's LISA database (Longitudinal Integration Database for Health Insurance and Labour Market Studies). Since the database is longitudinal and based on individual data, it is possible to track individuals (e.g., whether they have moved or remained in the locality after completing their studies). It is also possible to "tag" towns with learning centres similar to Campus Varberg, as well as towns comparable to Varberg but lacking such centres. By this, the design follows the idea of natural experiments (see e.g., Card 1992). Methods such as Difference-in-Differences (DiD) and Fixed Effects (FE) will be applied.

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Dual Vocational Education and Crime

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G19-1 Urban, Regional and Local Policy Evaluation, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 09:00 - 10:30

This paper examines how vocational education reforms can generate sizable crime-reduction externalities at the neighborhood level. We study the staggered rollout of Dual Vocational Training across Catalonia, starting in 2014. This new approach shifted vocational instruction toward firm-based apprenticeships, expanding workplace training from under 500 hours to over 1,000 hours and introducing subsidized paid apprenticeship contracts. Adoption differed across schools over time, generating policy-relevant quasi-experimental variation. We estimate difference-in-differences models with continuous treatment intensity at the census-tract level. The analysis links administrative records for the universe of Catalan vocational students to daily geocoded police reports (2008–2018).

The results show that a 1 percentage-point increase in the dual track share reduces reported youth crime by approximately 13%. Effects build gradually and strengthen over the second and third years, consistent with persistent behavioral change rather than purely mechanical incapacitation. Reductions concentrate during daytime hours—when apprentices are typically at firms—consistent with incapacitation. Declines are strongest for economically motivated property crimes (especially theft), consistent with increased opportunity costs through earnings and improved labor-market prospects. These results imply that apprenticeship-style programs can deliver substantial non-pecuniary social returns through reduced criminal externalities and, therefore, may play a role in disrupting intergenerational disadvantage.

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Coordinating Epidemic Control and Economic Support Policies in Cities: An Agent-Based Analysis of Unintended Urban Market Restructuring

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G19-1 Urban, Regional and Local Policy Evaluation, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 09:00 - 10:30

This paper looks at urban policy co-ordination and market restructuring under epidemic shocks. Specifically, it explores the trade-offs between public health policy for mitigating epidemics and economic support in cities. While public health policy is geared towards minimizing mobility and interaction, economic support aims to stimulate circulation and contact. The paper contributes to urban policy research by showing how epidemic-control measures and economic-support instruments, when designed without cross-market coordination, can produce enduring and unintended restructuring across urban business, labor, and housing systems. Methodologically, the paper links an epidemiological module to a multi-market urban agent-based model in order to trace cascading interactions across sub-markets at the intra-urban scale. Using the city of Beer Sheba, Israel as a case study, it demonstrates that some support measures, especially business-oriented subsidies, may stabilize short-term activity while intensifying longer-run commercial fragmentation, labor-market contraction, and housing pressure. The urban implications of these findings are discussed.

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Short-term rentals in Boston, USA: regulation, compliance and impact

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G19-2 Urban, Regional and Local Policy Evaluation, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

Short-term rentals (STRs) expanded rapidly in Boston during the 2010s, amid rising tourism, intensifying housing affordability pressures, and growing concerns over gentrification and displacement. In response, the City of Boston adopted a comprehensive STR ordinance in June 2018, with enforcement beginning in September 2019. While existing research suggests that STR regulation can reduce listings, various limitations remain: causal evidence is concentrated in a small number of cities and often relies on aggregate indicators that obscure intra-urban variation; enforcement dynamics and non-compliance remain under-examined; and few studies adopt mixed-methods approaches that connect market-level change to the practices and perceptions of hosts and regulators. This study addresses these gaps through a mixed-methods evaluation of Boston's 2018–2019 STR regulations. First, we estimate zip-code-level difference-in-differences models using AirDNA STR data and US Census neighborhood indicators, benchmarking Boston against a wide sample of major US cities. Second, we conduct semi-structured interviews with licensed STR operators and city officials to examine host decision-making, perceptions of regulation, and the institutional constraints shaping enforcement. Third, we conduct forensic analysis of major hosts to identify patterns of rule evasion and structural features of non-compliance. Our quantitative results indicate a substantial reduction in STR supply following enforcement, with an estimated decline of approximately 55%. Notably, the regulations reduced both occasional "sharing economy" listings and professional STR supply, producing broadly similar proportional declines across listing types. However, we also identify attenuation of the treatment effect for entire-home listings managed by professional operators, consistent with uneven compliance and enforcement challenges. Forensic analysis of the largest providers reveals high levels of non-compliance, including duplicated or invalid licenses and the strategic use of exemptions, often embedded within complex ownership and management arrangements. Interview evidence further supports these patterns: while compliant hosts generally reported low administrative burden, they perceived enforcement as uneven and widely believed that larger operators continued to violate the rules. Taken together, our findings suggest that Boston's STR regulations meaningfully reduced overall supply but have not shifted the market toward a more genuine home-sharing model. Persistent non-compliance appears to be driven by low fines relative to STR profitability, staffing constraints within enforcement agencies, and exemptions that are difficult to verify in practice. The study concludes with policy recommendations.

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How Reliable is LUCC Science? Assessing Knowledge Stability Beyond Data

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G19-2 Urban, Regional and Local Policy Evaluation, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

Land-use and land-cover change (LUCC) is widely used as a core driving factor in environmental assessment and policy-relevant research. However, LUCC data are subject to substantial uncertainty stemming from differences among data products, temporal instability, and classification inconsistencies. While these uncertainties are increasingly acknowledged at the data level, their implications for the stability of scientific conclusions and the reliability of policy-relevant knowledge remain poorly understood. In particular, it is unclear whether regions characterized by high LUCC uncertainty also exhibit greater inconsistency in LUCC-dependent research findings. This study develops an integrated analytical perspective to examine the relationship between LUCC data uncertainty and the stability of research conclusions across regions and thematic domains. Drawing on a large body of LUCC-related studies, we synthesize reported findings and assess the consistency of evidence in terms of effect direction, statistical significance, and the relative role of LUCC among multiple driving factors. Rather than focusing on pooled effect sizes, the analysis emphasizes patterns of agreement and disagreement in reported conclusions as an indicator of knowledge stability. By linking spatial patterns of LUCC uncertainty with patterns of knowledge instability, this work provides new insights into how data limitations may affect scientific evidence and policy interpretation. The proposed framework contributes to ongoing discussions on uncertainty in environmental research and highlights regions where LUCC-based evidence may require more cautious use in decision-making.

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Cost Structure of Wastewater and Sludge Treatment in Japan

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G19-2 Urban, Regional and Local Policy Evaluation, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

In Japan, sewerage services are owned and managed by municipal governments. The size of companies varies according to the population size of municipalities. At present, a lot of sewerage companies have serious problems. Firstly, sewerage companies are confronted with severe financial conditions. Water demand cannot increase due to population decline and widespread use of water-saving equipment. Therefore, revenue from sewage charge has been gradually decreasing. On the other hand, because sewer facilities are aging and natural disasters (e.g. earthquake, flood) frequently occur, operators need to maintain and repair facilities and take measures against disasters. Accordingly, capital cost has been gradually increasing. Secondly, sewerage companies are facing a labor shortage because of population decline. It is particularly difficult for some small companies to continue to provide sewerage services.
In order to solve these problems, since 2017, the Japanese government has been promoting wide-area consolidation policy to ensure the sustainable management of sewerage systems. In response, the Ministry of Land, Infrastructure, Transport, and Tourism (MLIT), which controls sewerage companies, developed a planning manual for wide-area consolidation and sharing of facilities and resources. After that, some companies proceeded with consolidation of facilities within and between companies, but management consolidation such as mergers has not occurred. One reason why management consolidation has not occurred is the lack of evidences of benefits arising from consolidation.
Under these circumstances, in this paper, we estimate translog cost function and examine the economies of scale in wastewater treatment and sludge treatment in Japanese sewerage industry. We estimate cost function using annual data on river basin sewerage companies which treat both sewage and sludge. We investigate whether economies of scale exist in wastewater treatment and sludge treatment and provide evidences regarding the benefits of wide-area consolidation policy.

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Computational Analysis of South Korean Local Government Mascot Characters Using Vision-Language Models and Semantic Embedding

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G19-2 Urban, Regional and Local Policy Evaluation, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

Local government mascot characters serve as place branding instruments in South Korea, where municipalities introduce these visual symbols to construct regional identity in competitive inter-municipal environments. This study examines whether such mascots achieve inter-regional differentiation or instead exhibit institutional isomorphism through standardized design repertoires.

We conducted a computational analysis of 207 municipal mascots in South Korea, excluding 22 cases with insufficient visual or textual data. We employed OpenAI's GPT-4o vision-language model (VLM) to extract structured attributes—including entity types, symbolic connections, and thematic elements—from mascot images and accompanying textual descriptions. To validate VLM-based extraction, a subset of cases was independently coded by human annotators, yielding substantial inter-rater agreement. Subsequently, 3,072-dimensional semantic embeddings were generated using the text-embedding-3-large model and analyzed through k-nearest neighbor (k=8) sparsified similarity networks, applying Louvain community detection and k-medoids clustering algorithms.

Our analysis identified four distinct design paradigms with high intra-cluster cosine similarities (0.826–0.843). Mixed entity types combining multiple symbolic elements and human-form representations dominate the dataset, accounting for 57% of all designs. Symbolic resources concentrate on tangible regional assets: local agricultural specialties (21.3%), historical figures (18.8%), and geographic landmarks (17.4%). Thematic framing centered on nature (34.3%), culture (28.0%), and future orientation (26.1%).

However, the modest average silhouette score (0.103) indicates that mascot designs occupy a continuous semantic space with overlapping boundaries rather than forming discrete categories. Chi-square analysis finds no statistically significant association between administrative region and cluster assignment, suggesting design conventions exhibit nationwide diffusion patterns that transcend geographic boundaries.

These findings reveal that South Korean municipal mascots serve both as tools for place differentiation and as vehicles of symbolic homogenization. The convergence toward standardized design repertoires challenges the effectiveness of mascot-based branding strategies for regional distinction. This study contributes methodologically by applying VLM-based visual analysis to large-scale place branding research, and by offering empirical evidence of isomorphic tendencies in symbolic practices within contemporary urban governance.

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Community-oriented urban policy and local earnings – a complicated relationship

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G19-3 Urban, Regional and Local Policy Evaluation, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

The literature on regional agglomeration suggests that local economic revitalisation is likely to involve a rise in local wages. In the context of urban regeneration, community-oriented policy envisages to improve prosperity among the residential population of deprived neighbourhoods. Yet, due to an ever-increasing preference of households to reside at central locations this policy may spur gentrification if outsiders are attracted to new jobs and upgraded housing environments. Apart from facing difficulties in gaining access to suitable data with neighbourhood reference, evaluation studies are confronted with conceptual challenges, since the empirical framework of this research relates to larger territories. The study utilises basic assumptions from the literature on regional economic growth, which apply to the neighbourhood level. Using Germany as a case study, the analysis explores whether local economies have received a boost that may have affected household sorting and local household income during the past two decades. The study reveals no considerable shift in sorting that would indicate gentrification. With a view to income over the past decade local households with a middle or higher income in programme areas have kept up with overall income growth and low-income households have experienced zero growth but appear to have thereby performed slightly better than their counterparts elsewhere. Moderate funding of urban regeneration in combination with support to local communities is not capable of providing a remarkable boost, but it may bring about improvements for the residential population without accelerating gentrification.

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Long-Term Impact of Territorial Division on Municipal Poverty

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G19-3 Urban, Regional and Local Policy Evaluation, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

In various regions around the world territorial reorganizations have been promoted through the division and creation of administrative units as mechanisms to improve local development and political representation. This study evaluates the long-term consequences of regional separations in Colombia by comparing municipalities that remained in their original regions with those that joined newly created ones. Using historical data on territorial divisions throughout the twentieth century, we implement a geographic regression discontinuity design that uses each municipality's distance to the separation boundary as the assignment variable, and construct instrumental variables based on the arbitrary and short-lived variation introduced by the redefinition of departmental capitals in 1908. This approach allows us to estimate the impact of administrative separation on current development indicators such as multidimensional poverty and unmet basic needs. The results show no significant long-term effects of separation on municipal development.

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On the heterogeneity of regional fiscal multipliers in Spain, 1980–2019

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G19-3 Urban, Regional and Local Policy Evaluation, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

This paper examines regional fiscal multipliers in Spain at the NUTS2 level over the period 1980–2019, combining a local projection approach with a dynamic CCE estimator that accounts for weakly exogenous regressors. The results indicate that government consumption generates positive and persistent effects on output and employment, whereas its influence on labor productivity is comparatively limited. Correlations between the estimated fiscal multipliers and potential determinants suggest that larger, denser, and more open regions display stronger employment responses. Moreover, promoting financial deepening and reducing public indebtedness appear to be alternative ways to enhance the positive effects of public expenditure shocks over time. From a policy perspective, these findings highlight that government spending shocks do not affect all regions uniformly. Consequently, countercyclical fiscal policies should incorporate regional asymmetries in both the magnitude and persistence of fiscal multipliers – an aspect particularly relevant for the design and implementation of EU Cohesion Policy. Although this paper has focused on the estimation of public consumption multipliers, those associated with other categories of government expenditure – such as public investment, education, health, or defense – are essential for designing more targeted and effective fiscal interventions. The lack of sufficiently long and consistent regional data currently constrains this degree of disaggregation, but extending the analysis in this direction represents a promising avenue for future research. Progress along this dimension would also contribute to the development of fiscal frameworks that better align national objectives with regional capacities, thereby enhancing the long-term effectiveness of public spending.

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Territorial Spillovers in the Implementation of Italy's NRRP

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G19-3 Urban, Regional and Local Policy Evaluation, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

Italy's National Recovery and Resilience Plan (NRRP) combines structural reforms and investments aimed at supporting the green and digital transition and strengthening long-term growth. Beyond structural effects, NRRP interventions generate short-term demand stimulus. However, the territories hosting projects do not necessarily coincide with those where implementing firms are located, potentially generating territorial spillovers.

This study quantifies these spillovers by mapping NRRP public works along two dimensions: project location ("origin") and firm location ("destination"), both identified at the level of Local Labour Systems (LLSs). LLSs are functional labor market areas characterized by strong internal commuting flows.

Out of €90.4 billion in awarded infrastructure projects, 72% of total value is implemented by non-resident firms, indicating substantial interterritorial linkages. The interregional origin–destination matrix highlights strong concentration patterns: regions such as Lazio and Lombardy emerge as major "exporters" of construction services, while Sicily, Campania, and Lombardy account for large volumes of originating resources. Diagonal entries reveal that a significant share of funds remains within regional boundaries, though cross-regional flows are substantial.

Based on this framework, we construct synthetic indicators at the LLS level, including a normalized trade balance index (net inflows over total flows) and an internal demand coverage index (share of intra-LLS allocations).

To preliminarily explore their determinants, we estimate OLS models focusing on a construction sector stress indicator capturing demand pressure relative to productive capacity. The indicator is negatively and significantly associated with both domestic demand and the normalized trade balance. Income per capita and population show positive and significant effects, while institutional quality (MAQI) is weakly significant.

Overall, the findings suggest that local productive capacity constraints play a key role in shaping territorial spillovers generated by NRRP infrastructure investments.

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Impact of local public transport schemes on economic growth

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G19-4 Urban, Regional and Local Policy Evaluation, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 09:00 - 10:30

This paper evaluates the economic impacts of local public transport schemes - small additions to the transport network - focusing on effects on the number of businesses, employment, turnover, productivity, and house prices. Using granular data from 1997 to 2019 and quasi experimental methods, we provide new evidence on the local economic consequences of these interventions. Our preliminary results show that although the number of businesses increases, there is no effect on total employment, and we observe a negative effect in median turnover and a small reduction in median employment. These patterns are consistent with a shift in the composition of firms: the number of micro businesses (fewer than 10 employees) rises, and because such firms typically generate lower turnover, this helps explain the observed declines in other outcomes. The impacts also appear highly localised, with no evidence of effects beyond 0.5 km. In the next stage of the analysis, we will explore these mechanisms in more detail and examine whether impacts differ by type of transport scheme (trams, buses, and accessibility projects).

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Evaluation of Transportation Mode Choice with the Free-Fare Bus in Sao Caetano do Sul, Brazil

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G19-4 Urban, Regional and Local Policy Evaluation, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 09:00 - 10:30

Urban mobility is a fundamental component of the daily life in cities, considering it guarantees access to health services, employment, education and leisure. Free-Fare on Public Transport (FFPT), a policy that aims to make the public transport economically more accessible, has been implemented around the world to deal with the mobility issue. The outcomes of this policy remain a subject of ongoing scholarly debate, considering it impacts different areas, such as health, labor, and environment. Existing research in this field is largely situated within the context of understanding FFPT's influence on travel mode selection. This research contributes to the debate on FFPT's effects on mode choice by focusing on a high-density environment. It investigates the city of São Caetano do Sul (SCS), in the Metropolitan Region of São Paulo, Brazil, which involves a small, but dense area. The FFPT in this city was implemented during the household survey "Origin-Destination Metro" data collection period, in 2023, and this is the main important database for the research. It also uses General Transit Feed Specification (GTFS) files to estimate the commuters' paths by public transport. Using a discrete choice model, the research estimates the impact of this policy in the commuter's mode choice. The study focuses on travels related to work and study and in the modes of car, public transport, motorcycle, and walk. Public transport includes an integrated network of subway, rail, different cities municipal bus and intermunicipal bus. Results indicate that the main important changes after the FFPT were a rise in public transport travels due to a decrease in motorcycle and car travels. Among different socioeconomic classes, low-income groups were the most benefited by this policy. Moreover, women and non-white people were proportionately more impacted than men and white ones. The findings suggest that FFPT can be an effective instrument not only for achieving modal shift but also for advancing urban equity in metropolitan areas.

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Managerial Capacity, Organizational Change and the Effectiveness of EU Cohesion Policy Projects: A Data Envelopment Analysis and Institutional Modeling Approach

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G20 Regional Policy, Cohesion Policy and Financial Instruments, Assessing Policy Effectiveness in the Transition Era, Conference hall 2 - North Building, agosto 26, 2026, 17:00 - 19:00

The effective absorption of European Structural and Investment Funds remains a critical determinant of regional development performance, particularly in cohesion countries where public investment heavily relies on EU co-financing. Despite the availability of substantial resources under the 2021–2027 programming period, implementation delays, partial fund absorption, and limited developmental impact persist. This paper investigates whether and to what extent the managerial capacity of implementing bodies influences the effectiveness of co-financed projects under the Partnership Agreement framework (ESPA).

Departing from purely procedural or bureaucratic explanations, the study conceptualizes fund absorption as a process of strategic and organizational change. Drawing on theories of organizational transformation (Lewin; Schein; Burnes; Balogun & Hope Hailey), absorption capacity is interpreted not merely as administrative compliance but as a multidimensional capability involving structure, leadership, human resources, institutional learning, and organizational culture.

Methodologically, uggests the employment of Data Envelopment Analysis (DEA) to assess the relative efficiency of Decision Making Units (DMUs) responsible for project implementation. Efficiency scores can be calculated using multiple inputs (administrative capacity, human capital characteristics, procedural complexity, governance structure) and outputs (absorption rates, timeliness, financial execution, and developmental impact indicators). DEA results can be complemented by regression analysis and a hierarchical logit model to capture interdependencies among institutional variables. Furthermore, an extended mathematical depiction model incorporating weighted sectoral effects can be developed to explore optimization scenarios and identify critical combinations of managerial factors that maximize performance.

The findings are expected to contribute to regional science by bridging quantitative efficiency measurement with institutional and organizational change theory. The study proposes a multi-level reform framework linking strategic prioritization, structural redesign, skill development, cultural transformation, and transition management. By identifying the structural determinants of absorption performance, the paper provides policy-relevant insights for improving the effectiveness of EU Cohesion Policy implementation at regional and national levels.

The contribution is particularly relevant for regions facing persistent absorption challenges and offers a transferable analytical framework for evaluating institutional performance in non-profit-oriented public organizations.

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European Cohesion Policy in Mitigating Development Traps: The Role of R&D Intensity

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G20 Regional Policy, Cohesion Policy and Financial Instruments, Assessing Policy Effectiveness in the Transition Era, Conference hall 2 - North Building, agosto 26, 2026, 17:00 - 19:00

This paper examines the causal effect of European Cohesion Policy (ECP) transfers on the risk of European Union (EU) regions falling into a regional development trap, with a specific focus on how research and development (R&D) intensity shapes this relationship. While earlier evaluations of the ECP have predominantly concentrated on economic growth outcomes, this study employs a multidimensional perspective that aligns with the newly developed regional development trap framework by Diemer et al. (2022). The analysis covers NUTS 2 regions across three programming periods (2000–2006, 2007–2013, and 2014–2020) and applies a fuzzy regression discontinuity design with heterogeneous local average treatment effects (HLATE). This approach exploits the 75% GDP per capita eligibility threshold for Objective 1/Convergence Objective support and allows the causal impact of the policy to vary systematically with R&D intensity.

The results do not provide robust evidence of a uniform direct effect of ECP transfers on reducing trap risk. Although a negative treatment effect appears in several specifications, it is not consistently significant, suggesting that ECP support alone is insufficient to significantly mitigate the structural conditions underlying development entrapment. By contrast, the heterogeneous component of the treatment effect is strong and robust across all model specifications. Regions with higher R&D intensity benefit markedly more from ECP support, exhibiting a significantly lower risk of development entrapment. This finding confirms that the effectiveness of cohesion spending is conditional on regional innovation capacity and supports the broader view that escaping structural stagnation requires innovation driven upgrading.

The study also highlights a persistent innovation paradox: a majority of treated regions, particularly in Central and Eastern Europe, display low levels of R&D expenditure, limiting the ECP's capacity to reduce entrapment risk. These results underscore the need for a reevaluation of the current fund allocation architecture, calling for stronger emphasis on building regional innovation systems, absorptive capacity, and human capital. By demonstrating that R&D intensity critically shapes the multidimensional effectiveness of cohesion policy, the paper provides key insights for designing more effective, place sensitive EU development strategies.

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Beyond Simple Success: Understanding Partial Achievement in EU-Funded Regional Development Projects in Slovakia (2014-2020)

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G20 Regional Policy, Cohesion Policy and Financial Instruments, Assessing Policy Effectiveness in the Transition Era, Conference hall 2 - North Building, agosto 26, 2026, 17:00 - 19:00

EU cohesion policy represents one of the largest regional development interventions globally, yet our understanding of project performance remains predominantly binary - projects either succeed or fail. This research challenges this simplification by examining the full range of project outcomes in Slovakia's 2014-2020 programming period, focusing specifically on the degree to which projects achieve their measurable indicators. Drawing on a comprehensive dataset of over 16,000 EU-funded projects across multiple operational programs, this study investigates why some projects fully achieve their targets while others experience partial or complete failure in meeting stated objectives. The research scope encompasses projects funded through various EU structural and investment funds, capturing the full spectrum of regional development interventions from infrastructure to innovation and social inclusion.

The primary aim is to identify the structural and institutional determinants of measurable indicator achievement. We examine how project complexity, implementation setting and beneficiary characteristics shape project outcomes. Particular attention is paid to the phenomenon of boundary inflation - the substantial proportion of projects achieving either complete success or complete failure - and what distinguishes these outcomes from partial achievement.

A key motivation for this research is the observation that traditional evaluation approaches, which focus on financial absorption or simple completion rates, miss crucial variation in quality. Projects may complete on budget and on time yet deliver substantially less than promised in terms of measurable results. By focusing on the achievement rate of pre-defined measurable indicators, this study provides a more nuanced assessment of cohesion policy effectiveness. The research examines the drivers of policy implementation success at the project level.

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Does Cohesion Policy foster regional growth? A comparative spatial analysis of the 2007–2013 and 2014–2020 programming periods.

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G20 Regional Policy, Cohesion Policy and Financial Instruments, Assessing Policy Effectiveness in the Transition Era, Conference hall 2 - North Building, agosto 26, 2026, 17:00 - 19:00

The study examines the effectiveness of European Union Cohesion Policy in fostering regional economic growth across two programming periods, 2007-2013 and 2014-2020. Despite substantial financial transfers under Cohesion Policy, existing empirical evidence on their growth effects remains inconclusive, particularly with respect to temporal variation and spatial interdependencies among regions. Addressing this gap, the study aims to quantify the impact of Cohesion Policy expenditure while explicitly accounting for spatial spillover mechanisms and differences between successive programming periods.

The empirical analysis is based on a sample of 226 NUTS-2 regions from 27 European Union Member States, excluding regions of the United Kingdom. The Spatial Durbin Models (SDM) are estimated separately for each programming period and jointly for the entire 2007-2020 horizon. This approach allows for the identification of time-varying policy effectiveness as well as cross-regional interaction effects.

The results indicate heterogeneity in Cohesion Policy outcomes over time. For the 2007-2013 programming period, Cohesion Policy expenditure does not exhibit a statistically significant effect on regional economic growth. In contrast, estimations for the 2014-2020 period reveal a positive and statistically significant growth impact, which remains robust when the full study period is considered. Across all model specifications, evidence supporting β-convergence among European regions is found, alongside positive spatial spillover effects in regional growth dynamics. At the same time, the analysis identifies small but negative spatial effects associated with cohesion policy expenditure in the later programming period and in the pooled model, while such effects are statistically insignificant in the earlier period.

The findings suggest that the growth effectiveness of EU cohesion policy has strengthened over time, potentially reflecting institutional learning, improved allocation mechanisms, and enhanced policy implementation capacity. Overall, the results contribute to the ongoing debate on the economic effectiveness of Cohesion Policy by highlighting the importance of temporal comparison and spatial interactions in evaluating regional development policies.

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Heterogeneous Regional Convergence in the European Union: Club Dynamics, Structural Breaks, and Spatial Spillovers

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G20 Regional Policy, Cohesion Policy and Financial Instruments, Assessing Policy Effectiveness in the Transition Era, Conference hall 2 - North Building, agosto 26, 2026, 17:00 - 19:00

This study examines income convergence among EU NUTS-2 regions from 2000 to 2023 using a combination of PS club convergence methodology, β-convergence and spatial econometric models. The results reveal that regional convergence in Europe is heterogeneous and nonlinear: four stable convergence clubs emerge, while overall convergence is rejected. Convergence was faster before 2012 and weakened afterward. A single income threshold and two structural breaks (2005 and 2012) mark shifts in growth dynamics. Spatial models reveal that neighbouring regions affect each other's growth, indicating that regional development in Europe depends on both local conditions and interactions across regions.

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Decentralization of Public Services: A Model for Poland

Dr. Wojciech Jarczewski

G21-1 Multilevel Governance and Decentralisation, Governing Transformations and Regional Responses,
Conference hall 2 - North Building, agosto 28, 2026, 09:00 - 10:30

The aim of this presentation is to present a model for the decentralization of public services using Poland as an example. The research was carried out using the following method:
a) analysis of the distribution of institutions performing national and regional public decision-making and control functions, as well as local administrative bodies;
b) analysis of the potential for locating and strengthening decision-making and control functions in particular centres;
c) review of international experience.

According to the proposed concept, deglomeration in Poland should serve three main purposes:

- to avoid excessive concentration of public decision-making and control functions in the capital city (Warsaw);
- to strengthen the polycentric structure of the settlement system by supporting urban centres that are important for the development of the country and its individual regions;
- to maintain the efficiency, competence, and managerial capacity of public administration, and thus avoid the risk of excessive dispersal of public institutions.

Results obtained
As a result of the analysis, data were collected and examined on the location of 159 central administration institutions (including 135 in Warsaw), 648 branches and local offices of national institutions (including 36 in Warsaw), and 346 local administrative institutions (including 23 in Warsaw). On the basis of an indicator-based analysis, the potential for locating and strengthening decision-making and control functions in particular metropolitan, regional, and subregional centres was then assessed. A literature review was also carried out on deglomeration experiences in the United States, Germany, France, the United Kingdom, and the Netherlands.

Model development and discussion of results
On the basis of the results obtained, a model of deglomeration was developed according to the following assumptions:

- limiting the transfer of institutions already located in Warsaw to new locations in other cities;
- new national institutions with decision-making and control functions should not be located in the capital city;
- strengthening decision-making and control functions in the public sector through the creation of new institutions, regional branches, and local offices, based on human capital and the existing institutional infrastructure.

In the final part of the presentation, an example will be given of how this model was applied in the process of identifying the optimal location for the Polish branch of the European Space Agency in 2026.

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Top-Down Regionalizations in Identifying Disaster Areas: Emerging Challenges and Regional Responses

Dr. Giovanni Baiocchetti

G21-1 Multilevel Governance and Decentralisation, Governing Transformations and Regional Responses, Conference hall 2 - North Building, agosto 28, 2026, 09:00 - 10:30

Territorial policies in many European countries have often undergone a transition toward decentralised models, with an increasingly prominent role played by local authorities in their planning. Nevertheless, there are still policy areas where decision-making is established at a centralized level, with consequences for the local contexts they affect. This is the case of the definition of emergency areas in Italy, specifically related to natural disasters. When an emergency occurs after a natural event (such as an earthquake or a volcanic eruption), it is the State who defines which areas are to be considered affected. In delineating these areas, it usually adopts an administratively based regionalization that mirrors municipal, provincial, or regional administrative boundaries, even when these do not exactly match the actually affected area. Such a model of definition may generate a range of negative impacts on the territories involved, including: inequalities in the geographical distribution of financial aid; the exclusion of certain local authorities from emergency governance processes; landscape impacts that are detached from the local context; and inaccurate media communication regarding the areas that have been effectively affected, with negative consequences on tourism. This contribution is based on a review of Italian case studies, supported by images and cartographic materials, for which on-field semi-structured interviews were conducted with local institutional actors. The aim is to provide insights into how a top-down administrative “trap” in the definition and governance of emergencies in territories affected by natural events might be overcome.

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Local Stakeholder Networks Models: Comparing Institutional and Civic Drivers of Collaboration in Small Cities

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G21-1 Multilevel Governance and Decentralisation, Governing Transformations and Regional Responses,
Conference hall 2 - North Building, agosto 28, 2026, 09:00 - 10:30

The successful development of cities is usually associated with the collaboration between different stakeholders. However, collaboration networks in urban contexts are complex, and their real impact on local development is dependent on network structure, leadership configurations, types of relationships or purpose of collaboration. The current study examines the role of stakeholder networks on local development in urban contexts and the characteristics of these networks by mapping the stakeholders' networks in two small cities from Romania. The two case studies, Beclean and Darabani, are similar through their demographic size, shaped by a shared post-socialist trajectory, but are significantly different in terms of accessibility, evolution and development levels. The research is based on semi-structured interviews with stakeholders from different fields of activity from each of the two cities, followed by Social Network Analysis and statistical analysis. The results highlight contrasting governance configurations. While both resulting networks are rather centralized, their leadership structures, purposes of collaboration and effects on local development differ significantly. In Beclean, the collaboration network was mainly centred around the local administration, which proved to have an essential role in attracting funding opportunities and developing essential local projects, while also bridging public and private actors along this process. The second case, Darabani, stands out through the presence of a local NGO which acted as a central stakeholder within the network, mobilizing community actors around the creation and development of an emblematic cultural event that generated notable social impacts and, to some extent, economic benefits. This study contributes to the understanding of emerging forms of urban governance in small cities by identifying the multi-layered characteristics of collaboration structures and the roles played by different categories of actors. The results of the study provide relevant insights for designing territorial policies that can contribute to promoting effective models of local governance in small cities.

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Changing Boundaries: Harmonizing Territorial Data for Comparative Subnational Research

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G21-2 Multilevel Governance and Decentralisation, Governing Transformations and Regional Responses, Conference hall 2 - North Building, agosto 28, 2026, 11:00 - 13:00

Despite a surge in the use of subnational-level data in research, changes in administrative boundaries remain an ill-understood phenomenon. Existing research commonly overlooks temporal instability in the number and territorial configuration of local authorities, which may lead to biased inferences. Over recent decades, many local authorities in Europe have undergone substantial boundary changes yet they remain chronically understudied.
Building on the systematic analysis of official geospatial data, combined with extensive verification of municipal boundary change using legislative documents, this paper provides a comprehensive account of local authority boundary changes across 35 European countries between 2014 and 2024. We first develop a comprehensive typology of local authority boundary changes, distinguishing between boundary changes, such as mergers, splits, separations and other, and corresponding municipality identifiers changes, includ-
ing name and official registry code changes. Second, we make an important empirical contribution by bringing into scientific circulation the LoQoG dataset, which records all
local authority boundary changes in Europe during this period. This dataset enables researchers and practitioners to consistently track relevant local units over time. Finally,
we demonstrate the utility of the LoQoG data for conducting more rigorous longitudinal analyses and obtaining more accurate estimates by explicitly accounting for administrative changes.

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Revisiting the Administrative-Territorial Structure of Municipalities in Bulgaria through the Concept of Centrality: Insights from the German-Speaking Tradition

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G21-2 Multilevel Governance and Decentralisation, Governing Transformations and Regional Responses, Conference hall 2 - North Building, agosto 28, 2026, 11:00 - 13:00

Bulgaria is characterized by a paradoxical combination of a highly centralized state structure and constitutionally guaranteed local self-government. Municipalities represent the primary level of subnational governance; however, the existing administrative-territorial configuration of 265 municipalities reveals substantial spatial fragmentation and pronounced asymmetries in administrative, economic, and demographic capacity. In the context of ongoing population decline, strong dependence on state transfers, and the increasing role of the public sector as a major employer in many peripheral municipalities, the question of administrative-territorial reform continues to surface periodically in policy debates. These discussions, however, tend to remain predominantly normative and demographic in orientation, rarely addressing the correspondence between institutional boundaries and the actual spatial patterns of service provision and territorial influence.

This paper starts from the premise that the issue of administrative fragmentation should be examined through the lens of centrality research rather than solely through indicators such as population size or administrative capacity. The main research question concerns the extent to which the current municipal structure corresponds to real spatial patterns of centrality. In this context, the paper explores the potential for adapting approaches developed within the German-speaking research tradition on centrality and central place theory, including indicators related to accessibility, service provision, and daily commuting.

The aim is to outline a methodological framework for examining municipalities in terms of their centrality, enabling a better understanding of the relationship between institutional territorial organization and underlying spatial structures. The expected contribution lies in reframing the debate on potential municipal administrative-territorial reform from a predominantly normative-administrative perspective towards a spatial-analytical one, while highlighting the relevance of German-speaking approaches to centrality for the Bulgarian context.

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Administrative Rescaling and Identity Integration: The Impact of County-Level Administrative Affiliation Changes on Place Identity

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G21-2 Multilevel Governance and Decentralisation, Governing Transformations and Regional Responses, Conference hall 2 - North Building, agosto 28, 2026, 11:00 - 13:00

Administrative division adjustment is a common instrument of territorial governance restructuring. Across Europe, municipal amalgamations and regional reforms have repeatedly altered administrative boundaries, raising questions about their long-term social consequences. Since the early 1980s, China has implemented large-scale county-level administrative affiliation changes, providing a valuable setting to examine how institutional boundary reform influences residents' place identity.

This study analyzes the impact of county-level administrative affiliation changes in China on residents' place identity with newly assigned prefecture-level administrative regions. Drawing on a nationwide survey of counties that experienced affiliation change after 1982, we examine whether the timing of administrative division adjustment shapes identity outcomes. Using multivariate regression, mediation analysis, and clustering methods, we assess both overall effects and heterogeneous identity patterns.

Preliminary findings indicate that earlier administrative division adjustments are associated with stronger place identity toward the prefecture-level administrative region. This relationship is partly mediated by the intensity of residents' socio-economic contact with the prefectural center. Residents who personally experienced the affiliation change also display distinct identity responses. Identity outcomes further cluster into differentiated patterns shaped by household registration status, income, and center–periphery interaction.

While robustness checks are ongoing, the evidence suggests that administrative division adjustment generates gradual and uneven identity integration. The findings contribute to broader debates on administrative boundary reform by providing empirical evidence on how institutional affiliation changes shape place identity over time.

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Governing the Twin Transition: Institutional Quality and Regional Divergence in Europe

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G21-2 Multilevel Governance and Decentralisation, Governing Transformations and Regional Responses, Conference hall 2 - North Building, agosto 28, 2026, 11:00 - 13:00

Europe's green and digital transitions advance unevenly across regions, shaped not only by technological capacity and infrastructure but also by the quality, effectiveness, and responsiveness of institutional environments. This paper examines how institutional contexts condition twin transition pathways across European NUTS 2 regions exploring the relationship between governance quality, transition profile, and socio-economic context.
Drawing on composite measures of green and digital transition capacity, socio-economic dynamics, and institutional quality indicators, we find that institutions matter, but in different ways across transition domains. Preliminary evidence suggests the digital transition may display stronger associations with institutional environments, while the green transition appears to involve more complex relationships where governance interacts with inherited production structures, sectoral composition, and infrastructure legacies across regions.
These findings challenge one-size-fits-all policy frameworks, suggesting that transition policies need to account for institutional variation across regions, address governance quality alongside infrastructure investments, and recognize that institutions may enable transformation in different ways depending on context.

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Creative Infrastructure Financing for Regional Development: Lessons from Indonesia's Sub-national Lending Model

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G21-3 Multilevel Governance and Decentralisation, Governing Transformations and Regional Responses, Conference hall 2 - North Building, agosto 28, 2026, 15:00 - 16:30

Infrastructure plays a vital role in improving productivity and accessibility, lowering logistics costs, facilitating trade, and attracting investment. Nevertheless, local governments in Indonesia face substantial fiscal and regulatory constraints that impede infrastructure development. Conventional financing sources—such as central government transfers and regional budgets (APBD)—often fail to keep pace with the growing demand for infrastructure investment. Recent policy reducing intergovernmental fiscal transfers has further limited the capacity of local governments to independently fund infrastructure projects. In response, PT Sarana Multi Infrastruktur (PT SMI), a state-owned enterprise under the Ministry of Finance, offers a range of financial instruments—including subnational loans, blended finance, and public-private partnerships (PPP)—as alternative solutions to help bridge the infrastructure financing gap. Among these instruments are low-interest subnational loans for infrastructure development under the National Economic Recovery (PEN) program, which were disbursed during the COVID-19 pandemic. This paper seeks to assess the impact of PEN loans on regional capital expenditure using a staggered difference-in-differences (DID) approach, followed by a fixed effects model linking capital spending to regional economic growth. The DID analysis employs a panel dataset constructed from PT SMI's internal data, regional financial reports, and datasets obtained from the Central Bureau of Statistics. The treatment group comprises regions that received PEN loans, while the control group includes regions that did not receive such loans during the study period. In addition, this study investigates implementation challenges and proposes policy recommendations for innovative infrastructure financing. Specifically, it addresses the following questions: (1) To what extent do creative financing mechanisms influence capital spending? and (2) How is local capital spending associated with changes in regional economic growth and revenue? As Indonesia restructures its regional financing framework through the implementation of a new statute governing central-regional fiscal relations (UU HKPD & PP HKFN), this research provides timely, policy-relevant evidence on how innovative public financing schemes can support economic growth and the country's structural transformation in the years ahead.

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Anchor firms in regional industrial transition processes in non-metropolitan areas

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G21-3 Multilevel Governance and Decentralisation, Governing Transformations and Regional Responses, Conference hall 2 - North Building, agosto 28, 2026, 15:00 - 16:30

European industrial regions experience stark changes in their development on their way to achieve twin transition goals. In non-metropolitan regions with anchor firms, governing transition policy is inherently intertwined with the outlook of these individual companies. As such the paper revisits the role of anchor firms and associated governance structures in these regional industrial transition processes. More precisely, the paper's objective is to advance an understanding of how the role of anchor firms shifts in light of the new challenges of contemporary industrial transitions.
Building on a literature review of anchor firms complemented by theoretical insights from transitions studies and the field of new industrial policies, the paper develops an analytical framework operationalising the mechanisms and functioning of anchor companies to allow for an empirical analysis. Conceptually, the existing literature on anchor firms focusses mainly on the shifts in the composition of local economic outcomes, anchor's embeddedness in innovation and production networks, as well as industrial path creation processes. To revisit how these mechanisms change and what mechanisms gain importance during industrial transition processes, we then apply this analytical framework and its dimensions in two explorative empirical case studies. Drawing on the case study work conducted as part of the ESPON NoStaGeo project, focusing on regions in the process of industrial transition, the paper presents the operationalisation of the theoretical arguments in an analytical framework by comparing them with arguments stemming from the Norrbotten region, Sweden, and Carinthia, Austria.
We argue that, by including insights from transition studies and new industrial policies, further aspects of the strategic role anchor firms play in decision-making networks ultimately shaping regional developments can be explored. In contrast to the discourse on incumbent firms, prevalent in the field of transition studies, this offers a more nuanced understanding of those companies that function as the backbone of their respective regional economies. Regions with anchor companies become arenas where transformation efforts, industrial policy, and territorial development unfold.

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The Contribution of Spatialities and Territory to Political Economy: Making Explicit the Spatio Temporal Assumptions of Economic Theories

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G21-3 Multilevel Governance and Decentralisation, Governing Transformations and Regional Responses, Conference hall 2 - North Building, agosto 28, 2026, 15:00 - 16:30

This article examines a proposition now widely discussed in the social sciences: space and time are not the exclusive domains of geography and history, but fundamental dimensions of any socio-economic analysis. Every social system occupies a space, forms a specific configuration, and transforms over time. Spatialities and temporalities are therefore not simply descriptive frameworks; they constitute the very phenomena and deeply shape their dynamics across political economy, sociology, and political science.
Investment, for instance, involves a spatial sequence: a localized concentration of resources followed by returning flows. Yet mainstream economics typically abstracts investment into a mere numerical magnitude. Keynesian theory also rests on an implicit national spatiality organized hierarchically, without explicitly recognizing this spatial form.
These examples highlight a methodological issue: economic theories rarely make explicit the spatial and temporal forms embedded in their conceptual frameworks. They often blur distinctions between concrete space and metaphorical space.
Indeed, in the field of thought, spatial forms play a subtle but essential role. The social sciences rely on spatial metaphors — networks, flows, scales, hierarchical levels, bases, anchors — to represent and explain social and economic processes.
To clarify these issues, the article mobilizes the combinatorial and hierarchical language of Q analysis (Atkin 1974; Johnson 1991; Holtier 1992), derived from set theory and graph theory. This formalism offers a systematic description of the spatial forms of economic phenomena. The goal is twofold: to describe the spatial and temporal configurations of concrete economic processes, and to reveal the spatial forms underlying economic theories themselves.
The first part revisits how equilibrium-based approaches progressively neutralized space and time (Corpataux & Crevoisier 2007), shaping the discipline's relation to spatiality.
The second part examines the renewed interest in territorial dynamics in the 1980s–1990s with the rise of innovation issues. New models — innovative milieus, industrial districts, technopoles — showed that innovation is territorially embedded, rooted in region-specific resources within globalization (Moulaert & Sekia 2003). Territorial differentiation thus appears as a key strategy for survival, allowing regions to rebuild competitiveness through innovation when price competition fails.
Since the 1990s, the generalization of mobility has required conceptual tools articulating both mobility and anchoring of knowledge, labor, capital, and, later, consumers. Finally, the article discusses development processes shaped by movements "from above" and "from below," unfolding through scale dynamics and internationalization, underscoring the need to jointly consider spatial forms, temporalities, and structural transformations.

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From Crown Jewel to Problem Child? The Evolution of Inner Cities in German Housing Markets

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G22-1 Housing and Urban Transformation in the Transition Era, Affordability, Energy Poverty, Renewal, Gentrification and Displacement, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 09:00 - 10:30

Urban Economists view cities as monocentric entities centered around a Central Business District (CBD). This paper investigates the slope and the evolution of the price gradient between the CBD and the rest of the settlement area for 1,108 cities in Germany. In our empirical work, we employ a novel definition of CBD that relies on the density and distribution of commercial activity within a city. We find that urban gradients are highly heterogeneous within Germany, with around 27 % of German cities even featuring a negative gradient. We find that around 70 % of the CBD-premium can be attributed to apartment quality, neighborhood characteristics and access to transport infrastructure. CBD-premiums decreased considerably between 2013 and 2016, but have registered an uptick since the Covid pandemic.

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The Price of Violence: The Impact of Social Unrest on Real Estate in Santiago, Chile

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G22-1 Housing and Urban Transformation in the Transition Era, Affordability, Energy Poverty, Renewal, Gentrification and Displacement, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 09:00 - 10:30

I estimate the causal effect of urban violence hotspots on real estate outcomes using the October 2019 social unrest in Santiago, Chile. Combining georeferenced incident hotspots from the national prosecutor's office with the universe of property transactions, I implement difference-in-differences and event-study designs with block, month, and municipality-by-year fixed effects. Residential prices in blocks with moderate to high violence exposure experience price declines of about 5–6% relative to controls, while low-exposure areas show no detectable effect. These discounts persist and grow over five years and are smallest during the metro-closure phase, when an accessibility mechanism would predict the largest impacts; furthermore, they increase after service resumed and COVID restrictions ended. To separate violence from accessibility disruptions, I classify blocks into mutually exclusive channels (Violence Only, Metro Only, Both, Control) and estimate a triple-difference decomposition. Both approaches indicate that residential price effects are driven by violence exposure rather than proximity to closed stations. Residential transaction volumes do not differentially decline, suggesting adjustment occurs primarily through prices. In contrast, commercial price effects are not significant, but violence exposure substantially reduces the probability of any commercial transaction, consistent with market thinning and potential selection among observed sales. Effects are concentrated in medium- and high-socioeconomic status neighborhoods and in central municipalities, consistent with greater sensitivity to perceived safety risks among higher-income buyers.

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Defining Housing Market Area: A case study of Greater Manchester

Ms Christina Kibasi

G22-1 Housing and Urban Transformation in the Transition Era, Affordability, Energy Poverty, Renewal, Gentrification and Displacement, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 09:00 - 10:30

What is a housing market area? Is it the area where the demand and supply of houses are at equilibrium? Is it a self contained territory where individuals live and work in the same place, or is it an area whose prices are inelastic?

A great deal of models have been created by real estate professionals, urban planners, academicians, and government agencies on the dimension of using government census data to drive decisions throughout the period. Though models with a 10-year time lag and robustness have been tested for effectiveness, efficiency, and replicability, coping with the pace of science and technology advancements.

Hence, the core purpose of the research is to define and delineate housing market areas using scalable and replicable models of spatial analysis by exploring spatial statistics, examining spatial dependence, and linking with the spatial heterogeneity assumptions, a crucial factor in distributing spatial weights across the Greater Manchester county in north-western England. The global spatial autocorrelation was computed to determine where the area has spatial autocorrelation or values are just random (no spatial dependence). The results of the Global Moran's I depict that there is spatial dependence in the central part of Manchester and positive spatial autocorrelation such that high prices and rents are concentrated in some parts of Trafford with a house price-to-rent ratio above 20, while there is negative spatial autocorrelation in parts of Wigan, Tameside, and Bury, whose house prices are varied and dispersed and whose house price-to-rent ratio is between 17 and 20.

Moreover, LISA (Local Indicators of Spatial Autocorrelation) for more localized analysis depicted the H-H values in the central part of Manchester, Trafford, Bolton, Stockport, and Salford, while L-L values were depicted in Oldham, Bury, Tameside, and Wigan. The places that had spatial outliers (L-H, H-L) were in the Rochdale boroughs whose price demand is elastic.

Therefore, using spatial autocorrelation is a newer advancement than former travel-to-work areas and migration containment rates in global development due to the rise of people working from home such that commuting patterns do not depend on daily transit between home and church. Utilizing the big data available in online property websites at the lowest level of postcode unit makes it easier to create functional boundaries that inform policy efficiently.

Detailed research is needed by adding the time factor to compute spatio-temporal autocorrelation, which vividly influences the real estate sector for effective and timely decision-making.

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Beyond Displacement: Political Gentefiers—Between Cultural Empowerment and the Reproduction of Urban Commercialization

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G22-2 Housing and Urban Transformation in the Transition Era, Affordability, Energy Poverty, Renewal, Gentrification and Displacement, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 11:00 - 13:00

While traditional literature on commercial gentrification typically focuses on the influx of external corporations and boutique chains that displace local minority-owned firms, this study introduces a more complex concept known as “Gentefication.” Derived from the Spanish word la gente (the people), this term describes a process where entrepreneurs from within the minority community itself lead the redevelopment of historically marginalized neighborhoods.

This paper examines the political and cultural implications of Latino-led commercial gentrification in Barrio Logan, a San Diego neighborhood undergoing rapid transformation. While gentrification is commonly associated with the displacement and political erosion of ethnic and racial communities, this study advances a nuanced perspective. It analyzes how middle-class Latinx entrepreneurs actively engage in urban politics and planning to assert community influence.

Drawing on qualitative research, the paper introduces "political gentefiers"—actors who leverage their economic positions to promote collective empowerment. Their involvement was instrumental in reshaping Barrio Logan’s community plan, resulting in stronger recognition of cultural identity and the promotion of affordable housing. These findings challenge dominant narratives by showing that such processes can function as grassroots activism, increasing the political voice of ethnic and racial communities in urban governance.

However, the study also highlights the contested nature of this shift. While providing political inclusion, these activities generate intra-ethnic class tensions and do not eliminate physical displacement pressures for lower-income residents. Ultimately, the paper reframes these neighborhoods not only as sites of loss, but as arenas of political struggle and collective agency, urging policymakers to develop inclusive mechanisms that address inequalities within the community itself.

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Shortage of reserve funds for major repairs among multi-owned condominiums: Evidence from individual data of a nationwide survey of condominium associations in Japan

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G22-2 Housing and Urban Transformation in the Transition Era, Affordability, Energy Poverty, Renewal, Gentrification and Displacement, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 11:00 - 13:00

Condominiums are a form of multi-owned housing governed by a mix of communal and individual property rights. While condominiums play a significant role in urban housing worldwide, their multi-owned nature poses a challenge to their long-term sustainability. Specifically, although repair reserve funds collected from each owner are intended for major condominium renovations, reaching a consensus on the level of reserve collection is difficult because owners have different intentions regarding whether to continue living in or sell the property.

This problem is becoming more prominent in Japan, where the number of condominiums over 40 years old is rapidly increasing. This study uses individual data from a nationwide survey targeting condominium management associations—the Comprehensive Condominium Survey in 2018 (Ministry of Land, Infrastructure, Transport and Tourism)—to investigate the characteristics of condominiums in which repair reserve funds cannot be appropriately collected. While the collective action problems of condominium management have been documented in general, this paper focuses on the long-term outcome of failure to conduct major renovations due to a shortage of reserve funds several decades after construction.

First, we document that, after around 20 years, more than 25% of condominiums face a shortage in accumulated repair reserve funds to conduct major repairs. Second, regression analyses reveal that variations in residents' intentions to remain living in the condominiums, as reflected by the rentalization of previously owner-occupied units, high vacancy rates, and the emergence of unknown ownership, often result in insufficient repair reserve funds. Third, variations in residents' intentions often lead to delinquent reserve payments and situations in which reserve amounts cannot be increased using the step-increase method. Even under the equal-installment method, reserve amounts tend to fall short of the required amount unless they are initially set at the level required by the maintenance plan.

The results show that current practices require an increase in repair reserve funds as major repairs approach, but some owners oppose this. Thus, the results suggest the need for preventive measures to avoid future management failures, specifically a dynamic plan at the construction stage for collecting the required amount of repair reserve funds over time.

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The Urban Structure of the São Paulo Metropolitan Region: A Spatial Quantitative Approach

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G22-2 Housing and Urban Transformation in the Transition Era, Affordability, Energy Poverty, Renewal, Gentrification and Displacement, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 11:00 - 13:00

In recent years, the literature on quantitative urban models has experienced significant growth, with contributions such as Ahlfeldt et al. (2015), Heblich et al. (2020), Tsivanidis (2023), and Redding and Sturm (2024), among others. This literature develops general equilibrium models whose equations closely match administrative data from national and local governments and incorporates real geographies rather than stylized ones, such as those used in earlier works (e.g., Lucas and Rossi-Hansberg, 2002).

Much of this literature focuses on cities in the developed world, with relatively fewer studies examining cities of developing countries. This gap represents an avenue for research, given the relevance of this modeling approach for analyzing public policies and urban challenges that are characteristic of developing economies. One such challenge is informal housing.

Alongside this strand of research, the literature on informal housing has also advanced significantly over the past two decades – Cavalcanti, Da Mata and Santos (2019), and Ferreira, Monge-Naranjo and Pereira (2025) are examples centered on Brazil. This literature analyses the causes, persistence, and consequences of informal housing and slums in urban areas, employing a variety of modelling approaches, ranging from causal inference to general equilibrium and simulation. Some studies investigate the spatial location of slums, typically assuming stylized urban structures.

This study develops a quantitative urban model centered on the São Paulo Metropolitan Region, the largest urban area in Brazil and one of the most populous metropolises in the world. The model explicitly incorporates informal housing and its spatial distribution within the metropolis, a key feature of the Brazilian urban environment – nationwide, 7.99% of the urban households were informal as of 2010 (Cavalcanti, Da Mata, Santos; 2019). Since income inequality is one of the main drivers of informal housing and slum formation, it is also explicitly modelled. The framework is designed to allow for counterfactual analysis of public policies and local interventions. Census and administrative data are readily available for the 39 municipalities that compose the metropolis.

This study contributes to the literature on quantitative urban models by focusing on an urban area in Brazil, a country for which no published studies currently exist in this field. A further contribution is to explicitly model informal housing within a real geographic setting in the context of a developing country.

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Does the energy transition reinforce urban inequality? Evidence from geolocated Energy Performance Certificates and housing transactions from Warsaw metropolitan area

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G22-2 Housing and Urban Transformation in the Transition Era, Affordability, Energy Poverty, Renewal, Gentrification and Displacement, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 28, 2026, 11:00 - 13:00

The decarbonisation of the building sector constitutes a central pillar of the European energy transition. Energy Performance Certificates (EPCs), introduced to enhance market transparency and promote energy-efficient investments, are increasingly embedded in housing transactions. While their environmental rationale is well established, less is known about their spatial economic consequences. This paper investigates whether the energy transition contributes to urban housing market stratification. The analysis draws on a unique geolocated dataset of more than 300,000 Energy Performance Certificates issued between 2015 and 2025 in the Warsaw Metropolitan Area, merged with transaction-level data from the Polish Real Estate Price Register. The EPC database provides detailed indicators of estimated primary and final energy demand, carbon emissions and renewable energy shares. Transaction records contain notarized sale prices, property characteristics and precise spatial coordinates, allowing for micro-level spatial analysis.

Three research questions are addressed. First, is energy efficiency capitalised into housing prices? Second, are high-performance buildings spatially concentrated in already high-value neighbourhoods? Third, does the price premium associated with energy efficiency vary across the metropolitan structure? To answer these questions, spatial hedonic modelling is combined with clustering techniques and grid-level demographic data to examine the socio-spatial patterns of energy modernisation.

Preliminary expectations suggest that energy efficiency is positively associated with transaction prices, but that improvements are unevenly distributed across the metropolitan area. High-efficiency buildings are likely to cluster in central and dynamically developing districts, potentially reinforcing existing price gradients. The findings may indicate that, although environmentally beneficial, the energy transition can interact with housing markets in ways that intensify affordability pressures and socio-spatial inequality.

The paper contributes to the literature on housing and urban transformation by demonstrating how environmental policy instruments may reshape metropolitan spatial structures.

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The Differential Impact of the National Program for Increasing Skilled Workforce for the High-Tech Industry: A Case Study of Peripheral Regions in the Israeli Labor Market.

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G23-1 Labour Markets in the Transition Era: Future of Work, AI, Unemployment, Gig Economy and Digital Nomads, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

Many studies assessing national educational reforms focus on the likelihood of acquiring advanced education and the associated labor market returns. This study investigates the impact of the 'National Program for Increasing Skilled High-Tech Personnel,' a policy aimed at promoting higher education in STEM fields (science, technology, engineering, and mathematics) across all segments of the Israeli population.

The findings reveal that the reform contributed considerably more to making STEM higher education accessible to residents of the periphery than to the rest of the population. However, this impact is not fully reflected in the earning capacity of these residents. This gap may stem from variations in the quality of education provided by different Israeli academic colleges, as well as the specific fields of study chosen by students.

Utilizing data from the Israel Central Bureau of Statistics (ICBS) and applying advanced econometric models, this study highlights the challenges of STEM education reforms. It underscores that while access has improved, disparities in institutional quality remain a significant barrier to achieving labor market equality.

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The "Governance of Meaning" in the Age of AI: Vocational Mismatch, Embodied Knowledge, and the Strategic Resilience of Craftsmanship in the Italian Regional Ecosystem (2026-2030)

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G23-1 Labour Markets in the Transition Era: Future of Work, AI, Unemployment, Gig Economy and Digital Nomads, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

This paper analyses the strategic role of artistic and technical craftsmanship within the current technological revolution driven by Generative Artificial Intelligence. While the dominant narrative often relegates traditional manufacturing to a nostalgic dimension, data from the 2026-2030 Excelsior Information System reveals an occupational paradox: as automation erodes codifiable technical tasks, the demand for "embodied knowledge" and transversal human skills is reaching historical peaks.
The analysis begins with a dramatic statistical reality: the Italian labor market suffers from a profound "hunger for mastery". For every 100 profiles graduating from vocational training paths, companies demand 194, creating a mismatch that exceeds 50% in sectors of excellence such as the Fashion System and Mechanical Engineering. In this scenario, the artisan emerges as the "Governor of Meaning": a figure capable of managing exceptions, aesthetic intuition, and ethical judgment—areas where algorithms, based on probabilistic patterns, remain structurally deficient.
The paper delves into the concept of skill hybridization. Drawing from the Excelsior reports on "Digital Competencies" and "Cultural and Creative Industries," it demonstrates that the contemporary artisan is not an analog subject but a "4.0 professional." Although 80% of entries in creative industries require digital skills, these are considered insufficient unless paired with soft skills such as problem-solving and flexibility, which represent the modern evolution of tacit knowledge.
A crucial point of the research concerns "Replacement Demand": it is estimated that 80% of the total labor demand over the next five years will be driven by the need to replace workers leaving due to demographic reasons. This turnover represents a unique opportunity for younger generations, provided that what we define as the "Artisan Compass" is activated. Career guidance must stop being an "anchor" tied to social prejudices and become a dynamic tool capable of guiding talent toward high-value-added educational paths.
In conclusion, this work proposes a re-evaluation of vocational training not as a "second-class choice," but as a pillar of national economic resilience. By integrating green and digital transitions with the "intelligence of the hands," craftsmanship stands as the ultimate bulwark against technological alienation, ensuring that the "sense of doing" remains at the heart of Europe's productive future.

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Mapping Skill Requirements in ICT Occupations using an IRT Modelling Approach

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G23-1 Labour Markets in the Transition Era: Future of Work, AI, Unemployment, Gig Economy and Digital Nomads, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

Online Job Advertisements (OJAs) represent a valuable resource for analysing labour market demand in contemporary economies. In this paper, we use proprietary Lightcast data to study ICT labour market demand in Italy. The dataset provides one of the most comprehensive views of online labour demand, covering millions of job postings collected daily from a wide range of sources, including specialised job portals and company websites. We propose a new approach to classify and map skill requirements for ICT occupations across selected Italian regions and provinces. The approach is based on a Multilevel Item Response Theory (IRT) model and delivers two main outputs. First, it constructs an index of “skill intensity” for each job advertisement, capturing the overall level of skill requirements and enabling territorial comparisons across regions and provinces. Second, it estimates parameters that identify the most critical skills for the ICT sector as a whole. These results can inform targeted economic and social policies and support early-career workers entering the ICT labour market. In addition, the skill-intensity index can be aggregated and incorporated into macroeconomic models to examine its relationship with territorial socio-economic indicators.

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Worker Sorting, Industry Sorting, and Agglomeration Effects

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G23-2 Labour Markets in the Transition Era: Future of Work, AI, Unemployment, Gig Economy and Digital Nomads, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

Significant spatial wage disparities can be observed in virtually all countries with free market economies. In particular, larger cities offer higher wages compared to more rural areas. There are at least two major explanations for this observation: (1) people with characteristics that are related to higher wages prefer to live in larger cities and (2) the same worker becomes more productive if she or he is located in a larger rather than a smaller city. In this paper, we shed light on the relative importance of those explanations and demonstrate that, after controlling for worker and firm sorting, there is still a significant agglomeration effect, which we call the true urban wage premium, that makes wages increase with the size of population. Following Card, Rothstein, and Yi (2024, 2025), we find a so-called hierarchy effect, i.e. the mobility of workers between cities of different sizes is usually not between representative firms. Furthermore, we demonstrate how the wage decomposition by Abowd, Kramarz, and Margolis (1999) can be adapted to identify the true urban wage premium. We split the AKM plant effects into an industry-specific component and a region-specific component. Those premia reveal the various sources of wage disparities and are informative to (local) policymakers. We come to the conclusion that on the one hand the decomposition is nearly fully absorbed by the regional component. On the other hand, bigger cities do not offer a more favorable industry mix.

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Spatial spillovers in local labour markets: tourism employment and wage bills across Chilean municipalities

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G23-2 Labour Markets in the Transition Era: Future of Work, AI, Unemployment, Gig Economy and Digital Nomads, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

Spatial location shapes how labour market opportunities and inequalities evolve, because economic outcomes in one place may be influenced by what happens next door. Tourism provides a particularly informative lens for studying these mechanisms: it is employment-intensive, relies on territorially embedded assets, and can generate both positive spillovers across neighbouring municipalities and competitive displacement.

Chile is a revealing setting. Between 2000 and 2020, the Metropolitan Region of Santiago consistently concentrated more than 40% of national GDP, while regional and municipal per capita income gaps remained persistent. At the same time, the country has undergone a gradual structural transformation toward service-based employment, which today accounts for roughly 70% of national employment. Within this transformation, tourism is far from marginal: between 2012 and 2022, employment linked to tourism-related activities increased by approximately 57%, while total national employment expanded by about 10% during the same period. Yet national aggregates conceal where these gains materialise, and whether tourism growth has been spatially diffuse or concentrated in already advantaged territories.

A key step is to look beyond job counts. Municipalities with similar tourism employment can generate very different tourism-related wage bills due to differences in occupational composition, seasonality, productivity, firm structure and specialization. Jointly analysing tourism employment and wage bills therefore allows an assessment of whether spatial concentration in jobs coincides with concentration in labour income, or whether job creation and income capture diverge across space.

Preliminary descriptive evidence based on municipal location quotients for 2007, 2012, 2017 and 2022 shows pronounced and persistent specialization: several municipalities display values above 2 and, in some cases, above 4, while many remain underrepresented.

The formal analysis focuses on two benchmark years, 2013 and 2023, covering all 345 municipalities. Spatial autocorrelation is assessed using global Moran’s I and LISA, and spatial econometric models (SAR, SEM and SDM) are estimated using explanatory variables capturing tourism capacity, accessibility, labour-market scale and density, human capital, and natural and cultural amenities, allowing the identification of direct and indirect spatial spillover effects.

1011

Patterns of health-related benefit claims in the UK - Ill health or ailing labour markets?

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G23-2 Labour Markets in the Transition Era: Future of Work, AI, Unemployment, Gig Economy and Digital Nomads, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

There has been a large increase in the number of people awarded disability benefits, Personal Independence Payment (PIP) in England and Wales between 2021 and 2024 (IFS, 2025). PIP is aimed to help compensate some of the living costs associated with disability; it is not means tested and does not depend on one's working status.
The increase of 48% between 2021 and 2024 has been far from uniform across space, ranging from 18% to 90% for local authorities. Joyce, Chaudhuri and Waters (2022) suggest the reason for the increase to be deterioration in health across all conditions that disability payments are granted for. A complimentary, economic explanation behind the persistence and the increase in health-related benefits has been maintained by Beatty and Fothergill (2002; 2005; 2020; 2023) who have maintained that uneven uptake of health-related benefits by geographical areas indicates the problem of hidden unemployment. Regional and local job opportunities influence the decision to apply for disability benefits. The diversion into disability benefits is more pronounced in areas with high levels of unemployment, that being older industrial areas and many coastal towns (Beatty and Fothergill, 2023).
The aim of this study is to ascertain if economic factors are associated with the increase in PIP by local authorities. The study uses local authority level data. A spatial econometrics model is used to explain the spatial pattern of the increase in PIP claims. The dependent variable is the percentage increase in PIP claims between 2021 and 2024. The explanatory variables are local authority level data on the level of PIP recipients in 2019, industry sectors, occupation, unemployment rate, demographic characteristics from 2021 Census data for local authorities, as well as households at risk of poverty rate for UK local authorities computed as part of Horizon 2020 IMAJINE project. The results indicate that the at risk of poverty rate and unemployment rate are positively related to increase in PIP claims; 2019 stock of PIP benefit recipients is negatively related to PIP claims increase indicating conditional "convergence" in claims levels.

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Spatial disparities in hiring problems: The role of firm characteristics, job features, and search channel

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G23-2 Labour Markets in the Transition Era: Future of Work, AI, Unemployment, Gig Economy and Digital Nomads, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

Against the backdrop of discussions about growing regional labour shortages, this study investigates spatial disparities in hiring problems using representative micro data on vacancies and establishments in Germany. Our results point to significant disparities that vary along the urban-rural hierarchy depending on indicator. While establishments in rural areas receive less suitable applications and more often abandon hiring plans, firms in cities more often report problems related to the applicants' qualification and wage expectations. Prevailing types of establishments and jobs explain an important part, but not all of the disparities. Evidence on concessions suggests, moreover, that employer responses to
labour shortages differ depending on the location type. While establishments in urban areas are more likely to compromise on wages, concessions on qualification are more frequent outside big cities. However, rural establishments report problems related to applicants' insufficient qualifications less
often. Heterogenous hiring problems indicate that there is need for place-sensitive policies rather than place-based policies that focus on specific locations.

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Foreign direct investment and labour informality in emerging economies: Evidence of Mexican municipalities

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G23-3 Labour Markets in the Transition Era: Future of Work, AI, Unemployment, Gig Economy and Digital Nomads, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

Multinational Enterprise (MNE) presence may affect the degree of informality in the host economy. Whilst foreign firms generally operate within the formal sector of the economy, they may also choose to outsource some business functions in the host informal labour markets. The economic significance of these effects will depend on the labour force requirements for a given economic sector and the reliance of MNEs on certain types of labour. This paper examines the case of Mexican subnational regions. On the one hand, recent decades have witnessed changes in sectoral composition of inward foreign direct investment (FDI) along with changes in the spatial distribution at the subnational level. On the other hand, labour informality is still commonplace in the Mexican economy, though, informality rates vary markedly across subnational regions. This paper studies the heterogeneous effects of MNEs' direct investment activities on informality in the host region and sector of destination. By exploiting cross-municipality variation in both labour informality and inward FDI stocks, we can assess the capacity of such investments to increase or decrease informal employment in the host regional economy. This paper sheds light on the link between FDI and labour informality in the context of an emerging Latin American economy. The implications on labour market outcomes are ascertained not only on individuals but regions as well.

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COVID-19 and Scarring Effect on First Post-Graduation Employment of Dutch Graduates

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G23-3 Labour Markets in the Transition Era: Future of Work, AI, Unemployment, Gig Economy and Digital Nomads, Auditorium 245A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

This study examines whether COVID-19 restrictions imposed scarring effects on new Dutch higher education graduates entering the labour market. Using microdata from Statistics Netherlands (CBS) covering the labour market entry periods of approximately one million graduates between 2014 and 2024, we estimate OLS regressions for entry wages and logistic regressions for the probability of full-time employment in graduates' first post-graduation jobs. We compare different phases and durations of exposure to pandemic-related restrictions and assess whether prior job experience mitigated potential short-term scarring effects on initial labour market outcomes.
The results show that the pandemic period reduced both early-career wages and the probability of full-time employment. Under pre-pandemic conditions, prior job experience consistently generated wage premiums and increased the likelihood of obtaining full-time employment relative to graduates without such experience. Prior job experience consistently acts as a protective buffer to COVID-19 disruptions, however it could not fully offset or erase them.
This research is among the first to analyze early-career outcomes across the entire pandemic period, offering novel evidence into the effects of COVID-19 exposure to the labor market entry of new graduates.

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The diverse impact of relatedness on emerging industries: competition for shared skill sets

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G24 Universities and Regional Development, Skills, Training and Lifelong Learning for Green and Digital Transitions, Hall 2 - North Building, agosto 26, 2026, 17:00 - 19:00

Skill relatedness has become one of the most widely used concepts for explaining regional economic diversification and inter-industry linkages. It has also been embedded at the core of regional innovation policies, such as in smart specialisation strategies. A central tenet in the relatedness perspective is that industries sharing similar capabilities with emerging sectors can support their development, thereby facilitating regional path creation and diversification. Universities has been increasingly recognised as important actors developing the pool of related skills. While existing literature provides evidence that skill relatedness within a region can foster the growth of emerging industries, it has not yet addressed the challenge that arises when multiple emerging sectors simultaneously depend on the capabilities of a single incumbent industry. In this study, we examine the skill relatedness of oil and gas industry and its impact on development of carbon capturing and storage (CCS), hydrogen and offshore wind sector in Norway's Vestland region. We have conducted semi-structured interviews with key regional actors including energy firms, universities, industrial clusters and local authorities and analysed key documents. The preliminary findings indicate competition among emerging industries for subsea-related skill sets and show that skill relatedness has had heterogeneous impact on their development. Furthermore, the findings show that universities face difficulties in attracting students to degree programs intended to develop subsea-related skills despite emerging job opportunities. These results contribute to ongoing debates on relatedness in economic geography and offer useful insights for the role of universities in regional sustainability transitions.

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More than a talent pipeline: Universities and the social microdynamics of the development of Video Games Clusters

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G24 Universities and Regional Development, Skills, Training and Lifelong Learning for Green and Digital Transitions, Hall 2 - North Building, agosto 26, 2026, 17:00 - 19:00

The multiple roles higher education institutions play in the emergence, development, and growth of creative clusters have been explored in the regional studies literature. Authors highlight several paths of influence, including skills development, knowledge transfer, infrastructure provision, and networking facilitation (Comunian et al., 2015; Plum, & Hassink, 2014). Most of these studies analyse creative clusters from the perspective of Economic geography, Econometric modelling, and Management Studies while focusing on formal interactions among clearly defined organizations and the impact these may have on competitiveness and innovation on regional levels (Ozalp, 2024;De-Miguel-Molina et al., 2012; Belyaeva et al., 2022). However, these studies partially leave out of focus the informal daily microdynamics of social life connected to the complex sociocultural and historical components of these clusters. This constitutes a gap in the literature that may obscure other types of less formal interactions among educational organizations and creative clusters that could play a crucial role in their sustainment and expansion over time.

To contribute to these missing pieces in the regional studies literature, this study examines the case of Dundee in the United Kingdom, a post-industrial peripheral city in Scotland that has developed a successful and stable cluster for video games within a growing creative industry sector, in which Abertay University is one of its main pillars. The study is part of a wider study of 6 video game clusters across Europe, the GAME-ER project, and it is based on a multisource approach, implemented since 2024 and still ongoing, including 45 qualitative semi-structured interviews, document analysis performed on 181 documents, archival research, and participatory observation.

By focusing on Dundee´s case, this study contributes to the literature by examining how higher education institutions contribute to the emergence and transformations of video games clusters in particular, while also enriching the knowledge concerning universities within creative clusters as a whole. The study identifies several roles, in addition to the ones already mentioned in the literature, through which Universities contribute: becoming social anchors for clusters in times of change and crisis; absorbing the expertise of game developers and translating it into curricular design and teaching; diversifying professional pathways for game developers who are already working in the industry; becoming a mnemonic repository for the whole cluster across time; providing a more balanced critical outlook on the industry for potential graduates; and integrating industry partners into research projects with national and international dimensions.

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The whether and where of graduate migration: Higher education graduates' mobility determinants and the role of higher education as a retention factor.

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G24 Universities and Regional Development, Skills, Training and Lifelong Learning for Green and Digital Transitions, Hall 2 - North Building, agosto 26, 2026, 17:00 - 19:00

The spatial distribution of highly skilled labour is a central concern in regional science, as graduate workers tend to concentrate in major metropolitan areas, leaving peripheral regions struggling to attract and retain talent. Understanding what drives graduates' early-career mobility is therefore critical for designing effective regional development policies. A particularly important but understudied question concerns the role of Higher Education Institutions (HEIs): does studying in a given region generate a genuine retention effect on graduates' job locations, independent of labour-market conditions and individual characteristics? Or do apparent retention patterns merely reflect pre-existing student profiles?
This study investigates the determinants of intranational graduate migration in Portugal, a country marked by strong regional imbalances and the dominance of Lisbon and Porto in labour opportunities. Using microdata from the Portuguese component of the EUROGRADUATE 2022 survey, which covers graduates from the 2020/21 cohort, we analyse a representative sample of employed graduates one year after degree completion. The dataset provides detailed sociodemographic, educational, and geographic information at NUTS III level, enabling the distinction between ties to the origin region and to the study region — an aspect often missing in previous studies.
We estimate two complementary models that address both the 'whether' and the 'where' of graduate mobility. First, a binary logit model estimates the probability that a graduate remains in their study region. Second, a conditional logit model examines the likelihood of choosing any of the 25 NUTS III regions as the place of work, with mutually exclusive dummies capturing origin, study, and joint ties.
Preliminary findings indicate that individual characteristics such as gender, age, and academic performance have statistically insignificant explanatory power for retention. Instead, retention appears predominantly geographic: region-specific factors strongly influence whether graduates stay. In the location-choice model, both origin and study regions exhibit significant positive effects on the probability of working in those areas, even after controlling for regional attractiveness. Origin ties are stronger, but study ties also matter. The joint effect of having both ties in the same region is positive but non-additive, suggesting substitutability between the mechanisms of attachment.
Overall, the results provide evidence that HEIs generate genuine place-based retention effects that extend beyond labour-market quality or individual mobility propensity. This finding, which is to be corroborated through further analysis and robustness checks, could have direct implications for the evaluation of place-based higher education investment as an instrument for regional development.

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Internationalization at the periphery: International university students in mid-and small size cities in Türkiye

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G24 Universities and Regional Development, Skills, Training and Lifelong Learning for Green and Digital Transitions, Hall 2 - North Building, agosto 26, 2026, 17:00 - 19:00

Local and central governments, as well as various civil institutions and organizations, prioritize the internationalization of their cities in terms of student numbers within the context of global competition. Factors influencing international student flow are positively related to the quality of higher education, economic factors, and historical ties between countries, while geographical distance and linguistic proximity are discussed as potential hinders of international student mobility. Higher education institutions, particularly whose locations are peripheral significantly differentiate their policies in many ways. In peripheral regions, in non-metropolitan contexts, universities have utilized a localized approach coupled with populist political discourse. The geography of higher education in Türkiye has drastically changed with the spreading of higher education institutions from the center to periphery since 1990s. This dispersion of higher education institutions all over the country generates a vibrant yet obscure landscape. Coupled with attracting international students, this distinctive geography of higher education institutions in Türkiye produces urban relational systems that call for new analyses. Since the last decade, Türkiye has emerged as a strong educational hub, particularly for students from Muslim-majority countries. As universities have been largely endowed by the government's insistent internationalization policy in higher education, the number of international students in Türkiye has increased by 251 percent in the last decade. This paper aims at exploring this imbalanced spatiality of internationalization of higher education institutions and social characteristics of Turkish cities. Understanding these unique patterns and formulating new perspectives to analyze the complexity of this landscape have become an interesting research topic. A novel database is compiled for the research. The analysis is conducted on a provincial level in order to locate clusters of specializations, densities and agglomerations that describe the distinctive characteristics of the international higher education nodes and corresponding cities. Analyzing and representing placements of international students reveal unique spatial typologies in relation to different provincial structures. The paper adopts a relational mapping perspective, i.e. quantitative inquiry for identifying clusters of higher education institutions and social characteristics of cities. The paper indicates an alternative formation of urban regions and hierarchies in Turkey, based on higher education clusters, social capacities, and international students.

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Regional Research Performance Towards Sustainable Development Goals

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G24 Universities and Regional Development, Skills, Training and Lifelong Learning for Green and Digital Transitions, Hall 2 - North Building, agosto 26, 2026, 17:00 - 19:00

Annual reports towards the progress of Sustainable Development Goals (SDGs) have shown that sufficient progress is not being achieved yet for most of the goals. Knowledge production is important in all its various context in tracking this progress to identify and solve problems along the way towards the achievement of SDGs. In this regard, the relationship between the scientific knowledge production by universities and SDGs has also begun to attract more attention in the literature. Within this scope, this study aims to examine the specialization and diversification composition as well as regional performance of Turkey's 26 NUTS 2 regions in terms of scientific knowledge production towards SDGs, based on the number of scientific publications and citations. Both publication and citation data for the 2015-2025 period are obtained from the Scopus database, which are classified according to SDGs. These data are gathered at the institutional level which is, then, aggregated to the NUTS 2 level regions. Location quotient, relative diversification and shift-share are used to gain the required insight into the structural composition and performance of the regions. The results highlight the rise of new centers beyond the traditionally leading regions as well as newcomers with positive regional performance. The traditionally leading regions have moderate to high diversity in their SDG publication and citation patterns with specialization in fields which show smaller number of regions with such concentrations.

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AI-Driven Urban Spatial Disaster Risk Analysis: A Multidimensional Taxonomic Perspective

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G25-1 Enriching Research and Policy Methods in Regional Science: Digital Tools, AI, Participatory Approaches, Mapping and Stakeholder EngagementNew proposals, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

Natural disasters constitute one of the most critical challenges confronting contemporary societies due to their direct impacts on human life, the spatial destruction they cause, and their long-term economic consequences. Urban areas, in particular, face disproportionately severe outcomes as a result of concentrated populations, dense infrastructure systems, and intensified economic activities. Processes such as rapid and uncontrolled urbanization, environmental degradation, and climate change have significantly increased both the frequency and severity of disasters, transforming disaster risks into more widespread, complex, and interdependent phenomena compared to previous periods. This transformation necessitates addressing disasters not merely as extraordinary events requiring post-event response, but as dynamic risk processes that must be systematically analyzed, managed, and mitigated in advance.

Within the pre-disaster phase of disaster management, the identification of risks, the spatial analysis of risk patterns, and the development of risk reduction-oriented policies have become increasingly critical. However, the growing diversity of risks and the complexity of spatial risk configurations have made the limitations of conventional analytical approaches more evident. The processing of large-scale spatial datasets, the modeling of multivariate relationships, and the enhancement of predictive capacity require more flexible and advanced analytical tools. In this context, despite certain methodological limitations, artificial intelligence (AI) technologies offer substantial potential for risk prediction, the analysis of complex interrelations among risk factors, and the production of high-resolution risk maps. Indeed, recent years have witnessed a rapid increase in the use of AI-based approaches in urban disaster risk analysis. The expanding body of literature calls for a comprehensive assessment that reveals methodological trends and research patterns within this field.

Accordingly, this study systematically reviews research focusing on the analysis of spatial disaster risks in urban areas using artificial intelligence algorithms. Studies selected according to predefined criteria are thematically analyzed in terms of risk categories, algorithm preferences, data types, spatial scaling approaches, and validation methods. Based on this analysis, a multidimensional taxonomy is developed for the AI-based assessment of urban spatial disaster risks. The study aims to provide a guiding methodological reference for researchers and to offer an analytical perspective for decision-makers in the fields of planning and disaster management.

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AI-Assisted Narrative Exploration: Generative AI as a Methodological Tool for Regional Development

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G25-1 Enriching Research and Policy Methods in Regional Science: Digital Tools, AI, Participatory Approaches, Mapping and Stakeholder EngagementNew proposals, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

In recent years, the rapid diffusion of artificial intelligence (AI) has become a key driver of economic and societal change. At the same time, economic geography has witnessed a growing interest in imaginaries, narratives and visions as drivers of regional development (Benner, 2024). Narratives are socially shared sense-making stories connecting events, actors and actions, thereby shaping which regional development paths appear plausible (Sotarauta & Grillitsch, 2023).
In addition to these developments, little conceptual or empirical research has systematically engaged with alternative regional futures and future-making practices (Gong, 2024). Moreover, despite the rapid diffusion of AI, the enabling and constraining effects of generative AI remain underexplored in the context of regional development, particularly in narrative-oriented approaches.
This contribution addresses this gap through an exploratory application to two structurally challenged regions in Germany, Lusatia and the Ruhr Area. Generative AI is conceptualized as a methodological instrument for narrative diagnosis and narrative design. Drawing on large language models (LLMs) such as GPT-5.2, the paper develops and illustrates a structured framework for AI-assisted narrative analysis and recombination for regional development and the exploration of alternative regional futures, while critically reflecting on its opportunities and limits.
It first discusses the role of narratives and generative AI in shaping regional trajectories, then examines their application potential for narrative mapping, narrative recombination and counterfactual narrative generation. In both regions, LLM-assisted narrative mapping is used to identify dominant development frames and marginalized storylines embedded in regional strategy and policy documents. These narrative configurations are then algorithmically recombined to generate counterfactual, adjacent possible futures, which are critically assessed with regard to their plausibility and transformative potential.
The empirical application enables a critical reflection on how generative AI can function as a reflexive “sparring partner” expanding the imaginative space of regional actors while leaving normative evaluation and strategic choice in human hands. Overall, this contribution advances the understanding of AI-assisted narrative co-creation in regional development contexts and proposes a structured methodological approach for broadening the imaginative and methodological horizons of regional research and future-making policy practice.
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A Context-Engineered AI Agent Framework for Automating Public Investment Evaluation

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G25-1 Enriching Research and Policy Methods in Regional Science: Digital Tools, AI, Participatory Approaches, Mapping and Stakeholder EngagementNew proposals, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

Ex-ante evaluation of large-scale public investment projects is a critical institutional mechanism for assessing policy relevance, economic viability, and fiscal accountability prior to implementation. However, prolonged review periods and complex administrative procedures frequently delay decision-making, increasing social costs and weakening the timely provision of essential infrastructure and public services. Although recent advances in large language models (LLMs) have opened new possibilities for automating knowledge-intensive policy tasks, conventional LLM applications encounter significant limitations when processing extensive regulatory documents and structured evaluation frameworks. In particular, context rot and hallucination can undermine analytical reliability and institutional consistency in high-stakes public decision environments.
To address these challenges, this study proposes a Context Engineering–based AI agent framework for automating structured public investment evaluation. The framework organizes the assessment process into four coordinated stages. First, during the knowledge ingestion phase, institutional guidelines, evaluation criteria, and standardized cost references are retrieved through a Retrieval-Augmented Generation (RAG) mechanism to ensure traceability and regulatory alignment. Second, in a multi-agent collaborative analysis stage, specialized agents responsible for demand forecasting, cost estimation, and policy assessment exchange data through a Shared Unified History, maintaining analytical coherence across modules. Third, Recursive Summarization selectively transmits essential information between stages to prevent context degradation during long-document generation. Finally, Memory Consolidation integrates intermediate outputs into a logically consistent final evaluation report.
Empirical testing using real-world public project proposals demonstrates that the proposed system generates evaluation documents with high structural integrity and alignment with institutional standards. Furthermore, the framework produces confidence intervals for key performance indicators, such as benefit–cost ratios, enabling pre-submission scenario simulations and early identification of potential vulnerabilities.
The findings indicate that context-engineered AI agents can substantially reduce administrative lead times while strengthening reliability, transparency, and traceability in public investment decision-making. More broadly, this research advances the methodological integration of LLM-based systems into institutional policy evaluation, positioning context-aware AI as a scalable governance infrastructure for enhancing efficiency and consistency in the public sector.

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Bridging Policy and Practice: Mentoring as a Strategy for the strengthening of researcher training and employability

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G25-2 Enriching Research and Policy Methods in Regional Science: Digital Tools, AI, Participatory Approaches, Mapping and Stakeholder EngagementNew proposals, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

Research training (RT) has revealed a relevant and challenging issue in the higher education context and literature as well as in the agenda of public bodies, national governments, and representative organizations. This relevance considers the strengthening of the career, the expansion of opportunities for researchers, and the socioeconomic benefits at regional, national and transnational levels.

Within this context, this proposal presents the findings of a theoretical feasibility analysis examining the principal contributions of the existing literature, the recommendations of RT, and the role of academic mentoring in fostering the development and consolidation of the skills, competencies, and knowledge outlined in these recommendat ions.

Regarding the recommendations of RT, it is important to stress the main contributions to framing comprehensive researcher profile and training framework. First. The recognition of doctoral candidates as early career researchers and the integration of doctoral studies into institutional policies. Second . A diversity of pathways and contexts for RT, and the relevance of an integrated view of the researcher profile, articulating technical and scientific skills with transversal and strategic capabilities, such as leadership, interdisciplinary collaboration, critical thinking, ethics, communication, and results orientation . Third . The relevance of transversal skills such as communication, leadership, teamwork, project management, critical thinking, and ad aptability to different professional contexts. Fourth . A broader understanding of the researcher profile beyond scientific production and formal training, aligning it with the demands of employability, mobility, and the social impact of research Salzburg, 2010; Eurodoc, 2018, Nikol & Lietzmann, 2019, the Vitae Researcher Development Framework, 2020).

Taking these considerations into account, this presentation seeks to contribute to the ongoing discussion on research training discussion on research training and academic mentoring by highlighting their strategic relevance for and academic mentoring by highlighting their strategic relevance for strengthening researcher development frameworks and fostering more sustainable and impactful strengthening researcher development frameworks and strengthening researcher development frameworks and fostering more sustainable and impactful research careers and regional socioeconomic impact.

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Room for improvement: The low level of reproducibility in Regional Science and how it can be improved

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G25-2 Enriching Research and Policy Methods in Regional Science: Digital Tools, AI, Participatory Approaches, Mapping and Stakeholder EngagementNew proposals, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

This paper presents an empirical analysis of reproducibility of published regional science articles. We investigate articles published in four main regional science journals over a period of five years.
In our analysis we focus on one of the most basic requirements for reproducibility, the availability of the data. We analyze the selected articles and assign each to one of four categories. Category A contains articles where the data can be directly accessed by the reader based on the information provided. Only 3% of the Regional Science articles we investigated fall into this category. On the other end of the spectrum, category D contains those articles, where the reader cannot get access the data at all (because of data privacy, lack of information, author's unwillingness to share, etc.). 28% of the Regional Science articles we investigated fall into this category.
In our paper, we will explain, why we find this result to be alarming. We will compare the results to those of a comparable analysis for Real Estate journals. The detailed results over all the categories broken down by journal and year of publication provide some hints for how to improve the situation. Regional Science is in a more favorable position to achieve a major improvement than Real Estate. We will discuss some possible strategies for journals and organizations like ERSA to advance reproducibility in published Regional Science research.

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Automatic Identification and Characterization of Regional Sentiments on Labour Market Policies

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G25-2 Enriching Research and Policy Methods in Regional Science: Digital Tools, AI, Participatory Approaches, Mapping and Stakeholder EngagementNew proposals, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

People's perceptions of labour market policies play a critical role in shaping their political sustainability and effectiveness. Yet these perceptions may be territorially uneven and shaped by recent policy reforms. The evaluation of these perceptions, as well as opinions or even the expression of sentiments, is an important analytical dimension to assess the substantive effectiveness, operational efficiency and social legitimacy of labour market policies and can be deepened through the application of sentiment analysis techniques that enable the extraction, classification and automated interpretation of sentiment and evaluative patterns present in the means of expression of such perceptions. This study introduces a regional dimension to the analysis of attitudes toward labour market interventions, using Portugal as a case study,.Drawing on a specialized corpora extracted from several social media platforms, regional news outlets, and parliamentary debates, we apply natural language processing techniques to detect sentiment polarity and patterns, while geolocating opinions across Portuguese regions of the continental territory. Using lexicon-based approaches, we identify and classify evaluations of key policy instruments. The analysis situates these perceptions within the context of major labour policy changes in Portugal over the last few years. After 2011, austerity-linked reforms tightened employment protection and altered unemployment benefit rules; in the mid-2010s and beyond, successive governments introduced measures aimed at rebalancing worker protections, increasing minimum wages, and strengthening activation programs to reduce long-term unemployment. The recent proposal aiming at changing the labour law has already generated strong controversy, leading to general strikes. Nevertheless, it is expected that regional specific economic structures—such as export-oriented clusters around Porto versus rural areas in the interior with persistent job scarcity—shape dominant narratives, even though results are still preliminary to lead to assertive conclusions. By embedding computational text analysis within a spatial framework informed by Portuguese (regional) socioeconomic indicators, this study offers a scalable methodology for monitoring geographically differentiated public opinion. The preliminary findings suggest that labour market reforms in Portugal may be interpreted not only through ideological lenses but also through the lived economic realities of specific regions, underscoring the need for place-sensitive policy design and communication. In this paper, we present and discuss how we evaluated people's perceptions of labour market policies, using specialized lexicons for the identification and characterization of their sentiments, describing the selection criteria, the operationalization process and how we were able to analyse systematically emotional patterns for evaluating the impact of changing labour market policies.

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From Data to Development: Citizen Science in Urban and Regional Transformation

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G25-2 Enriching Research and Policy Methods in Regional Science: Digital Tools, AI, Participatory Approaches, Mapping and Stakeholder EngagementNew proposals, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

Citizen Science (CS), defined as the active involvement of citizens in scientific research addressing societal challenges, has emerged as a transformative approach in contemporary urban and regional development. By enabling public participation in data collection and analysis, CS expands the knowledge base available to researchers and policymakers while fostering collaboration between volunteers and academic institutions. Unlike traditional science communication initiatives, CS generates original data and tangible scientific outputs, thereby contributing directly to evidence-based policy design.

This paper examines how CS initiatives promote local development by strengthening collaborative governance, enhancing data-driven planning, and empowering communities. Drawing on literature and selected case studies, it highlights the capacity of CS to support planning processes related to land use, environmental monitoring, biodiversity conservation, and social-ecological resilience. Through structured evaluation frameworks that assess impacts across society, governance, economy, environment, and science, CS demonstrates multidimensional benefits extending beyond knowledge production. These include increased environmental literacy, skill development, civic participation, and strengthened community cohesion.

Within urban and regional contexts, CS contributes to more inclusive and adaptive development strategies by integrating local knowledge into formal planning mechanisms. It supports sustainable policy implementation, enhances trust between institutions and citizens, and fosters social justice by enabling communities to articulate local needs and monitor environmental risks. Technological advancements associated with smart city frameworks further expand the scope of CS, facilitating real-time data generation and participatory design processes.

Despite its promise, the institutional integration of CS faces structural challenges, including data quality assurance, digital inequalities, and the need for sustained financial and organizational support. Addressing these barriers requires standardized protocols, transparent communication, and long-term policy commitment.

Overall, CS represents an innovative participatory methodology that bridges scientific research and local governance. By aligning community-generated knowledge with regional policy objectives, it offers a viable pathway toward resilient, sustainable, and socially inclusive urban and regional development.

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Dynamic Stock Analysis of Residential Building Materials in the Pays de la Loire Region, France, Using Artificial Neural Network (ANN) Models

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G25-2 Enriching Research and Policy Methods in Regional Science: Digital Tools, AI, Participatory Approaches, Mapping and Stakeholder EngagementNew proposals, Auditorium 256 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

The concept of Urban Mining proposes a transformative vision by considering the built environment as a regional resource mine. It views urban areas not only as places of consumption, but also as strategic reservoirs of raw materials that can be recovered at the end of a building's life. However, the lack of short- and medium-term visibility regarding the type and quantity of recoverable materials remains a major limitation. Therefore, a combined analysis of material stocks and inflows and outflows represents a key challenge for understanding and managing the metabolism of socio-economic systems. In this context, a bottom-up, building-by-building methodology based on an artificial intelligence model was developed and applied to the Pays de la Loire region in France. This study aims to identify the main material stocks and flows resulting from the deconstruction of residential buildings in order to provide a detailed understanding of the resources available in the territory. The study led to the development of five artificial neural network (ANN) models to predict the envelope materials of residential buildings including wall type, wall thickness, floor type, and roof type. The French National Building Database (BDNB) was used as the main data source. The results show good accuracy, with high correlation coefficients ($R > 0.90$ for some models) and mean absolute percentage errors (MAPE) below 20%. These models were then used to fill in missing data for 488 953 residential buildings in the regional database. Based on this completed dataset, the total stock of materials in building envelopes was estimated at 92.36 million tonnes (Mt). Concrete accounts for the largest share (74%), followed by stone and mixed aggregates (14%), brick (7%), wood (2%), and tiles (1%). Finally, construction and demolition waste was estimated for the 2024–2030 period using deconstruction scenarios. In 2025, waste generation is estimated at 254 kt, of which 41% originates from Nantes Métropole. Single-family houses account for 79% of the waste, and 65% comes from buildings constructed before 1945. Concrete represents more than 75% of the generated waste. These results make it possible to anticipate waste flows and to adapt resource management and recycling strategies accordingly.

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Revisiting the Energy Quadrilemma: Balancing Revisiting the Energy Quadrilemma: Institutional Competition, Defence Priorities, and the Political Economy of Energy Transitions

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G26-1 Green transition Industrial Policy, Reindustrialization and Net-Zero Manufacturing: Regional Pathways in a Transition Era, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

Achieving a just and economically productive energy transition requires more than technological deployment; it demands institutional and industrial alignment. This paper explores how supply-chain limitations and cross-sectoral competition can constrain the economic benefits of renewable energy investment. Adopting the “energy quadrilemma” as a conceptual lens—encompassing sustainability, affordability, security, and economic development. We add to the literature by operationalising the energy quadrilemma within an ex-ante Computable General Equilibrium CGE framework by explicitly modelling cross-government competition for scarce industrial capacity. A purpose-built CGE model for Northern Ireland is employed to illustrate these dynamics, focusing on a 1 GW offshore wind target. Under ideal conditions, offshore wind development generates £285 million in Gross Value Added (GVA) and 2,630 person-years of employment; however, when regional fabrication capacity is diverted to national defence contracts, gains fall by over 50%. The model is not used to optimise energy deployment, but to reveal how governance and institutional constraints shape economic narratives around the transition, and the case study highlights how institutional fragmentation and competing strategic priorities undermine the promise of green growth. The paper argues for a more integrated policy framework that recognises industrial capacity as a critical enabler of the renewable transition and provides recommendations for aligning energy and industrial strategies in smaller economies.

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Waste Management and Territorial Vulnerability in Mayotte: Evidence from Tsingoni .

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G26-1 Green transition Industrial Policy, Reindustrialization and Net-Zero Manufacturing: Regional Pathways in a Transition Era, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

This paper examines waste management in Mayotte through an ongoing research-action project conducted in the municipality of Tsingoni, with a focus on territorial vulnerability and institutional capacity in peripheral island regions. As a French outermost region characterized by rapid demographic growth and structural development gaps, Mayotte faces increasing ecological pressures combined with limited waste treatment capacity: in 2021, less than 1% of collected household waste was recycled, while landfill sites are approaching saturation.
Rather than interpreting these dynamics solely as infrastructure deficits, the paper conceptualizes waste management as an indicator of territorial vulnerability in a structurally dependent regional economy. From this perspective, waste governance reveals structural constraints in the region's capacity to internalize environmental externalities. Environmental and sanitary costs are unevenly borne by the most precarious populations, often concentrated in informal settlements exposed to pollution and health risks. Waste thus emerges as a synthetic indicator of territorial vulnerability, reflecting both institutional fragility—limited coordination capacity, fragmented governance, and difficulties in adapting policy instruments to local configurations—and persistent socio-spatial inequality.
Based on ongoing qualitative fieldwork conducted in Tsingoni (68 semi-structured interviews and field observations), the paper presents preliminary findings on the social construction of waste. The analysis reveals a central semantic distinction between "Tzama", referring to a form of dirt perceived as natural and "Plastiki", associated with sanitary threat, contamination, and mosquito-borne diseases. In addition, preliminary results indicate that the symbolic roles of the river and fire are central to local waste practices: the river is perceived simultaneously as a sacred living entity and a site of disposal, while fire operates as a means of purification and elimination. These symbolic dimensions structure everyday waste practices and reinforce territorially embedded patterns of vulnerability.
In a peripheral island economy characterized by structural dependence and limited institutional capacity, waste is not merely a technical externality but a socially embedded category shaped by lived conditions and exposure to risk. The case of Mayotte contributes to regional science debates by questioning the territorial adaptability of ecological transition models and by emphasizing the need to account for vulnerability, institutional capacity, locally embedded representations of environmental risk.

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To choose or not to choose: towards a sustainable energy intensive sector in the Netherlands

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G26-1 Green transition Industrial Policy, Reindustrialization and Net-Zero Manufacturing: Regional Pathways in a Transition Era, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

The Dutch energy intensive industry is confronted with the need for a fundamental transformation in view of the climate goals to which the Netherlands has committed itself. A structural transformation is required to meet the ambition to be climate neutral by 2050. This transition is hampered by relatively high electricity prices, severe competition from countries outside Europe and changing comparative advantages. The need to fundamentally reflect on the position of the Dutch energy intensive industry is further strengthened by the geopolitical tensions and the ambitions of Europe to enhance strategic autonomy to which Dutch industry can potentially make a contribution. This paper presents evidence on the evolution of comparative advantages of the Dutch energy intensive industry and continues to reflect on the implications for a Dutch industrial policy that can strike a balance between economic, social and sustainable goals of Dutch policy.

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FDI-led reindustrialisation and regional development trajectories: Evidence from Hungary

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G26-2 Green transition Industrial Policy, Reindustrialization and Net-Zero Manufacturing: Regional Pathways in a Transition Era, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

Following the 2008 financial crisis, the European Union (EU) has placed increasing emphasis on regional industrial specialisation and reindustrialisation. More recent challenges, including the green and digital transitions and the strengthening of defence capabilities, have further reinforced the strategic importance of industrial development. In Hungary, foreign direct investment (FDI) and EU cohesion funds have been the main drivers of industrial restructuring. The country currently has one of the highest shares of foreign-controlled manufacturing in the EU.
FDI has contributed to productivity growth and technological upgrading, particularly in manufacturing. At the same time, however, it has increased the risk that certain regions become locked into a regional “development trap”, where growth remains dependent on low-cost labour and assembly-based production with limited local innovation capacity.
This study examines whether FDI-led reindustrialisation has contributed to Hungary’s convergence towards the average level of the former EU12 member states. Using NUTS 3-level data, we identify five regional types characterised by different industrial development trajectories. Our results show that reindustrialisation supported Hungary’s catching-up process until around 2015. After that point, several FDI-intensive manufacturing regions appear to have entered a development trap, where weak innovation capacities constrain further upgrading and growth.
We argue that the current pattern of reindustrialisation in Hungary may reinforce long-term structural vulnerabilities in affected regions and may also slow the country’s overall convergence with the EU average.

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Green FDI Beyond Renewables: Mapping the Geography of Transition-Relevant Investment in Europe

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G26-2 Green transition Industrial Policy, Reindustrialization and Net-Zero Manufacturing: Regional Pathways in a Transition Era, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

Foreign direct investment (FDI) is a critical vehicle for financing and diffusing the capital, skills and know-how needed for the transition toward a green, low-carbon economy. Yet “green FDI” remains systematically under-measured. Existing approaches largely rely on sector proxies – typically renewable energy and waste – that cannot detect green activities embedded within other industries, providing a partial and geographically biased picture of transition-relevant investment. Here, we introduce a taxonomy-guided, project-level measurement framework that combines large language models (LLMs) with the EU Taxonomy for Sustainable Activities to evaluate whether investment activities are consistent with sector-specific green activities and criteria. Applying this approach to 109,084 inward greenfield FDI projects into the EU27+UK over 2013–2024, we classify 15.7% of inward FDI value as green – around twice the share captured by focusing narrowly on renewable energy and waste sectors. In other words, sector-based metrics overlook roughly half of green FDI, missing large volumes of transition-relevant investment in manufacturing and related services, and revealing a geography of green FDI that extends well beyond regions endowed with solar and wind resources. The project-level lens also reveals sharp differences in the geography of investor origins: beyond-energy green FDI is more strongly linked to extra-European sources than renewable-focused green FDI, implying distinct geopolitical dependencies and strategic vulnerabilities in the financing of industrial decarbonisation. Benchmarking against blinded human coding and extensive robustness tests show high accuracy and reproducibility across alternative prompts, parameters and models. Together, the findings demonstrate that green FDI follows multiple pathways beyond renewables and that taxonomy-guided LLM classification enables scalable monitoring of investment alignment with environmental objectives to support the green transition.

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The growth and shrinkage of coal cities in the paradigm of technological transition: cases of Russia and China (results of the project “International Academic Cooperation of HSE University”)

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G26-2 Green transition Industrial Policy, Reindustrialization and Net-Zero Manufacturing: Regional Pathways in a Transition Era, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

This study is devoted to a comparative analysis of the development trajectories of coal towns in Russia and China in the context of global technological transition. The selected cases are the cities of Kuzbass (Russia) and the city of Fuxin (Liaoning Province, China). The choice is justified by their representativeness: both regions are considered the "coal heart" of their countries, symbolizing the coal industry's long-standing key role in the national economy. Kuzbass is an integrated coal industrial complex, where mines, processing plants, metallurgical and chemical production facilities are distributed across several cities, forming a unified production and distribution network. Fuxin serves as a typical example of a Chinese coal industrial city that has undergone a transformation from rapid industrialization to a resource crisis. Today, both regions are experiencing significant population outflow, especially among young people.

The paper examines the historical prerequisites for the deployment and establishment of the coal industry in each region, as well as the profound changes that industrialization brought about in the demographic structure, economy, and cultural identity of the studied cities. Special attention is paid to the phenomenon of "explosive" population growth rates and urban infrastructure expansion, which were a direct consequence of the large-scale mobilization of resources during the Soviet and post-Maoist periods, respectively.

The theoretical framework of the study is the concept of technological transitions. The transformation of cities is viewed through the lens of shifting dominant institutions and technological paradigms, both at the global level and locally. The central research question addresses the problem of desynchronization: to what extent does the dynamics of institutional and technological change in coal towns align with global trends, and at what points does a gap emerge? The analysis explores how this desynchronization affects the prospects of these cities.

As a result of the analysis, similar effects of desynchronization between global energy transition trends and local institutional strategies have been identified. In both cases, the state acts as a key actor shaping adaptation trajectories. However, differences in regulatory models are evident. Further analysis will aim to deepen the understanding of how these divergent strategies influence the prospects of the cities — whether they contribute to the preservation of outdated structures or open up opportunities for integration into a new technological paradigm.

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Perceived ecosystem service value as a mediator between environmental worldviews and citizen intentions to participate in ecosystem service co-creation: evidence from urban parks in Šiauliai (Lithuania)

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G28 Biodiversity Loss, Ecosystem Services and Nature-Based Solutions: Spatial Planning under Planetary Boundaries, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

Urban parks represent critical socio ecological spaces for mitigating biodiversity loss, enhancing ecosystem services (ES), and supporting nature based solutions (NBS) within cities operating under increasing environmental constraints. Understanding how residents perceive and value ES, as well as what motivates them to participate in ES co creation, is essential for integrating community perspectives into spatial planning frameworks aligned with planetary boundaries. This study investigates the relationships between citizens' environmental worldviews, their perceived value of ES provided by urban parks, and their intentions to engage in ES value creation in the city of Šiauliai, Lithuania.

A large scale survey was conducted among city residents (N = 1064), capturing three core dimensions: (1) perceived value of ES delivered by urban parks—including cultural, regulating, and supporting services; (2) environmental worldviews, operationalised through ecocentric and anthropocentric orientations; and (3) behavioural intentions to participate in ES value creation. Structural Equation Modelling (SEM) was applied to examine the dominant pathways among these constructs and to quantify both direct and mediated effects.

The results demonstrate that both ecocentric and anthropocentric worldviews positively predict perceived ES value. This finding suggests that valuing urban nature is not exclusive to ecocentric perspectives; citizens motivated by human centred benefits also recognize the importance of ES in urban parks. Furthermore, perceived ES value emerged as the most influential predictor of intentions to participate in ES value creation, exerting a substantially stronger effect than either worldview orientation. The SEM analysis indicates that the influence of worldviews on participation intentions operates primarily through perceived ES value, highlighting the mediating role of perception based mechanisms in shaping pro environmental civic engagement.

These findings advance the understanding of socio-psychological drivers relevant to urban ES governance and provide evidence for designing spatial planning and NBS strategies that more effectively integrate public participation. Strengthening communication about the multifunctional benefits of urban green spaces may serve as a key intervention to mobilise residents and support sustainable urban space management practices. The study offers empirically grounded insights for municipalities seeking to foster resilient urban ecosystems through participatory approaches.

Keywords: perceived ecosystem service value, environmental worldviews, intentions to participate in ES value co-creation

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Environmental externalities associated with the expansion of industrial parks in the Bajío region of Guanajuato, Mexico under the stimulus of nearshoring.

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G28 Biodiversity Loss, Ecosystem Services and Nature-Based Solutions: Spatial Planning under Planetary Boundaries, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

This study aims to examine the negative environmental externalities produced by industrial parks and warehouses in the Bajío region of Guanajuato, Mexico, as a consequence of their expansion driven by nearshoring, a strategy that has emerged as a strong trend in the reconfiguration of global value chains. The methodology employed includes a review of theoretical frameworks on globalization, nearshoring, regional competitiveness, and environmental externalities, particularly those that establish a relationship between industrial processes, their negative environmental impacts, and the generation of negative environmental externalities—that is, impacts on people who do not directly participate in these economic activities and who are not compensated for them. Furthermore, it adopts the direct method for valuing environmental externalities, which involves using data on: changes in land use, soil degradation, overexploitation of water resources, water pollution, generation of hazardous or special handling waste, as well as on processes associated with externalities such as: increased land prices, loss of control over natural resources by local inhabitants, and abandonment of agriculture. The data obtained comes from documentary sources and relates to the location of industrial parks and warehouses (considering their area of influence), and therefore cartographic information is presented. Analysis of this information reveals the environmental repercussions of nearshoring through the expansion of industrial parks and warehouses for local communities, as well as the challenges the region faces in achieving sustainable development.

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From green visions to viable projects: financing and business models for nature-based urban regeneration in Thessaloniki

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G28 Biodiversity Loss, Ecosystem Services and Nature-Based Solutions: Spatial Planning under Planetary Boundaries, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

Nature-Based Solutions (NBS) are increasingly promoted as effective responses to urban challenges, including climate change, environmental degradation, and quality-of-life issues. Despite their growing recognition, their large-scale implementation remains limited, primarily due to financial, institutional, and governance constraints. A core challenge lies in the fact that NBS generate multiple environmental, social, and economic benefits that function as public goods. These benefits are shared across many stakeholders and therefore cannot be easily captured through conventional revenue streams. Thus, many relevant projects remain dependent on short-term public funding, with limited pathways for long-term financial sustainability.
This paper presents findings from the ReGenWest project, focusing on the identification of financial opportunities, barriers, and business models for NBS interventions, within the urban regeneration of the railway station district of Thessaloniki. The analysis is based on a systematic assessment of how NBS projects may create and deliver value, how costs are structured, and how financing and governance arrangements influence implementation. Particular attention is paid to the applicability of these projects within the Greek institutional and regulatory framework. In doing so, the work highlights the multifunctional value of NBS and addresses the persistent investment gap associated with their public-good nature.
On this basis, the study develops a structured business model template grounded in established NBS business model frameworks. This template is applied to produce a set of intervention-specific business model profiles (cards), ranging from public space greening and tree planting to permeable pavements and net-zero buildings. Each resulting profile synthesises key elements of value creation, delivery, and capture, as well as indicative cost categories, financing mechanisms, and implementation enablers and barriers. The interventions are further grouped into five business model categories based on their spatial context and dominant financing logic: "public space interventions", "private space interventions", "public–private hybrid solutions", "multi-tenant building solutions", and "renewable energy solutions".
The findings underline that successful implementation depends on combining public funding with private and community contributions through blended and hybrid financing approaches. In the Greek context, reliance on EU and national funding, together with long-term operation and maintenance costs, underscores the importance of political support, stakeholder engagement, and adaptive governance. In this context, theoretical business model concepts can be translated into practical, context-specific tools, thereby helping bridge the gap between strategic planning and implementation. The proposed approach offers a transferable framework for compact Mediterranean cities seeking to integrate NBS into urban regeneration strategies in a financially credible and socially supported manner.

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Diversity–Risk–Price Interactions and Efficiency Performance in EU Fisheries

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G28 Biodiversity Loss, Ecosystem Services and Nature-Based Solutions: Spatial Planning under Planetary Boundaries, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

This paper examines the relationships between diversity, downside risk, price dynamics, and technical efficiency across 23 EU fisheries sub-ecosystems, each representing the fishing activity of a member-state within the broader EU marine ecosystem. Diversity is measured using the Berger–Parker, Simpson, Shannon, and Concentration Ratio indices, which capture species dominance, dependency, and structural resilience across sub-ecosystems and over time.

Downside risk is assessed through a left-tail financial indicator that estimates the probability of extreme negative outcomes in fisheries. This serves as a sub-ecosystem level proxy for the inherent risk in fishing activities, providing an empirical and probabilistic measure of worst-case losses, which is crucial for understanding the economic vulnerability of these fisheries. Risk is first computed at the species level within each sub-ecosystem and subsequently aggregated into a weighted sub-ecosystem risk measure. Analogous leader-risk and top-five weighted risk indicators are derived to evaluate whether vulnerability is concentrated in a small set of species or distributed across a wider portfolio.

Price dynamics constitute the economic dimension of the analysis. For each sub-ecosystem, we compute a weighted average landing price as an aggregate measure of its economic value, reflecting species composition and market relevance. Leader prices and top-five weighted prices are also calculated to assess value concentration and to determine whether economic performance is driven by a few high-value species or supported by a diversified structure.

Technical efficiency is evaluated using a Cobb–Douglas stochastic production frontier and a bias-corrected Data Envelopment Analysis (DEA) incorporating environmental variables. The DEA employs a double-bootstrap procedure to obtain consistent efficiency scores under both input- and output-oriented models.

A central objective of the study is to examine whether diversity, risk, prices, and efficiency differ significantly across sub-ecosystems and evolve over time. Using ANOVA and Kruskal–Wallis tests, we assess spatial and temporal heterogeneity in ecological conditions, economic valuation, and production performance. Theoretically, lower diversity increases concentration, dominance, and dependency on a small number of species, thereby raising ecological and financial vulnerability. Likewise, efficiency-enhancing strategies may reduce diversification, potentially amplifying revenue variability and downside risk. Our empirical results reveal marked differences in diversity, risk exposure, and price structures across EU fisheries, offering insights that contrast or align with theoretical expectations. These findings provide a basis for targeted policy interventions aimed at strengthening the long-term sustainability and economic stability of the fishing sector.

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One Reef, Many Values: Understanding Cross-National Drivers of Coral Conservation in the Gulf of Aqaba

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G28 Biodiversity Loss, Ecosystem Services and Nature-Based Solutions: Spatial Planning under Planetary Boundaries, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

The Gulf of Aqaba's (GoA) coral reef ecosystem, one of the northernmost and most thermally resilient reef systems worldwide, faces growing anthropogenic threats, including a planned desalination plant in Jordan. This study applies the Contingent Valuation Method (CVM) to estimate the non-use value of coral reef conservation in the GoA, comparing Israeli and Jordanian populations. A representative sample of Israeli and Jordanian non-users was surveyed regarding their willingness to pay (WTP) an annual voluntary donation to dedicated national reef conservation funds. The analysis employed a Heckman two-step selection model to account for zero bids, thereby reducing selection bias and yielding more inclusive estimates of public support.
The results indicate substantial national non-use values, estimated at approximately $87.2 million annually in Israel and $36.6 million in Jordan. Motivational patterns differ across countries: Israeli respondents expressed stronger bequest values, emphasizing intergenerational responsibility, while Jordanian respondents demonstrated higher existence values, reflecting spiritual and cultural reverence for nature. These findings suggest that public support for conservation is shaped by distinct ideological and cultural contexts, even within a shared ecological system. The study contributes methodologically by integrating protest-bid correction within a cross-border valuation framework and substantively by revealing how cultural orientations influence conservation preferences. Policy implications include tailoring conservation messaging to national value structures, emphasizing stewardship for future generations in Israel and spiritual respect for nature in Jordan to enhance the legitimacy and effectiveness of transboundary reef protection. More broadly, this approach underscores the importance of culturally informed strategies in environmental policy for ecologically continuous yet socially diverse regions.

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Equaliser or divider? Questioning the societal impacts of digitalisation policies

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G29 Digitalization and inequality: territorial disparities and policy effectiveness, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

Digitalisation has increasingly been embraced by policymakers as a universal solution to a wide range of socio-economic challenges, including inequality, access to services, and economic competitiveness. However, the assumption that digitalisation inherently delivers inclusive benefits remains insufficiently tested through empirical evidence. Our research examines whether digitalisation in Romania has succeeded in reducing societal inequalities or, conversely, exacerbated them. The study is based on data from a nationally representative survey conducted across Romania which explored issues such as disparities in digital access, intensity of usage, and the digital competencies of different population segments.

The findings indicate that, while digital infrastructure has advanced uniformly at a technical level, significant inequalities persist in terms of digital access and use, which in turn create wider socio-economic rifts. For example, an extremely visible digital divide between urban and rural areas is questioning the “equaliser effect”, with rural regions lagging behind in the frequency and quality of digital tool usage. Moreover, the territorial rural–urban split tends to widen at each level of the digital divide, amplifying, for example, outcomes of digital use. Education-based inequalities are also evident, sometimes alongside age-related differences. By contrast, gender disparities are minimal and, in some cases, almost non-existent.

While our results do not deny the positive impacts that digitalisation can and could have (including effects such as social inclusion and economic development), they challenge the optimistic narrative that digitalisation alone is a panacea for inequality. Instead, they reveal that without careful planning and equitable implementation, digitalisation may reinforce existing social and territorial disparities. In particular, the analysis reveal that the benefits of digitalisation are dependent upon a balanced territorial distribution of digital education.

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Factors of Digital Mobility Divide and its Effect on Accessibility, Socio-Spatial Integration and Equity

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G29 Digitalization and inequality: territorial disparities and policy effectiveness, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

Cities increasingly seek to enhance municipal services and mobility through digitization, based on the assumption that “smart” technologies foster progress, efficiency, and sustainability. Yet, such advancements can unintentionally exclude populations with limited digital skills, deepening digital divides.
While most research on the digital divide focuses on socio-demographic factors, only a few have linked digital gaps to habitus—a set of cultural, social, and perceptual dispositions shaping individual actions. No prior study has systematically examined the relationship between habitus, the digital divide in urban mobility, and its effects on access to opportunities and social-spatial integration.
This study addresses this gap through a conceptual framework based on three hypotheses: (1) The digital divide in urban mobility stems from a “habitual mechanism” involving socio-demographic variables, attitudes, perceptions, and travel habits; (2) The digital mobility divide restricts access to opportunities (e.g., employment, education) for disadvantaged groups; (3) There is a positive relationship between accessibility and social-spatial integration.
A mixed-methods empirical study was conducted in Tel Aviv. The quantitative phase included a survey of 733 respondents from diverse socio-demographic backgrounds. The questionnaire, informed by two initial focus groups (low vs. high income and digital skills), measured access to digital mobility tools (smartphone ownership, proximity to shared mobility, perceived affordability), socio-demographics, attitudes and perceptions toward digital mobility, digital skills, and perceived improvements in accessibility and integration. Structural Equation Modeling (SEM) was used to analyze relationships between observed socio-demographic variables, latent perceptions and attitudes, and actual use of digital mobility means.
Results revealed two latent factors and one manifest factor related to perceptions of digital mobility: self-assessed digital competence, attitudes toward use, and privacy concerns. These factors were positively related to socio-demographic variables and access to mobility tools. Perceptions were also positively associated with actual digital mobility usage (e.g., public transport apps, shared mobility). Two additional latent factors emerged—accessibility and social-spatial integration. Digital mobility usage was found to enhance both perceived accessibility and integration. Importantly, a positive link was observed between accessibility and equity-related outcomes, including improvements in employment and education, and reduced travel costs.
In the qualitative phase, three focus groups were held with municipal mobility planners to interpret and validate the quantitative findings. These discussions both confirmed and enriched the analysis. This research offers new insights into the mechanisms driving digital divides in urban mobility and highlights the importance of increasing digital accessibility to empower disadvantaged groups, foster social-spatial integration, and promote urban equality.

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Digital Health, Workforce Well-being and Regional Competitiveness in the European Union: Evidence from a Multi-Indicator Cluster Analysis

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G29 Digitalization and inequality: territorial disparities and policy effectiveness, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

Digital transformation, demographic ageing and rising mental-health needs are reshaping labour markets across the European Union (EU), accentuating long-standing disparities in workforce well-being and territorial competitiveness. While previous research has separately examined health, productivity and innovation capacity, evidence linking these domains in a coordinated, cross-country EU framework remains limited. This study addresses this gap by integrating indicators of population health and physical activity, labour productivity and sickness absence, and competitiveness and digital readiness. Using harmonised EU-27 data and an unsupervised k-means clustering approach, four distinct country configurations were identified.

Cluster 1 combines high healthy life expectancy, the highest levels of physical activity, strong labour productivity and leading performance in the Global Competitiveness Index and DESI, illustrating how mature digital ecosystems and preventive health systems facilitate the effective conversion of health capital into economic performance. Cluster 2 also exhibits excellent health outcomes but only moderate activity levels and digital readiness, suggesting unrealised productivity potential. Cluster 3-largely Central and Eastern Europe-shows the lowest health indicators and weak digital foundations, yet records the highest measured productivity and lowest sickness absence, raising concerns about sustainability and measurement differences. Cluster 4 lags across nearly all dimensions, reflecting deep structural constraints.

The results demonstrate that similar health levels do not translate into comparable productivity or competitiveness across the EU. Digital readiness, institutional design and workplace environments significantly mediate the health–productivity link. The study highlights the need for cluster-tailored policies integrating digitalisation, prevention and occupational health to reduce territorial inequalities and strengthen the EU’s long-term resilience and competitiveness.

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Computational Literacy and Territorial Inequality in Mexico's Digital Transition: A Spatiotemporal Analysis, 2018–2024

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G29 Digitalization and inequality: territorial disparities and policy effectiveness, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

The ongoing digital transition is reshaping economic structures, labor markets, and territorial dynamics, positioning digital skills as a critical dimension of social and regional development. Within this broader transformation, computational literacy constitutes a specific and measurable component of digital literacy, reflecting individuals' capacity to perform tasks such as information processing, file management, and programming. This study analyzes the evolution of computational literacy in Mexico between 2018 and 2024, with particular attention to its territorial and socioeconomic distribution.

Using data from the National Survey on the Availability and Use of Information and Communication Technologies in Households (ENDUTIH), which is statistically representative at the national, state, and urban–rural levels, we construct a Computational Literacy Index (CLI) through Principal Component Analysis (PCA). To ensure temporal comparability, factor loadings are estimated using 2018 as the baseline year and subsequently projected onto later waves (2020, 2022, and 2024). The index is standardized on a 0–100 scale to facilitate interpretation and spatial comparison.

The results reveal three main findings. First, despite a decline in the use of computers, laptops, and tablets, the CLI shows an overall increase during the period, with a significant rise in 2020 followed by relative stagnation. Second, substantial territorial disparities persist, particularly along the urban–rural divide, with rural areas consistently lagging behind. Third, improvements in computational literacy are spatially concentrated in regions with preexisting higher levels of socioeconomic and metropolitan development, suggesting a process of territorial reinforcement rather than convergence.

These findings highlight the importance of distinguishing between device access and advanced computational skills in the analysis of digital transformation. More broadly, the study contributes to the literature by providing a spatiotemporally comparable indicator of computational literacy and by demonstrating how the digital transition may reproduce or even intensify existing territorial inequalities in developing contexts.

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Mapping Circular Innovation: A Regional Analysis of Technological progress in the Circular Economy

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S01 Sustainability, Innovation, and Regional Development, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

The transition towards a circular economy (CE) has emerged as a central pillar of sustainable development strategies in Europe. However, despite the growing policy relevance of circular transformation, there is limited empirical evidence on the territorial factors that drive the emergence and spread of circular innovations. This paper investigates the regional determinants of circular economy innovation across European NUTS 2 regions, focusing in particular on the role of technological complexity and relatedness within regional knowledge bases.
Innovation output is proxied by circular patents, which are identified using a new automated landscaping approach applied to PATSTAT data. This approach is based on a three-phase mixed-methods process: seed selection, seed expansion, and semantic pruning. Patents are geolocated at the NUTS2 level, enabling comprehensive mapping of circular inventive activity across regions and over time. The empirical analysis is conducted within a knowledge production function framework, where the main explanatory variables include a knowledge complexity index and the average relatedness density to the CE domain.
This study examines whether regions with more complex and diverse technological structures are better positioned to generate circular innovations. Furthermore, a spatial econometric approach is implemented to account for interregional knowledge spillovers and spatial dependence. This allows us to assess whether circular innovation dynamics are influenced by not only internal capabilities, but also geographical proximity and cross-regional linkages. By integrating complexity theory, diversification and spatial analysis, this paper makes a valuable contribution to the literature on the circular economy and regional innovation systems. It provides new empirical evidence on the structural and spatial factors shaping the geography of circular innovation in Europe. The findings have important implications for designing place-based strategies that foster a more inclusive, capability-driven circular transition across European regions.

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Spatial Proximity and Technological Relatedness in the Twin Transition Interfirm Agreements

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S01 Sustainability, Innovation, and Regional Development, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

This paper investigates the determinants of interfirm agreements — joint ventures and strategic alliances — in the context of the twin transition, examining how spatial proximity and technological relatedness shape collaborative behaviour among firms. The twin transition, combining digitalisation and environmental sustainability, is increasingly driving firms to pool capabilities and share risks through interfirm collaborations. Yet the spatial and sectoral logic underpinning such partnerships remains poorly understood.
Drawing on a novel dataset from SDC Platinum covering announced agreements worldwide over 2000–2025, we identify green, digital, and twin transition agreements through keyword-based classification of deal names and synopses. Italy serves as the empirical laboratory, allowing direct comparability with an established benchmark while advancing the analysis in time coverage and thematic focus. A descriptive mapping of Italian firms' participation in transition-related agreements is complemented by an econometric analysis of partnership formation based on the rare-events logit framework.
A key novelty of the paper is the decomposition of proximity effects by agreement type, testing whether green and digital partnerships exhibit a distinctive spatial and sectoral logic compared to the full sample. The findings are expected to shed light on whether transition-related collaborations are geographically concentrated or widely distributed, and which sectors and regions are leading the formation of green and digital alliances — with direct implications for the design of industrial and cohesion policies.

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The evolution of technological knowledge in the Global Value Chain (GVC) of mixed-tech industries: An explorative study of European aquaculture

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S01 Sustainability, Innovation, and Regional Development, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

This paper investigates the evolution and geography of technological knowledge within the Global Value Chain (GVC) of a mixed-technology industry, focusing on European aquaculture. In GVCs, technological capabilities are typically concentrated in core economies hosting lead firms and advanced innovation systems, while peripheral regions tend to specialize in lower value-added activities. Recent research on mixed-technology GVCs highlights the coexistence of high- and low-tech segments within the same value chain, generating asymmetric knowledge flows shaped by institutional contexts and power hierarchies. From an evolutionary economic geography perspective, however, these asymmetries are dynamic and may shift through processes of path dependence, related diversification, and knowledge recombination—particularly during periods of green and digital transition.

The aquaculture industry provides a compelling empirical setting. Technological leadership is concentrated in Northern and Western Europe—especially Norway, Scotland, and Denmark—where vertically integrated firms, strong research institutions, and coordinated public-private innovation systems support upstream innovation in breeding, feed, digital monitoring, and disease management. In contrast, Southern and Eastern European regions focus more heavily on grow-out farming and processing, often within fragmented innovation systems and with lower R&D intensity. This uneven geography raises the question of how green and digital transitions reshape the spatial distribution of technological knowledge and enable (or hinder) functional upgrading within mixed-tech GVCs.

To address this question, we constructed a novel patent dataset covering aquaculture-related patents with at least one inventor located in Europe (EU, UK, Norway, Iceland, and Switzerland) between 2000 and 2024. Patents were classified into five technological foci—Feed, Production Systems, Management and Monitoring, Veterinary Care and Disease Management, and Breeding and Genetic Improvements—based on Cooperative Patent Codes (CPC). These were further attributed to three upstream value chain segments: Inputs & Services, Production, and Processing & Value-adding.

Using country- and region-level matrices and Social Network Analysis across five non-overlapping periods, we mapped the spatial evolution of technological knowledge networks at European and global scales. Preliminary findings indicate increasing participation of new entrant countries and regions, particularly in environmentally oriented technological trajectories, suggesting that green transition dynamics may open new pathways for repositioning within aquaculture GVCs.

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Exploring regional disparities in R&D efficiency: A stochastic frontier approach

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S01 Sustainability, Innovation, and Regional Development, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

This study examines regional disparities in research and development (R&D) efficiency across European Union (EU) regions, building on the neoclassical premise that technological change is a key driver of long-term economic growth. Since the Lisbon Strategy, the EU has promoted R&D investment as a central pillar of competitiveness and cohesion, setting a target of 3% of gross domestic expenditure on R&D (GERD). Although average EU investment has increased from around 1.8% at the beginning of the century to approximately 2.3% in 2025, and several Central and Northern regions exceed the 3% target, regional income gaps persist and have even widened. In response, the EU introduced Regional Smart Specialization Strategies (RIS3), requiring regions to identify their strengths and focus resources on sectors with innovation potential. However, risks such as regional lock-ins, limited diversification, and weak innovation systems may hinder the effectiveness of these strategies. The paper argues that increasing R&D spending alone is insufficient; what matters is the efficiency with which resources are transformed into innovation outputs.
To measure this efficiency, the authors apply a parametric stochastic frontier model using panel data for NUTS-2 EU regions from 2008 to 2021, with patents as the proxy for innovation output. This approach allows the separation of inefficiency from random noise and enables the simultaneous estimation of efficiency scores and external determinants.
The paper makes three main contributions. First, it provides the first measurement of regional R&D efficiency in Europe. Second, it highlights efficiency as a crucial intermediate link between R&D investment and economic growth. Third, it offers policy-relevant insights, showing persistent center-periphery efficiency gaps and questioning the effectiveness of focusing solely on increasing GERD without improving the quality and allocation of regional innovation resources

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The roles of local action groups in supporting sustainable innovation: evidence from German LEADER regions

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S01 Sustainability, Innovation, and Regional Development, Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

A growing body of literature highlights that sustainability transfromation is driven by actors who assume specific agency roles. Among these, leadership and intermediation have received increasing attention in transformation and regional development studies. Transformative leadership refers to practices through which actors articulate visions, mobilize others, and challenge established routines and power relations (Wolfram, 2016; Grillitsch and Sotarauta, 2019). Intermediation, by contrast, emphasizes the role of actors who connect heterogeneous stakeholders, translate between knowledge domains, and facilitate collaboration across institutional and sectoral boundaries (Lord et al., 2025; Sovacool et al., 2020; Sundqvist and Tuominen, 2024). While both roles are widely recognized as important, their concrete practices and their contributions to collective transformative processes remain insufficiently integrated into existing frameworks.
This paper addresses this gap by explicitly bridging the concept of collective change agency with the transformative capacity framework. We argue that leadership and intermediation can be understood as distinct but complementary manifestations of local agency that contribute to the development of transformative capacity through specific practices. These roles can also be executed simultaneously by the same actors (De Haan and Rotmans, 2018). Building on existing literature, we derive a set of leadership and intermediation practices and examine how these practices relate to key collective processes associated with transformative capacity, namely system analysis, foresight, experimentation, innovation embedding, and monitoring (Wolfram, 2016).
Empirically, the paper draws on a comparative study of two rural regions in Germany, focusing on the so-called Local Action Groups (LAGs) within these regions. LAGs are collective bodies managing the formulation and implementation of rural development strategies under the EU's LEADER approach ("Liaison Entre Actions de Développement de l'Économie Rurale", meaning "Links between activities for the development of rural economy"). These organizations are particularly well positioned to enact both leadership and intermediation, as they operate at the intersection of policy, civil society, and local economic actors (Bosworth et al., 2016; Esparcia et al., 2015; Lacquement and Raynal, 2013). By analyzing how different agency practices align with observed collective processes in each region, the study contributes to a more nuanced understanding of how transformative capacity is built in rural contexts.

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Cohesion Policy, SMEs and Regional Resilience in a Polycrisis Era: Evidence from the 2014-2020 Crisis Response

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S02 Cohesion Policy and Crises: Lessons from the Pandemic and the Ukrainian Aggression, and Pathways for the Future(RP), Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

This paper draws on the findings of the Ex-Post Evaluation of Cohesion Policy 2014–2020, Work Package 12 (Crisis Response) and focuses on Small and medium-sized enterprises (SMEs). SMEs were disproportionately affected by the pandemic and subsequent energy crisis, facing a sudden loss of revenue due to reduced or halted operations. They had to adapt to changes in customer demand, with some products experiencing sudden drops and supply chain interruptions, reducing the capacity to acquire necessary materials. The effects varied across sectors and territories, disproportionately affecting smaller enterprises, as it necessitated rapid adaptation often beyond their capacity.
Drawing on Case Study I of the ex-post evaluation, this paper assesses how ERDF crisis-response mechanisms — particularly CRII/CRII+ and REACT-EU — supported SME resilience across six Member States.
Despite the difficulty of obtaining a final assessment of the impact of Cohesion Policy, the analysis of COVID-19 indicators on SME working capital support shows high target achievement by the end of 2022. The findings suggest that liquidity loans and working capital grants played a key role in preventing bankruptcies and sustaining business continuity. In limited cases, it shows the net effects of the interventions, the importance of an appropriate sectoral approach to ensure effectiveness, and the capacity of programmes to sustain SME resilience and prepare the future recovery. Meanwhile, REACT-EU contributed to long-term investments in digitalisation, decarbonisation and competitiveness. Finally, the flexibilities granted by the crisis response mechanisms have mitigated difficulties in programme implementation.
The case study examined differential effects. The crisis response instruments were also aimed at maintaining support for less developed regions and promoting territorial cohesion. Other positive unintended effects were intangible, such as raising awareness of opportunities offered by technological and green solutions, enhancing administrative processes for project application and selection, and increasing proficiency in using financial instruments.
The response to the crisis was extensive, especially in the Member States covered by the study. However, accelerated reprogramming and tight implementation deadlines increased administrative burdens and favoured simpler, pre-existing instruments. These were often extensions of existing measures, ensuring coherence. This paper explores the trade-offs between emergency support and strategic transformation, and draws conclusions on how crisis responsiveness can be embedded within future Cohesion Policy frameworks. One lesson learned for the future is that defining flexible, easy-to-implement rules is critical to ensuring a fast response.

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Simplification in a Polycrisis: Balancing Flexibility and Cohesion (Alessandro Valenza, t33)

Mr Alessandro Valenza

S02 Cohesion Policy and Crises: Lessons from the Pandemic and the Ukrainian Aggression, and Pathways for the Future(RP), Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

The polycrisis context of 2020–2023 prompted an unparalleled degree of simplification and flexibility within Cohesion Policy. Drawing on the 2014–2020 Ex Post Evaluation (Work Package 12), this paper analyses the efficiency implications and longer-term risks associated with crisis-driven simplification. Evidence shows that rapid reprogramming and flexibilities, such as 100% co-financing, the increased use of financial instruments, simplified cost options and faster amendment procedures, enabled timely adjustments and supported emergency responses.
Building on established delivery systems enabled swift mobilisation while maintaining place-based governance structures. However, these measures also created administrative challenges and, in some cases, increased centralisation.
The evaluation identifies three dimensions of flexibility: executive, extraordinary, and extended. highlighting both opportunities and trade-offs. Although simplification improved responsiveness, concerns were raised regarding long-term strategic coherence and potential diversion from cohesion objectives. The lessons learned stress that flexibility is essential in crisis situations, but it must be balanced with preparedness, foresight, and
This paper discusses how simplification mechanisms could be institutionalised for future crises without undermining Cohesion Policy's long-term identity.

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Stress-testing cohesion policy: Lessons from the ERDF crisis responses 2014-2020

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S02 Cohesion Policy and Crises: Lessons from the Pandemic and the Ukrainian Aggression, and Pathways for the Future(RP), Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

Since 2020, Europe has experienced a sequence of overlapping crises that no policy framework could reasonably have anticipated: the COVID-19 pandemic, the large-scale displacement of people following Russia's invasion and the subsequent energy crisis. These shocks unfolded in rapid succession putting significant strain on regional economies and governance systems. In this context, cohesion policy, was called upon to respond with speed, flexibility and territorial sensitivity. The ex-post evaluation of European Regional and Development Fund (ERDF) crisis responses provides reflections on how cohesion policy functioned under extreme pressure, as well as gives valuable insights for enhancing preparedness and resilience in view of crises.

Beyond the introduction of specific crisis mechanisms, such as the CRII/CRII+, REACT-EU, CARE/FAST-CARE and SAFE, the experience highlights the importance of structural features of cohesion policy. These have been the shared management, the established programme structures, the existing networks, the place-based implementation. All these enabled a rapid programming, resources mobilisation, adaptation to region-specific needs, while at the same time maintaining the long-term cohesion objectives.

At the same time cohesion policy's crisis instruments demonstrated that Europe's resilience is uneven and territorial disparities can exacerbate crises. Cohesion policy must evolve in the future by reducing unnecessary complexity, strengthening the local capacity, investing in foresight for better anticipating crises, ensuring the long-term development goals.

The crisis response revealed that cohesion policy is more than a funding mechanism. Although the ERDF volumes mobilised were modest compared to the national measures in place, their added value was essential, especially for regions with limited fiscal space. The crisis response demonstrated that existing institutional arrangements managed to absorb the shocks of the polycrises and support territorial resilience in the EU. It also showed what must change if the EU is to cope with a next wave of disruptions. Cohesion policy can act as EU's backbone for territorial resilience by progressively equipping prepared territorial systems, capable institutions, trusted partnerships and adaptive delivery mechanisms. The session presentation will first outline the crisis context and the underlying framework of the ex-post evaluation of the ERDF crisis response. It will then briefly introduce the methodological approach and conclude with the main findings and lessons learned for strengthening cohesion policy preparedness and resilience in view of future crises.

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Health System Investments under Cohesion Policy: Emergency Response or Structural Strengthening?

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S02 Cohesion Policy and Crises: Lessons from the Pandemic and the Ukrainian Aggression, and Pathways for the Future(RP), Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

The COVID-19 pandemic placed unprecedented pressure on health systems across the European Union and rapidly evolved into a systemic economic and territorial crisis. In this context, Cohesion Policy provided an immediately available channel for emergency support. Through CRII/CRII+, REACT-EU and related flexibility measures, significant resources were redirected within the 2014–2020 framework towards urgent health investments.

Drawing on the health case study of the ex-post evaluation of the ERDF and Cohesion Fund 2014–2020, this paper examines to what extent the emergency use of Cohesion Policy effectively supported health systems and how this mobilisation affected longer-term structural investment priorities and implementation dynamics. The analysis covers six Member States and is based on triangulated evidence from programme data, indicators, document review and stakeholder interviews.

The findings indicate that Cohesion Policy played a complementary stabilisation role. Although it did not represent the main source of health financing during the pandemic, reprogramming and REACT-EU eased pressure on public finances and supported urgent investments in medical equipment, hospital capacity and laboratory infrastructure. In some cases, investments accelerated digitalisation and infrastructure modernisation, while in others short implementation periods and administrative constraints limited transformative impact.

The balance between emergency response and structural reform depended on framework conditions such as crisis severity, available unspent funds and national co-financing. Administrative capacity was decisive in determining how effectively crisis instruments could be used. The short implementation period, increased administrative workload and centralisation of crisis decisions placed considerable pressure on governance systems, often leading managing authorities to favour simpler and tried-and-tested projects to ensure timely execution.

The experience suggests that future Cohesion Policy design must reconcile crisis-responsiveness with the preservation of long-term territorial cohesion objectives.

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Economic and Non-Economic Instruments in Creating Adaptation to Climate Change in Polish Cities

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S04 Urban Climate Change Adaptation: Financial and Spatial Perspective(RP), Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Adaptation to climate change is a key element of contemporary urban development policy, understood as a process of adjusting urban systems to changing environmental conditions and strengthening their resilience to climate-related risks. The aim of the article was to identify, classify, and assess the effectiveness of economic and non-economic instruments used by Polish cities.
The empirical basis of the study was a questionnaire survey conducted in 135 cities as part of the project “Coincidences of the Ecologization of the Financial and Spatial Economy of Cities in the Context of Adaptation to Climate Change.” The analysis covered four areas: the effective-ness of instruments for the ecologization of spatial management, mechanisms of financial–spatial coordination, the usefulness of municipalities’ own-source revenues, and the application of cost–benefit analysis (CBA).
The analysis of the survey results indicates the predominance of planning and strategic tools over financial instruments. The highest-rated measures included standards for biologically active areas, green infrastructure networks, green roofs, and expert support. Financial instruments, such as tax reliefs or retention fees, were considered less effective due to low awareness among be-neficiaries, high implementation costs, and a lack of integration with subsidy schemes. Cost–benefit analysis (CBA) is applied in adaptation activities in a moderately widespread manner but has not yet become a universal or automatic procedure. It is used significantly more often in larger urban centers (with more than 100,000 inhabitants), and its application strongly co-occurs with the use of other efficiency assessment tools (ENPV/ERR, NPV/IRR).
In the assessment of the usefulness of own-source revenues as adaptation instruments, the hi-ghest rankings are given to those sources that are directly linked to environmental impacts, inc-luding fees related to water retention, waste management, and transport. This indicates that they are perceived as instruments with real regulatory and incentive potential. By contrast, traditional local taxes are treated mainly as stable sources of financing rather than as tools for shaping be-havior toward increased climate resilience.
The key conclusion, however, is the deficit of institutional coherence: in 60% of cities, there are no formal mechanisms linking the financial sphere with spatial planning in the context of adap-tation. Although more advanced organizational solutions can be observed in the largest cities, the overall picture suggests that adaptation to climate change has not yet been systematically integra-ted into the mainstream of local governance.

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The influence of climate change on scientific research program of public economics and urban economics

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S04 Urban Climate Change Adaptation: Financial and Spatial Perspective(RP), Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Climate change created the demand for the invention of new auxiliary hypothesis, which induced progressive problem-shift within both in general public economics scientific research programme (PESRP) and urban economics scientific research programme (UESRP). The difference between changes in PESRP and UESRP is because the new auxiliary hypothesis replace some of the old ones in protective belt of UESRP, but do not replace any of the old ones in protective belt of PESRP. I assume that, even before climate change, climate itself fails to be part of the hard core of both PESRP and UESRP. Based on this, I pose two research questions:

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Greening urban economies in the context of city functions and size – analysis of the coherence of spatial and financial measures

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S04 Urban Climate Change Adaptation: Financial and Spatial Perspective(RP), Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Contemporary cities face challenges related to growing urbanization pressure and climate change, which necessitate the adaptation of public policies to address these challenges. Effective policy requires an integrated approach in which spatial planning instruments and financial tools are interlinked and support the achievement of environmental objectives. The presented research concerns the greening of the urban economy in the context of the coherence of spatial and financial actions in Polish cities. An analysis of the scientific literature indicates that, despite the development of research on the greening of the urban economy, there is a lack of systematic analyses concerning the diagnosis of greening activities in the spatial and financial economy implemented in parallel in cities, as well as the identification of the integration of activities depending on the size of the city and its function in the settlement system. Filling this gap will allow for the formulation of practical recommendations for urban policy and the development of a theory of environmental policy integration not only in Polish cities but also in cities in Central and Eastern Europe.
The research analysis covers 135 cities, which were classified according to size (small, medium, large) and function in the settlement system (national, regional, local). The research was conducted in the form of surveys addressed to local government units responsible for spatial planning and financial policy.
The analysis of the data showed that the coherence of environmental measures in Polish cities varies and depends heavily on the size of the city and its function in the settlement system. Large cities are characterized by the highest level of integration of instruments, including coordinated spatial planning, investments in environmental infrastructure, and the implementation of financial mechanisms supporting environmental projects. The article also identifies factors that promote and limit the consistency of actions, such as the availability of financial resources, administrative competencies, interdepartmental coordination, and national policy support.
This article aims to identify the extent of coherence in greening policies in Polish cities, taking into account their size and function in the settlement system.

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Investment needs and opportunities of polish cities in the context of adaptation to climate change

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S04 Urban Climate Change Adaptation: Financial and Spatial Perspective(RP), Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Growing climate pressures and the associated need to develop Municipal Adaptation Plans (MAPs) increase the importance of implementing measures to adapt to climate change, especially in urban areas. It is becoming important to build urban resilience by, among other things, shaping urban spaces and undertaking initiatives in the field of greening spaces, appropriate water management, and many others. However, there are still few studies describing the relationship between declared adaptation needs and the actual investment power of cities. The aim of this article is to identify this gap and to define a typology of priorities and spatial diversity of adaptation measures in Polish cities. The research method was desk research and surveys conducted among 135 cities in Poland. Respondents assessed the scale of adaptation needs to climate change and indicated up to five possible actions that could be taken within five years. Two hypotheses were verified: (H1) larger cities and/or those with a higher per capita budget have greater opportunities to implement adaptation measures; (H2) cities more often prioritise “greening” than comprehensive blue-green and energy interventions. The results show a discrepancy between the high assessment of needs and the limited scope of possible actions to be taken. Hypothesis H1 was partially confirmed – larger and wealthier cities show greater potential for action. Hypothesis H2 was confirmed – spot and greening actions dominate compared to integrated and capital-intensive initiatives. The main barriers are financial, human resource, and institutional constraints. These results highlight the need for better coordination of climate adaptation with spatial planning and for increasing the implementation capacity of cities.

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Investment Needs and Opportunities of Polish Cities in the Context of Adaptation to Climate Change

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S04 Urban Climate Change Adaptation: Financial and Spatial Perspective(RP), Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Growing climate pressures and the associated need to develop Municipal Adaptation Plans (MAPs) increase the importance of implementing measures to adapt to climate change, especially in urban areas. It is becoming important to build urban resilience by, among other things, shaping urban spaces and undertaking initiatives in the field of greening spaces, appropriate water management, and many others. However, there are still few studies describing the relationship between declared adaptation needs and the actual investment power of cities. The aim of this article is to identify this gap and to define a typology of priorities and spatial diversity of adaptation measures in Polish cities. The research method was desk research and surveys conducted among 135 cities in Poland. Respondents assessed the scale of adaptation needs to climate change and indicated up to five possible actions that could be taken within five years. Two hypotheses were verified: (H1) larger cities and/or those with a higher per capita budget have greater opportunities to implement adaptation measures; (H2) cities more often prioritise “greening” than comprehensive blue-green and energy interventions. The results show a discrepancy between the high assessment of needs and the limited scope of possible actions to be taken. Hypothesis H1 was partially confirmed – larger and wealthier cities show greater potential for action. Hypothesis H2 was confirmed – spot and greening actions dominate compared to integrated and capital-intensive initiatives. The main barriers are financial, human resource, and institutional constraints. These results highlight the need for better coordination of climate adaptation with spatial planning and for increasing the implementation capacity of cities.

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Student Digital Vulnerability: A Cross-Country Analysis

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S05-1 Digitalisation, Skills, and Regional Transformation, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 28, 2026, 09:00 - 10:30

The use of digital technologies in European education systems has expanded substantially in recent years, particularly following the widespread adoption of hybrid and online learning models. Nonetheless, a non-negligible share of students continues to face digital vulnerability, understood as the risk of having limited access to adequate digital devices, insufficient internet connectivity, or low levels of digital competence. According to EU-SILC data, around 5.4% of school-aged children (6-16) live in households unable to afford a computer or internet connection (Ayllón et al., 2023). Moreover, results from ICILS 2023 indicate that approximately 43% of 14-year-olds in the EU fail to reach a basic level of digital literacy.
Recognizing the importance of digital competencies for future labor-market participation, the European Commission has set clear goals and actions through its Digital Education Plan (2021-2027) and the Digital Decade 2030 agenda. These initiatives aim to ensure universal access to digital learning, strengthen student digital skills, upskill teachers, and integrate ethical and safe use of technology in education, thereby preparing students for a competitive, digitally driven economy. Alongside these institutional efforts, a flourishing economic literature has been developed in recent years. Several studies, surveyed in the next section, have focused on the digital divide analysing how family background, school resources, and territorial disparities contribute to unequal digital access and skills acquisition among students. However, despite the growing interest in student digitalization, student digital vulnerability in European countries has not yet been systematically investigated.
This paper seeks to fill this gap by constructing a harmonized measure of student digital vulnerability and applying it to recent cross-country European data. Using microdata from the latest edition of PISA (2022), we first develop a comparable index capturing the two key dimensions of digital vulnerability, i.e. material and skills vulnerability for 9 EU countries (Austria, Belgium, Germany, Denmark, Spain, Finland, Greece, Italy and Sweden). We then investigate the main factors associated with these vulnerabilities, documenting how individual characteristics, family background, and school-level resources contribute to shaping digital disadvantage among students.

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When Infrastructure Is Not Enough: The Emergence of Competence-Based Digital Inequalities in a High-Connectivity Region

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S05-1 Digitalisation, Skills, and Regional Transformation, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 28, 2026, 09:00 - 10:30

This paper investigates digital inequalities in Liguria, a north-western Italian region that offers a particularly meaningful regional case within the broader European digital transition. Liguria combines high levels of internet connectivity with distinctive structural characteristics: one of the oldest age structures in Europe, pronounced territorial fragmentation between coastal urban centers and small inland municipalities, and persistent socio-economic disparities across provinces. These features make it an especially relevant context for analyzing how digital divides evolve in regions where infrastructure is largely consolidated but social and demographic vulnerabilities remain significant. The study integrates Eurostat and ISTAT data with original evidence from the RAISE 2025 survey, allowing us to position Liguria within the national and European landscape while examining digital access, skills, and attitudes at the micro level. The analysis focuses primarily on access to the internet and digital tools and on digital competences, while also briefly addressing attitudes toward emerging technologies.
Overall, the Ligurian case highlights a transformation in the nature of digital inequality: the primary divide is no longer infrastructural but competence-based and socially stratified. In a region characterized by high connectivity yet marked demographic ageing and territorial fragmentation, policies aimed at digital inclusion must move beyond broadband expansion and prioritize lifelong learning, targeted interventions for older and economically vulnerable populations, and place-sensitive strategies for peripheral areas. By focusing on a regional context that is both digitally advanced and structurally fragile, this study contributes to a more nuanced understanding of digital inequalities within contemporary European regions.

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The Household as a Digital Divide: Family Structure and Computational Skills in Mexico, 2024. A demographic and regional approach

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S05-2 Digitalisation, Skills, and Regional Transformation, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 28, 2026, 11:00 - 13:00

This study examines digital literacy among children and youth in Mexico, emphasizing the role of household composition in shaping inequalities in computer skills. Using data from the 2024 National Survey on the Availability and Use of Information Technologies in Households (ENDUTIH). It is built a Computer Literacy Index (CLI) for individuals aged 6 to 24. The index synthesizes a range of competencies—from basic tasks such as email use and file management to more advanced abilities including database management and programming—through Multiple Correspondence Analysis (MCA). The resulting standardized measure (0–100 scale) captures 50% of the total variance in digital skills.

Descriptive results show that approximately 49% of the population aged 6–24 uses a computer, indicating broad yet incomplete access. Gender differences in digital literacy are minimal once access is achieved, suggesting a narrowing digital gender gap. In contrast, age displays a strong and consistent gradient: children aged 6–11 exhibit very low average skill levels, adolescents show substantial improvement, and young adults aged 18–24 reach the highest scores. This pattern reflects cumulative learning processes linked to schooling, cognitive development, and increasing autonomy in technology use.

Socioeconomic status emerges as a key axis of inequality. The CLI increases systematically with household economic position, highlighting persistent structural barriers in the development of digital competencies. Beyond these classical demographic variables, household structure introduces additional differentiation. Youth living in single-parent households exhibit slightly higher digital literacy levels than those in two-parent or extended households. However, disaggregation by sex of the household head reveals that internal household dynamics—particularly resource allocation and educational prioritization—may be more consequential than structural composition alone.

Territorially, Mexico City and Tlaxcala record the highest levels of digital literacy, with a broader Central–Bajío–Northern Border corridor displaying relatively strong performance. Southern and coastal states show lower averages, reflecting enduring regional disparities.

Overall, the findings suggest that digital inequality in Mexico is shaped primarily by age and socioeconomic stratification, while household organization moderates opportunities for digital skill development. Policies aimed at digital inclusion should therefore move beyond expanding connectivity and prioritize early skill formation within structurally disadvantaged contexts.

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The geography of digital transformation: Skill diversity, product innovation, and firm performance in Poland

Ms Weronika Wilczewska[1]
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S05-2 Digitalisation, Skills, and Regional Transformation, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 28, 2026, 11:00 - 13:00

This paper investigates the relationship between digital skill diversity demanded by Polish manufacturing firms and the degree of digitalization embedded in their product offerings, with particular attention to how this mechanism varies across NUTS-2 regions. While existing literature has established links between digital competences and firm-level performance, two critical gaps persist: the channel through which heterogeneous digital skills become translated into tangible product features remains empirically under-explored, and the moderating role of regional knowledge infrastructures in this process is largely overlooked. We address both gaps by asking whether product digitalization mediates the skills–performance relationship, and whether regional innovation ecosystems amplify or constrain this mediation.
We propose a novel measurement framework integrating three complementary data sources for the period 2020–2025. First, we analyse online job postings from major Polish recruitment platforms, classifying demanded skills according to the European Skills, Competences, Qualifications and Occupations (ESCO) taxonomy. From these classified postings, we construct firm-level indicators of digital skill intensity and diversity—including Shannon entropy and the Herfindahl–Hirschman Index—subsequently aggregated to NUTS-2 regions. Second, we perform systematic content analysis of corporate websites, including historical snapshots retrieved via the Wayback Machine, to construct a multidimensional product digitalization index. This index captures concrete digital features identified in product descriptions: IoT connectivity, AI/ML components, cloud integration, process automation, data analytics capabilities, and digital user interfaces. Third, we collect firm-level financial data from the Polish National Court Register (KRS) to measure performance outcomes. Methodologically, we employ panel models with firm fixed effects, lagged skill measures, and coarsened exact matching (CEM) to mitigate endogeneity and selection concerns. We test three hypotheses: (1) digital skill diversity predicts product digitalization trajectories, (2) product digitalization mediates the relationship between skill diversity and financial performance, and (3) these effects vary significantly across Polish regions. We anticipate that skill diversity—rather than mere intensity—drives digital product recombination, that this effect is amplified in regions with denser innovation ecosystems, and that pronounced regional disparities in skill portfolios contribute to a widening digital divide in manufacturing output. The findings carry direct implications for regional smart specialization strategies and EU cohesion policy targeting the digital transformation of industry.

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Regional Variations in Innovation Resilience, PhD Employees and Digitalization efforts

Dr. Adelheid Holl[1], Prof. Ruth Rama[1]
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S05-2 Digitalisation, Skills, and Regional Transformation, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 28, 2026, 11:00 - 13:00

This paper examines the role of advanced human capital and digitalization in shaping firms' innovation resilience during the COVID-19 pandemic, with particular attention to regional heterogeneity. Using firm-level microdata from the 2020 Spanish Innovation Survey, which includes a dedicated COVID-19 module, we analyse three dimensions of crisis-induced innovation behaviour: engagement in unplanned innovation activities, COVID-19-related R&D, and increases in R&D expenditure triggered by the pandemic. We focus on two analytically distinct yet complementary firm-level resources: the presence of PhD-trained employees engaged in R&D and innovation activities, and firms' digitalization efforts, proxied by investment in software and databases.
The results indicate a robust positive association between both advanced human capital and digitalization and firms' innovation resilience during the crisis, particularly for adaptive and opportunity-driven innovation responses. Firms employing PhD-level innovation personnel are significantly more likely to initiate new or reoriented innovation activities under crisis conditions, highlighting the importance of highly specialised and adaptable knowledge for coping with unexpected shocks. Similarly, firms that invested in digital technologies exhibit higher probabilities of engaging in COVID-19-related R&D and increasing innovation expenditure, underscoring the role of digital capabilities in enabling rapid reorganization of innovation processes.
We further explore regional heterogeneity by examining interaction effects between firm-level resources and regional context. While the relationship between PhD innovation employees and innovation resilience varies only modestly across regions, the marginal contribution of digitalization is more context-dependent. In particular, digital investments display weaker marginal effects in industrial core regions, suggesting diminishing short-run returns to digitalization where pre-existing capabilities are already well developed. The findings highlight the multilevel and context-sensitive nature of innovation resilience and provide insights for regionally differentiated innovation and digitalization policies in times of crisis.

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Designing Inclusive Digital Capacity Building in Rural Innovation Contexts through Multi-Actor Platforms

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[1]University of Pisa

S05-2 Digitalisation, Skills, and Regional Transformation, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 28, 2026, 11:00 - 13:00

Digitalisation is a central driver of regional transformation and a key dimension of the twin transition affecting European rural areas. Despite ambitious EU strategies, persistent digital divides remain: rural regions continue to lag behind urban areas not only in infrastructure provision but also in digital skills attainment and effective technology uptake. While DigComp has become the main institutional reference framework for digital competence development at EU level, limited empirical attention has been devoted to how such frameworks are operationalised within territorially embedded innovation processes. This paper asks: how can digital skills and competence development be operationalised across diverse EU rural contexts by combining DigComp as a non-prescriptive framework with participatory and context-sensitive approaches? We adopt DigComp 3.0 as a conceptual starting point and interpret it as a boundary object that provides a shared vocabulary for competence development. The study examines six rural Multi-Actor Pilots (MAPs) within the Horizon Europe project FUTURAL, which prototypes community-led Smart Solutions addressing local societal, environmental, and economic challenges. The MAPs function as territorially embedded innovation platforms where digital competence development is linked to technological deployment through co-created training strategies. Methodologically, the research applies a multi-sited comparative design based on mixed methods, combining structured post-workshop surveys with qualitative data from workshops, pilot documentation, and MAP leaders' reflections. A harmonised capacity-building framework has been used to ensure comparability, while training design remains context-sensitive, incorporating literacy adaptation, accessibility measures, multilingual materials, and differentiated competence levels. Preliminary findings indicate that competence building strategies are calibrated to the intended user base of each Smart Solution, ranging from specialised stakeholders to broader community groups. The results illustrate how participatory approaches grounded in DigComp can support territorially embedded human capital formation, reinforcing the role of capacity building as a driver of rural digital transition.

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Mapping Energy Poverty in Lombardy Using a Fuzzy Multidimensional Index

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S06 Advances in the energy transition: efficient buildings and sustainable industrial processes(RP), Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

The ecological transition and decarbonization agenda have brought energy poverty into sharp focus. However, despite growing policy and academic attention, consensus on its definition or measurement remains elusive. This paper proposes a novel multidimensional energy poverty index based on a fuzzy set approach (fMEPI), addressing three key principles: the multifactorial nature of energy poverty, the limitations of binary classifications, and the need for indicators computable at local scales. Drawing on administrative, census, and modelled data, the index integrates five dimensions: housing conditions and energy efficiency, residential energy consumption, financial capacity, climate conditions, and energy-related needs. Applied to the Lombardy region (Italy), results reveal that vulnerability is concentrated in mountainous and hilly areas, and that large municipalities exhibit significant intra-urban heterogeneity. The proposed methodology offers a practical tool for regional and local authorities to design and target policies against energy poverty.

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Supercapacitors as a system-level solution for enhanced self-consumption strategies

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S06 Advances in the energy transition: efficient buildings and sustainable industrial processes(RP), Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

In the recent past, new frontiers have opened up in the field of district-level energy generation and utilization, due to the promulgation of the European Renewable Energy Directive. In this work, carried out under the MASE - ENEA program agreement on Electrical System Research, we introduce the new expanded composition and operation logics of the experimental test facility S.A.P.I.EN.T.E. installed at the ENEA Casaccia Research Centre (north of Rome), in a state of continuous plant evolution. Then, we demonstrate, through initial experimental activities, and a sequent extensive experimental campaign, the advantages in terms of energy self-consumption and self-sufficiency that the use of supercapacitors can bring in the context of Renewable Energy Communities and Jointly Acting Renewable Self-Consumers.

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First evidence from the Smart Readiness Indicator test phase in Italy for non-residential buildings

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S06 Advances in the energy transition: efficient buildings and sustainable industrial processes(RP), Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

The Smart Readiness Indicator (SRI), introduced under the Energy Performance of Buildings Directive (EPBD) III, assesses a building's capability to use smart technologies by evaluating three key functionalities: optimising energy efficiency and operational performance, adapting to occupants' needs, and interacting with the electricity grid to enable energy flexibility. Article 8 of Commission Implementing Regulation (EU) 2020/2156 allows Member States to conduct a voluntary national testing phase of the SRI. In Italy, the Ministry of the Environment and Energy Security (MASE), with technical support from ENEA, launched a 12-month national test phase in March 2025. This study reports the first results from selected case studies evaluated within this new technical framework developed by European Commission.
The assessments applied the official European SRI calculation sheet (version 4.5), using Method B for a full evaluation of 54 smart services across nine technical domains: Heating, Cooling, Domestic Hot Water, Ventilation, Lighting, Dynamic Building Envelope, Electricity, Electric Vehicle Charging, and Monitoring and Control. Seven impact criteria were considered, including energy efficiency, comfort, occupant information, and energy flexibility and storage. All domains were treated as mandatory to ensure comparability with other Member States' test phases. Case studies focused on non-residential buildings (offices, educational, and healthcare facilities) with nominal thermal power above 290 kW, equipped with medium- to high-level Building Management Systems (BMS).
Results show average SRI values of around 40% for office and educational buildings, with maximum values near 45%. Performance is mainly limited by the "Grid" key functionality, which remains low due to the absence of active grid-related services despite the technical readiness of BMSs. High scores were observed in lighting and mechanical ventilation, particularly when occupancy-based controls were used. More recent buildings, constructed after 2010, achieved higher SRI scores, highlighting the positive effect of regulatory requirements for advanced building automation and control systems. These findings suggest that future improvements will rely primarily on regulatory and market developments enabling building–grid interaction.

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Does Institutional Quality Affect Individuals' Perceptions of Inequality? Yes, but only at the local level

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S07-01 Methods for the evaluation of EU economic dynamics and policies, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

This study investigates whether regional institutional quality influences individuals' subjective perception of inequality in Italy. While research typically focuses on objective economic measures, this paper addresses the gap in understanding how governance affects psychosocial experiences of disparity. Using a novel dataset of 1,300 respondents merged with the Institutional Quality Index (IQI), the authors employ a multilevel OLS approach to analyze perceptions at local, national, and global levels. The results reveal that higher institutional quality—particularly corruption control and government effectiveness—is significantly associated with lower perceived inequality, but only at the local level. Interestingly, objective income and national Gini indices fail to explain perceptions at broader scales, highlighting the "parochial" nature of institutional influence. These findings suggest that local governance reforms are essential for mitigating perceived social disparities and fostering social cohesion.

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Cohesion versus Competitiveness: False dilemma or real trade-off?

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S07-01 Methods for the evaluation of EU economic dynamics and policies, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

Over the past decades, EU Cohesion Policy has been the Union's main tool to reduce territorial disparities while supporting economic development. As debates on the post-2027 budget increasingly emphasize competitiveness, innovation, and strategic autonomy, questions arise about whether a stronger focus on growth may conflict with cohesion objectives. This paper examines whether Cohesion Policy generates trade-offs or synergies between competitiveness and territorial convergence.
Using a panel of NUTS3 regions over 2014-2024, the analysis applies a two-step Generalized Method of Moments estimator to address endogeneity in funding allocation. Beyond average regional effects, the study assesses how Cohesion Policy reduce territorial inequalities, while promoting overall competitiveness. Competitiveness is measured through labour productivity and capital deepening, alongside indicators of territorial inequality.
The findings show no evidence of a trade-off between cohesion and competitiveness. Cohesion Policy is associated with labour productivity growth and a reduction in regional disparities, with effects materializing after a time lag. Impacts are non-linear, suggesting diminishing returns at high funding levels and the relevance of absorptive capacity. From a policy perspective, the results challenge the notion that cohesion and competitiveness represent competing objectives. They can be compatible and mutually reinforcing, provided that policy design accounts for regional capacity constraints, timing of effects, and diminishing returns. A more tailored, context-sensitive approach to Cohesion Policy is therefore essential to maximise both growth and convergence outcomes.

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The Use of Financial Instruments for Small Business Innovation: A Review of Policy Outcomes and Structural Gaps.

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S07-01 Methods for the evaluation of EU economic dynamics and policies, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

Purpose: This systematic review of the literature examines the effectiveness of public financing programs for innovative small and medium-sized enterprises (SMEs) during the post-pandemic period, identifying key research gaps and future research directions.
Methodology: Following the PRISMA 2020 guidelines, we conducted a systematic review by AI-assisted active learning (ASReview) to refine the screening process and minimize selection bias. The final analysis includes 42 peer-reviewed articles from Web of Science and Scopus. The search focused on public financing instruments including grants, tax incentives, loan guarantees, and equity/quasi-equity mechanisms. Studies were systematically selected using predefined inclusion/exclusion criteria and methodological quality was assessed.
Key Findings: Evidence strongly supports that public financing generates positive input additionality, stimulating private R&D investment without crowding out private funds. Effectiveness is highly heterogeneous, with the greatest impact observed in younger, smaller and financially constrained firms. The certification effect—whereby public funding signals firm quality to private investors—emerges as a critical mechanism. However, research gaps persist, including insufficient granular firm-level data, under exploration of non-financial support mechanisms, limited understanding of different innovation modes (particularly DUI—Doing, Using, Interacting), and contradictory findings regarding optimal instrument design. Emerging research areas include inclusive digital finance, green innovation financing, and Europe's "scale-up gap."
Implications: Policymakers should prioritise information dissemination over simply increasing fund availability, tailor instruments to firm heterogeneity, and simplify administrative processes. Future research must develop integrated longitudinal datasets, employ more experimental designs, and address the "black box" of non-financial support.

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Ex-Ante Policy Impact Assessment Tool for Locally Implemented Public Investment Policies

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S07-01 Methods for the evaluation of EU economic dynamics and policies, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

Achieving meaningful territorial cohesion through public policy intervention requires a careful evaluation of the impact. This also means addressing the potentially heterogeneous impact within a region, such as between urban, rural, and remote areas. Advancements in the theoretical and empirical understanding of heterogeneities between places imply that administering similar interventions across spaces can yield heterogeneous results, as seen in place-based policies. Literature (e.g., Fratesi, 2020; Fratesi and Wishlade, 2017) highlights that differences in socioeconomic
context between places can act as a catalyst or dampener in a policy intervention mechanism that can boost or hinder the achievement of an optimal policy outcome. This phenomenon is a double-edged sword for the accountability of public budget spending.
This spatial heterogeneity of policy impact is well-known and well-documented at the regional scale, where data is readily available (e.g., Bachtrögler et al., 2020; Crescenzi and Giua, 2020). However, this is not the case for the sub-regional scale. A proper policy evaluation should be done at the corresponding scale where the policy is implemented. Yet most evaluation practices still shy away from carrying this out due to the paramount challenge of data availability (Gibbons et al., 2014). The failure to acknowledge this will blur out the important insights on where and how policy intervention works or fails.
This paper proposes a way to carry out ex-ante policy impact evaluation on a sub-regional or local scale. This is important in helping countries and regions plan their geographical distribution of resources to efficiently achieve optimal policy outcomes. To achieve its objective, this research combines spatial microsimulation, a geographical data disaggregation method, and discrete choice modelling based on an economic structural model to allow for policy scenario simulations. Spatial microsimulation is an established method to geographically disaggregate microdata by combining survey microdata, taking advantage of the extensive information on socio-economic characteristics of each survey sample, and census data with its complete coverage of the population. This data disaggregation is done to complement the well-established discrete choice modelling in economics, which is able to simulate different policy scenarios in accordance with the latest theoretical economic understanding of labour supply response among working-age mothers.
This paper takes on the case of Italian public investment in formal public childcare capacity expansion under the Piano Nazionale di Ripresa e Resilienza (PNRR). This policy aims to address the national gender employment gap problem in order to achieve the Barcelona Target 2030 and the overarching targets of the European Pillar of Social Rights. This case is chosen given its timely relevance and the magnitude of public attention, given the amount spent out of the public budget.

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How Effective Is EU Cohesion Policy? Evidence from a Regression Discontinuity Approach

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S07-01 Methods for the evaluation of EU economic dynamics and policies, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

The EU Cohesion Policy (CP) is a central instrument of the Union's strategy to promote balanced development across member states, targeting less developed regions through investments in infrastructure, innovation, and environmental sustainability to reduce economic and social disparities. A large body of literature has examined the impact of CP on regional economic performance using a wide range of empirical approaches. More recently, however, the focus has shifted toward the identification of causal effects, with an increasing number of studies relying on Regression Discontinuity Design (RDD), which is particularly suitable for evaluating the policy since its structure allows for a quasi-experimental design approach.
Recent RDD-based studies, including Percocco (2017) and Bachtrögler et al. (2020), highlight the importance of regional context in shaping the effectiveness of CP. However, most studies relying on this approach fail to account for the spatial heterogeneity in the allocation of funds. Although CP formally distinguishes less developed (treated) from more advanced regions (non-treated), the latter grouping together EU transition and more developed regions, all EU regions receive support, and funding levels vary widely even within the group of less developed regions.
Against this background, Cerqua and Pellegrini (2018) represent the only contribution to date that extended the RDD framework to explicitly incorporate treatment intensity (i.e., different levels of fund allocation) for CP evaluation over the 1994-2006 period. Building on their contribution, our study evaluates the effects of the policy over the 2008–2023 period, which remains largely unexplored in the existing literature, by applying recently developed continuous-treatment RDD approaches, such as that proposed by Dong et al. (2023). The empirical analysis utilizes regionalized and annualized data on CP payments provided by the Directorate-General for Regional and Urban Policy of the European Commission (EC, 2017), enabling us to move beyond the conventional programming-period framework and capture the time-varying intensity of EU support. Preliminary results suggest that, among less developed regions, intermediate levels of funding are associated with negative and statistically significant marginal effects, indicating the presence of allocation and absorption inefficiencies in Southern European regions, particularly in Portugal and Greece.

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The Making of Regional Inequality: Market Stages in an Integrated or Fragmented World

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S07-02 Methods for the evaluation of EU economic dynamics and policies, Hall 2 - North Building, agosto 28, 2026, 11:00 - 13:00

The current geopolitical landscape is highly fragmented and complex. It is characterized by rising tensions, shifting alliances, and by a largely uncertain global governance. This turbulence has dire consequences, especially at territorial level: it may contribute to widening interregional disparities. Prior ex ante assessments of the way these instabilities may find a solution suggest that a scenario with the EU deepening its internal integration, coupled with tighter global economic linkages (Integration scenario), would yield stronger economic performance, associated with smaller increases in cross-country disparities. By contrast, a scenario with looser internal integration within the EU, coupled with a fragmented global economy (Fragmentation scenario), would bring about comparatively larger within-country disparities, as slower economic expansion would keep internal inequality more contained.

In this paper we propose a set of simulations aiming at disentangle the role played by pre-market, in-market, and post-market factors in driving regional inequalities. Simulations are based on the fifth generation of the MAcroeconometric Social Sectoral Territorial (MASST5) model.

Our results suggest a mosaic of often contradictory effects. Should either state of the world depicted in the two scenarios prevail, our simulation results provide a detailed picture of the mechanisms driving overall results, thereby informing policy interventions aiming at minimizing the negative effects of specific development patterns.

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Towards an evidence-based learning cycle of EU cohesion policy: combining ex-ante assessments and ex-post evaluations through meta-analyses

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S07-02 Methods for the evaluation of EU economic dynamics and policies, Hall 2 - North Building, agosto 28, 2026, 11:00 - 13:00

This paper discusses the potential for an evidence-based EU cohesion policy cycle inspired by the recommendations of Barca (2009), where ex-ante modelling exercises continuously learn from ex-post evaluations from previous studies on the effectiveness of past policy interventions. We argue that meta-analysis could be an ideal tool to combine all prior knowledge and update key parameters for subsequent spatial general equilibrium and scenario modelling. To illustrate this potential, we apply a systematic literature review of nine recent EU policies and initiatives with explicit spatial impacts that could be synergetic with the EU cohesion policy. Our findings reveal at best a very limited availability of econometric ex-post impact assessments or policy evaluations for most of the policies that we consider. Especially studies with a causal design are almost non-existing. We therefore signal a strong need for more ex-post primary impact evaluations that are essential for the ambition to learn from and improve upon policy practices in financially one of the largest policy domains of the European Union.

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LIRI (Local Industrial Resilience Index): regional resilience through resilient neighbourhoods measured on grid-level data

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S07-02 Methods for the evaluation of EU economic dynamics and policies, Hall 2 - North Building, agosto 28, 2026, 11:00 - 13:00

Regional economic resilience is widely acknowledged as a multidimensional and spatially uneven process, yet most empirical studies continue to treat regions as homogeneous units. This paper advances a micro-spatial perspective on resilience by arguing that regional resilience emerges from the resilience of local neighbourhoods and industrial ecosystems. We introduce the Local Industrial Resilience Index (LIRI), a novel grid-level measure that captures how resistance, recovery, renewal, and reorientation jointly shape adaptive capacity at the sub-regional scale. Using geo-referenced firm-level data for the Warsaw metropolitan region (Mazowieckie Voivodeship, Poland), we operationalize resilience on a 2 × 2 km grid over the period 2012–2021, allowing us to uncover patterns that remain invisible in aggregate regional analyses

Methodologically, LIRI integrates firm survival and birth dynamics with detailed measures of local industrial structure, including specialisation, diversity, concentration, and related variety. Resistance and recovery are derived from deviations between observed and expected firm survival and entry, while renewal and reorientation capture the degree to which new firms branch into related or unrelated activities. This multidimensional framework explicitly balances short-term robustness with longer-term adaptability. By grounding resilience in firm-level behaviour and local industrial relatedness, the index provides a micro-founded and spatially fine-grained measure of industrial resilience.

Empirical results show that resilience does not follow a simple core–periphery pattern. While the Warsaw core exhibits high resilience, several medium-sized towns also display strong adaptive capacity, whereas many peripheral and mono-industrial neighbourhoods remain structurally vulnerable. Related variety emerges as a key driver of local resilience, fostering both firm survival and adaptive renewal, while high sectoral concentration consistently undermines resilience across all dimensions. These findings demonstrate that regional resilience is an emergent property of interconnected local industrial ecosystems rather than a function of scale or density alone. The paper contributes to evolutionary economic geography and resilience research by offering a transferable measurement framework and provides actionable insights for place-based, ecosystem-oriented regional policy.

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Do EU-funded research networks reinforce strategic autonomy? Evidence from artificial intelligence

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S07-02 Methods for the evaluation of EU economic dynamics and policies, Hall 2 - North Building, agosto 28, 2026, 11:00 - 13:00

The establishment of more research networks in Europe is considered critical to achieve more strategic autonomy and technological sovereignty in strategic area. There is however, little empirical research on how such networks can advance these objectives and under what conditions. The paper assesses the impact of technology-specific EU-funded research networks on patent activity, using artificial intelligence as a case study. By combining the entropy balancing matching approach and weighted least squares regression, together with regional data, we found a robust positive effect of AI-funded research networks on AI-patenting activities between 2013 and 2021. While the network strength exhibits a monotonic relationship with patent activities, the effect of network centrality, capturing quality and prestige, follows an inverted-U-shaped pattern highlighting the need for more widespread networks beyond major hubs. The level of development, sectoral concentration and the degree of innovativeness further amplifies the magnitude of these effects. In addition, we find evidence of knowledge and technological spillovers from AI-funded research networks to other areas of patenting, notably biotech and environmental innovation. Several policy implications can be drawn from these findings. First, EU programmes aimed at fostering interregional innovation collaborations, most notably Horizon Europe, should be further strengthened as part of the broader policy agenda to advance strategic autonomy. In this respect, the European Commission's proposal to increase the future budget of Horizon is consistent with the need to reinforce cross-border knowledge linkages in strategic technological domains. Second, policy efforts should not only increase the intensity of collaborations but also encourage a wider diffusion of network linkages beyond the current core of highly central hubs. Evidence about diminishing marginal returns related to excessive centrality suggests that overly concentrated network structures may limit additional innovation benefits.

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Local Ecological Provision and Cultural Capital across India's Regions

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S10 Culture Based Development in the Regions of India, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 28, 2026, 09:00 - 10:30

This paper aims to review the cultural reasons behind the different water access across the regions of India using the data from National Family Health Survey for the years 2019-2021 and combining it with the cultural data from the Survey on Literacy and Culture of India for the year 2014. I compiles the dataset that allows me to test the working hypothesis that is in the presence of economic controls. The local cultural capital plays a significant role in explaining which type of water source is predominantly used by households. In order to quantify the local cultural capital, the current study employs the Culture Based Development (CBD) paradigm and obtains the cultural heritage (CH) and living culture (LC) components for every region. In addition, cultural heritage and living culture are next used to calculate the local cultural entropy (CE). The results show that the cultural variables always matter yet using only CH and LC have inconclusive directions, while cultural entropy has a persistent positive association with the use of higher quality of sources of water.

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Cultural Discrimination and Behavioural Polarization

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S10 Culture Based Development in the Regions of India, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 28, 2026, 09:00 - 10:30

This paper analyses discrimination as a trigger for polarization. We distinguish between economic and social aspects of discrimination as well as between individual and regional level. Specifically, we culturally augment an economics of identity model, by explaining the choice of insider or outsider identity based on discrimination and using this choice as a predictor of individual and local degree of polarization in cultural attitudes. Using data from the German Socio-Economic Panel (IAB- BAMF-SOEP refugee subsample) about Syrian, Iraqi, Afghan and Eretria refugees in 2016-2019, we employ a unique approach to quantifying the polarization of individual attitudes (i.e. the individual polarization). We find consistent evidence that on individual radicalization and polarization seem to be a culturally sensitive effect on individual level in terms of being associated with subjective perception of experienced discrimination. Refugees' subjective experience of being discriminated in the receiving country leads to a negative polarization of the individual values or attitudes regarding democratic institutions and gender norms, but also with respect to happiness. Yet, on the regional level these feelings seem to develop mostly in places that suffer from relative economic deprivation. Finally, a cultural entropy measure for the balance between the traditional and modern attitudes in a place seems to most successfully explain the average levels of polarization of individuals in a locality.

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Public Goods, Cultural Entropy and Beggars across India's Regions

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S10 Culture Based Development in the Regions of India, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 28, 2026, 09:00 - 10:30

'Being kind to strangers for one's own sake' is an old CBD contribution, showing the benefits of kindness to strangers for local development. But is this kindness to strangers equitable or economically endogenous – are places less kind to those less privileged and why? Using data on beggars across the states of India, this paper explores the role of local rebalancing of the minds through aesthetic education into cultural heritage and living culture. The Cultural Entropy measure shows how better balance between the two types of aesthetic exposure of the mind associates with a more compassion to poor individuals locality, when controlling for overall wealth and inequality in places. The paper next delves into the association between overall public good provision locally and its equitable accessibility to the poor individuals as conditioned by the local Cultural Entropy.

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Hate Speech, Institutions and Hate Crime: Teressa May’s anti-immigrants interviews and stop-and-search evolution across the UK regions

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S11 The CBD Tiebout-Hirschman-Rothschild Model & Ultra-Right Voting, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 28, 2026, 15:00 - 16:30

Can individual political agency, biased with taste for discrimination, create significantly impactful narratives that can sway the behaviour of important institutions such as the police force without officially changing the law? This paper studies the case of Theresa May's hostile rhetorical legacy on immigrants, recorded in a press database, and its temporal association with the rise of stop-and-search policy practice among people of colour in the United Kingdom in the period of her being in political power. A difference in differences methodology is employed to delve into the causal direction between political hate speech and the tendency to rising hate crime of the institutions. Specifically, the paper delves into the type of regional milieu in which the hate speech was most impactful. The results reveal the role of the Tiebout-Hirschman-Rothschild mechanism for making places more vulnerable to hate speech instigating hate crime by the institutions.

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The Mechanism behind Thatcher’s Reconfiguration of Class Relations in the UK

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S11 The CBD Tiebout-Hirschman-Rothschild Model & Ultra-Right Voting, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 28, 2026, 15:00 - 16:30

The paper aims to examine how Thatcherism reconfigured British class relations. To that end it considers Thatcher’s flagship policy of crushing the trade unions. We test empirically which is the main factor that allowed this policy to come in place: shifting cultural attitudes, institutional-political agency, or socio-economic deprivation. The aim is to map out the shifting class relations in the 1970-1995 period. We expect that the effect could also be mixed, namely: that when the institutions (organised bodies with power over the people) are more extractive, they can dominate the cultural impact (people's attitudes) and that when the institutions are less extractive, the cultural impact will be more prevalent. To conduct the analysis, we use data from Google Ngrams, Thatcher’s speeches and aggregate data from ONS GDP. We use timeseries analysis, vector error correction models and Granger causality tests to disentangle the causal links. In developing this analysis, we use insights from multidisciplinary literature, including Todd, Acemoglu, Putnam, Reich, and Tubadji.

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The Rise of Far-Right Party in India and Local Culture

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S11 The CBD Tiebout-Hirschman-Rothschild Model & Ultra-Right Voting, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 28, 2026, 15:00 - 16:30

The Bharatiya Janta Party (BJP) in India is a far-right Hindu nationalist and social conservative party in India that is ruling since 2014. This paper aims to reveal the links between the accumulation of local cultural capital and voting for the BJP. In particular, employing the Culture Based Development (CBD) paradigm we can differentiate between cultural heritage (CH) and living culture (LC) and sub-components of local cultural capital and quantifying the balance between them (by using the Cultural Entropy measures). Using voting data from 1951 till 2025 and Google Ngrams data to quantify culture we show that there is Keynesian socio-economic oscillation that is predicted by the levels of cultural entropy.

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Local-Based Strategies as planning tools for making places and liveable environments in peri-urban territories.

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S15-Rethinking public space and planning strategies in urban and post-suburban areas for regenerating livable environments, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 28, 2026, 11:00 - 13:00

Sociodemographic statistics show that most of the population lives in the surrounding commuting zones of the cities, what strongly justifies an urbanistic territorial focus on the suburban/peri-urban areas. New urban practices and theories position these post-suburban areas as self-standing territories, vital to the sustainable urban ecosystem and no longer solely dependent on the central city. By rethinking peri-urban regions not as peripheral extensions but as integral components of a sustainable urban fabric, it is needed to redefine the way urban and suburban integrated planning should be approached.

During the last decades a new social and cultural dynamic has been developing in the suburban areas, characterized by a population that lives and works outside these areas, alongside with a population that lives and works in the peri-urban areas to which is added a retired population (+60 Generation) both living and staying all day long in these areas. In fact, this "permanent resident" population shows a tendency to increase, configuring the formation of a new socioeconomic and cultural logic that requires stronger governance structures and better institutional planning, which improve the capacity to stimulate economic activities and sustainable land-use.

If we intended planning is primordially aimed at solving questioning problems and inducing structural changes, planning processes must make a contribution not only to substantiating these changes but also to mobilising the social forces necessary to fulfil the proposed policies (Albrechts, 1991).

The circumstances described above accentuate the need to continue betting on the trend of recent decades of the polycentric city, which enables access to all public and private services and facilities in an easily accessible area, preferably on foot or by public transport, from the places of residence, also promoting local commerce.

To the historian of science Thomas S. Kuhn, “under normal conditions the research scientist is not an innovator but a solver of puzzles, and the puzzles upon which he concentrates are just those which he believes can be both stated and solved” (Apud Gleick, 1998, p. 37).

The puzzles we have to stated and solved is the urban fabric, mostly made of public space, it was built not under urban concepts of the pre-industrial or eighteenth-century but as a disruptive interpretation of the CIAM functional city, which image is frequently made of complex and entropic spaces, even chaotic areas.

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From community space to no man's land? – The use of public space by vulnerable social groups in post-socialist housing estates. A case from Budapest, Hungary

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S15-Rethinking public space and planning strategies in urban and post-suburban areas for regenerating livable environments, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 28, 2026, 11:00 - 13:00

Under state socialist planning, large housing estates were built as inclusive, community-centred environments. These spaces were particularly safe for women and children, reinforced by intense social control and close neighbourhood ties. Our study examines the transformation and use of public spaces in post-socialist housing estates, with a particular focus on vulnerable social groups. The research sample area was the central housing estate of Budapest-Pesterzsébet (20th district). The research is based on a complex methodology; in addition to secondary methods, we conducted quantitative and qualitative primary research (resident questionnaire survey, walking interviews - in-depth field interviews, mental map studies, and mapping of pedestrian movement patterns). According to our findings, community areas that were previously actively used have now mostly become underused, neglected spaces that pose a risk to safety. These changes particularly affect young and middle-aged women and young people, limiting their movement and participation in urban life. Research on pedestrian space utilisation has shown that residents' spatial movement basically follows traditional routes, avoiding originally protected and traffic-free routes. This proves that socially oriented planning and the physical infrastructure created as a result do not guarantee the creation of inclusive, safe spaces that can be occupied by communities. A static public space that maintains its former characteristics can lose its social base. For the population to return to community areas, it is necessary to conduct a detailed assessment of the needs of different age groups and genders, and to take them into account in urban planning and development.
Keywords: state socialist urban planning principles, post-socialist large housing estates, pedestrian use of public spaces, spatial inclusion, safety

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People and Place Research for People and Place Based Policies. A Study of Professional Well-Being of Alumni of North Kazakhstan with Generalized Q Analysis

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S15-Rethinking public space and planning strategies in urban and post-suburban areas for regenerating livable environments, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 28, 2026, 11:00 - 13:00

This paper aims to show why people and place-based policies should be grounded on people and place research, using Generalized Q Analysis, and shifting the focus of the research from the features of observed entities into the study of entities associated with combined and evident features of people and places. For the present study “people and places” are the university recent alumni of North Kazakhstan. The “people and place-based policies” are the programs of English proficiency, international mobility provided by the University North Kazakhstan. The literature links regional development with human capital and professional wellbeing, and this with English proficiency and international mobility. The study tries, first, to test this hypothesis using a regression relating professional wellbeing of 1250 alumni with their places of origin, gender, marks, sector of employment, English proficiency and international mobility, but no major evidence is achieved. Then, to test what people and places have higher professional wellbeing, following the Generalized Q Analysis, the 1250 alumni were explained by 10 profiles and, on the one hand, directly related with professional wellbeing and, on the other hand, clustered and related with a differences and differences regression with professional wellbeing. Results indicate that people with English proficiency do not have higher professional well-being because English is not useful for existing follow-up studies and for more common employments. Alumni with professional wellbeing are male, self-employed, urban or rural that attend the students’ mobility activities most probably in a Russian speaking language environment. This clearer evidence justifies more attention to people and place-based approach for people and place-based attitudes and policies.

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Smart Urban Management Through Georeferenced Digital Models: Towards a Common Urban Intelligence Framework

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S15-Rethinking public space and planning strategies in urban and post-suburban areas for regenerating livable environments, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 28, 2026, 11:00 - 13:00

European cities face increasingly complex territorial challenges, including socio-spatial inequalities, fragmented public spaces, environmental stress and uneven regional development. Despite the growing availability of urban data, planning practice often remains constrained by fragmented, non-interoperable datasets that limit comparative and evidence-based analysis. This paper develops a methodological framework for constructing a georeferenced Common Digital Model (CDM) designed to integrate heterogeneous spatial data at neighbourhood scale and enable territorially differentiated urban diagnostics.

Building upon traditions of planning support systems and spatial decision-support infrastructures, the proposed framework systematises data harmonisation, layered geospatial modelling and comparative analytics within a coherent structure aligned with regional science applications. The CDM integrates morphological, mobility, environmental, socio-demographic and participatory layers into a unified analytical architecture. Key indicators—including network centrality, land-use mix, green space per capita and distance to public space—operationalise the model and allow multi-dimensional assessment of spatial performance.

The framework is illustrated through an exploratory comparison of contrasting neighbourhood typologies using openly available geospatial data sources, such as OpenStreetMap street networks, land-use data, green space layers and population grids. While limited in scope, this demonstration highlights how minimal data integration can reveal structurally differentiated territorial profiles. Urban core areas are expected to exhibit higher network integration and functional diversity but lower environmental provision per capita, whereas suburban territories may display greater green availability yet weaker configurational accessibility and lower land-use diversity.

The paper argues that the central challenge in smart urban management is not data scarcity but structural integration. By embedding normative objectives—such as sustainability and inclusion—into measurable spatial indicators, the proposed framework supports more transparent, comparative and territorially grounded planning strategies. The approach provides a replicable methodological basis for analysing urban–suburban differentiation and regional asymmetries within contemporary European metropolitan contexts.

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Towards AI readiness in the public sector: A multi-level perspective on individuals and organizations

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S16-Innovation, Transparency, and Policy Implementation in the Israeli Public Sector, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 27, 2026, 09:00 - 10:30

Artificial intelligence (AI) holds significant promise for enhancing efficiency and responsiveness in public organizations, yet its adoption across the public sector remains limited. This qualitative study examines how public sector employees perceive both their own readiness and their organizations' readiness to adopt AI.
The analysis draws on semi-structured interviews with 17 employees from Israeli government ministries and local municipalities and applies an inductive thematic approach. The findings point to a personal readiness is shaped by tensions between established and emerging professional identities, between recognized potential and everyday integration, and between individual openness and concerns over legitimacy. Organizational readiness is characterized by tensions between regulation and temporary suspension, between technological infrastructure and operational capacity, and between competing priorities and repeated postponements.
These dynamics suggest that while AI is increasingly familiar and experimentally used, it has yet to become embedded in routine public sector practice. The study contributes to emerging debates on public sector digital transformation by conceptualizing readiness as an unsettled, multi-level process and by identifying conditions that may support the transition from experimentation to everyday use of AI.

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Widening the Gap: A Difference-in-Differences Analysis of Israel's 2010 Capitation Reform and Regional Health Disparities

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S16-Innovation, Transparency, and Policy Implementation in the Israeli Public Sector, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 27, 2026, 09:00 - 10:30

Background: Israel's National Health Insurance system exhibits persistent regional disparities in health outcomes. In 2010, the government reformed its capitation formula to allocate additional funding to HPs serving peripheral communities, aiming to reduce these disparities.
Objective: This study evaluates the effectiveness of the 2010 capitation reform in narrowing regional health gaps, as measured by self-reported health (SRH).
Methods: Using a difference-in-differences design and longitudinal panel data (15 sub-districts over 21 years, 2002–2022; n=315), we analyzed SRH data from the Israeli Social Survey, which includes approximately 7,500 respondents annually. The peripherality index served as the treatment variable. Regression models included sub-district and year fixed effects, controlling for sociodemographic variables.
Results: Contrary to the reform's intended goals, regional health disparities between peripheral and non-peripheral areas grew wider after its implementation. While health outcomes in peripheral regions had been gradually catching up prior to the reform, this positive trend reversed in the years that followed. Rather than narrowing the gap, the policy coincided with renewed divergence in self-reported health, suggesting that the additional funding did not translate into meaningful improvements in underserved areas.
Conclusions: The findings highlight the limitations of relying solely on funding formula adjustments to achieve health equity. Without mechanisms that ensure targeted investments and organizational accountability, even well-intentioned reforms risk falling short of their goals. Future policies aiming to reduce regional disparities should prioritize not only equitable allocation but also effective implementation strategies that translate resources into meaningful improvements in service delivery and population health.

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Old Rules, New Ideas: Navigating Digital Innovation in Public Administration Through Informality

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S16-Innovation, Transparency, and Policy Implementation in the Israeli Public Sector, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 27, 2026, 09:00 - 10:30

Public-sector innovation has become essential as governments face rising citizen expectations and complex challenges, yet traditional bureaucratic structures that ensure stability and accountability often limit the flexibility required for innovation. This study examines how administrative culture influences digital innovation in Israeli local governments through in-depth interviews with 36 public-sector professionals and managers. The research contributes to the literature by empirically linking administrative culture with public-sector innovation, revealing mechanisms through which cultural factors enable or constrain innovative practices. Israel presents a unique case characterized by high centralization yet marked informality, minimal deference to hierarchy, and reliance on personal influence channels. Four key themes emerged from thematic analysis: collaborative innovation across hierarchical boundaries, informality as both catalyst and potential barrier, trust-building through incremental successes, and structural barriers including centralization and conservatism. Findings reveal that informal networks and relationships facilitate information flow and creative problem-solving, though they risk introducing bias and inconsistency. Trust emerged as fundamental yet dynamic, requiring demonstrated successes rather than promises. Collaborative approaches weakened rigid hierarchies while maintaining bureaucratic frameworks, creating "collaborative hierarchy" models. The study demonstrates that rather than viewing bureaucratic structures as inherently incompatible with innovation, successful public-sector innovation requires strategic navigation of bureaucratic systems while leveraging cultural dynamics supporting change. The Israeli case illustrates how cultural traits like informality and negotiation-based decision-making can enhance innovation capacity when appropriately harnessed. This suggests administrative culture represents a field of tensions where informality, trust, legitimacy, and hierarchy simultaneously hinder and enable innovative practices in public administration.

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Technological, Organizational and Environmental determinants of sustainable innovation in Spanish firms

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S17 Digital Transformation, Artificial Intelligence, and Regional Development: Productivity, Competitiveness, and Territorial Dynamics, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

This paper examines the determinants of eco innovation and social innovation in Spanish firms, drawing on microdata from the 2022 Encuesta sobre Estrategias Empresariales (ESEE). While previous research has highlighted the relevance of technological capabilities and environmental regulation for eco innovation, empirical evidence on the joint drivers of environmental and social innovation and their organizational antecedents, remains limited. Building on the Technology–Organization–Environment (TOE) framework and the resource based view, this study estimates a set of Probit models to analyse how strategic sustainability orientation, environmental financial effort, technological capabilities, and organizational barriers shape firms' propensity to innovate sustainably.

Results reveal a clear asymmetry between eco innovation and social innovation. Eco innovation is significantly influenced by specific organizational barriers, particularly coordination failures and resource needs, while social innovation appears less sensitive to internal obstacles. In both domains, environmental investment and environmental expenditure emerge as the most robust predictors of sustainable innovation, confirming strong complementarities between environmental commitment and broader sustainability outcomes. Technological capabilities, especially digitalization and R&D intensity, consistently increase the likelihood of innovating, whereas firms operating in high technology sectors exhibit a lower propensity to adopt sustainable innovations. Organizational barriers related to knowledge and innovation capabilities show negative effects, particularly in models with aggregated indices.

Incremental TOE models confirm that technological and environmental factors dominate the explanation of sustainable innovation, while organizational factors display heterogeneous and often inhibitory effects. Overall, the findings underscore the importance of strengthening firms' technological capabilities and environmental investment efforts, while addressing internal organizational rigidities that hinder the transition toward more sustainable business models.

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AI and Regional Growth

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S17 Digital Transformation, Artificial Intelligence, and Regional Development: Productivity, Competitiveness, and Territorial Dynamics, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

Artificial intelligence (AI) is widely expected to transform economies, yet evidence on its effects on regional economic growth remains limited. This paper distinguishes between two channels through which AI shapes economic outcomes: AI generation —the creation of AI innovations— and AI adoption —the deployment of AI technologies. Using panel data for European regions over 2013–2023, we measure AI generation, using AI patents as a proxy, and construct a latent measure of AI adoption anchored in observed firm-level uptake to compare their relationships with GDP per capita growth. Fixed-effects estimates reveal a clear asymmetry. AI adoption, which is geographically diffuse across European regions, is linked with significant gains in GDP per capita. AI generation, which is heavily concentrated in a handful of metropolitan regions, displays a weaker and largely insignificant relationships with local economic outcomes. Interaction effects show that AI adoption also enhances the returns to regional investments in R&D and higher education. The findings point towards AI strategies that prioritise adoption alongside investment in complementary capabilities, rather than focusing narrowly on indigenous AI generation. Such an approach would not only prevent greater economic polarisation within Europe but also make a more significant contribution to the overall competitiveness of the continent.

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From Adoption to Impact: Effects of Artificial Intelligence on Productivity and Heterogeneity in the Spanish Manufacturing Sector

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S17 Digital Transformation, Artificial Intelligence, and Regional Development: Productivity, Competitiveness, and Territorial Dynamics, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

This paper examines the heterogeneous effects of predictive artificial intelligence (AI) adoption on total factor productivity (TFP) among Spanish manufacturing firms, with particular emphasis on the role of the COVID-19 pandemic as a technological turning point. Predictive AI—encompassing advanced data analytics, cloud computing, and algorithm-based forecasting tools—has become increasingly central to firm-level decision-making and operational efficiency. Yet, empirical evidence on which firms benefit most from these technologies remains limited. Using firm-level data from the Encuesta sobre Estrategias Empresariales (ESEE) for 2018 and 2022, we analyze how the productivity effects of predictive AI vary across the TFP distribution and how these effects evolved before and after the pandemic. Our empirical strategy combines quantile regression techniques to capture productivity heterogeneity with two-stage least squares (2SLS) estimations to address potential endogeneity in AI adoption. The results reveal that the positive impact of predictive AI on TFP has become stronger and more widespread in the post-pandemic period, with particularly pronounced effects among firms located in the upper quantiles of the productivity distribution. Firm-level capabilities—such as training investment, international market engagement, and process innovation—consistently enhance productivity outcomes. In addition, regional capital intensity supports firm productivity, while strong localization economies exert negative spillover effects. Overall, the findings highlight the growing productivity returns to predictive AI adoption and underscore the importance of firm capabilities and regional context in shaping these gains.

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Technological sovereignty and European productivity: a regional perspective

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S17 Digital Transformation, Artificial Intelligence, and Regional Development: Productivity, Competitiveness, and Territorial Dynamics, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

The debate on European technological sovereignty has intensified in light of persistent productivity gaps, asymmetric dependencies, and geopolitical pressures. While current policy frameworks such as the Open Strategic Autonomy (OSA) agenda and the EU's Economic Security strategy define sovereignty at the continental level, they often overlook the profound regional heterogeneity that characterizes Europe's innovation systems. This paper proposes a regionalized and operational definition of technological sovereignty, grounded in innovation systems theory and the concept of sovereignty as embedded agency and strategic openness.
The objective of the contribution is to identify and measure three distinct modes of regional knowledge creation: local own capacity, interregional own capacity, and external collaboration, and assess their individual and combined effects on regional productivity. Methodologically, the paper builds an original matched dataset linking AI patents, firms, and regions, and computes sovereignty indicators based on patent ownership and transaction flows. The empirical strategy relies on population-weighted panel regressions (2015–2023) associating Total Factor Productivity (TFP) levels with lagged sovereignty indicators and their interaction, controlling for structural and geographical characteristics.
The originality of the work lies in its non-protectionist, non-autarkic operationalization of technological sovereignty, its focus on patent ownership and invention, and its ability to unpack sovereignty components at the regional level.

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An extended multiregional IO model to measure the energy impacts of telework

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S17 Digital Transformation, Artificial Intelligence, and Regional Development: Productivity, Competitiveness, and Territorial Dynamics, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

Teleworking is arguably one of the most notable effects of the digital transition in developed countries. After the COVID-19 pandemic, it seems that telework will stick, at least to some extent. Admittedly, a number of studies have now assess the energy impacts of telework for alternative case studies. This paper contributes to the existing literature using a multiregional input-output (MRIO) model and relaxing some of the assumptions behind energy impact assessments of telework in two different ways. First, we couple the MRIO model with a job-residential location choice model in which preferences for local amenities are not fixed; rather, they are an increasing function of telework intensity. Second, regarding production and consumption, we relax some of the rigidities in Computable General Equilibrium models so that some Keynesian multiplier effects may appear. Furthermore, our model disaggregates household consumption patterns by (1) region degree of urbanisation. Each commodity has its own energy consumption coefficient per unit of output. We calibrate our model to replicate the Austrian multiregional economy in 2021. We then shock our model restricting telework and simulating an alternative set of job-residential location choices. Individual choices result in alternative aggregate household consumption and labour supply. The model is solved iteratively until reaching a new equilibrium, thus providing alternative regional energy consumption levels as well. We interpret the gap between the observed and alternative energy consumptions as the energy impacts of telework.

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Subjective wellbeing in spatial context; the influence of psychological traits and personality types

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S18-The spatial economics of happiness, unhappiness and discontent: moving Beyond GDP to Reverse the Joyless Economy, Hall 1 - South Building, agosto 28, 2026, 11:00 - 13:00

It has long been known that personality traits (such as the Big Five) have a profound influence on how one reacts to context, be it spatial, temporal, situational or chronic. As personality types are combinations of traits their influence is of complementary interest. Many wellbeing studies conducted by geographers, economists and regional scientists omit trait (or types) as arguments in their models of wellbeing (voluntarily or involuntarily) and the implications of their omission or inclusion remain unclear.
This paper is in two parts. Part 1 models the distribution of several measures of wellbeing from YOU Survey questions put to first year students on a university campus in New Zealand: see (Morrison et al., 2023, Liu et al., 2023). The same survey was applied to three separate cohorts of freshmen - in the year preceding COVID-19 (2019), during the breakout (2020) and the year after (2021).
I pool the three cohorts (n= 4000) and estimate three cross-sectional models of wellbeing: 1) without traits, 2) with traits and 3) with personality types. I test the effect of COVID-19 as an exogenous shock in the presence and absence of traits and types. Tests for heterogeneity by age, sex and ethnicity are conducted.
Part 2 retests the impact of COVID-19 including and excluding traits and types using a longitudinal panel sample that follows each of the three baseline YOU surveys for four years (two follow-up surveys per year). This design allows me to assess the impact of COVID-19 on the wellbeing of the same student with and without controls for traits and types.
The purpose of the paper is to assess the consequences of omitting or including measures of personality in models of wellbeing under separate environmental conditions.
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Subjective Well-Being and Left-Behind Places: The moderating effect of regional digital characteristics

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S18-The spatial economics of happiness, unhappiness and discontent: moving Beyond GDP to Reverse the Joyless Economy, Hall 1 - South Building, agosto 28, 2026, 11:00 - 13:00

This study investigates the relationship between individual life satisfaction and different typologies of left-behind areas across the European Union at the NUTS-2 level, while also examining the moderating role of digital characteristics in this relationship. Using a novel dataset of approximately 7,000 individuals collected under the Horizon MOBI-TWIN project, we analyze how living in distinct left-behind contexts, as classified by Velthuis et al. (2023) into six categories ranging from long-term economic prosperity to disconnected and high-poverty regions, shapes subjective well-being. Additionally, we integrate regional digital economy and societal characteristics from EUROSTAT with individual-level digital perceptions from the survey dataset to explore the role of digital connectivity in either amplifying or mitigating the effects of left-behindness on life satisfaction. Empirically, we employ multivariate regression analysis and instrumental variable regression to estimate the effect of left-behindness on well-being, while also examining the role of digital characteristics in this relationship.Our findings will contribute to understanding the spatial determinants of life satisfaction and the extent to which digital inclusion can serve as a buffer against the adverse effects of regional socio-economic decline. These insights have important implications for regional policy and digital development strategies aimed at fostering well-being in structurally disadvantaged and marginalised areas.

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Beyond the Rural Happiness Paradox: The Geography of Multidimensional Subjective Wellbeing Across Welfare Regimes in Europe

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S18-The spatial economics of happiness, unhappiness and discontent: moving Beyond GDP to Reverse the Joyless Economy, Hall 1 - South Building, agosto 28, 2026, 11:00 - 13:00

Wellbeing research is increasingly used to move beyond GDP, yet empirical work on the geography of subjective wellbeing still often relies on single-item life satisfaction and a binary rural-urban distinction-choices that can conceal spatial inequalities in domains linked to social cohesion and mental health. Using European Social Survey Round 6 data for 24 European countries (n≈30,000), this study applies a multidimensional "Personal and Social Wellbeing" framework to map wellbeing across five settlement types (cities, suburbs, towns, villages, countryside) and five welfare-regime clusters. We construct composite indices for evaluative wellbeing, affective wellbeing, social wellbeing, basic psychological needs satisfaction, mental resources, and life satisfaction. Across Europe, the commonly reported "rural happiness advantage" in life satisfaction and affective wellbeing largely disappears after adjusting for demographic and socioeconomic composition. In contrast, advantages for villages and countryside persist for social wellbeing and mental resources, indicating that smaller settlements may provide protective environments for trust, reciprocity, belonging, and psychological resilience (i.e., dimensions central to contemporary concerns about loneliness, stress, and discontent). Welfare regimes condition these gradients: spatial disparities are comparatively muted in Nordic contexts, while stronger urban penalties, especially in evaluative wellbeing, are evident in parts of Eastern Europe. Country-level results further show that "wellbeing peaks" vary by dimension, underscoring that there is no single rural-urban hierarchy of subjective wellbeing. Overall, the findings demonstrate that spatial wellbeing is multidimensional and institutionally embedded, and that relying on life satisfaction alone can misdiagnose where (and in which dimensions) territorial wellbeing gaps emerge - an important implication for place-sensitive wellbeing policy and governance beyond GDP.

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Territorial Justice Is People: Perceived Access to Services and the Production of Left-Behindness

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S18-The spatial economics of happiness, unhappiness and discontent: moving Beyond GDP to Reverse the Joyless Economy, Hall 1 - South Building, agosto 28, 2026, 11:00 - 13:00

This paper examines how perceived access to services structures territorial justice, wellbeing, and the emergence of left-behindness. Moving beyond approaches that either aggregate all services into a single index or rely exclusively on objective distance-based indicators, we conceptualise access as the perceived travel time required to reach services and distinguish between two analytically salient bundles: basic services (e.g., markets, primary schools, family doctors, pharmacies) and specialised services (e.g., high schools, universities, advanced health services, cultural venues). Using a latent class approach, we identify four accessibility regimes that capture how service access is experienced as a configuration rather than as independent dimensions. This typology replaces binary framings (close/far; present/absent) with graded categories of perceived distance, providing a policy-relevant framework for differentiated interventions.

Results reveal that the most favourable perceived access does not concentrate in the largest metropolitan cores, but rather in medium-sized cities—particularly those between roughly 50,000 and 200,000 inhabitants—where service diversity is paired with lower everyday mobility frictions and a stronger sense of fairness. Beyond a threshold of approximately 200,000 inhabitants, perceived accessibility can deteriorate due to congestion, longer intra-urban travel times, and functional relocation of certain services away from high-rent central areas. Conversely, small towns and rural areas show systematic disadvantages, with rural territories exhibiting not only limited specialised services but also concerning gaps in basic services, deepening perceived territorial injustice.

Regional patterns further indicate that accessibility outcomes depend less on simple urban–rural composition and more on the structure of urban networks. Regions with well-distributed intermediate centres tend to delay the appearance of penalised classes, whereas territories dominated by a few large cores and many very small settlements display higher shares of low-access regimes. The findings challenge “single-engine” metropolitan development models and underscore the role of intermediate cities as distribution belts that underpin territorial cohesion. Finally, the paper nuances the left-behindness discourse by showing that perceived exclusion can emerge even near metropolitan areas when travel times to essential services exceed acceptable thresholds.

Overall, perceived access operates as a key pathway linking territorial position to wellbeing, place attachment, and trust, reinforcing the argument that territorial justice is ultimately people-centred rather than place-centred.

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Who Thrives Where? A Bayesian Multilevel Analysis of Personality Traits and Individual Capability

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S18-The spatial economics of happiness, unhappiness and discontent: moving Beyond GDP to Reverse the Joyless Economy, Hall 1 - South Building, agosto 28, 2026, 11:00 - 13:00

Building on recent advances in the empirical operationalization of Sen's Capability Approach, this study investigates how individual personality traits shape individuals' capability levels. Prior work has demonstrated that capabilities can be rigorously measured as latent opportunity sets using multidimensional Bayesian Item Response Theory (IRT) and perception-based indicators rather than achieved functionings, thereby aligning measurement more closely with Sen's normative emphasis on substantive freedoms. Extending this framework, the present study introduces personality structure and regional reference groups as key determinants of capability formation.
We draw on the RuWell dataset, a cross-sectional survey of rural residents in Albania, Kosovo, Moldova, and Romania. Using the previously validated multidimensional capability measure, we examine whether personality traits (operationalized through the Big Five dimensions) predict individual capability levels. In line with theoretical perspectives from subjective well-being through the lens of social comparison processes, we argue that capabilities are shaped not only by absolute personal dispositions but also by relative standing within one's regional social environment (=regional reference groups). Individuals evaluate their opportunity sets partly by comparing their own traits (e.g., openness, extraversion, emotional stability) to the "typical trait constellation" of people in their region (county or rayon). These comparisons reflect perceived fit and room for action, and thus may expand or constrain capability levels even when objective resources remain constant.
Methodologically, we estimate a series of Bayesian hierarchical regressions models in which dimension-specific latent capability traits serve as outcome variables. Personality traits enter the model both as individual-level predictors and as relative deviation scores from the regional mean profile. This allows us to determine whether individuals with certain dispositions systematically experience larger opportunity sets, or whether the gap between one's personality and the prevailing social environment matters. Furthermore, the Bayesian framework enables us to incorporate measurement uncertainty from the latent capability estimates directly into the regression model, ensuring that inferences respect the probabilistic nature of the underlying IRT measurement.
We expect three key contributions. First, we introduce personality structure as a meaningful psychological conversion factor in the Capability Approach, capturing how internal dispositions shape individuals' ability to transform resources into real freedoms. Second, by integrating regional reference groups, we build a conceptual and empirical bridge between capability research and theory of social comparison. Third, our findings will provide new insights into why people with similar objective circumstances perceive different opportunity sets, and why regional environments may amplify or attenuate these perceptions depending on personality–context alignment.

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Daily Life System: an exploratory analysis

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S19-1 From policy design to place-based action in functional areas: challenges for cohesion policy in times of global change, Auditorium 224 - North Building - Juridical Faculty, agosto 26, 2026, 09:00 - 10:30

The aftermath of Covid-19 and persistent territorial marginalisation have profoundly reshaped daily mobility patterns, necessitating innovative approaches to territorial delineation that capture evolving spatial relations and well-being dynamics. This contribution proposes a multidimensional framework for defining "Daily Life Systems" (DLS)—supra-municipal units that integrate scope (diverse activities), space (hierarchical centers), and time (travel constraints)—to better inform cohesion policies in post-pandemic contexts.
Objectives: The primary aim is to overcome limitations of traditional representations which focus narrowly on work-commuting (only 32% of trips per Audimob data) and inadequately cover peripheral territories. By mapping citizens' full circadian cycles—including family management (37.2%), leisure (26.2%), education, and services—the framework seeks to maximise local self-containment, reveal service-demand mismatches, and support adaptive governance for enhanced life satisfaction particularly to capture also the specificities of small and remote systems in peripheral and marginal areas that traditional classifications overlook.
Methodology: Grounded in central place theory and time-geography, the approach operationalises DLS via isochrones (travel-time budget invariant) around pivot municipalities hosting hierarchical functions. It leverages empirical socio-economic data, presence and location analysis of public services, amenities, and infrastructures to ensure full territorial coverage.
Originality: Unlike single-flow models, this work innovates by centering citizen well-being through temporal invariants and multi-activity flows, enabling scalable applications (e.g., SNAI inner areas, health districts). It offers a people-centered approach to define a hierarchy of centralities and new daily life perimeters at national scale, providing policymakers with precise tools to adapt boundaries to transformed daily geographies, fostering equitable, place-based responses to pandemic-induced spatial shifts.

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Bridging the gap: Sustainable Urban Mobility Plans (SUMP) as a catalyst for functional integration in Polish metropolitan areas

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S19-1 From policy design to place-based action in functional areas: challenges for cohesion policy in times of global change, Auditorium 224 - North Building - Juridical Faculty, agosto 26, 2026, 09:00 - 10:30

In the Polish legal and administrative framework, Functional Urban Areas (FUAs, known as MOF - Miejskie Obszary Funkcjonalne) often suffer from institutional fragmentation. While the core cities and their suburban rings are economically and socially intertwined, transport planning has historically been conducted in silos. The lack of a comprehensive metropolitan law (with the sole exception of the Upper Silesian Metropolis) has left Polish FUAs reliant on "soft" cooperation tools. The rapid adoption of SUMPs in Poland is inextricably linked to the Integrated Territorial Investments (ITI) mechanism. For the 2021 - 2027 financial perspective, the Polish government and the European Commission made the possession of a certified SUMP a prerequisite for FUAs to access structural funds.

The primary objective of this study is to evaluate the role of SUMPs in enhancing the governance of Polish FUAs. The research focuses on two dimensions:

1. How SUMPs harmonise the conflicting interests of core cities (limiting car traffic) and suburban municipalities (demanding better accessibility).
2. Whether the process of creating a SUMP has led to the creation of permanent metropolitan cooperation platforms.

The methodology is based on comparative desk research and qualitative policy analysis. The study examines a representative sample of SUMP documents from selected Polish metropolitan areas. The analysis focuses on the "Governance" and "Integration" chapters of these documents, comparing them against the National Urban Policy 2030 (NUP 2030) guidelines.

Preliminary analysis suggests that SUMPs are indeed "forcing" a level of cooperation that was previously absent. Key expected insights include:

- From roads to mobility: A visible shift in suburban municipalities from prioritising road expansion to supporting multimodal hubs and "Park & Ride" systems.
- The "ITI effect”: The Integrated Territorial Investment (ITI) mechanism acts as a powerful incentive, making SUMP the first document where local mayors must agree on shared transport priorities.
- Implementation barriers: Despite high-quality strategic planning, the lack of a "metropolitan budget" remains a significant hurdle for the long-term execution of these plans.

This research contributes to the debate on metropolitan governance in post-socialist transition countries. It demonstrates how "soft" EU-driven planning tools can compensate for "hard" legislative gaps. For policymakers, the study provides a roadmap for utilising mobility planning as a gateway to broader spatial and economic integration within functional regions.

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Functional Rural Areas and Territorial Cohesion: Accessibility-Based Delimitation for Place-Based Policy in Spain

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S19-1 From policy design to place-based action in functional areas: challenges for cohesion policy in times of global change, Auditorium 224 - North Building - Juridical Faculty, agosto 26, 2026, 09:00 - 10:30

Functional areas are increasingly recognised as key arenas for place-based policy intervention, particularly in contexts characterised by demographic decline, territorial inequalities and fragmented governance. In Spain, large rural territories face persistent population loss and limited access to essential services, revealing a mismatch between administrative boundaries and real functional dynamics. This paper proposes a nationwide delimitation of rural functional areas based on effective accessibility to education and healthcare services, providing a new territorial framework to support cohesion-oriented policies.

The methodology builds upon central place theory, reinterpreted through an equity-oriented perspective. Two core principles are operationalised: a 30-minute maximum travel time to essential services and the minimum population thresholds required to sustain key facilities. The analysis considers more than 36,000 population nuclei, identifying functional centres based on the presence of hospitals, secondary schools, primary schools and health centres. Using network-based travel time calculations over the national road infrastructure, areas of influence are delineated and subsequently adjusted to account for low-density gaps and polycentric configurations.

The resulting system of approximately 600 functional areas reflects actual spatial interdependencies more accurately than conventional municipal or provincial units. This approach allows for the identification of territories with structural accessibility deficits and provides an operational scale for coordinating service provision, strengthening inter-municipal cooperation and guiding territorial investment strategies.

Beyond methodological innovation, the paper discusses how accessibility-based functional delimitation can enhance the effectiveness of cohesion policy instruments in rural and peripheral contexts. By aligning policy intervention with real service areas rather than administrative fragmentation, the proposed framework supports place-based governance, improves resource allocation and contributes to more equitable territorial development in times of demographic change. The paper also critically examines the institutional, legal and administrative barriers that hinder the adoption of functional approaches in Spain, including rigid sectoral planning structures, fragmented competences across levels of government, and the persistence of funding mechanisms anchored in conventional administrative units.

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Mission-Oriented policies for rural CCIs innovation: Complementing EU Smart Specialization Strategies (S3) with CAP LEADER programs

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S19-2 From policy design to place-based action in functional areas: challenges for cohesion policy in times of global change, Auditorium 224 - North Building - Juridical Faculty, agosto 26, 2026, 11:00 - 13:00

The European Union's Cohesion Policy aims to promote territorial convergence, yet Smart Specialisation Strategies (S3) can reinforce regional divergence by favoring high technological complexity over the soft innovation strengths of non-urban areas, such as Cultural and Creative Industries (CCIs). S3 also operates mainly at NUTS 2, where regions rarely align with urban–rural divisions, so aggregate indicators can obscure rural needs in priority setting, project selection, and evaluation. Together, these gaps narrow the range of rural initiatives that qualify as innovation in S3 portfolios.

CCIs provide an empirical lens for these governance and scale mismatches, as they sit at the intersection of soft innovation, place-based identity, and multi-level governance. Besides S3, Rural CCI work also draws on LEADER under the Common Agricultural Policy, and Creative Europe, yet coordination across these instruments remains limited, producing fragmented support in peripheral territories.

The paper proposes a framework for a more coherent policy mix that can complement S3 support on rural CCI development. It compares CCI-related S3 projects in the Kohesio database with CCI-related LEADER projects in the EU CAP Network database, complemented by evidence on Creative Europe access patterns. S3 allocation is disaggregated to NUTS 3 to make urban and non-urban patterns visible.

Findings highlight three linked mismatches. First, LEADER-supported rural CCIs are often hybrid practices using creative activity to address practical challenges tied to local services and community infrastructure, yet their small budgets and short cycles constrain durable capability building. Second, urban and non-urban CCIs are fundamentally different: urban projects target digital and entertainment industries, while non-urban projects concentrate on infrastructure and heritage renovation, which is a poor fit with S3 innovation priorities that leaves no reliable step-up route from community-led practice to larger investment. Third, Creative Europe remains difficult to access for locally embedded work because competitive calls favour formalisation and high-visibility outputs.

Based on these results, the paper proposes a mission-oriented policy mix that treats CCIs as a component of territorial cohesion and resilience. The proposal positions LAGs as intermediaries that translate local demand into investment-relevant formats, adds an S3 step-up track for soft innovation and peripheral capability building. Creative Europe can provide lower-threshold networking and circulation formats that connect mature local practices to wider learning and exchange. Integrated Territorial Investments (ITI) offer an underused governance format that could coordinate these cross-instrument actions within urban–rural functional areas, targeting cumulative impact rather than isolated projects in separate policy lanes.

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Between policy and practice: implementing the circular economy in municipalities of Lodz Metropolitan Area as a challenge for place-based governance in the context of EU cohesion policy

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S19-2 From policy design to place-based action in functional areas: challenges for cohesion policy in times of global change, Auditorium 224 - North Building - Juridical Faculty, agosto 26, 2026, 11:00 - 13:00

Over the past decade, the circular economy (CE) has emerged as a central component of European Union cohesion policy, framed as a strategic tool for promoting climate neutrality, resource efficiency, and territorial resilience. While its strategic framing is increasingly coherent at the EU and regional levels, the practical implementation of CE largely depends on local governments operating within functional areas. This shift from policy design to place-based action exposes tensions between ambitious strategic goals and the institutional, financial, and organizational capacities of local actors. This paper examines the implementation of the circular economy in the functional area of the city of Łódź (Lodz Metropolitan Area, LMA) as a test case for place-based governance in times of green transition and growing territorial complexity. The core objective is to identify the "implementation gap" between EU and regional strategic frameworks and the operational reality of local government units (LGUs). The study situates CE within the broader debate on the transformation of cohesion policy instruments and the effectiveness of territorial tools such as Integrated Territorial Investments (ITI).

The empirical basis of the paper consists of qualitative research conducted in 2025 among all member municipalities of the Lodz Metropolitan Area Association. The study combined in-depth interviews and structured questionnaires covering seven thematic areas, including waste management, public procurement, participatory instruments, local strategies, and monitoring systems. The analysis allows for a comparative assessment of institutional readiness, patterns of inter-municipal cooperation, and barriers to integrated action.

The findings reveal three key challenges for cohesion policy in advancing the circular economy at the functional scale. First, significant institutional and competence gaps limit the capacity of municipalities to move beyond sectoral, fragmented initiatives toward an integrated territorial approach. Second, although ITI provides a formal framework for cooperation, coordination mechanisms remain weak, and common standards and monitoring tools are insufficiently developed. Third, social and educational barriers constrain the behavioral dimension of CE, reducing the transformative potential of strategic objectives.

The case of Lodz Metropolitan Area demonstrates that the circular economy can serve as a "stress test" for place-based governance, as it requires coordination of infrastructure, regulatory frameworks, market mechanisms, and social practices across administrative boundaries. Bridging the implementation gap demands stronger multi-level governance, reinforced supra-local coordination, and better alignment between ITI projects and long-term development strategies. Without such adjustments, the place-based approach risks reproducing fragmentation instead of strengthening territorial cohesion.

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Greening urban economies as an integrated process in territorial policy – analysis of the coincidence of spatial and financial instruments in urban functional areas (the example of Poland)

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S19-2 From policy design to place-based action in functional areas: challenges for cohesion policy in times of global change, Auditorium 224 - North Building - Juridical Faculty, agosto 26, 2026, 11:00 - 13:00

The greening of the urban economy is one of the key challenges of contemporary urban development in the context of sustainable development and the implementation of territorial policy. Climate change, urbanization pressure, and growing social demands in terms of environmental quality, as well as systemic requirements and those resulting from local policies, necessitate the integration of pro-environmental measures in both the spatial and financial spheres of cities. The literature on the subject shows a growing interest in research on the greening of the urban economy, but previous analyses have focused primarily on selected aspects, such as spatial planning, transport policy, and greening. However, it is crucial to integrate these activities, both in terms of subject area and territory, and the research undertaken is related to this context. It takes into account the simultaneous (synergistic) use of spatial and financial management instruments in creating the greening of the urban economy, which is a new research approach. The identified research gap is also extended to include the identification of the consistency of greening activities in the context of the size of the city and its function in urban functional areas, as well as the implementation of territorial policy objectives.

The article aims to identify the scope of coincidence of greening activities in the spatial and financial economy of Polish cities and their functional areas. The study used a survey method addressed to local government units responsible for spatial planning and financial policy. In total, surveys were conducted in 135 cities, from which those falling within the territorial scope of urban functional areas were selected for analysis. In order to ensure the completeness of the data, cities from the functional areas of Warsaw, the Tri-City, Katowice (Central Silesian Subregion), and Wałbrzych were included in the study. The proposed functional areas represent their diversity in terms of type (metropolitan and agglomeration), size, and function of the central center in the regional system, and geographical location.

The results indicate that the consistency of actions is, however, varied, which may provide a basis for further research in the field of urban and regional policy design in Poland and other countries with a similar settlement structure and development challenges. The article also discusses the practical implications of the analysis of coincidence. High consistency of greening instruments enables more effective use of urban resources, accelerates the achievement of SDG, and increases the degree of integration across functional areas.

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Left-behind places in Europe: a multidimensional and relative concept

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S19-3 From policy design to place-based action in functional areas: challenges for cohesion policy in times of global change, Auditorium 224 - North Building - Juridical Faculty, agosto 26, 2026, 17:00 - 19:00

The World Bank outlines five characteristics of the left-behind regions (or lagging regions): i) some are more dynamic than others, ii) there are “low income” and “low growth” regions, and both have the lowest social outcomes iii) demographic decline is a defining feature of lagging regions, with both fertility and net migration rates that fall below the national averages, iv) they are peripheral, but not necessarily sparse and v) jobs in lagging regions are concentrated in low value-added non-tradables.
In Europe, the present Cohesion Policy has changed the focus from traditional regions to places and people; thus it would be important to characterize and identify the left-behind “places” (and also the left-behind “people”). If following the World Bank criteria, very little can be said about the existence and persistence of these places basically due to the unavailability of GDP/income figures at a finer spatial scale than NUTS regions in the official European databases. As for the rest of socioeconomic variables mentioned by the World Bank (such as demographic, labour or geographic indicators). there is simply no comprehensive European database at local level (LAUs).
In the EXIT Project we estimated figures of average household income at local level and also collect country by country the socioeconomic variables existing at local level for years 2011 and 2021 in order to characterize, identify and illustrate the multidimensional and relative nature of the elusive left-behindness concept when applied at local level.

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Challenges for place-based policies: lessons learned from the implementation of Integrated Territorial Investments in functional urban areas in Poland

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S19-3 From policy design to place-based action in functional areas: challenges for cohesion policy in times of global change, Auditorium 224 - North Building - Juridical Faculty, agosto 26, 2026, 17:00 - 19:00

The introduction of a place-based approach to the programming of the EU 2014-2020 cohesion policy required the creation of new territorial governance structures, the identification of new areas of intervention and the development of new mechanisms for the distribution of funds. The implementation of a new cohesion policy tool, Integrated Territorial Investments (ITIs), dedicated to supporting the sustainable development of cities and their functional areas, played a key role in this process.
This paper focuses on identifying the main challenges for introducing PBPs in functional urban areas (FUAs) in the context of lessons learned from the implementation of ITIs in Poland.
The research was divided into three stages. The first stage outlined the main ITIs assumptions and the effects of their implementation in the form of formalizing inter-municipal partnerships reflected in the delimitation of the area of intervention, creating territorial governance mechanisms and strategic planning rules, as well as highlighting the changes that have taken place in the 2021-2027 cycle. In the second stage, these were compared with the perspective of actors involved in the implementation of ITIs based on the results of a questionnaire survey conducted in 50 FUAs. Three dimensions were analyzed in detail: cooperative, institutional, and programming. In the third stage, recommendations were formulated to improve the effectiveness of implementation PBPs in FUAs.
The results of the research indicate that the reorientation of cohesion policy towards more integrated actions tailored to the needs of specific FUAs had far-reaching consequences for: 1) multi-level governance through the intensification of establishing and formalizing cooperation between municipalities at both the horizontal and vertical levels; 2) strategic planning through the requirement to develop a long-term strategy tailored to specific territorial characteristics; 3) the distribution of financial resources towards the integration of funds and programs in order to achieve synergies in investments supporting the endogenous potential of territories. The key issues for the effective implementation of ITIs included: meeting formal and legal requirements, reformulating existing cooperation schemes, and integrating spatial and financial actions on a supra-local scale
The results of the study provide decision-makers with guidelines for effective programming of cohesion policy interventions in 2028-2034.

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The unintended restriction of access to territorial development policies due to administrative burden

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S19-3 From policy design to place-based action in functional areas: challenges for cohesion policy in times of global change, Auditorium 224 - North Building - Juridical Faculty, agosto 26, 2026, 17:00 - 19:00

Administrative burden is well-documented as a barrier to access in social policy, yet its operation in territorial development policies remains theoretically underdeveloped. This article examines how administrative burden restricts access to EU Cohesion Policy, analysing ERDF and ESF implementation in the French region of Auvergne–Rhône-Alpes. Drawing on 52 semi-structured interviews, documentary analysis, participant observation, and a beneficiary survey, it identifies two pathways through which administrative burden generates differential exclusion: stringent verification requirements that produce compliance and psychological costs filtering out lower-capacity organisations, and coordination failures that generate ambiguity raising information and compliance costs for less-resourced actors. A third pathway — inter-organisational cooperation as a mitigating mechanism — is shown to operate selectively, reproducing rather than correcting the insider advantage it theoretically counters. The findings reveal a paradox of administrative cohesion: a policy designed to correct territorial inequalities systematically excludes the actors it is most intended to reach.

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Green Capital, Grey Future? The Paradox of Green Dedicated Investments (GDI) and Regional Energy Poverty in the CEE Region

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S20 Green Finance and Regional Sustainability Indicators: Emerging Perspectives on Green Dedicated Investments (GDI), Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

The European Green Deal’s promise of a "Just Transition" suggests that the path to climate neutrality must not exacerbate social inequalities. However, empirical evidence from the "turbulent times" of the recent energy crisis suggests a disconnect between capital allocation and social needs. While the Green Dedicated Investment (GDI) indicator successfully measures the economic volume of sustainable capital flows, it remains an open question whether these funds reach the most vulnerable regions. This paper investigates the spatial distribution of GDI in the Visegrád Four (V4) countries (2019–2024) to determine whether green investments alleviate or deepen regional disparities.

The research contrasts regional GDI intensities (NUTS2 level) with indicators of social vulnerability, specifically energy poverty rates, long-term unemployment, and housing quality. Our findings reveal a "Green Investment Paradox": the highest GDI values are often found in industrialized hubs concentrating on low-carbon technologies (e.g., electromobility, battery manufacturing), while peripheral regions suffering from high energy poverty receive minimal private green capital. In these vulnerable areas, the lack of market-based financing for building renovation creates a "lock-in" effect, trapping residents in carbon-intensive, high-cost living conditions. The study argues that without a "socially weighted" approach to GDI, the current financing model risks creating a "green two-speed Europe," where the benefits of the transition are privatized in industrial centers, while the costs fall disproportionately on the periphery.

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Green Transition and Regional Employment Disparities in the Visegrád Countries

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S20 Green Finance and Regional Sustainability Indicators: Emerging Perspectives on Green Dedicated Investments (GDI), Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

The transition toward a low-carbon economy is reshaping regional labour markets across Europe, creating new opportunities while potentially deepening existing territorial inequalities. This study investigates regional employment disparities in the Visegrád countries (Czechia, Hungary, Poland, and Slovakia) at the NUTS2 level between 2000 and 2024, with particular attention to structural characteristics relevant to the green transition. By linking labour market performance to broader development conditions – including human capital, innovation capacity, economic structure, and infrastructure – the analysis provides insights into regions' preparedness to absorb green dedicated investments (GDI) and benefit from sustainability-oriented growth.
Using principal component analysis and cluster analysis, regions are grouped according to multidimensional labour market and development profiles. Beta and sigma convergence methods are applied to examine the dynamics of regional employment disparities over time, highlighting how economic cycles and external shocks influence convergence patterns. The results reveal persistent structural heterogeneity across regions, suggesting unequal capacities to adapt to structural transformations associated with decarbonisation and the emerging green economy.
While long-term convergence in employment rates is observable, it is highly sensitive to macroeconomic conditions. Convergence weakened during the global financial crisis and became unstable in the period marked by the COVID-19 pandemic, indicating that shocks can disproportionately affect structurally weaker regions – those likely to face greater challenges in attracting and utilising green investments. The findings imply that the spatial distribution of GDI may reinforce existing development gradients unless accompanied by targeted policies addressing skills, innovation systems, and institutional capacity.
By integrating labour market analysis with perspectives on green transformation, the study contributes to understanding how regional socio-economic structures shape the territorial impacts of sustainability-oriented investments. The results highlight the importance of differentiated, place-based policies to ensure that the green transition supports not only environmental goals but also inclusive regional development across Central Europe.

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Green Finance, Cohesion Policy, and Europe’s Long-Term Development Pathways

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S20 Green Finance and Regional Sustainability Indicators: Emerging Perspectives on Green Dedicated Investments (GDI), Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

Green finance is an essential component of the European Union's strategy for developing a climate-neutral economy, and cohesion policy is currently its major instrument for tackling disparities among EU territories. Increased interlinkages between green finance and cohesion policy fuel interesting research topics about their combined impact on European territorial trajectories. The research aims to find if there is any compatibility or if it can create disparities.
Following a regional approach, the research has built and integrated the Green Dedicated Investments (GDI) indicators within a framework linking green finance and cohesion policy. By using information at the NUTS-2 level of regions, the research adopts a research strategy that examines the spatial distribution of green investments and their links with the intensity of cohesion policy and regional development outcomes. In this context, the research will employ spatial analysis and panel regression models to evaluate the impact of green finance and cohesion policy on regional growth and productivity.
This also allowed for gaining insights into the way economic funds from green investments concentrate more in developed and more innovation-intense regions compared to structural funds from cohesion policies focusing more on less developed regions across Europe. The econometric results show a positive contribution of green finance to long-run regional development; however, the importance varies from region to region. It also indicates that in less developed regions, the effectiveness of green investments depends largely on the support from cohesion policies focusing on improving institutional capacity.
However, the research concludes that green finance on its own might not be sufficient to ensure a territorially balanced green transition. Indeed, cohesion policy is critical to the mediation of the regional consequences of green investments and to ensuring that the green transition is aligned with inclusive and sustainable development paths in Europe. The results of the research confirm the importance of policy consistency and illustrate the potential of the GDI indicators for assessing the territorial consequences of green finance.

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Do ESG Ratings Penalize Regional Institutions? New Evidence from Original Data.

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S20 Green Finance and Regional Sustainability Indicators: Emerging Perspectives on Green Dedicated Investments (GDI), Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

This paper examines whether commercial ESG ratings systematically penalize regional financial institutions in the European Union, and whether any such “penalization” reflects genuine sustainability differences or artefacts of measurement, disclosure, and aggregation choices. The study builds an original EU financial-institution dataset combining conventional finance KPIs with structured Environmental, Social, and Governance (ESG) disclosure variables aligned with typical CSRD-style reporting content. A transparent “Core ESG” rating is then derived using principal component analysis (PCA) to replicate an underlying latent sustainability dimension while limiting subjective weighting. The resulting Core ESG rating is benchmarked against provider ratings for EU financial institutions from MSCI, ISS ESG, and Sustainable Fitch to assess (i) how closely the latter tracks each provider and (ii) whether systematic gaps emerge by institutional type (e.g., banks versus insurers) and regional orientation (regional i.e. Landesbanken versus non-regional institutions). The design is motivated by evidence that ESG ratings diverge substantially across agencies due to differences in scope, measurement, and weighting, with important consequences for comparability and capital-market interpretation (Berg et al., 2022; Christensen et al., 2022). By combining an explicit data model with a PCA-based aggregation consistent with recent work on rating disagreement and aggregation methods (Bissoondoyal-Bheenick et al., 2024), the paper provides an empirically implementable framework to diagnose whether rating methodologies generate structural disadvantages for regionally anchored financial institutions.

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Public Catalyst or Private Substitute? Decomposing the GDI to Analyze the Efficiency of EU Green Funds in the V4 Region

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S20 Green Finance and Regional Sustainability Indicators: Emerging Perspectives on Green Dedicated Investments (GDI), Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

In the "turbulent times" of fiscal constraints and high interest rates, the composition of green financing sources becomes critical for regional resilience. The Central and Eastern European (CEE) region relies heavily on European Union funding (e.g., RRF, Cohesion Funds) to drive its green transition. However, a key debate in regional science is whether these public funds "crowd in" private capital (acting as a catalyst) or "crowd out" private investment (creating dependency). This paper addresses this issue by decomposing the Green Dedicated Investment (GDI) indicator into public (GDIpub) and private (GDIpriv) components.
Using a panel dataset of the Visegrád Four (V4) countries from 2018 to 2024, we analyze the interaction between EU climate funding inflows and private green fixed capital formation. Our results indicate a dual dynamic: in advanced capital regions, public funds successfully catalyze private GDI (positive multiplier effect), whereas in lagging regions, EU funds often substitute for the lack of private capital, leading to a "subsidy trap." The study argues that the sustainability of the GDI trajectory depends on shifting the financing mix from public-dominated to private-led models. We propose a new metric, the "Green Multiplier Effect," to evaluate the efficiency of resource utilization in regional policy.

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Beyond the Density Paradox: Dual Thresholds and Pareto Optimization of the Urban Climate Dilemma (Korea, 2014–2023)

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S21 Cities at Risk: Urban Growth Dynamics in the Presence of Climate and Natural Shocks, Hall 2 - North Building, agosto 27, 2026, 09:00 - 10:30

Compact-city strategies are central to climate mitigation, yet densification can simultaneously amplify urban losses from floods and heatwaves by expanding impervious surfaces, intensifying heat storage, and concentrating exposure along mobility networks. This paper reframes urban compactness as a multi-objective optimization problem and identifies two decision-critical thresholds: (i) a structural threshold at which marginal mitigation gains diminish while hazard impacts accelerate, and (ii) a Pareto "knee" that marks a Pareto-efficient stopping point between transport decarbonization and climate-risk reduction.

We assemble a balanced panel of 229 South Korean municipalities (2014–2023) and operationalize a time-comparable Korean Compactness Index (K-CI) based on the "3Ds + accessibility" paradigm—capturing density (population, employment, floor-area ratio), land-use diversity (entropy mix), connectivity (intersection density), and transit accessibility (station-area share; with bus-stop density as a robustness proxy). To avoid dilution by non-urban land, compactness components are measured over urbanized areas. Mitigation performance is proxied by per-capita road-transport CO_2 emissions (cross-validated with per-capita VKT), while adaptation outcomes capture realized impacts: real per-capita flood damages and heat-related illness per 100,000 residents. The model conditions explicitly on hazard triggers—extreme-rainfall days (≥80 mm/day) and heatwave days (≥33°C)—and baseline geographic exposure (elevation/lowland share), while controlling for socioeconomic vulnerability and asset exposure (aging structure, GRDP, land values).

Non-linear effects are estimated using municipality- and year-fixed-effects panel threshold regression with bootstrap tests, allowing for multiple endogenous thresholds. Inference is robust to cross-sectional dependence via Driscoll–Kraay standard errors. As a quasi-experimental mechanism check, we exploit the COVID-19 period (2020–2022) as an exogenous shock to activity flows; the persistence of compactness gradients under suppressed mobility is consistent with built-form "stock" mechanisms rather than transient activity effects.

Finally, we simulate the bivariate response space implied by the estimated functions to recover Pareto frontiers and locate the knee point using curvature-based detection. Comparing the Pareto knee with the structural threshold reveals a policy-relevant gap between social optima and physical limits, enabling an operational zoning logic (safe/warning/danger) for resilient, climate-smart densification strategies.

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A Study on Temporary Evacuation Planning for Tsunami Inundation from a Nankai Trough Megaquake: Assessment of Evacuation Sites and Tsunami Evacuation Simulations Using 3D Urban Models

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S21 Cities at Risk: Urban Growth Dynamics in the Presence of Climate and Natural Shocks, Hall 2 - North Building, agosto 27, 2026, 09:00 - 10:30

This study aims to propose a rapid and efficient evacuation plan against large-scale tsunami inundation caused by a megathrust earthquake along the Nankai Trough. The study area is Kasugade-Kita 1-chome in Konohana Ward, Osaka City. A three-dimensional urban model capable of calculating evacuation time was constructed using the national 3D city model “PLATEAU” and digital road network data.

First, based on tsunami inundation assumptions, non-wooden buildings with accessible rooftops were selected as evacuation sites. The accommodation capacity of each building was estimated from rooftop area and required space per person. The results revealed that the existing designated tsunami evacuation building alone cannot accommodate the entire daytime population. Therefore, the installation of a tsunami evacuation tower in Konohana Park was proposed to compensate for the shortage.

Next, evacuation completion time was calculated through network analysis based on the 3D urban model under multiple evacuation behavior patterns, considering both scenarios with and without capacity constraints. The results indicate that distributed evacuation, which actively utilizes vertical evacuation to reinforced concrete buildings, is the most rapid and efficient strategy.

Furthermore, tsunami propagation was reproduced using fluid simulation in Blender and visualized within the detailed 3D urban model. This approach enables intuitive understanding of tsunami dynamics and enhances disaster preparedness materials.

These findings demonstrate that integrating 3D urban models with evacuation simulation provides an effective method for quantitatively evaluating evacuation strategies and verifying the effectiveness of distributed evacuation planning.

Furthermore, tsunami propagation was reproduced using fluid simulation in Blender and visualized within the detailed 3D urban model. This approach enables intuitive understanding of tsunami dynamics and enhances disaster preparedness materials.

These findings demonstrate that integrating 3D urban models with evacuation simulation provides an effective method for quantitatively evaluating evacuation strategies and verifying the effectiveness of distributed evacuation planning.

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Climate and the structure of national urban systems

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S21 Cities at Risk: Urban Growth Dynamics in the Presence of Climate and Natural Shocks, Hall 2 - North Building, agosto 27, 2026, 09:00 - 10:30

This paper investigates the long-run determinants of cross-country differences in the equality of city size distributions, with a particular emphasis on the role of climate-related factors. Using a harmonized global definition of cities and a balanced panel dataset covering the period 1975–2025, we estimate country-level Pareto coefficients as our main indicator of the degree of equality in national urban structures. To account for model uncertainty in a context characterized by multiple plausible explanatory dimensions, we employ a Bayesian model averaging framework that jointly considers geographic, socioeconomic, and institutional factors. The results reveal that climatic conditions are systematically and robustly associated with the internal configuration of national urban systems. Specifically, higher mean temperatures are positively correlated with more equal city size distributions, while greater average precipitation is linked to more uneven urban hierarchies, even after controlling for both country- and time-specific effects. Conversely, drought intensity does not emerge as a consistent determinant across model specifications. When focusing on urbanization rates instead of city size distributions, precipitation remains the only climatic variable displaying a stable and statistically significant association. Overall, the findings suggest that persistent climatic patterns shape not only the scale of urbanization but also the spatial concentration of populations within countries.

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Mapping Regional Labour Market Skill Demands Through Automated LLM-Based Analysis: Implications for EU Cohesion Policy

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S22 Navigating the future EU Cohesion Policy post-2027 in a transition era, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

Cohesion policy, as a cornerstone of the European Union's strategy for reducing regional disparities, increasingly relies on evidence-based diagnostics of labour market competencies to guide investments in human capital development and smart specialisation. Yet, generating granular, comparable, and timely data on skill demands across regions remains a persistent methodological challenge, particularly when traditional instruments such as surveys and official statistical classifications struggle to capture the rapid evolution of occupational requirements.
This paper addresses this gap by presenting an automated, scalable workflow for extracting and classifying labour market intelligence from large volumes of job posting data, using locally deployed open-weight large language models. Drawing on a corpus of over 56,000 job advertisements collected from a major Romanian recruitment platform over a period of nearly nine months, the pipeline combines web data extraction with a multi-stage semantic enrichment process. This includes occupational classification aligned with the ESCO taxonomy — the EU's standardised framework for Skills, Competences, Qualifications and Occupations — as well as automated skill extraction and mapping.
The resulting dataset covers 2,152 validated IT job postings, classified across 75 ESCO occupations and enriched with 2,797 unique skills mapped to 881 ESCO skill concepts. By anchoring the output to ESCO, the methodology directly enables cross-regional and cross-national comparisons, a key requirement for cohesion policy monitoring and evaluation. The approach runs entirely on consumer-grade hardware without reliance on commercial cloud APIs, making it replicable and cost-effective for regional development agencies, managing authorities, and research institutions in less developed regions operating under tighter resource constraints.
From a cohesion policy perspective, the methodology offers a practical instrument for tracking skill mismatches, supporting the design of European Social Fund Plus interventions, and aligning regional educational and vocational training strategies with actual employer demand. The paper discusses how continuous application of this pipeline can serve as a monitoring tool for smart specialisation strategies and contribute to a more dynamic, data-driven approach to reducing territorial inequalities in the digital economy.

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Impact of cohesion policy on air traffic evolution. A case study on European Union airports

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S22 Navigating the future EU Cohesion Policy post-2027 in a transition era, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

This research analyses airport passenger traffic across European Union airports from 2020 to 2025 using monthly data from the Eurostat database. This work examines the impact of the COVID-19 crisis and the subsequent recovery dynamics as reflected in traffic seasonality, operational efficiency indicators, airport clustering structures, passenger traffic forecasts, and the evolution of international traffic shares. A particular focus is placed on the role of the European Union's cohesion policy in supporting air traffic development by investing in airport infrastructure, enhancing regional connectivity, attracting new airlines, and reducing regional disparities through increased mobility in these areas. The analysis is based on a curated dataset covering more than 100 airports from 12 European countries. Data preprocessing and statistical analysis were done in Python, using performance indicators, clustering techniques, Principal Component Analysis (PCA), and the Holt-Winters exponential smoothing model to capture trend and seasonal dynamics. The results indicate a strong recovery in air traffic following the COVID-19 crisis, with predictable seasonal variations and heterogeneous development trajectories across airports and countries. Trend-based forecasts suggest continued traffic growth toward 2030, particularly in tourism-oriented and marginal regions of Europe. The findings highlight the contribution of cohesion policy investments to improved regional accessibility and sustained air transportation development within the European Union.

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Territorial Typologies of Innovation-to-Sustainability Transformation: Evidence for EU Member States

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S22 Navigating the future EU Cohesion Policy post-2027 in a transition era, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

This paper aims to bring light into the process of transforming the strategic innovation capacity into sustainable development outcomes in the case of the European Union (EU) Member States, with the aim of identifying territorial typologies relevant for the design of EU Cohesion Policy post-2027. In a context marked by geopolitical uncertainty, green and digital transitions, and increasing pressure on public budgets, understanding the efficiency of this transformation process becomes crucial for shaping more targeted and performance-oriented policy interventions.
Using Eurostat data, two composite dimensions are constructed, namely an input dimension measuring the strategic innovation capacity of the member states, and an output dimension related to sustainable development outcomes. Considering that the extracted data are either benefit-type or cost-type variables, a normalization or an inverse normalization step was performed prior to using the indicators for the analysis.
Grey systems theory, through the grey clustering method, offers a distinct tool for complex and uncertain situations, characterized by limited data. Over years, it has been proven that grey systems theory has proved its applicability in a wide range of domains, which have made it the primarily option for the researchers in the field when dealing with incomplete data.
To capture the complexity of the innovation-to-sustainability nexus, multiple weighting scenarios are developed, ranging from full emphasis on innovation capacity to full emphasis on sustainable outcomes. Additionally, a four-year dynamic perspective is incorporated using a grey clustering approach, allowing the observation of countries' movements across clusters. Robustness is ensured through 100,000 simulations with slightly varying coefficients, enabling an assessment of cluster stability.
The results reveal distinct territorial typologies. "Systematic leaders" demonstrate a consistent ability to translate innovation inputs into sustainable outcomes. Other groups include countries with strong innovation capacity but limited sustainability performance, as well as states achieving relatively good outcomes despite weaker innovation inputs. These asymmetric patterns suggest that innovation capacity alone does not automatically guarantee sustainable transformation.
The findings provide evidence for a more nuanced, place-based approach to EU Cohesion Policy post-2027. Rather than uniform support mechanisms, differentiated strategies are needed to address structural inefficiencies in the innovation-to-sustainability conversion process and to foster upward convergence across Member States.

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How Happy Are Europeans? Implications for the Future Cohesion Policy

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S22 Navigating the future EU Cohesion Policy post-2027 in a transition era, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

How happy are Europeans, and what exactly contributes to their well-being? This study aims to identify whether there are common patterns among European countries and the main factors associated with the level of happiness. The analysis is based on seven indicators considered relevant for assessing well-being, selected from the World Happiness Report for the period 2015–2022 and correlated with seven of the 17 Sustainable Development Goals (SDGs), including good health and well-being, decent work and economic growth, partnership for the goals and reduced inequalities. The analyzed indicators are also directly correlated with the indicators proposed by the European Union in the cohesion strategy for 2021–2027, which aims to reduce disparities between European countries. The results showed that the applied methods illustrate two clusters among analyzed countries. To highlight similarities between countries, cluster analysis was applied. The results indicate the existence of two distinct groups of countries. The first cluster mainly includes Western European countries, characterized by a higher standard of living. The second cluster brings together most Central and Eastern European countries, as well as cases such as Spain and Portugal. The differences between groups are particularly visible in the case of indicators regarding the perception of corruption, healthy life expectancy at birth, logarithmic GDP, and freedom to make choices. The results suggest that well-being in Europe is not distributed evenly, and institutional and socio-economic factors play an important role in shaping the level of happiness at the national level. They can also provide useful pointers for Cohesion Policy post-2027, which places a special emphasis on people and their needs, aiming to "leave no one behind", and serves as a primary tool for European solidarity. The results of happiness research in Europe contribute to achieving the cohesion objective PO5 – a Europe closer to its citizens, by providing direct information about the needs and perceptions of each nation. The study's results help in developing policies tailored to the specifics of each country, supporting their sustainable and integrated development.

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Effects of Incentives for Conversion to Organic Farming: An Evaluation of Causal Pathways and Long-Term Outcomes

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S25-1 Counterfactual methods for regional policy evaluation, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

This study examines the long-term effects of public incentives for conversion to organic farming, focusing on how such policies affect both farm survival and the persistence of organic production over time. Using a nine-year follow-up of administrative data from a policy program implemented in Italy, the analysis addresses a key challenge in policy evaluation: production outcomes are only observed for farms that remain active, while survival itself may be influenced by the incentive.
To deal with this issue, the study adopts a causal framework based on potential outcomes and principal stratification, allowing different causal pathways to be explicitly modeled according to farms' latent survival responses to treatment. The evaluation is implemented within a Bayesian inferential framework, which enables the joint estimation of survival, production outcomes, and the distribution of principal strata in both the target population and the treated group.
The results indicate that the incentive has limited effects on farm survival, benefiting only a small subset of farms whose continuation depends on the support. In contrast, among farms that would have survived even in the absence of the incentive, the policy substantially increases the likelihood of maintaining organic production in the long run. Differences in the composition of the principal strata reveal systematic heterogeneity in structural characteristics, such as farm size and organizational form, pointing to non-uniform responses to the policy and enabling an assessment of how the targeting mechanism shapes the population actually reached by the incentive.
Complementary survey evidence on treated and surviving farms provides additional insights into the strategies and conditions associated with long-term persistence in organic farming. Overall, the study offers policy-relevant evidence on the mechanisms through which conversion incentives operate and highlights the importance of aligning policy design and targeting with heterogeneous farm responses.

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Green Funds and Climate Discontent

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S25-1 Counterfactual methods for regional policy evaluation, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

Do Green Funds lower Climate Discontent and support Environmental Voting? Environmental concerns have become central to contemporary political debate as the urgency of addressing climate change intensifies. Meeting international climate targets requires rapid and far-reaching reductions in greenhouse gas emissions, entailing substantial economic and social adjustments. These measures impose immediate and unevenly distributed costs, including higher living expenses, lifestyle changes, and structural transformations in carbon-intensive regions, while their benefits largely accrue in the long term. As a result, ambitious climate policies risk triggering political backlash among voters who bear these short-term burdens. This project examines whether compensating citizens for the costs associated with climate action through European financial support can enhance public support and make the green transition politically sustainable.

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Million Dollar Plants – A golden bullet for regional development?

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S25-1 Counterfactual methods for regional policy evaluation, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

Subsidizing large-scale investment projects is a central element of structural policy worldwide. The relocation or setting up of so-called Million Dollar plants attract a great deal of political, social, and economic attention, since they are expected to serve as catalysts for regional development and transformation. Even though, according to growth theory and the new economic geography, particularly investment projects in technology-intensive industries are considered suitable for activating endogenous growth, establishing Million Dollar plants is rarely free of conflict. Empirical evidence on causal effects of large-scale investments on the regional economy is available only for North America so far, and focuses on economic effects like productivity, employment and knowledge transfer.

One of our contributions to empirical literature is the development of a multidimensional indicator system for the assessment of large-scale investment projects, considering economic, social and environmental aspects as well as sustainability of the investments. The system includes project characteristics, expected public revenues (e.g. taxes) and expenditures (public subsidies, infrastructure investments), labor market effects, regional development dynamics and potential bottlenecks, consumption of natural resources (e.g. sealed surfaces, water), and indicators for public acceptance of the investment projects.

In our empirical analysis, we focus on subsidized German large-scale investments registered in the GRW funding statistics of the Federal Office for Economic Affairs and Export Control (BAFA) for the years 2010 to 2024. Following the common definition used in EU funding practice, we define projects of at least e 50 million as large-scale investments. This definition allows for a broad range of different types of projects to be captured, including new establishments, site expansions, and technological transformations. We observe a broad range of large-scale investments in Germany – with heterogeneous sectoral, technological and regional characteristics, and with varying degrees of compatibility with the existing economic structure. Thus, estimating one causal average effect would not be sufficient. Instead, we plan a two-step estimation procedure. In the first step, we will develop a classification system of German investments using cluster techniques. In the second step, we will conduct cluster-specific causal analyses on the basis of synthetic control groups.

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Territorial Impacts of the European Capital of Culture: Evidence from Guimarães 2012

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S25-2 Counterfactual methods for regional policy evaluation, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

The socio-economic development literature widely acknowledges that cultural heritage and cultural initiatives may help to bring about major economic and social benefits. Since 1985, the European Capital of Culture (ECoC) programme of the EU promotes annual cultural events in different European cities, or partner cities and towns. The aim is twofold. On the one hand to promote and celebrate Europe's rich cultural diversity and heritage, mutual understanding and intercultural dialogue, with cities at the centre of cultural life across Europe. On the other hand, particularly since the 1990s, to foster the contribution of culture to the regeneration of local/regional economies and their sustainable socio-economic development. However, the empirical research on the impact of ECoCs on local economies suggests that while cultural activities may contribute to wellbeing and short-term benefits, they tend to have limited or mainly temporary impacts on local economies, with little evidence of wider territorial sustainability effects regarding economic transformation and long-term socio-economic development. In this regard, the overall objective of the present study is to collect territorial evidence on how the cultural development initiatives promoted with ECoC in the case of Guimarães (ECoC in 2012), contributed to improve long-run territorial development both in the host city and in its surrounding region. Spill-over effects are in fact explored, examining how the ECoC initiative in Guimarães influenced cultural, economic, and social transformations at both urban and regional levels. Particularly, the quantitative analysis makes use of the Synthetic Control Method (SCM), which estimates counterfactual trends, allowing the identification of net changes in key indicators—such as employment, value added, and tourism flows—relative to a statistically constructed control group of similar territories. The methodology is applied to NUTS3 regions and spillovers from the NUTS3 region hosting the event on the remaining areas of the wider NUTS2 region where the ECoC is located are also measured.

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Of Pandas and People: National Parks and Rural-Urban Population Dynamics

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S25-2 Counterfactual methods for regional policy evaluation, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

Based on a conceptual framework derived from the Push-Pull Theory and leveraging the China's Giant Panda National Park (GPNP) pilot program as a quasi-experiment, this paper analyzes the impact of environmental regulation related to biodiversity protection on rural-urban population dynamics. Employing a difference-in-differences approach with county-level panel data from Sichuan Province (2013–2022), we find that the GPNP reduces population by 4.1% on average, mainly from rural loss due to sharply declining agricultural productivity, especially in agriculture-dependent counties. However, urban population increases in the GPNP pilot counties with large, dense urban areas, strong transport links, and urban-biased policies. The results suggest that regulation may impoverish rather than depopulate rural regions, and thus requires additional compensation schemes.

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Breaking the Union: Fiscal Consequences of (Political) Misalignment

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S25-2 Counterfactual methods for regional policy evaluation, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

This paper examines the fiscal consequences of dissolving Italian municipal unions (Unioni di Comuni), a form of inter-municipal cooperation in which municipalities jointly provide selected public services while retaining substantial political and administrative autonomy. I build a new dataset of union dissolutions over recent decades and classify each episode by the crisis that triggered it using official documents and local news sources. A core focus is on politically driven breakups: dissolutions following unexpected and abrupt shifts in political control, proxied by razor-thin municipal elections in at least one member municipality, which plausibly disrupt coordination within the union. I merge these data with municipal budget records to construct function-specific per-capita expenditures for the former union area and track how spending is reallocated when service provision returns to individual member municipalities. I estimate average and dynamic (event-time) effects using synthetic difference-in-differences, reweighting stable unions to match pre-dissolution trajectories and applying standard difference-in-differences adjustments. I assess identification via pre-trend and placebo tests. I also compare politically triggered dissolutions with more routine dissolution episodes to evaluate whether political shocks are associated with distinct short-run post-breakup spending patterns in the aftermath, and I examine heterogeneity across service domains, local fiscal capacity, and baseline spending levels.

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Between Experience and Structure: A Critical Review of Meaningful Work Across Disciplines and Implications for Economic Geography

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S29 Decent work: Job quality in regional science, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 09:00 - 10:30

Labour markets are conventionally understood through wages, contracts and material working conditions. Yet workers' location decisions, retention behaviour and labour market participation are equally shaped by non-pecuniary dimensions of work, including meaningfulness, recognition, work relationships, learning opportunities or purpose. For economic geography, this poses a fundamental challenge: if what makes work valuable cannot be reduced to monetary compensation or classic job attributes, then standard accounts of regional labour market dynamics, spatial sorting and place-based inequality are incomplete. This paper addresses that challenge through a critical, interdisciplinary review of meaningful work scholarship across organisational psychology, sociology of work, philosophy, labour economics and economic geography.
Organisational psychology has generated rich knowledge about antecedents and consequences of meaningful work but has been critiqued for individualising meaningfulness and neglecting structural conditions and power relations. Sociological perspectives reveal that meaningful work is unequally distributed across employment regimes and occupational hierarchies. Labour process theory demonstrates that the capacity to experience work as meaningful is fundamentally shaped by managerial control and bargaining position. Economic approaches conceptualise meaningful work as a non-pecuniary job attribute but reveal troubling compensating differentials whereby workers accept inferior material conditions in exchange for perceived meaning. Philosophical contributions distinguish between meaning, meaningfulness and worth, clarifying persistent conceptual ambiguities. Economic geography occupies a distinctive position in this conversation. Drawing on labour geography, political economy and institutional approaches, it situates meaningful work within regional labour markets, sectoral cultures and place-based occupational identities. What counts as valuable work is historically and institutionally embedded, shaped by regional development trajectories, dominant industries, and local norms regarding contribution and worth. Spatial inequalities in access to meaningful work reflect not only wage differentials but uneven distributions of autonomy, recognition or occupational dignity across regions and sectors. Economic geography thereby reframes meaningful work from an individual psychological state into a geographically constituted achievement inseparable from the spatial organisation of production and social reproduction.
This review identifies three critical gaps: insufficient integration of subjective experience and structural conditions; limited attention to value pluralism and regional variation; and inadequate theorisation of negotiation, voice and relational dynamics. The paper concludes by arguing for relational, context-sensitive frameworks embedding meaningful work within broader ecologies of job quality, institutional arrangements and regional contexts, positioning economic geography as a key discipline for understanding the spatial and institutional foundations of valuable and meaningful work.

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Platforms and Job Quality: Ripple Effects in Local Labour Markets

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S29 Decent work: Job quality in regional science, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 09:00 - 10:30

The paper examines the implications of firms' use of digital platforms for job quality. By shifting the focus to platform adoption by firms, rather than workers' direct participation in platform-mediated work, the paper argues that the effects of digital platforms are not confined to jobs directly mediated by platforms, but extend more broadly across the local labour market, generating ripple effects on workers who are not directly involved with platforms. Using Italian data for the period 2018–2024, the paper provides empirical evidence of negative ripple effects on individual job quality. These effects are not uniform but vary systematically across occupations according to skill level and the cooperative atmosphere permeating local labour markets.

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Promoting and measuring the effectiveness of labor insertion policies in an emerging country

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S29 Decent work: Job quality in regional science, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 09:00 - 10:30

Youth employment represents a hard challenge across emerging countries, where the youngsters generally face structural, economic, and demographic barriers limiting their access to stable and decent jobs (ILO, 2025).
In Senegal, youths' labor insertion faces a very fragile context marked by high informality, youth unemployment around 20% (ages 15–24), and an annual inflow of approximately 300,000 new entrants compared to only about 30,000 available formal job opportunities (Diallo et al., 2023). Although Senegal remains one of the most politically stable countries within West Africa, its labor market is highly segmented, with over 90% of young people working under precarious conditions and without social protection (Rodríguez-Castelán and Vazquez, 2022). Demographic growth amplifies employment vulnerability, further exacerbated by skill mismatches and institutional weaknesses.
The objective of this contribution is to investigate the evolution and effectiveness of active labor market policies and youth employment programs implemented by the Senegalese government since 2000. The study adopts a systematic review approach of the main labor and self-employment policy initiatives, as well as more recent programs. By offering a comprehensive assessment of youth employment policies implemented by the Senegalese government over the past two decades, this study provides an interpretive framework for understanding the current policy mix in Senegal. It also classifies the Senegalese model as a "promotional-concerted" type with a strong focus on self-employment. In this light, it contributes to the theoretical debate by distinguishing African trajectories from Western paradigms. These findings support policy recommendations, advancing literature on inclusive development in informal economies.

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A new challenge for cohesion policies: Is AI a new source of regional divergence?

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S30-1 Beyond Next Generation EU: Impact Assessment and Implications for Cohesion Policy, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 27, 2026, 09:00 - 10:30

Over the last decades, European Union cohesion policy has been shaped by the principles of place-based policies, with outcomes often seen as falling short of expectations. The post-pandemic response has introduced a more centralized governance design (e.g., NGEU), reopening the debate on which institutional architecture is best suited to sustain territorial convergence. This paper situates that debate in the context of the rapid advance of generative AI, which may raise productivity in automatable tasks while simultaneously reshaping the economic value of human skills in tasks that remain non-automatable.

To study these changes, we adopt a task-based framework due to Jones and Tonetti (2026) inspired by the "weak links" logic of O-ring production (Kremer, 1993): production processes are made of many complementary tasks, with a low elasticity of substitution across tasks. Put differently, tasks are not easily replaceable with one another: weak performance in some steps can drag down aggregate output even when other steps are highly efficient. Within each task, however, technology (capital/AI) and human labour are perfect substitutes: a task is performed by whichever input delivers it at lower cost, and advances in AI tend to expand the set of tasks for which technology is economically viable.

In this setting, territorial heterogeneity—human capital, institutional quality, innovative capacity, and adoption capabilities—can generate different trajectories both in the speed at which territories automate "automatable" tasks and in the productivity of tasks that remain structurally human. As a result, AI can trigger convergence or divergence dynamics: on the one hand, automation may relax bottlenecks; on the other, it may increase the relative weight of non-automatable tasks, making deficits in skills and organization more damaging in lagging territories.

The paper's contribution is to clarify the mechanisms through which AI may widen or narrow regional gaps and to discuss the implications for policy design: when the priority should be strengthening local adoption capabilities and skills in residual tasks, and when more centralized coordination may be more effective in preserving the goal of territorial cohesion.

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Next Generation EU: A Stress Test for Cohesion Policy?

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S30-1 Beyond Next Generation EU: Impact Assessment and Implications for Cohesion Policy, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 27, 2026, 09:00 - 10:30

Next Generation EU (NGEU) represents a major innovation in the European Union's economic governance, both because of its exceptional and temporary nature and because of its institutional design. Through the Recovery and Resilience Facility (RRF), NGEU introduces a performance-oriented intervention logic based on milestones and targets, with disbursements conditional on results and a strong thematic concentration of investments. While this approach enabled a rapid response to the economic consequences of the COVID-19 crisis, it also raises important questions from a territorial and governance perspective.
This paper analyses the interaction between NGEU and EU cohesion policy, traditionally grounded in a long-term, place-based framework centred on ex ante allocation, additionality, partnership and multilevel governance. The coexistence of both instruments during the 2021–2027 programming period creates a policy environment in which different intervention logics operate simultaneously. From this perspective, NGEU can be interpreted as a stress test for cohesion policy, as it challenges its core principles and highlights potential tensions between performance orientation and territorial sensitivity.

Using Spain as a case study, the paper examines how NGEU interacts with a highly decentralised governance structure. Drawing on data on the territorial allocation and implementation of RRF and REACT-EU funds, combined with regional socio-economic indicators at the NUTS-2 level, the analysis identifies patterns in fund absorption and implementation speed.
Preliminary findings suggest that territorial outcomes are closely linked to regional administrative capacity. In the absence of explicit territorial allocation criteria, implementation dynamics may risk reinforcing existing disparities. These results underline the need to strengthen coherence between performance-based instruments and territorial approaches, reinforce regional capacity, and preserve multilevel governance in the post-2027 reform of cohesion policy.

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The impact of cohesion policy on domestic public spending: A dynamic analysis at the EU regional level

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S30-1 Beyond Next Generation EU: Impact Assessment and Implications for Cohesion Policy, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 27, 2026, 09:00 - 10:30

This work evaluates the additionality principle of European structural funds at EU NUTS-2 level across different programming periods, up to the most recent cycles. Existing evidence provides mixed conclusions on whether EU transfers complement or substitute domestic public spending. The debate on the additionality of cohesion funds has re-emerged in light of recent economic crises, which may have led national and regional governments to use cohesion funds to replace domestic fiscal expenditure under budgetary constraints and austerity policies, and in view of the simultaneous implementation of NGEU during the 2021-27 cohesion policy programming. We investigate the dynamic impact of cohesion policy expenditures on domestic public spending and the sources of heterogenous effects (based for example on different business cycle position and typology of funds). The empirical strategy employs the local projection approach (Jorda, 2005) which allows to estimate impulse-response functions and flexible modelling of heterogeneous and nonlinear dynamics across regional characteristics. Instrumental variables methods are applied to identify plausibly exogenous variation in cohesion policy expenditures. Our work provides relevant insights regarding the introduction of the additionality principle in the forthcoming 2028-34 cohesion policy cycle and has implications also for Next Generation EU, whose spending may have displaced public investments.

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Do geopolitical risks impact public fund effectiveness?

Measurement and explanations for the European regions

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S30-2 Beyond Next Generation EU: Impact Assessment and Implications for Cohesion Policy, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 27, 2026, 15:00 - 17:00

Raising geopolitical threats and economic linkages can influence the effectiveness of regional development policies with geographical differences. We construct novel trade-adjusted measures of exposure to geopolitical risk for the European regions and present evidence on the changes of cohesion policy impact driven by geopolitical issues over the past two decades. Our findings indicate that the adverse effects of geopolitical risk on cohesion policy effectiveness vary across and within European countries. Territorial divergences are explained by differences in regional positioning in global value chains and foreign direct investments. Policy implications are finally discussed.

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The Role of Administrative Capacity for an Effective Implementation of EU Cohesion Policy

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S30-2 Beyond Next Generation EU: Impact Assessment and Implications for Cohesion Policy, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 27, 2026, 15:00 - 17:00

This reflection paper examines the influence of administrative capacity on the absorption and effective use of Cohesion Policy funds. First, it examines the current level of absorption of Cohesion Policy funds in the 2014-2020 programming period. Second, a literature review on the relationship between administrative capacity and the absorption of Cohesion Policy funds highlights the factors affecting the availability of administrative resources. Third, the role of administrative capacity for the effectiveness of funds usage in EU regions is discussed.
The literature concludes that the effects of Cohesion Policy are heterogeneous across regions. Administrative capacity is an important element of a region's absorptive capacity, also due to the project selection process through managing authorities. Therefore, measures should be taken to attract motivated and well-qualified staff and to ensure communication and coordination with stakeholders and other relevant bodies. Finally, a recent study on regional development opportunities of green and digital technologies is presented, pointing to the knowledge of administrative staff about regional characteristics and capabilities as essential contribution to "good" policy implementation.

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Are place-based innovation policies more effective than space-neutral ones? Evidence from environmental patenting across EU regions

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S30-2 Beyond Next Generation EU: Impact Assessment and Implications for Cohesion Policy, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 27, 2026, 15:00 - 17:00

The proposal on Cohesion Policy post-2027 features an enhanced focus on strategic objectives (i.e. achieving leadership in emerging technologies such as AI and clean tech, strengthening defence capabilities, etc.) and a shift towards more top-down governance. This approach draws on the recent experience of the NextGenerationEU instrument and aligns with the strategic competitiveness agenda highlighted in the Draghi Report.

However, can this renewed strategic orientation be reconciled with the traditional objective of Cohesion Policy to foster regional convergence?

This paper investigates this question through the lens of green innovation investment policies. There is limited research systematically exploring these policies from a territorial perspective. The paper addresses this gap by analysing the effects of EU green R&D investments under Cohesion Policy and Horizon 2020, used as proxies for place-based and place-neutral green innovation policies, on regional environmental (green) patenting levels. The empirical analysis relies on a double/debiased machine learning framework based on post-double-selection LASSO.

The results show that green innovation policies have significant but highly heterogeneous effects. Positive impacts are largely concentrated in more developed and innovative regions. By contrast, no statistically significant causal effects on green patenting are found in less developed and less innovative regions, which already display substantially weaker green innovation capacities.

This evidence highlights the risk that a stronger emphasis of Cohesion Policy on new strategic priorities such as promoting green technologies may achieve very little in relation to the objective of regional convergence if adequate enabling conditions are not in place. Moreover, place-based (Cohesion Policy) and place-neutral (Horizon 2020) subsidies appear to exhibit substitution effects, which may further reduce policy additionality and undermine the coherence of the EU innovation policy mix.

Overall, the paper underscores the importance of strengthening regional innovation ecosystems and framework conditions to ensure that green innovation policies contribute not only to competitiveness but also to convergence.

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Assessing the drivers of project time efficiency under Next Generation EU: Evidence from Italy

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S30-2 Beyond Next Generation EU: Impact Assessment and Implications for Cohesion Policy, Auditorium 45 - Central corpus - Faculty of Pedagogy, agosto 27, 2026, 15:00 - 17:00

This work investigates the drivers of time-efficient execution of projects financed under the NGEU in the Italian case. Drawing on project-level data from the ItaliaDomani and OpenPNRR databases and employing survival analysis techniques, we examine the effects of regional context factors on project execution time. Moreover, we assess whether centralized or decentralized implementation is associated with faster execution and explore potential non-linear impact of institutional quality according to the different implementing bodies. In addition, we consider project-level characteristics including co-financing with other funding sources. Our main results indicate that territorial features play a crucial role in explaining time efficiency. In particular, institutional quality, development level and agglomeration economies emerge as key determinants, alongside centralized project implementation especially in regions with weaker institutional capacity. These findings may provide ex-ante insights into the effectiveness of NGEU and offer policy implications for the design of the 2028-34 EU cohesion policy.

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Foreign Direct Investment and the Limits of Regional Upgrading: Evidence from GVC Roles in Central and Eastern Europe

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S33 Regional Vulnerabilities and Trade Dependencies, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

This paper examines how foreign direct investment (FDI) shapes regional development trajectories in Central and Eastern Europe using a NUTS-2 panel dataset (2008–2018) covering the Visegrad countries plus Slovenia, Croatia and Romania. The analysis integrates Eurostat regional FDI stocks, regionalised EU input-output tables measuring GVC upstreamness, and EPO patent indicators capturing technological complexity, diversity and specialisation, while controlling for regional fitness and knowledge structure.

The empirical framework adopts a role-based GVC perspective distinguishing controller, supplier, assembler and outsider regions following the Capello–Dellisanti (2024) classification. Building on this framework, the paper links GVC roles to regional knowledge structures and absorptive capacity, allowing an assessment of how FDI interacts with regional innovation characteristics. Interaction models estimate how FDI effects vary across regional functions and sectoral structures.

The results show that FDI is a strong driver of labour productivity growth, particularly in assembler regions, confirming its efficiency-enhancing role. However, these gains do not translate into systematic functional upgrading or sustained upstream mobility. Manufacturing-related FDI remains tied to downstream assembly activities, while upstream shifts are limited and primarily associated with regional R&D intensity rather than FDI volume.

Technological upgrading outcomes are weak and spatially uneven. Once regional fitness and knowledge structure are controlled for, FDI has only marginal effects on capability building and becomes negative in outsider regions. Rather than promoting diversification, FDI induces role-contingent specialisation that narrows regional knowledge bases. Regional fitness, and not FDI, emerges as the main driver of endogenous complexity growth.

This decoupling between productivity gains and technological upgrading suggests the persistence of an assembler trap across large parts of the region. Integration into global production networks therefore occurs in CEE regions without corresponding integration into global knowledge creation. The findings indicate that FDI tends to reinforce existing GVC positions more than it facilitates upward transitions. Sustainable upgrading requires policies strengthening domestic innovation capacity, absorptive capabilities and region-specific R&D ecosystems; otherwise, FDI-led growth risks locking regions into stable but structurally dependent development paths.

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Non-Tariff Measures and the Transmission of Tariff Shocks: Evidence from European Regions

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S33 Regional Vulnerabilities and Trade Dependencies, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

This study analyses how non-tariff measures (NTMs) shape the transmission of external trade shocks across European regions. Adopting a double-stage empirical strategy based on local projections, we first estimate the dynamic effects of tariff shocks on regional trade and then assess how these effects vary across regions characterised by different levels of NTMs. Rather than modelling NTMs as transitory shocks, we treat them as a sum of active NTMs, and so in terms of a persistent regulatory instrument that conditions the magnitude of tariff-induced trade responses. Our results reveal substantial heterogeneity in the impact of tariff shocks across European regions and show that, in the presence of high pre-existing levels of NTMs, the negative effects of tariffs on export performance are significantly attenuated. These findings contribute to the literature on trade spillovers, regulatory environments, and regional economic resilience, highlighting the importance of accounting for structural regulatory conditions when evaluating the effects of external trade shocks and the role of EU integration policies.

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The Economic Security Strategy: Regional Trade Vulnerabilities and Economic Dynamics

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S33 Regional Vulnerabilities and Trade Dependencies, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

The renewed focus on trade dynamics in Europe reflects rising concerns over economic security amid geopolitical fragmentation, supply chain tensions, and systemic shocks. In response, the EU's agenda of Open Strategic Autonomy and the European Economic Security Strategy aims to reconcile openness with resilience by identifying and managing critical dependencies. Yet, these approaches remain largely spatially neutral, overlooking the territorial embeddedness of vulnerabilities and capabilities within European production systems.
This paper advances a regional perspective tailored to the heterogeneous positions of European regions within global trade. We define regional economic security over two dimensions: dependency and economic importance, able to describe a region's capacity to sustain economic activity while mitigating exposure to disruptive external dependencies, without forgoing the benefits of trade integration. Specifically, our conceptual refinement explicitly incorporates regional peculiarities as their industrial specialization. Some regions are already European or global leaders in specific products and technologies, with a competitive edge rooted in accumulated capabilities, skills, and innovation ecosystems. Other regions have instead benefited from trade dependencies by accessing relatively cheaper external inputs and distant markets, at the cost of high risk exposure. For them, economic security is less about autonomy per se and more about deep, stable, and diversified integration within European production networks, which reduces geopolitical exposure while preserving openness. Embedding economic security within differentiated regional pathways provides a more nuanced understanding of how Europe's strategic autonomy is built—unevenly and incrementally—from the regional level upward.

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The State and the Missing Middle: The Role of Mini-Multinationals in the Reconfiguration of Global Value Chains

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S33 Regional Vulnerabilities and Trade Dependencies, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

This paper examines the role of micro and small enterprises (MSEs) — or "mini-multinationals" — in the ongoing reconfiguration of global value chains (GVCs) amid heightened geopolitical tensions and security-driven industrial policy. While the literature on GVC restructuring has largely focused on large lead firms and flagship investments, we argue that MSEs represent a critical "missing middle" whose foreign direct investment (FDI) decisions shape the territorial viability of state-led reconfiguration strategies. Drawing on a novel firm-level dataset that combines greenfield FDI project data from ORBIS Cross-Border Investment (CBI) with firm-level information from ORBIS for the period 2014–2025, we compare the sectoral composition, geographical footprint, and policy responsiveness of mini-multinationals and large multinational enterprises (MNEs). Preliminary evidence reveals systematic differences: mini-multinationals are more concentrated in less capital-intensive industries and may exhibit distinct geographic patterns relative to their larger counterparts. To assess policy responses, we implement an event-study design centered on the onset of the Trump II presidency in early 2025 — a key inflection point for tariff announcements and security-driven trade measures. Our findings contribute to debates on state agency, supply-chain resilience, and the microfoundations of GVC reconfiguration, highlighting that effective industrial policy must account for the investment behavior of small firms, not only large multinationals.

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When Economic Security and Growth Are Constrained: Trade Vulnerability in European Regions

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S33 Regional Vulnerabilities and Trade Dependencies, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

When Economic Security and Growth Are Constrained: Trade Vulnerability in European Regions

Abstract

Trade integration has long been viewed as a central driver of regional growth and convergence, associated with productivity gains, export upgrading, and enhanced competitiveness. Yet recent crises—including the global financial crisis, energy supply disruptions, and renewed geopolitical tensions—have exposed the fragility of trade-dependent growth models. While integration into international supply chains can generate efficiency gains, it also increases exposure to external shocks, raising new concerns about economic security and sustainability. These developments call for a re-examination of how trade openness, regional growth potential, and vulnerability interact across space.

This paper analyses how trade-related vulnerabilities are unevenly distributed across European regions and how they shape regional growth trajectories under conditions of heightened uncertainty. It bridges the regional trade and vulnerability literature with emerging policy debates on economic security and new growth perspectives from a regionally grounded political economy approach. The first objective is conceptual: to move beyond aggregate trade openness indicators by developing a multidimensional framework of trade-induced growth constraints. The second objective is empirical: to assess whether regions facing stronger trade constraints exhibit systematic economic challenges, including weaker growth performance, greater volatility, declining competitiveness, lagging technological capacity, and shifts toward more locally embedded economic activities.

Empirically, the paper develops a Trade Constraint Index (TCI) that captures the extent to which regional growth is externally constrained by trade dependence. The index integrates three dimensions: trade exposure (export intensity and reliance on imported intermediates), trade sensitivity (export concentration and energy/material intensity), and adaptive capacity (sectoral diversification, knowledge intensity, and institutional capacity). Higher values indicate stronger trade-induced growth constraints. Using fixed-effects panel regression models, the analysis examines how trade constraints influence growth, competitiveness, technological upgrading, and structural reorientation across regions.

The findings highlight the magnitude and spatial unevenness of trade-induced constraints across European regions. Overall, the paper argues that trade vulnerability has become a central channel through which economic security concerns and evolving growth debates are articulated at the regional scale in an increasingly volatile global economy.

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Spatial Interdependencies in Support for Populist Radical Right Parties: Evidence from Slovakia

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S34-1 Geography and the determinants of political discontent, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

Populist radical right parties known for populist, anti-immigrant, and Eurosceptic stances have gained varying electoral support in the European Union. Slovakia is no exception and this study investigates the determinants of support for populist radical right parties in Slovakia, focusing on spatial spillover effects and regional disparities. Using spatial econometric models and panel data from 79 Slovak districts across three election cycles (2016, 2020, 2023), the analysis identifies both contextual and compositional factors influencing PRRP support. By integrating advanced spatial econometric approaches, we revealed that variations in PRRP support arise not only from the characteristics of a specific region (direct effect) but also from the influence of neighboring regions' characteristics (indirect effect), emphasizing the role of spatial interdependencies in shaping political preferences. The study highlights the need for regionally coordinated policies to address economic inequalities and foster social cohesion. Findings of this study contribute to the broader discourse on populism and regional development in CEE, underscoring the importance of targeted interventions in lagging regions to mitigate the spread of populist narratives and strengthen democratic resilience.

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Political discontent and its geographies: Who, What, When, Where, and Why.

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S34-1 Geography and the determinants of political discontent, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

Political discontent has become a defining feature of contemporary democracies, visible in declining trust in government, lower electoral participation, and the growing success of anti-establishment and populist parties. While influential accounts attribute these trends primarily to economic drivers, this paper argues that economic factors alone cannot explain the scale, timing, and spatial concentration of discontent. Instead, it advances a geographically grounded framework structured around five questions: who expresses discontent, why it has intensified, where it clusters, when it becomes politically consequential, and with what implications. Summarising the growing body of research on the geography of political discontent, the paper makes four main claims: (1) economic factors alone are insufficient to explain the rise of discontent; (2) perceptions are as important as factual reality to explaining political discontent; (3) geography and place play a role, not only as a background; (4) socialisation and social interactions are a key mechanism through which places shape individual political outlooks and behaviours.

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Contagion effect on political discontent. An analysis of the growth of anti-establishment political options at the local level in Spain, France, Italy, and Germany

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S34-1 Geography and the determinants of political discontent, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 09:00 - 10:30

Over the last decade, a global rise in support for populist, anti-establishment, and radical political parties has been observed. To date, most of the economic literature examining the roots of the increase in anti-system political support has focused on the role of spatial income inequalities. However, the local areas with significant income gaps relative to their immediate surroundings constitute a clear minority. The objective of this paper is to analyse the contagion effect of political discontent arising from spatial income disequilibria. To test the proposed hypothesis, local-level data from Germany, France, Spain, and Italy were compiled. Local spatial units (municipalities or equivalent) are used to observe contagion processes at a highly disaggregated scale. Income inequality does not generate its strongest increase in anti-system voting within the municipality where it emerges, but instead produces a more pronounced electoral response in neighbouring territories. Political unrest may germinate in areas that don't matter, but it is greatly amplified in surrounding areas. These findings suggest that when a territory falls behind and no timely corrective action is taken, discontent can spread to nearby, more prosperous areas.

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On the mismatch between life and political discontent

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S34-2 Geography and the determinants of political discontent, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

Ten years ago, the result of the Brexit referendum represented one of the first sensational and unexpected electoral outcomes explicitly against the political and economic status quo. In the last decade, it was followed by the rapid increase of the support for radical parties in most developed countries.
The literature on this phenomenon highlighted the peculiar geography of protest voting, recurrently overlapping with the spatial distribution of economic and social decline (Dijkstra et al., 2020; Hooghe and Dassonneville, 2018). This empirical association supported the idea that the lack of occupational and economic opportunities fuelled life discontent that, in turn, translated into extreme voting (McCann, 2020). In this perspective, the persistent economic stagnation of marginalized areas triggered what Rodríguez-Pose (2018) termed the “revenge of places that don’t matter”.
While a broad literature provided evidence supporting this interpretation, some recent studies pointed to the occurrence of some mismatches between the geographies of life dissatisfaction and political discontent. Lenzi and Perucca (2025) suggested that the reasons of such mismatch are related to two understudied determinants of political discontent. The first one concerns the rise of inequality across different social groups and territories. In an era of increasing wealth polarization (Piketty and Saez, 2003), more unequal local communities are likely to foster individual discontent, through mechanisms of comparison and benchmarking. The second factor involves the heterogeneous role of some non-economic factors in shaping individual voting behaviour. A long line of research has shown how group influences individuals’ preferences and behaviours toward in- and out-group members (Shayo, 2020). The political mobilization of identities to provoke place-based resentment (Bornschier et al., 2021) remains unexplored, especially in its regional dimension, which includes identifying local behavioural patterns and social beliefs that may either reinforce or mitigate such mechanisms.
This paper focuses on the relationship between life and political discontent, and on the way in which inequalities and individual and collective cultural features mediate this association. Making use of individual survey data on the preferences for Brexit and other individual characteristics (among which personal life dissatisfaction), this study provides new evidence in the literature on the geography of discontent.

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Cohesion or illusion? Losing funds and European sentiment

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S34-2 Geography and the determinants of political discontent, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

Does losing access to European funding lower European sentiment? This paper examines the causal impact of losing EU Cohesion Policy funding on regional European sentiment, measured through voting behavior in European Parliament elections. Exploiting the staggered timing of regions losing the less developed (convergence) status, we apply difference-in-differences estimators to identify the effect of funding cuts. Our findings indicate that regions experiencing funding losses exhibit a significant decline in support for pro-EU mainstream parties, coupled with increased votes for opposition and anti-establishment parties. These political shifts are particularly pronounced in regions that suffered adverse economic outcomes after losing funds. This study highlights the political consequences of cohesion funding reductions and underscores the importance of cautious policymaking regarding EU financial allocations. To our knowledge, this is the first paper to causally examine how losing EU funding affects public sentiment toward the EU.

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Ballots, budgets and bricks: Brexit and the polarisation of individual economic behaviours

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S34-2 Geography and the determinants of political discontent, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

While the literature on the geographies of discontent has primarily focused on the determinants of electoral outcomes, less is known about the economic impacts of 'discontent-driven' political events. In this paper, we explore the consequences – rather than the causes – of populist events such as Brexit. We measure the extent to which political polarisation influence economic expectations and actual behaviours. Using British nationally representative surveys and administrative data, we show that the Brexit referendum triggered stark divergences in individual micro and macro expectations between Leave and Remain supporters. These diverging beliefs influenced major financial decisions. Leavers became more likely to purchase durables and engage in housing transactions, and areas with higher proportions of Leave voters experienced increased housing transaction volumes and rising prices. Our findings highlight how issue polarisation, beyond partisanship, can influence both economic expectations and real-world decisions.

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Regional inequalities, support for anti-establishment candidates, and COVID-19 vaccination uptake in Poland

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S34-2 Geography and the determinants of political discontent, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

This article aims to explain the regional differences in COVID-19 vaccination rates in Poland, taking into account living conditions and quality of life in municipalities, political conditions, and socio-economic spatial processes. The study used publicly available data on: the percentage of vaccinated residents in 2,477 Polish municipalities as of 20 March 2022, characteristics of municipalities representing their level of socio-economic development, and the level of support for anti-establishment candidates in the 2020 presidential election. The analysis was conducted using the Spatial Durbin Error Model (SDEM). The results indicate that lower vaccination rates occurred in municipalities with characteristics typical of less developed areas with poorer living conditions and characterized by support for anti-establishment politicians. We identified the existence of significant spillover effects, indicating the diffusion of pro- and anti-vaccination attitudes between neighbouring municipalities. Our study contributes to the literature on the determinants of vaccination coverage by combining the perspectives of public health, regional economics and political geography.

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Geographies of Hate and Hope: The Regional Determinants of Migrants' Educational Aspirations

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S34-2 Geography and the determinants of political discontent, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 11:00 - 13:00

Anti-system and nationalist political movements have become central actors in advanced democracies, generating a well-documented "geography of discontent" shaped by local socioeconomic and demographic conditions. While existing research has extensively examined the territorial determinants of political resentment, far less is known about its consequences within affected communities. This paper shifts attention from the origins of discontent to its local-level implications, asking whether and how hostile political climates toward ethnic minorities shape young people's educational aspirations, and whether these effects differ by ethnicity.
We focus on Italy between 2012 and 2018, a period marked by increasing social fragmentation and rising support for anti-system parties. Using administrative microdata from INVALSI on secondary school students (10th grade), we construct measures of tertiary education aspirations for native Italian students and first- and second-generation foreign students. These individual-level data are combined with province–year indicators of anti-minority political narratives, racial hate-related events, and socioeconomic conditions. The richness of the data enables multilevel estimations that account for both individual characteristics and contextual factors.
Our findings reveal persistent and widening aspiration gaps between Italian and foreign students, particularly among first-generation migrants residing in provinces characterized by strong anti-minority climates. Exposure to hate events and hostile narratives is systematically associated with lower tertiary education aspirations among foreign youth, though the magnitude of the effect varies across groups. Parental education and school type mitigate these negative effects, highlighting the buffering role of family and institutional contexts. In contrast, Italian students' aspirations appear largely unaffected by local hostility. This paper demonstrates that the geography of discontent carries long-term socioeconomic consequences. Hostile political environments not only reflect territorial grievances but also shape migrants' future-oriented behaviors and life chances. In doing so, they contribute to the reproduction of inequality and the fragmentation of local communities.

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Territorial Injustice, Discontent and Democratic Resilience across EU Regions

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S34-3 Geography and the determinants of political discontent, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

This paper investigates how rising inequality, recurring economic and social crises, and political discontent are spatially distributed across European Union regions. It develops a conceptual framework linking objective and perceived inequalities to experiences of territorial injustice and, ultimately, to democratic resilience, emphasizing long-term regional vulnerabilities and unequal opportunities. Particular attention is paid to how discontent correlates with lagging regional economic performance, persistent inequalities, and the uneven distribution of the benefits of EU integration.
Empirically, the paper offers a contextual analysis that documents regional patterns and identifies the conditions under which economic insecurity, inequality, and perceived unfairness coincide with heightened political dissatisfaction. It relates regional indicators of economic performance, inequality, and crisis exposure to measures of political discontent and electoral outcomes, showing how support for populist and far-right parties varies across territorial profiles. Moving beyond a narrow focus on “left-behind” places, the paper also examines why dissatisfaction can emerge in relatively prosperous regions, where residents may feel alienated or disillusioned by perceived policy performance and governance failures. The paper concludes by outlining policy-relevant implications for territorial cohesion and democratic resilience, providing an evidence base for place-sensitive interventions to reduce structural vulnerabilities and strengthen social and political inclusion across the EU.

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Beyond the culture wars: How economic grievances shape voting behaviour in polarised democracies

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S34-3 Geography and the determinants of political discontent, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

Across Europe, contemporary political debate appears increasingly organised around cultural conflict. Electoral competition, media narratives, and party strategies frequently revolve around questions of gender, migration, identity, and "traditional values," encouraging the view that cultural cleavages have become the principal drivers of political polarisation. This paper challenges that assumption by arguing that the visibility of cultural disputes does not necessarily imply their causal primacy. Instead, cultural conflict may represent the language through which deeper economic grievances are articulated. The study asks whether electorates are fundamentally divided by values or whether economic concerns continue to structure voting behaviour beneath the surface of culture-war politics.

Empirically, the paper examines Slovakia as a critical case of democratic transition and polarisation, where post-socialist economic restructuring intersects with contemporary political contestation. The analysis draws on individual-level data from the Slovak Voting Advice Application (Volebný kompas), comprising 103,263 respondents—approximately 13% of the electorate—who expressed positions on 39 economic, social, and geopolitical statements using five-point Likert scales. The focus is placed on economic issues capturing different forms of state intervention, including food price regulation, compensation for energy cost shocks, and targeted mortgage assistance.

Methodologically, the study combines descriptive statistical comparisons across demographic groups with decision-tree modelling (CART) to identify non-linear and hierarchical patterns in voter attitudes. This approach addresses the limitations of conventional cross-tabulation in large but unevenly distributed datasets and enables transparent identification of key demographic cleavages.

The results demonstrate that economic polarisation in Slovakia is both pronounced and internally differentiated. Economic issues display greater within-society disagreement than highly visible cultural questions. Educational attainment emerges as the most consistent structural divide, gender strongly shapes support for household-oriented interventions, and the 25–34 age cohort functions as a pivotal generational boundary separating post-transition voters from pre-1989 cohorts. These findings suggest that economic grievances remain central to electoral alignment and political discontent, even when public discourse is dominated by cultural narratives. The paper contributes to debates on the geography of discontent by showing how economic insecurity and demographic positioning continue to underpin voting behaviour in polarised democracies.

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Facts or Feelings about Crime: Exploring the Security-Discontent Nexus in Europe

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S34-3 Geography and the determinants of political discontent, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

Across European regions, electoral support for parties emphasising crime has increased in recent years. While these parties frequently frame insecurity as a central political issue, it remains unclear whether their electoral success is driven by actual crime rates or by citizens' perceptions of insecurity, and if these dynamics extend to broader forms of political discontent, including Eurosceptic attitudes. Using a regional panel dataset for European regions covering three European Parliament electoral periods over 2009-2024, this paper examines these mechanisms in two steps. First, we construct two region-level electoral indices. The first captures crime-oriented electoral votes, and the second Euroscepticism-oriented electoral votes. Information on parties' position on the two dimensions (support for law-and-order and favour of European Integration) under analysis is extracted from the Chapel Hill Expert Survey, and data on regional votes from the European NUTS-Level election dataset developed by Schraff et al. (2022). Second, using a system of simultaneous equations, we analyse whether an increase in electoral support for parties emphasising crime-related narratives is associated with subsequent changes in Eurosceptic voting.
We find that perceived crime, rather than actual crime rates, drives electoral support for law-and-order parties. In fact, actual crime rates show no robust effect on voting behaviour. Furthermore, lagged increases in crime-related electoral support correlate positively with higher levels of Eurosceptic voting. These findings suggest that insecurity political narratives serve as a transmission channel, linking local or national concerns to broader political discontent within the European Union.

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Through the territorial lens: How EU green policies shape green discontent?

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S34-3 Geography and the determinants of political discontent, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 28, 2026, 15:00 - 16:30

This paper investigates the territorial drivers of green discontent across European regions. We conceptualize discontent as emerging from the uneven distribution of local costs and global benefits associated with environmental policies. While climate action generates collective gains, its economic and social burdens are often concentrated in specific places, shaping perceptions that either “too much” or “not enough” is being done.
Using a spatial autoregressive model, we examine how these perceptions relate to regional green policy intensity, socioeconomic conditions, and development levels, while accounting for cross-regional spillovers.
Results reveal two distinct dynamics. The perception that “not enough” has been done is negatively associated with green policy strength, measured through EU investments in green projects and public environmental expenditures. Regions with stronger environmental commitment show lower levels of this dissatisfaction. By contrast, the perception that “too much” has been done is primarily linked to policy stringency, especially where environmental measures impose visible costs on polluting activities.
Spatial patterns further differentiate the two. “Not enough” sentiment is geographically concentrated and spills across borders, whereas “too much” sentiment is more dispersed and locally rooted. The latter appears less structured by standard socio-demographic factors and more consistent with a place-based backlash emerging from regions that perceive themselves as left behind.

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Operationalising RRI through CO-VALUE pilot experimentation at Alicante Science Park

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S40 Leveraging Public Procurement for Regional Sustainability Transitions, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

Operationalising Responsible Research and Innovation (RRI) within company-led knowledge valorisation remains a practical and policy challenge. This paper reports on the CO-VALUE pilot experimentation coordinated by Alicante Science Park (PCA), which tested a "co-valorisation" model across five pilots (involving seven principal actors) to make RRI principle of citizen engagement operational in everyday innovation workflows. The pilot portfolio deliberately combined circular-economy initiatives (FYCH Technologies, Solublion) with data and emerging-technology cases (Aguas de Alicante, InferIA, Golden Owl, Weitec) to probe methodological robustness across diverse technical, ethical and market contexts.

Methodologically, CO-VALUE adopted a participatory action-research design. Each pilot implemented a standard three-phase facilitation sequence (exploration, co-design, validation), with occasional extension to a fourth session where tensions required deeper deliberation (notably in Aguas de Alicante and Weitec). Citizens were recruited to ensure socio-demographic diversity using a professional survey company and local open calls; participants received €40 per 2.5-hour workshop. Facilitation teams was decisive in ensuring that a methodology developed by the Belgian consultancy company Stickydot was effectively implemented.

Interim findings indicate that early citizen inclusion, professional facilitation and transparent documentation convert participatory inputs into actionable design requirements, especially where products directly affect daily life (e.g., InferIA's explainable-AI interfaces; Weitec's urban surveillance application). Circular-economy pilots produced more process-oriented learning but fewer immediate product changes, underscoring the need to match method to sectoral challenge. Practical constraints emerged on the further operationalisation of the process, involving a less costly method that would make it long-term financial sustainable.

Policy implications are threefold: (1) recognise governance outputs as legitimate innovation results; (2) invest in permanent facilitation capacity within science parks and regional development agencies (RDAs); and (3) link citizen-informed requirements to procurement and innovation funding mechanisms (innovation vouchers, municipal co-funding, pilot procurement) to secure sustainability. By embedding RRI's core dimensions (anticipation, inclusion, reflexivity and responsiveness), the CO-VALUE co-valorisation model offers a transferable template that aligns innovation with sustainability.

We conclude that operationalised RRI is feasible at company level when supported by institutional pathways and professional facilitation. The CO-VALUE co-valorisation model offers a transferable template for practitioners seeking to reconcile competitiveness with democratic legitimacy and sustainability in EU regions. Findings inform practitioners and policymakers engaged in territorial RRI and human-centred tech governance. Future research will track longitudinal impacts on firm competitiveness, social equity and adoption rates, and will test cost-effective facilitation models and funding mixes to embed co-valorisation as a routine service within regional innovation support structures.

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The rhetoric of collaboration: Achieving genuine collaboration in the public procurement of human service delivery - The case of the UK and Australia

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S40 Leveraging Public Procurement for Regional Sustainability Transitions, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

Multi agency service hubs have become a common way of integrating public services at scale as well as providing a tangible operational response to fragmented front line delivery. UK examples include Multi Agency Safeguarding Hubs and Family Hubs. Their design and intended outcomes are shaped by established multi-organisational models such as partnership, networks, integration, and co creation. However, although often presented as holistic, collaborative institutions, this integrated practice remains incomplete. Evidence shows, collaborative practice within hubs remains partial: behavioural barriers, entrenched professional boundaries, and divergent organisational priorities frequently limit the realisation of genuinely integrated working, despite strong rhetorical commitments to collaboration (Parker et al. 2023). A reliance on contractual agreements that delineate the professional boundaries of each service operating within the hub can prevent genuine collaboration and its inherent benefits. As a result, in the UK case, procurement must be conducted by one of the partner bodies acting as the contracting authority, while in Australia a top-down funder-driven process is masked by collaborative rhetoric. In this paper, we seek to explore this conundrum by examining: (1) how multi agency hubs differently conceptualise and operationalise multi-organisational models within public procurement compared to genuine collaborative service delivery; (2) in what ways these differing genuine collaborative logics can interact, complement, or cause conflict when brought together within multi agency hub arrangements; and (3) what theoretical insights emerge from comparing genuine collaboration embedded in procurement frameworks with genuine collaboration embedded in service delivery to inform the development of more coherent, effective and efficient multi agency hub models. Analysis will be based on documentary examination of multi agency service hub policy in the UK and Australia to understand how collaboration is theorised in human services contexts and in public procurement.

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Transformation to a Circular Economy through Public Procurement? An analysis of local and regional calls for tender using GPT-4

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S40 Leveraging Public Procurement for Regional Sustainability Transitions, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

Public Procurement, accounting for approximately 14% of GDP in the European Union, has significant potential to support sustainability transitions. This can be achieved through stimulating demand for innovative products and processes (e.g. Public Procurement for Innovation), or taking a lifecycle perspective for considering environmental impacts (e.g. Green Public Procurement). Increasingly circular economy (CE) is becoming of interest in procurement practices, for example through embedding circularity into supplier selection and evaluation processes. To understand how CE considerations are currently incorporated into procurement practices, this research uses an automated content analysis (ACA) approach through a large language model (GPT-4), applied to a selection of 89 calls for tender from the European Union's Tenders Electronic Daily (TED) database. These notices met the criteria of: matching the keyword search "circular economy"; published in the year 2023; conducted under an open procedure; focused only in one country; and issued by a local or regional authority. The framework underpinning the ACA is based on CE characteristics and urban transformative capacities. The ongoing findings reveal only 60% of notices include criteria beyond price, and just 20% reference explicit CE related practices in supplier requirements or project descriptions. Future research will refine the analytical framework and expand the dataset across multiple years. These enhanced findings aim to contribute to the development of more robust criteria for operationalising CE strategies, which will build organisational capacities in local and regional governments.

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Remote Working and Prospects of Peripheral Development

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S42-1 Innovating from the Periphery: Digitalisation, Ageing and Regional Responses to Global Multicrisis(RP), Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 26, 2026, 09:00 - 10:30

This study examines technologically based remote work as a potential means to overcome regional peripherality—an issue that remains largely underexplored. It evaluates the theoretical and practical potential of remote work to facilitate inter-regional integration and regional development, focusing on its impacts on employment, income, and population retention in selected peripheral regions of Israel. The analysis draws on theoretical perspectives of regional development, peripherality, and technology-mediated labor mobility.

Remote work has emerged as a technology-driven transformation in the organization of labor, expanding economic possibilities beyond geographic constraints. Beyond enhancing individual work flexibility, it offers potential tools for strengthening inter-regional integration and mitigating spatial inequalities. However, despite its global prominence, the developmental dimensions of remote work have received little systematic study, and its role in reducing peripheral disadvantage remains uncertain.

Recent global labor market trends reveal a growing push by corporations to return employees to offices, restricting or eliminating remote work options. This reversal undermines one of the most promising opportunities for peripheral-region workers, who anticipated greater access to high-quality employment and career advancement through remote connection to metropolitan labor markets. The tension between early expectations and current reversals underscores the necessity of reassessing remote work's developmental potential and limitations.

The research aims to assess the extent, potential, and barriers of remote work in addressing regional disparities and promoting equitable development. Using qualitative methodologies, it draws on sector-based data, fieldwork, surveys, media analysis, and in-depth interviews—both online and in person—with employers, employees, and local and national officials. This multi-actor approach allows examination of the frequently assumed "win-win" nature of remote work for both firms and regional populations.

Preliminary findings show that low levels of digital connectivity and limited infrastructure in peripheral areas severely constrain remote work opportunities. Rather than constituting an inclusive labor transformation, remote work has become a selective privilege concentrated among urban professionals with stable digital access and organizational support. Peripheral regions, meanwhile, continue to face brain drain and limited local economic growth.

This study contributes to broadening the theoretical understanding of remote work by identifying structural and policy obstacles to its equitable diffusion. It seeks to produce regionally grounded policy recommendations to better harness the potential of remote work in reducing spatial inequality and fostering inter-regional integration.

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Manors as Rural Development Drivers and Local Innovation Hubs

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S42-1 Innovating from the Periphery: Digitalisation, Ageing and Regional Responses to Global Multicrisis(RP), Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 26, 2026, 09:00 - 10:30

This research analyzes the impact of manors as innovation hubs on population development and on remote rural areas in Estonia after the post-COVID-19 era of expanding remote work and the second-home boom.

Manors have been dominant drivers of the rural economy for centuries, serving as employers and innovators. According to the observations, the well-kept manor complex possesses a considerably better demographic situation in the nearby area. The manor's influence on the place's spirit and identity is the inhabitants' pride and attachment to the place. Hypothetically, well-maintained and used manors surrounding villages have a considerably better demographic profile and higher real estate prices.

We will design a comparative analysis of manor and non-manor settlements using 2021 and previous censuses' village-level population data, the Estonian Land Board transactions database, the manor's database, and the business register. As the intensity of manor utilization depends considerably on their accessibility and location, the intention is to focus on the remote areas that make up 50% of Estonia's territory, but which are home to only about 10% of the population. Another criterion is the maintenance and functionality of manors, which is why a corresponding typology is needed. Then we intend to carry out selected case studies in the pre-defined manor-type villages, investigating:

- place attachment and identity,
- stories about manors and places,
- local cultural and social capital, and
- innovations that have been introduced in the closest vicinity to the manors.

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Cohesion Policy in Romania beyond absorption: survey evidence on development traps, administrative constraints and strategic reorientation (2028–2034)

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S42-1 Innovating from the Periphery: Digitalisation, Ageing and Regional Responses to Global Multicrisis(RP), Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 26, 2026, 09:00 - 10:30

Although one of the constant topic in the Romanian public debats is that of absorption capacity, the fundamental problem in Romania is that of difficulties in implementation (generating a high cost-benefit ratio) and in maximizing impact. Being at the beginning of 2026 at a level of total EU payments of 26% (compared to an EU average of 21%), Romania seems to confirm an absorption capacity that keeps pace with the general dynamics at European level in the implementation of cohesion policy. But what is the relationship on the ground? Can the implementation system be improved to reduce costs and maximize benefits? Is cohesion policy correlated with Romania's strategic development priorities, in the broader context of priorities at European level?
Using both quantitative and qualitative data collected through a survey addressed to representatives of central and regional administrations, local authorities, non-governmental organisations, and private sector actors, this paper examines how actors involved in the implementation of regional policy in Romania assess structural bottlenecks, thematic priorities, and institutional constraints affecting regional performance during the 2021–2027 programming period. It investigates perceptions regarding: (i) regional development traps (infrastructure deficits, limited administrative capacity, labour force out migration, procedural complexity), (ii) the effectiveness of operational programme implementation and the determinants of EU funds absorption, (iii) the integration of key EU strategic priorities (Green Deal, Digital Compass, resilience, energy security, circular economy), and (iv) the need for administrative simplification and strengthened multi-level governance. We tried to pinpoint areas of agreement and disagreement regarding the necessity of modifying the budgetary framework, streamlining regulatory processes, increasing financial flexibility, and fortifying monitoring tools, in order to better direct EU resources toward regional convergence, innovation, and sustainability, as well as to identify strategic directions for the 2028–2034 Multiannual Financial Framework.
Methodologically, the research combines descriptive analysis of Likert-scale data with interregional comparative examination, aiming to identify convergences and divergences in institutional actors' perceptions. The expected findings are likely to highlight the tension between the EU's strategic orientation towards green and digital transitions and the domestic administrative constraints that limit effective implementation at regional level. The paper contributes an empirical perspective on the adaptive capacity of Cohesion Policy in a Central and Eastern European Member State, outlining implications for the future design of regional policy, budgetary flexibility, performance-oriented conditionalities, and the architecture of European territorial cooperation.

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Does excellence-based funding penalise peripheral innovation?

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S42-2 Innovating from the Periphery: Digitalisation, Ageing and Regional Responses to Global Multicrisis(RP), Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

The impact of the FP7-to-Horizon 2020 transition on university–industry collaboration in less-developed EU The transition from the Seventh Framework Programme (FP7, 2007–2013) to Horizon 2020 (H2020, 2014–2020) intensified the excellence-based logic of competitive EU research funding. Less-developed NUTS-2 regions — those whose 2007–2009 mean GDP per capita fell below 75 percent of the EU-27 average — entered this transition with thinner research infrastructures and weaker absorptive capacity. The descriptive allocation paradox is well documented: such regions secure disproportionately less competitive funding relative to their research and innovation stock. What is not yet established is whether the FP7-to-H2020 transition produced a measurable causal worsening of this gap in the university–industry collaboration (UIC) channel specifically — the channel that EU policy designates as the primary mechanism through which regional research ecosystems translate framework-programme funding into innovation capacity.
This paper provides the first NUTS-2-level causal estimate of the dual-channel UIC funding gap induced by the FP7-to- H2020 transition. The dual channel is the central conceptual novelty: the paper separates the extensive margin (H1: the gap in the absolute count of UIC projects in which a region participates) from the intensive margin (H2: the gap in percapita UIC funding received). The two margins jointly characterise whether the transition penalised less-developed regions through reduced participation, through reduced funding per project, or both. The dual decomposition provides finer-grained evidence than a single funding-gap coefficient and prepares the ground for a subsequent stage of the project (H3) that traces the channel through to patent and co-publication outcomes.

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Infrastructures of Inclusion: The Under-recognized Agency of Community Anchor Institutions in Bridging Rural Digital Divide

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S42-2 Innovating from the Periphery: Digitalisation, Ageing and Regional Responses to Global Multicrisis(RP), Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

Anchor institutions (libraries, post offices, schools, daycare centres) are considered to be crucial for keeping alive rural community life but their role tends to be underrecognized in digital inclusion research. By leveraging existing assets like buildings and staff, their role extends beyond simple access in providing free internet and devices to digital help and digital literacy training. By acting as trusted community hubs that bridge the digital divide for underserved populations, their potential could be used more efficiently to build local capacity for digital equity. Based on the case study from Estonia, from an advanced e-country's context, the current paper focuses on the under-researched issue of institutions as indispensable source for digital support. It first shows how rural community anchor institutions play a pivotal role in bridging the digital divide. Then it proposes for a conceptual change to start to think about anchor institutions by prioritising and resourcing their engagement with helping to digitalisation 'micro assets' in rural context.

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Digital Transition and Regional Inequalities: Telework and the Dynamics of Peripheralisation in Estonia

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S42-2 Innovating from the Periphery: Digitalisation, Ageing and Regional Responses to Global Multicrisis(RP), Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

The rapid acceleration of digital technologies has reshaped spatial behaviours and labour structures, with the pandemic normalising flexible work arrangements and further decoupling residence from workplace. Teleworkability—defined as the potential to work outside the traditional workplace—has emerged as one of the most spatially consequential outcomes of the Digital Transition (DT). Yet its broader implications in mobility remain insufficiently understood, as population-wide studies remain scarce. Estonia represents a unique setting in this regard: globally recognised for its digitalisation, while characterised by a monocentric urban structure, peripheral rural regions, and socio-demographic divisions.

This study uses longitudinal, population-wide demographic data from 2019, 2022, and 2024 to examine how teleworkability shapes residential mobility patterns across Estonia's urban hierarchy. Specifically, the analysis follows two stages, (1) origin-destination residential mobility, featuring net migration results by telework category across pandemic (2019-2022) and post-pandemic (2022-2024) periods, and (2) multinomial regression models, assessing how the teleworkability affects urbanisation, suburbanisation, and counter-urbanisation for singles and couples across the two periods, controlling for predictors linked to life-course and socio-demographic factors.

The results from net migration show marked differences between periods, with rural areas experiencing major losses in 2019-2022, yet showing positive migration in 2022-2024 among teleworking couples. Overall, digitalisation favours suburbanisation from both Tallinn and other county capitals, as core urban areas gain residents only among singles, while peripheries achieve balance among couples, remaining unattractive for singles. Regression results show that teleworkability influences residential immobility and mobility, but its effect is relatively small compared to life-course and socio-demographic and socio-economic factors. Ethnic minorities are less likely to access telework and relocate, and both age, children and occupation are strong predictors in models. Nevertheless, telework is associated with higher urbanisation and suburbanisation among singles, likely reflecting agglomeration economies and fewer mobility constraints. In contrast, relaxed commuting needs make couples who telework much less likely to urbanise, especially dual-telework households, found more likely to remain stayers, although they saw a big increase in counter-urbanisation odds in the post-pandemic period. On the other hand, partial telework couples are more likely to suburbanise, as the on-site work requirement of one partner draws households toward major urban regions.

This study builds upon the dichotomy of the DT enabling population de-concentration while concentrating jobs in major urban regions. The findings contribute to ongoing debates about regional inequalities, clarifying the role of remote work in on-going inequalities.

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Cultural pilgrimage tourism as a regional transformation ecosystem: developing a CPT Transformation demand framework

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S43 Transformational Pathways for Smart Municipalities and Regions: Ecosystems, Synergies, and Governance(RP), Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

Regions increasingly seek endogenous development pathways capable of addressing demographic decline, economic peripheralisation, governance fragmentation, and pressures for sustainable transformation. While cultural and pilgrimage tourism have been examined separately within tourism studies, their potential role as territorially embedded innovation mechanisms remains theoretically underdeveloped. In particular, cultural pilgrimage tourism (CPT) has not been conceptualised within the framework of regional transformation, innovation ecosystems, or transformation demand. This represents a significant research gap at the intersection of tourism studies and regional science.
The paper aims to conceptualise cultural pilgrimage tourism as a regional transformation ecosystem and to develop a CPT Transformation demand framework that explains under what structural and institutional conditions CPT can function as a catalyst for sustainable regional development. Rather than treating CPT as a sectoral tourism product, the proposed framework positions it as a multi-layered socio-technical system embedded in place-based governance structures and regional innovation dynamics.
Methodologically, the study adopts a theory-building research design grounded in abductive reasoning and conceptual synthesis. It integrates insights from cultural and pilgrimage tourism research, regional innovation ecosystem theory, socio-technical transition studies, and place-based development approaches. Through systematic conceptual mapping, the paper constructs a three-layer analytical model consisting of: (1) a Transformation demand layer capturing structural pressures, latent territorial capital, and underutilised synergies; (2) an Ecosystem capacity layer encompassing governance readiness, social cohesion, digital infrastructure, and innovation potential; and (3) a Synergic transformation dynamics layer explaining how CPT generates economic, socio-cultural, environmental, and quality-of-life effects through iterative feedback mechanisms.
The framework advances regional science by introducing a structured approach to identifying when and how CPT can evolve from a cultural mobility phenomenon into a territorially embedded innovation ecosystem. It further proposes a typology of CPT regions based on the interaction between transformation demand and ecosystem capacity. The model offers conceptual foundations for subsequent empirical validation in peripheral or heritage-rich regions and provides policy-relevant insights for municipalities seeking to mobilise cultural assets within smart, sustainable, and ecosystem-based governance strategies.
By bridging tourism theory with territorial transformation discourse, the paper contributes to a more nuanced understanding of how cultural pilgrimage tourism can support resilient, place-based regional futures.

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Living Labs as an Instrument for Activating Transformative Demand: The Potential of Slovak Cities in the Context of Innovation Ecosystems

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S43 Transformational Pathways for Smart Municipalities and Regions: Ecosystems, Synergies, and Governance(RP), Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

Cities and regions are facing increasing complexity of environmental, social, and technological challenges that require new forms of innovation governance and solution co-creation. The concept of Living Labs (LL) represents an experimental and participatory approach enabling the involvement of diverse stakeholders in the joint design, testing, and implementation of innovative solutions in real-life environments. This paper examines the potential for the development of Living Labs in Slovak cities and their role in processes of territorial transformation. Theoretically, the article builds upon the concepts of regional innovation ecosystems, transformative demand, and the synergistic integration of socio-technical innovations. Living Labs are conceptualized as operational nodes within urban innovation ecosystems, facilitating the mobilization of latent territorial capacities and supporting experimental forms of adaptive governance. The empirical section is based on a comparative analysis of selected Slovak cities in which initiatives incorporating elements of Living Labs or similar participatory innovation platforms were identified. The analysis assesses the level of institutional support, the degree of stakeholder engagement, linkages to strategic documents, data infrastructure, and the potential for long-term sustainability. The findings indicate a fragmented and predominantly project-based character of existing initiatives; however, they also reveal significant transformative potential grounded in active communities, university capacities, and increasing digitalization capabilities. The discussion highlights the need for a more systemic integration of Living Labs into strategic urban governance, the strengthening of data architecture, and the establishment of stable institutional frameworks that support co-creation and experimentation. Although the analysis is embedded in the Slovak context, the findings are also relevant for other post-communist countries facing similar structural and institutional challenges. The paper contributes to the debate on how Living Labs can activate transformative demand and enhance the resilience and innovation capacity of smart cities.

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Challenges to Smart City and Regional Development: Insights from Slovakia

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S43 Transformational Pathways for Smart Municipalities and Regions: Ecosystems, Synergies, and Governance(RP), Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

The smart city concept has evolved from a technology-centred notion into a comprehensive framework for urban and regional development. Rather than focusing solely on digital tools, it emphasises the use of information and communication technologies as enabling instruments for achieving broader societal objectives, including improved quality of life, social inclusion, environmental sustainability, and effective governance. Central to this approach is smart governance, which links technological innovation with coordinated strategic planning and coherent public policies.
The paper analyses key challenges related to the development of smart cities and smart regions in Slovakia. It is based on research conducted within the STICS project and combines a systematic review of national and regional strategic documents with empirical evidence. The methodology includes qualitative content analysis of policy and planning documents, case studies of selected Slovak cities, and structured interviews with representatives of local governments.
The study demonstrates that successful implementation of smart solutions depends less on isolated technological initiatives and more on institutional capacity, stakeholder coordination, and multi-level governance. Urban and regional challenges often exceed administrative boundaries; therefore, smart cities must be understood within the wider context of functional urban areas and smart regions. However, governance arrangements in Slovakia remain fragmented, characterised by weak horizontal coordination across policy sectors and insufficient vertical alignment between national, regional, and local levels. This fragmentation limits the ability of public authorities to design and implement integrated strategies reflecting functional socio-economic and mobility linkages. Another major issue is the insufficient integration of functional territorial relationships into planning and decision-making processes. Many initiatives remain isolated pilot projects lacking coordination at the regional level, which restricts their capacity to address cross-boundary challenges such as mobility management, energy systems, environmental resilience, and public service provision. Moreover, limited institutional and administrative capacities of self-governing regions hinder the systematic incorporation of smart approaches into economic development, social policy, environmental management, and spatial planning.
The findings indicate that the advancement of smart cities in Slovakia relies primarily on governance transformation rather than technological deployment alone. Strengthening multi-level governance, improving data governance and evidence-based decision-making, and adopting adaptive, integrated, and territorially sensitive planning instruments are essential prerequisites for inclusive, resilient, and sustainable smart urban and regional development.

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Local governments and diplomacy: towards new territorial organization at the French-Luxembourg border.

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S44-1 Local governments, diplomacy, and regionalism(RP), Auditorium 224 - North Building - Juridical Faculty, agosto 27, 2026, 09:00 - 10:30

The Greater Region that includes five regions belonging to four countries (Belgium, France, Germany, Luxembourg), has a lot of cross-border relations. These cooperations bring together different levels of public authorities, from national to regional and local governments. It aims to develop a coherent space, to build a common cross-border living area and reduce the barriers created by the border. The EU encourages the development of cross-border relations as they are part of the European integration process; they contribute to economic and social cohesion and stability beyond borders. This analysis will focus on relations between local authorities on the Franco-Luxembourg border. Many municipalities are building links with their counterparts on the other side of the border. They become true diplomats by negotiating common development strategies with their neighboring municipalities. The objectives are numerous, such as encouraging harmonious development of territories by offering complementary facilities to their populations but also knowing your neighbors better and developing a cross-border identity. Cooperation increasingly leads to the creation of institutionalized bodies within which different political orientations are defined, development plans are drafted jointly at different scales (from the regional scale to the local scale for the agglomerations of the European Development Pole of Longwy, Esch-Belval, city networks, etc.). The legal framework has evolved over recent decades; new tools have been defined by the European Union and by the States (EGTC, LCCG -Local cross-border cooperation grouping, Eurodistrict, etc.). Financial tools such as the ERDF and the INTERREG program also encourage this rapprochement between communities across borders. This local approach is part of multi-level cross-border governance and contributes, through the international links that are being forged, to the development of a form of paradiplomacy.
This study proposes to show, based on several case studies, how relations between local governments began, what the objectives and concrete achievements have been, and also the obstacles encountered, possible improvements and future prospects.

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Aqaba and Eilat: Twenty-Five Years of 'Good Neighborly Relations' in a Post Conflict Environment

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S44-1 Local governments, diplomacy, and regionalism(RP), Auditorium 224 - North Building - Juridical Faculty, agosto 27, 2026, 09:00 - 10:30

This study evaluates patterns of municipal cross-border cooperation (hereinafter CBC) between the cities of Aqaba (Jordan) and Eilat (Israel), situated side-by-side at the head of the Gulf of Aqaba. This cross-border municipal environment had a special place in the vision for ‘good neighborly relations’ outlined in the 1994 Israel-Jordan Peace Treaty. Notwithstanding this vision, the ongoing regional conflict and the context of cold Israeli-Jordan relations is reflected in the dearth of civilian initiatives and the dominance of political and security authorities.
Aqaba-Eilat municipal cross-border ties are reviewed through documentary analysis and field research including participant observation at municipal and cross-border settings - seaports, border-crossing points, tourist operations and environmental activities. Conversations with stakeholders (residents, entrepreneurs, national and local government, and security officials) allow a sector-based analysis of perceptions and interests focused on the border. These reveal the delicate, almost underground, cross-border interactions which somewhat rescale this cross-border municipal region.

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Twinning and cross-border cooperation in the Hungary-Romania border region

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S44-1 Local governments, diplomacy, and regionalism(RP), Auditorium 224 - North Building - Juridical Faculty, agosto 27, 2026, 09:00 - 10:30

For a long time, the traditional method of cross-border cooperation was the establishment of twinnig partnerships, which has a long history in Europe. The development of inter-municipal cooperation began after the First World War, but it gained serious momentum after World War II, when, in order to rebuild Europe and create a global order based on peaceful cooperation. The Romanian revolution in 1989 opened the border, twinning between Hungarian and Romanian municipalities has emerged: 33% of the Hungarian local governments had a Romanian twinning partner in 2002 (Giczi, Sík, 2014). This led to forming euroregions and, recently, EGTCs. which is reflecting the diversity of this long border section. Ethnic character is an important element of cooperation (Benczi, 2023), however Interreg cross-border cooperation programmes promote rather thematic cooperation, which needs a different approach than traditional twinning.
The study aims to identify the territorial patterns of twin town cooperation along the Hungary-Romania border, point out the relationship between twin town cooperation and project-based cooperation: which twinning partnerships proved to be successful on project-level as well. for the analysis the twinning database of the National Association of Local Governments of Hungary was used, as well as the project-level database of the Interreg V-A Romani-Hungary 2014-2020 programme. The results underline the added value of an existing twinning in project-based cooperation, highlighting the role of major cities and their institutions, which are the key for sustainable cooperation in the border area.

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Do City Diplomacy and City Marketing Converge?

Drivers, Conceptual Pathways and Outcomes: a PRISMA review.

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S44-2 Local governments, diplomacy, and regionalism(RP), Auditorium 224 - North Building - Juridical Faculty, agosto 27, 2026, 15:00 - 17:00

Cities are consolidating forms of external action that intertwine practices of city diplomacy with instruments of place marketing. This city marketing-city diplomacy nexus remains overlooked. To contribute to better comprehension and systematization, this article presents a PRISMA review of 31 studies, coding definitions, categorizing drivers, levels of integration between city diplomacy and city marketing, and outcomes. A narrative analysis of the correlations between these elements in the database of articles indicates a variable geometry, reflecting analytical cleavages between economic and normative logics, between degrees of embeddedness of the marketing–diplomacy nexus, and across outcome profiles. The paper, aiming to clarify the state of the art regarding the relationship between city diplomacy and city marketing, shows concepts whose theoretical boundaries remain blurred. A structural overlap rather than a convergence emerges, in light of theoretical plasticity of the two fields. The theorization of the relationship is flexible enough to accommodate diverse goals, narratives, and stakeholders. No single strategic model emerges; internationalization efforts tend to blend cooperative (partnership building, networks) and competitive (attracting investment, talent, tourists) approaches and styles. While city diplomacy and city marketing often partially overlap, they rarely align perfectly: each actor frames and prioritizes international action differently. The review offers a shared lexicon and a comparative map to reassess the possible legitimacy, styles, and effectiveness of cities as international actors, while identifying priority avenues for future research.

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Municipal Twinning as Paradiplomatic Practice: The Bulgarian–Hungarian Experience

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S44-2 Local governments, diplomacy, and regionalism(RP), Auditorium 224 - North Building - Juridical Faculty, agosto 27, 2026, 15:00 - 17:00

Paradiplomacy, understood as the international activities of sub-national governmental actors, has gained increasing scholarly attention in recent decades; however, the role of municipal twinning relations as instruments of paradiplomacy in Central and Eastern Europe remains relatively underexplored. This study examines the Bulgarian–Hungarian twinning network, focusing particularly on partnerships shaped by shared historical and horticultural traditions. The research aims to explore how municipal twinning relations function as mechanisms of sub-national diplomacy, how historical migration and diaspora networks influence their development, and how these partnerships contribute to sustainable local cooperation and identity preservation.

The empirical research is based on two primary data sources. First, a comprehensive database compiled by the Hungarian National Association of Local Authorities (TÖOSZ) in 2018 was analysed to identify existing twinning relations involving Hungarian municipalities. The results were subsequently validated through cross-referencing with the database of the National Association of Municipalities in the Republic of Bulgaria (NSORB). Second, qualitative data were obtained through semi-structured interviews conducted with representatives of municipalities, minority self-governments, and relevant stakeholders engaged in twinning activities.

The analysis identifies structural characteristics of the Bulgarian–Hungarian twinning network and presents four case studies demonstrating best practices in municipal paradiplomacy: Halásztelek–Polikraishte, Szentes–Sevlievo, Budapest XIV district (Zugló)–Veliko Tarnovo, and Szigetszentmiklós–Gorna Oryahovitsa. These partnerships share a common historical foundation in Bulgarian horticultural migration to Hungary during the late nineteenth and early twentieth centuries. The findings indicate that twinning relations grounded in diaspora heritage and historical economic interactions tend to exhibit greater sustainability, institutional depth, and community involvement than partnerships formed solely for administrative or symbolic purposes.

The study concludes that Bulgarian–Hungarian twinning relations represent a distinctive model of heritage-based paradiplomacy in which local governments transform historical migration and cultural memory into contemporary frameworks of international cooperation. These partnerships contribute to community building, intercultural dialogue, and the strengthening of transnational municipal networks within Europe.

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Cross-border municipal cooperation in the Austrian-Hungarian border region: an empirical analysis of sister city relations

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S44-2 Local governments, diplomacy, and regionalism(RP), Auditorium 224 - North Building - Juridical Faculty, agosto 27, 2026, 15:00 - 17:00

Hungary occupies a distinctive geopolitical position in Europe, sharing borders with seven countries and functioning as a contact zone between different political, economic, and cultural regimes. Consequently, its border regions have been the subject of sustained academic interest since the 1970s, particularly in the context of post-socialist transformation and European integration. Among these regions, the Austrian–Hungarian border area stands out as one of the most dynamic and institutionally developed cross-border spaces in Central Europe.
This study examines the evolution of cross-border cooperation in the Austrian–Hungarian border region, with special emphasis on sister city relationships as a form of municipal diplomacy. While large-scale institutional frameworks such as Euroregions and EU-funded programs have received considerable attention, less focus has been placed on the role of local governments in fostering cross-border integration through formalized partnerships. Sister city agreements represent a decentralized and socially embedded mechanism of cooperation, often involving cultural exchange, educational collaboration, and civil society engagement.
The empirical analysis concentrates on municipalities in Győr-Moson-Sopron and Vas counties, Hungary's two western counties directly bordering Austria. Using the comprehensive database of the National Association of Local Authorities of Municipalities (TÖOSZ), the study maps and evaluates the Austrian-related sister city partnerships of settlements in this border zone. The research investigates the geographical distribution of partnerships across Austrian federal provinces, the thematic content of cooperation, and the overall structure of the municipal network.
By providing a systematic overview of cross-border sistering practices in Hungary's western borderlands, the paper contributes to a better understanding of how local-level institutional relations support territorial integration. The findings highlight the importance of geographic proximity, historical embeddedness, and cultural exchange in shaping durable cross-border ties, thereby offering new insights into the micro-level foundations of regional cooperation in Central Europe.

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Ballot Design, Mayor’s Dilemma: How Electoral Rules Shape Governance

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S44-3 Local governments, diplomacy, and regionalism(RP), Auditorium 224 - North Building - Juridical Faculty, agosto 27, 2026, 17:30 - 19:30

The paper examines how political competition, shaped by electoral rules, affects municipal spending, and whether responses differ between re-running incumbents and one-term-only mayors. We exploit a quasi-natural experiment in Italy: the sharp 15'000-inhabitant threshold at which municipalities switch from single-ballot elections to a run-off system. Using a sharp regression discontinuity design, we estimate the causal effect of this institutional change on municipal expenditure commitments (Italian "impegni di spesa") over the term of office and stratify the analysis by mayors’ re-election incentives. The results reveal opposite responses concentrated near elections: incumbents seeking re-election increase spending in the final years of the term, whereas one-term-only mayors display null or negative effects, with a decline in current expenditure. These patterns are driven primarily by current education spending, which rises for re-running incumbents and falls for one-term-only mayors. The evidence is consistent with an electoral-competition mechanism in which, as elections approach, incumbents reallocate resources toward visible and quickly adjustable services that can signal responsiveness, while outgoing mayors—facing weaker accountability—do not sustain (and may even retrench) such spending. Overall, the findings identify political competition as a key local driver of political budget cycles and highlight the importance of carefully accounting for heterogeneity in candidates’ incentives.

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Crisis City Diplomacy: Polish Metropolises in Response to the Russian Invasion of Ukraine

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S44-3 Local governments, diplomacy, and regionalism(RP), Auditorium 224 - North Building - Juridical Faculty, agosto 27, 2026, 17:30 - 19:30

Russia's full-scale invasion of Ukraine has profoundly reshaped patterns of governance across Europe, revealing cities as frontline international actors in responding to war-related crises. While scholarship on paradiplomacy and city diplomacy has documented the growing international engagement of local governments, less attention has been paid to how urban authorities operate under conditions of armed conflict and geopolitical disruption. This paper addresses this gap by examining how Polish metropolitan cities responded to the war in Ukraine and how their actions challenge existing analytical frameworks of decentralised development cooperation and humanitarian governance.

The paper develops a three-role analytical framework conceptualising cities as donors, hubs, and brokers within multilevel systems of wartime assistance. This framework captures the functional diversity and simultaneity of urban international engagement in crisis contexts. As donors, cities provided direct material, financial, and technical support to local governments in need. As hubs, they aggregated, coordinated, and redistributed assistance from domestic and international partners, functioning as key logistical and organisational and territorial nodes in transnational aid chains. As brokers, cities connected actors across governance levels and sectors, facilitating new partnerships, cooperation networks, and institutional pathways of support.

Empirically, the analysis draws on original survey data from eleven Polish metropolitan cities and eleven semi-structured interviews with municipal officials conducted between January and March 2025. The mixed qualitative approach enables a fine-grained reconstruction of practices, coordination mechanisms, and temporal dynamics of assistance, while capturing variation across cities. The findings demonstrate that war catalyses a crisis-driven mode of city diplomacy characterised by urgency, institutional innovation, and governance ambiguity, in which cities often act ahead of or alongside national authorities.

By situating wartime urban engagement within the interdisciplinary debates on local resilience and multilevel governance, the paper argues that cities should be understood not merely as sites affected by conflict, but as strategic actors shaping the governance of solidarity, spatial coordination, and responsibility in times of geopolitical rupture.

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University Location, Student Choice, and Regional Demographics

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S45 Regional Economy and Human/Capital Mobility, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

This study investigates inter-prefectural student migration associated with university enrollment in Japan using a modified gravity model. While the traditional gravity framework explains migration flows by population size and geographic distance, this research extends the model by incorporating higher education variables such as the number of universities, enrollment capacity, academic selectivity, and field composition. Using prefecture-level panel data, the analysis estimates how the spatial distribution of higher education opportunities affects youth mobility patterns.
In addition to the empirical analysis, the study develops a simple theoretical model in which students choose their destination region by comparing expected lifetime earnings and the costs of enrollment and migration. In this framework, the supply and quality of universities influence regional expected benefits and thus shape migration incentives. The theoretical structure provides microfoundations for the modified gravity specification.
The model further controls for regional economic conditions, including income levels, urban amenities, and labor market prospects, to distinguish educational pull factors from general economic attractiveness. Estimation is conducted using the Poisson pseudo-maximum likelihood (PPML) method to address zero flows and heteroskedasticity. The study aims to clarify how higher education infrastructure influences long-term demographic dynamics and regional inequality.

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Types of Japanese Firms' FDI in Poland, Czech Republic, and Hungary: A Firm-Level Analysis

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S45 Regional Economy and Human/Capital Mobility, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

This study focuses on Japanese firms having performed FDI into Poland, Czech Republic, and Hungary, all of which have been the gateway of FDI in Central and Eastern European countries. Firm-level data of Japanese companies operating in either of those three countries in the 1990s to early 2020s are examined. The main results are as follows. First, machinery industries and wholesale industries of those products have many affiliates in all of the three countries, although distributions of industries are different among them. Second, many wholesalers of machineries were established in the 1990s to 2010s, followed by manufacturers producing them in the 2000s and 2010s.

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Childcare Support and Regional Fertility Gaps under Monopolistic Competition

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S45 Regional Economy and Human/Capital Mobility, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

Declining fertility has become a persistent concern in many advanced economies, with particularly low birth rates observed in highly populated urban areas. While agglomeration economies generate productivity gains and expand consumption variety, they may simultaneously increase the opportunity cost of childrearing. This paper develops a two-region general equilibrium model with monopolistic competition to examine how childcare support policies affect regional fertility gaps under urban agglomeration.
The model incorporates a Dixit–Stiglitz framework with iceberg transport costs and endogenous firm entry. Households derive utility from homogeneous agricultural goods, differentiated manufactured goods, and the number of children. Childrearing requires time, creating a trade-off between labor supply and fertility. Government policy is modeled as a reduction in the time required per child, capturing childcare services such as daycare provision.

The analysis shows that fertility tends to be lower in larger regions due to higher effective opportunity costs of time, even when consumption variety is greater. However, a childcare-time-reducing policy implemented in the larger region increases fertility more strongly there than in smaller regions. As a result, regional fertility gaps can shrink. The mechanism operates through the interaction between real wage effects and time constraints.
The model further demonstrates that time-reduction policies may be more effective than direct income transfers in high-wage urban areas. These findings suggest that urban-targeted childcare support can serve not only as a pronatalist policy but also as a regional inequality mitigation tool.

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Staying in Germany after the doctorate. Regional and sectoral mobilities and career outcomes of Foreign Postdocs.

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S45 Regional Economy and Human/Capital Mobility, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

In recent decades, the higher education system of most OECD countries is characterized by a dynamic increase in the number of foreign PhD students being among the highest qualified workers. In times of a shortage of highly qualified talent, retaining doctoral graduates in the university region is very important in order to generate returns on public investment in education (Geissler/Koenig 2021), and to benefit for innovative activity (Hunt, Gauthier-Loiselle, 2010) and for economic activity (Ackers 2005). While there is a great literature on skilled international migration, studies on labour market outcomes of foreign Postdocs in destination countries are rather scarce (Tani, 2022). Hence, this leaves unresolved the issue for national economic and innovation policies in how successfull foreign scientists are on the labour market and in which segments of the labour market benefit most. The aim of this study is to shed light on the group of stayers - Postdocs who continue their careers in the destination country. We compare the regional and sectoral mobilities of foreign and non-foreign Postdocs in Germany and discrepancies in their career outcomes during the early career phase. First, we explore the stay rates of foreign and non-foreign Postdocs in the granting university region when they secure the first position after the doctorate. Second, we compare the sectoral mobilities and career outcomes of both Postdoc groups during the early career phase (up to three years after the doctorate). The focus is on career pathways in the academic and private sector and a set of labour market outcomes is studied such as fixed-term contracts, salaries, working time, management position and educational job matching. This enables us to detect whether there are considerable discrepancies between foreign and non-foreign Postdocs when transitioning into the labour market after graduation and whether initial differences diminuish over time. In a third step, regression analyses are conducted to analyse to what extent these sectoral differences in employment outcomes are marked by variation across disciplines and early-career research productivity.

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Construction, Nursing Care, and Agriculture:

Economic Impacts of the Policies of Introducing Additional Foreign Workers Limited to Certain Industrial Sectors

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S45 Regional Economy and Human/Capital Mobility, Auditorium 277 - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

Considering a small country with four industries where we assume the productivity of agriculture sector should be damaged by the smokestack construction activities, we examine the impact on trade, natural environment, wage gap, and economic welfare of policies to increase the number of foreign workers in the construction, agriculture, and nursing care sectors, each of which plays a different role in the economy. We find that if the urban-rural wage gap is small enough, under certain conditions, introducing additional foreign workers to the agriculture sector may cause positive effects on domestic economic welfare regardless of expanding urban-rural wage gap and a declining natural environment. While introducing foreign workers to the construction or nursing care sector will surely reduce domestic economic welfare. If the urban rural wage gap is large enough to encourage rural domestic workers to move to urban area, foreign workers' introduction to any sector must reduce domestic economic welfare.

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Bridging Science and Society: Socio-Ecological Approaches to Ecosystem Restoration in European and Mediterranean Regions

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S47-1 Collective action and transitioning: exploring new forms of territorial development processes in uncertain and challenging times, Hall 2 - North Building, agosto 26, 2026, 09:00 - 10:30

In the context of climate change, ecosystem restoration practices increasingly require a socio-ecological systems (SES) perspective that frames ecological interventions within their social, economic, and cultural contexts (Maniraho et al., 2023). Land-use patterns, governance structures, and community practices, make restoration outcomes highly dependent on socio-cultural dimensions. By fostering stakeholder engagement, co-creation of knowledge, and inclusive governance, SES approaches enhance resilience, ensures long-term sustainability, and aligns restoration efforts with climate adaptation and mitigation goals (Aronson et al., 2020; Suding et al., 2015).

This contribution builds on the ongoing experience of three European projects (MONALISA, PRESINMED, RESTORE4Cs), adopting SES perspectives and methodologies to target ecosystem restoration (drylands and semi-arid landscapes, Mediterranean high-mountain wet grasslands and snowbed ecosystems, coastal wetlands) in different European and Mediterranean regions. Across these diverse settings, transdisciplinary co-creation processes integrate multiple social science methodologies (multi-criteria analysis, social acceptability assessment, semi-structured interviews, online surveys) to actively engage local stakeholders (from farmers and land managers to NGOs and local authorities) in the joint design and implementation of restoration strategies. This approach facilitates the integration of ecological processes with social, economic, and cultural factors, supporting adaptive solutions that are both locally relevant and socially accepted.

The innovative contribution of this study lies in operationalizing the SES approach across diverse ecosystems through a transdisciplinary framework. By combining ecological restoration with participatory methodologies and embedding social learning spaces into real-world projects, it demonstrates how restoration can move beyond technical solutions to become adaptive, inclusive, and governance-oriented.

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A cluster without geographical proximity ?

Textometry and social networks analysis of the TENLOG cluster in Occitania

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S47-1 Collective action and transitioning: exploring new forms of territorial development processes in uncertain and challenging times, Hall 2 - North Building, agosto 26, 2026, 09:00 - 10:30

In this communication, we introduces and applies a novel methodological framework to empirically assess organised proximity (the non-spatial closeness among actors) in a geographically dispersed logistics cluster, and a rapidly evolving system located in the Occitania Region (South-west of France). In 2018 and 2022, the initial cluster was reformed and expanded; the new cluster now includes various actors who are often located several hundred kilometres away. The question that arises is the legitimacy of the participants' belonging to the same system and the homogeneity of the cluster. Does the TENLOG cluster make sense, or is it mainly artificial, due to the weakness of geographical proximity relations? Does the establishment of remote relations between the players lead not only to the loss of geographical proximity but also to the loss of valuable links and interfaces?
To address this question, we analyse the close relations at stake within the TENLOG cluster to determine whether the actors continue to work together and share the same values.
We use two qualitative and quantitative methods, textometry and social network analysis (SNA), to assess the level of organised proximities among the participants, even when they are located at significant distances :

- Textometry (using IRaMuTeQ software), to capture the logic of similarity through discourse analysis, including Reinert's lexical world classification, Labbé's intertextual distances, revealing how actors share or diverge in representations, values, and professional registers.
- Social Network Analysis (SNA, using Gephi software), to capture the logic of belonging, measuring closeness centrality, modularity (Louvain algorithm), and relational density, to identify key actors, gatekeepers, and network cohesion.

This mixed-method design allows us to distinguish between actors whose views are similar but who are relationally far, and vice versa, a nuance difficult to catch in studies. We demonstrate that, despite spatial fragmentation, TENLOG maintains strong organised proximities through shared discourse and dense relational networks, particularly among facilitators and public actors.
Our findings challenge the assumption that geographical proximity is a prerequisite for cluster vitality : despite physical distance, organised proximities persist and that the challenges of "clustering at a distance" are not as significant as initially thought, allowing us to remain optimistic about its development. We offer a replicable toolkit for researchers and policymakers to assess the building of clusters and networks, especially those operating across regions.
This methodological contribution opens new pathways for studying organised proximity, relevant for researches on distributed innovation, remote collaboration, and territorial governance.

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Beyond Capital: The Role of Shared Leadership and Collective Engagement in Transitioning Post-Industrial Regions

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S47-1 Collective action and transitioning: exploring new forms of territorial development processes in uncertain and challenging times, Hall 2 - North Building, agosto 26, 2026, 09:00 - 10:30

In the current era of global instability - characterized by climate change, energy crises, and the socio-economic repercussions of post-pandemic recovery - territorial development processes are undergoing a fundamental transformation. A growing body of research underscores the importance of bottom-up initiatives in driving socio-economic transitions towards green and sustainable societies. Across diverse application areas and geographies, researchers point to the potential, challenges, and mechanisms through which community-led and grassroots actions contribute to systemic transformation. These initiatives are no longer viewed as peripheral but as central mechanisms for systemic change, operating as laboratories of experimentation and bridges between citizens and institutions. The concept of "Just Transition" necessitates that these processes do not leave marginalized groups behind, making the study of community-led collective action particularly urgent, especially since marginalized communities are frequently absent from the discussion on just transition initiatives (Clement et al., 2025).
The choice of this topic is justified by the need to explore how local agency can be mobilized in "uncertain and challenging times". While international and national policies provide the framework, it is the local initiatives that translate these goals into lived realities. Understanding the success factors of these initiatives is crucial for policymakers and practitioners aiming to foster territorial resilience. This study specifically delves into the preconditions for successful project implementation in marginalized communities across Europe, where traditional institutional capital may be weak, but social capital remains a potential catalyst for change. By exploring how non-professional, voluntary-based community collaboration groups utilize external funding for self-created initiatives, this research addresses a significant gap in our understanding of effective project management within ad hoc bodies aiming to deliver societal benefits.

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The process of territorial data construction to support rural transitions: the case of Val di Cecina and Pays Pyrenées Mediterranée Rural Living Labs

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S47-2 Collective action and transitioning: exploring new forms of territorial development processes in uncertain and challenging times, Hall 2 - North Building, agosto 26, 2026, 11:00 - 13:00

The Long-Term Vision for Rural Areas recognises the centrality of engaging territories and local actors to address rural transitions. At the same time, the European Commission places data at the centre of its growth and policymaking. This paper aims to explore the processes and dynamics in the real-world context through two Living Labs: the Rural District of Val di Cecina (Italy) and the Pays Pyrénées Méditerranée (France), both activated under the Horizon Europe GRANULAR project. The ambition of GRANULAR is to help understand the characteristics, dynamics and drivers of rural areas through innovative data and indicators. In this context, the role of Living Labs shifts from the traditional field of product innovation to a more general idea of territorial agencies, for organizing policies and promoting participatory governance. The two Rural Living Labs show engagement issues and specificities related to their novel role. They deal with large rural areas and focus not on isolated interventions but on the broader management of the territory. This adds significant complexity, as they address a wide range of issues, including tourism flows, mobility and food systems, while involving diverse local actors. Building on previous research across seven RLLs, the objective of the paper is to analyse how these Rural Living Labs operationalise broad European ambitions at the micro-territorial level. The study adopts a comparative explorative case study design that combines in-depth qualitative analysis of internal documents, participant observation, and semi-structured interviews with key stakeholders. The preliminary evidence, emerging primarily from participatory observation of the functioning of the two cases, traces the different efforts to build an operational network, capable of coordinating relations, guaranteeing effective internal and external interactions and with the ability to structure an appropriate path of research activities.

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Co-producing Local Knowledge in Urban Commons: Leveraging Digital and Social Tools to Document Commoning Practices

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S47-2 Collective action and transitioning: exploring new forms of territorial development processes in uncertain and challenging times, Hall 2 - North Building, agosto 26, 2026, 11:00 - 13:00

Rationale: Urban common spaces play a crucial role in fostering social cohesion and urban resilience. However, their dynamic nature requires new methods of impact assessment that go beyond traditional design audits. Effective regeneration of these spaces depends on understanding of the interactions between governance processes and residents' everyday practices.

Research Gap: Current knowledge production models often treat end-users as passive recipients of pre-defined solutions, neglecting the perspectives of marginalized groups and specific local contexts. Existing urban indicator systems rarely incorporate residents' situated, bottom-up knowledge of commons creation and management.

Research Aims: This study reviews methodologies for co-producing local knowledge, shifting communities from informants to active contributors. The focus is on operationalizing participatory mapping techniques that capture demographic diversity in the use of urban spaces.

Methods: A transdisciplinary approach was employed, combining literature review with findings from case studies in selected European cities. One of the tools analyzed is the PPGIS ReliefMaps+ platform, which allows the collection of spatial and narrative data on residents' experiences. The methodology also includes crowdsourcing data from social media to analyze temporal trends in space usage. The Social Interaction Framework was applied to systematically document collective behaviors and barriers to inclusion.

Expected Results: The research is expected to produce validated participatory mapping protocols applicable in diverse local contexts. A geodatabase integrating quantitative and qualitative data on perceptions of the commons by different demographic groups will be developed. The analysis will demonstrate how specific design and management features influence the sense of safety and belonging among older adults, youth, and migrants. The ultimate outcome will be the strengthening of local observer networks' capacities, enabling continuous, evidence-based monitoring of urban regeneration.

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Governance process and knowledge creation in research-driven Agro Living Labs: the case of the Tetrae program in France

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S47-2 Collective action and transitioning: exploring new forms of territorial development processes in uncertain and challenging times, Hall 2 - North Building, agosto 26, 2026, 11:00 - 13:00

Agro Living Labs (ALLs) have emerged in France as hybrid spaces connecting research, practice, and local actors to support agroecological transitions. This study examines their diversity and organizational dynamics within TETRAE, a participatory research program established in 8 French regions. A mixed-methods approach combined a questionnaire addressed to key resource persons involved in open innovation initiatives (n=49) with three contrasting case studies: a dynamic territorial food network, a collaborative marketplace platform for forest ecosystems services, and agricultural systems climate change adaptation foresight workshops. The analysis identifies four main configurations. (1) Research-led initiatives, where scientific teams coordinate collective action, (2) Transformative ALLs, aiming at systemic transformation through multi-actor governance, (3) Technical participatory initiatives, focused on solving specific technical or sectoral challenges, and (4) Collaborative networks, fostering exchange and shared understanding among diverse stakeholders. Results show that ALLs do not follow a single model but evolve along a maturity continuum. Governance arrangements shift between openness and strategic steering. Organizational adaptability responds to funding constraints and mismatches between research and local dynamics. Knowledge co-production ranges from open-ended local framing to expert-driven processes, each with trade-offs. Territorial embeddedness strengthens trust and legitimacy but can also constrain renewal. Overall, ALLs are evolving frameworks enabling experimentation, dialogue, and incremental change. This typology and comparative analysis refine the conceptual understanding of ALLs and offer insights to guide future research for food system territorial transitions.

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Understanding the role of new commons in territorial development dynamics of mountain areas: findings from the Swiss Alps

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S47-2 Collective action and transitioning: exploring new forms of territorial development processes in uncertain and challenging times, Hall 2 - North Building, agosto 26, 2026, 11:00 - 13:00

Mountain regions are facing many challenges related to global social and environmental changes. Collective action and commons (in the sense of Ostrom, 1990) appear as a way to cope with these challenges; they have been, and continue to be, well-developed in many mountain areas, especially in the Swiss Alps. Today, we can observe the presence of new forms of mountain commons (in the sense of Hess, 2008) that were recently created and that are structured around resources other than natural (forests, pastures, water). Examples of new mountain commons identified in Switzerland include participatory cafés and grocery stores, self-help groups for parents, mountain heritage restoration associations or mountain hut management organisations. They participate to the productive function of the territory by providing goods and services and they also contribute to reinforce the domestic and residential base of the territory by increasing its quality of life. For example, in the village of Fang, in Anniviers valley, the reforming of an old institution, the Village Society, has revitalised the hamlet's life, with members restoring ancient heritage such as the mill and oven and organising events, path maintenance and village flowering. These initiatives, which are mostly non-profit organisations and cooperatives, therefore recreate or maintain social ties and contribute to an improved quality of life in those mountain villages. The desire to contribute to "living well in the mountains" is often a conscious and explicit goal among the members of these communities. Based on in-depth studies conducted in the frame of the ComMount research project, this paper questions the way commons articulate different functions and, by this, can act as one of the pillars of mountain socio-economic system. It also questions the way they integrate into local development trajectories.

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Influence of low-carbon logistics on the structure of the retail network and trade formats in the cities and rural areas

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S49-1 Global challenges and regional changes in retail trade the urban and rural areas perspective(RP), Auditorium 68 - South Building - Faculty of Philosophy, agosto 27, 2026, 15:00 - 17:00

The aim of the paper is to analyze influence of rising e-commerce trend and low-carbon logistics on the structure of the retail network and trade formats in the cities and rural areas, based on literature review and authors own study regarding consumer perceptions on greening of last mile logistics operations.

Retail trade is strongly influenced by (mega) trends in economic, social, technological and legal development, which has led to its transformation and dynamic changes, especially in recent years. These changes are significant from the point of view of spatial planning, especially in urban areas. For instance, increased competition and global technological changes led to a shift into the digitisation of trade. The spread of the internet, and later mobile devices, paved the way for the development of e-commerce, which gained particular momentum there after 2010. The emergence of e-platforms such as Allegro, the expansion of courier and logistics services, and changing consumer expectations regarding shopping convenience.

According to the Consumer Digital Empowerment Index survey, 75% of European consumers believe that in ten years' time, consumer experiences will mainly take place in the digital space, which shows that in their opinion, the digital world will dominate traditional commerce.

With the growth of online commerce, the role of last mile logistics (LML) operations, including parcel delivery, is increasing. LML is considered the least efficient and most complex part of the supply chain. One of the significant challenges facing LML operations, particularly road transport, is low-carbon logistics, optimisation and modernization of proccesses. In order to meet the emerging challenges related to LML operations, it is necessary to implement innovative solutions aimed, among other things, at reducing the demand for freight transport, optimising the use of freight transport, increasing the use of resources, improving the energy efficiency of the fleet and reducing the carbon dioxide content in energy sources, which has impact on the structure of the retail network and trade formats both in the cities as well as in rural areas. Another aspect to consider is product packaging in e-commerce, which has a negative impact on the environment, particularly in the case of plastic waste and non-returnable packaging, as well as the use of reverse logistics solutions.

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Spatial Accessibility of Parcel Lockers as a Driver of E-Commerce Development in Urban and Rural Areas

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S49-1 Global challenges and regional changes in retail trade the urban and rural areas perspective(RP), Auditorium 68 - South Building - Faculty of Philosophy, agosto 27, 2026, 15:00 - 17:00

The rapid expansion of e-commerce represents a pivotal challenge for modern retail, reshaping distribution logistics and service accessibility across areas with varying settlement structures. Global digital transformation and the surge in e-commerce, intensified by COVID-19, have altered consumer behavior and the structure of distribution channels while simultaneously generating new challenges in last-mile logistics.

The objective of this presentation is to analyze the spatial distribution and accessibility of parcel lockers, treated both as a component of service infrastructure and as an important link in the retail system within the context of e-commerce development. The literature highlights that parcel lockers offer an efficient alternative to traditional door-to-door deliveries, enabling reductions in courier route lengths, CO_2 emissions, and transport pressure in urbanized areas, provided they are strategically located and accessible by foot, bike, or as part of routine trips. However, existing studies and systematic reviews focus mainly on the urban environment, prioritizing the impact of parcel lockers on public space, service accessibility, and urban spatial order. As a result, their potential in rural and peripheral areas remains relatively underexplored.

The results of the analysis will make it possible to determine the extent to which the development of parcel locker infrastructure contributes to mitigating inequalities in retail service access. Furthermore, the analysis will examine whether observed spatial disparities may influence the future development of e-commerce at regional and local levels, addressing broader global challenges and regional shifts in the retail sector.

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Reconfiguration and Economic Performance of British Retail Centres in the Post-Pandemic Era

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S49-1 Global challenges and regional changes in retail trade the urban and rural areas perspective(RP), Auditorium 68 - South Building - Faculty of Philosophy, agosto 27, 2026, 15:00 - 17:00

The UK retail landscape has undergone profound transformation over the past decade, with debate largely centred on the decline of traditional high streets and town centres. Long-term structural shifts—driven by technological advancement and changing consumer behaviour—were significantly exacerbated by the Covid-19 pandemic, supply chain disruption, and the cost-of-living crisis. This study provides a data-driven assessment of the transformation and economic performance of UK retail centres between 2019 and 2024, focusing particularly on the post-pandemic period and the nature of recovery. By examining pre-pandemic, within-pandemic, and post-pandemic phases, we evaluate how structural trends and a major economic shock reshaped traditional retail spaces.
Before the pandemic, weakening demand for 'brick-and-mortar' retail was already evident, reflecting the rapid growth of e-commerce platforms such as ASOS and SHEIN. Using longitudinal retailer occupancy data at the individual store level, we show that the pandemic primarily accelerated these pre-existing trends. Vacancy rates rose by a record +25.4% during the pandemic. Although the post-pandemic period has seen a modest reduction (-5.2%), vacancy remains well above the pre-pandemic average (10.6%), indicating a weak and uneven recovery. Traditional sectors—particularly fashion, tour operators, entertainment venues, and bank branches—have continued to contract, with more than 5,000 bank branches closing nationally.
Recovery, however, is not uniformly negative. In line with adaptive resilience and retail cycle frameworks, we identify clear signs of reorientation. Convenience retail, grocery stores, cafés, fast food outlets, and leisure uses have demonstrated resilience, supported by lasting shifts in consumer demand. Changing working patterns have also reshaped retail geographies: smaller local and district centres, typically anchored by convenience and service functions, have generally outperformed commuter-dependent centres. This shift aligns with planning discourse around the 15-minute city, which emphasises proximity to everyday amenities.
Overall, post-pandemic recovery reflects structural adjustment rather than rebound. While elevated vacancies and surplus space persist, adaptation and diversification are underway, producing uneven but significant reconfiguration across the UK retail system.

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The Polish retail market in the face of digital transformation

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S49-2 Global challenges and regional changes in retail trade the urban and rural areas perspective(RP),
Auditorium 68 - South Building - Faculty of Philosophy, agosto 27, 2026, 17:30 - 19:30

The Polish retail sector is a fascinating theater of change. On the one hand, statistics—such as those from the “Digital Poles 2023” report—indicate that nearly 80% of Internet users regularly shop online. On the other hand, consumer behavior studies show that over 40% of customers visit brick-and-mortar stores almost every day. The Polish market has its own unique characteristics. It is dominated by discount stores such as Biedronka and Dino, which, in the face of inflationary pressure, have become the driving force behind the entire industry. At the same time, regulatory factors, such as restrictions on Sunday trading, have fundamentally changed shopping habits, strengthening the position of smaller formats and online commerce. It is a powerful branch of the economy, employing over 1.2 million people and constantly adapting to new market conditions. Despite the digital revolution, traditional retail outlets are still doing well. They offer something that the virtual world cannot fully replicate: the sensory experience. The ability to touch the material, try on clothes, or get advice from an expert are values that remain priceless for many customers. Today, brick-and-mortar stores are becoming more like experience centers and brand showcases rather than just transaction points. Online sales are no longer an innovation; they have become the norm. Convenience, an almost unlimited assortment, and the ability to instantly compare offers have made e-commerce responsible for a significant portion of the retail market. Technology is no longer an add-on; it has become the lifeblood of modern commerce, without which the entire operation simply grinds to a halt. Artificial intelligence is bringing about the biggest revolution. AI systems can analyze customer behavior in real time, offering them hyper-personalized product recommendations. What's more, AI allows for accurate demand forecasting, which is key to optimizing inventory and avoiding costly shortages or surpluses. Retail is constantly evolving, and those who want to not only survive but also set trends must think one step ahead by implementing modern solutions for business and e-commerce.

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Urban and rural areas perspective in retail trade - Is the deepening of disparities in the centre-periphery model irreversible?

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S49-2 Global challenges and regional changes in retail trade the urban and rural areas perspective(RP), Auditorium 68 - South Building - Faculty of Philosophy, agosto 27, 2026, 17:30 - 19:30

The development of settlement structures is increasingly showing signs of progressive polarisation. On the one hand, the population, jobs, infrastructure, broadly understood services and trade are concentrated in several (a dozen or so) metropolitan centres and their immediate surroundings, while on the other hand, in other towns, and especially in rural areas, the population potential is declining, migration outflows are intensifying, and the social, economic, and technical infrastructure is depreciating.
In large rural areas experiencing increasing marginalisation, often accompanied by marginalisation, access to services and trade, especially basic ones, is declining. The shrinking network of local retail stores, growing competition from online services, and the spatial concentration of retail sales through supermarket chains, which locate their stores only in local or supra-local centres, are increasingly causing difficulties in the supply of basic products. Indirectly, this reduces the attractiveness of most rural areas and even small towns, both for rural residents and for newcomers. It also often becomes a barrier to the development of tourism, recreation, and leisure activities. In rural areas, there is a steady decline in the number of retail grocery stores, and the ongoing consolidation and spatial concentration of rural grocery stores and, more broadly, of all retail sales, reduces their accessibility.
If sustainable retail is understood as retail organisations undertaking initiatives to ensure that their activities, manufacturing, and production processes do not have a negative impact on the environment, then in rural areas, especially marginalised ones, it is difficult to see such initiatives. The article uses a multivariate analysis of changes in the distribution and intensity of commerce in selected peripheral and marginalising areas in Poland to assess the scope and significance of these processes in the context of greater cohesion of development processes.

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The Consumers Behavior and Retail Market in Polish Urban Centres

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S49-2 Global challenges and regional changes in retail trade the urban and rural areas perspective(RP),
Auditorium 68 - South Building - Faculty of Philosophy, agosto 27, 2026, 17:30 - 19:30

Over the decade 2010-2020, there have been far-reaching changes in the functioning and distribution of retail chains in Europe, but also in individual EU countries, including Poland. The changes affect both structures associated with large urban centres and their agglomerations as well as smaller centres, often serving mainly the surrounding rural areas. On the one hand, consumer behaviour is changing rapidly and radically, while on the other, retail structures are undergoing profound changes - both in terms of volume as well as spatially. The article draws attention to the rapid evolution of consumer behaviour and the corresponding change in the location structures of retail chain facilities both in urban and rural areas.

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The impact of interpersonal trust on firm size

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S50-1 Entrepreneurial SMEs and territorial contexts: strategies, impacts, and dynamics, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

Firm size—measured by the number of employees—plays a central role in determining economic performance. This paper examines a potential determinant of firm size: interpersonal trust. I estimate
the causal impact of within-firm trust on the size of Spanish firms by exploiting latent patterns of mistrust across Spanish regions and using trigger variables as instruments for variation in trust levels across municipalities. I identify a positive causal relationship between trust and firm size using balance
sheet data from Spanish firms. I document two mechanisms through which trust expands firm size: improvements in total factor productivity and greater access to credit. I incorporate these mechanisms
into a simple structural model and show that if firms in the bottom decile of trust converge to the regional mean, their size would increase by 11 percent.

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Territorial governance and economic performance of fishing SMEs: analysis of a successful trajectory of scallop fishing in the Seine Bay (2000-2025)

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S50-1 Entrepreneurial SMEs and territorial contexts: strategies, impacts, and dynamics, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

The objective of our article is to link the implementation of collectively decided management measures with improvements in the economic performance of fishing SMEs. Specifically, we retrospectively examine a 25-year period (2000–2025), during which measures were gradually implemented in the scallop fishery in Seine Bay. We also aim to show that collaboration among stakeholders allowed these management measures to be imposed on fishers. This cooperation has altered the economic trajectory of the fishery, substantially improving stock status and, consequently, the economic performance of fishing SMEs.
At the beginning of the 21st century, the scallop population was overexploited (Hardin, 1968), to the extent that fishers had to work 15 hours per day, seven days a week, just to earn a living. Twenty years later, thanks to territorial governance involving the Regional Fisheries Committee, a production valorization organization, and scientific researchers, scallop biomass increased more than tenfold (from 10,000 tons to 105,000 tons in 2025), and hourly fishing productivity increased one hundredfold. Data from FranceAgriMer show that annual landings rose from approximately 5,500 tons in 2010 to nearly 15,000 tons in 2025, representing an almost continuous increase over the period.
Our research draws on multiple data sources. First, we trace the implementation of various management measures in the Seine Bay scallop fishery (2000–2005). Then, using a mixed-method approach (Rice & Gondwe, 2023), we exploit: (i) a FranceAgriMer database derived from transactions in fish markets in Normandy over a 25-year period (2000–2025), and (ii) three semi-structured interviews with key fishery stakeholders. The methodological value of this approach lies in combining official transaction data with access to information on the economic performance of fishing SMEs.
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Risk Prevention Strategies by Micro and Small Enterprises in Global Value Chain Reconfiguration: A Theoretical and Empirical Regional Perspective

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S50-1 Entrepreneurial SMEs and territorial contexts: strategies, impacts, and dynamics, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

This paper analyses whether risk prevention strategies adopted by micro and small enterprises (MSEs) affect offshoring decisions within regional production systems. Recent shocks have exposed the fragility of globally fragmented value chains and reinforced the European Union's commitment to Open Strategic Autonomy (OSA). While the debate has largely focused on multinational enterprises, the role of domestic suppliers in shaping offshoring incentives remains underexplored. The paper develops a formal model in which local suppliers choose whether and how to invest in risk prevention. Building on previous studies (Ehrlich & Becker, 1972; Menegatti, 2009), risk prevention is conceptualised as an ex-ante investment that reduces the probability of adverse events and whose effectiveness may depend on strategic complementarities across firms. Suppliers can allocate resources between two types of strategies: (i) "egoistic" strategies that increase individual resilience, and (ii) "mutually reinforcing" strategies that generate positive spillovers within the region. Because the returns to mutually reinforcing strategies depend on the extent to which other local suppliers also invest, strategic interaction may generate multiple equilibria. The region may become trapped in a low-investment equilibrium in which only a few firms adopt mutually reinforcing strategies, limiting collective resilience and sustaining stronger incentives for offshoring. Conversely, when a critical mass of suppliers invests in mutually reinforcing prevention, complementarities can produce cumulative regional effects, increasing reliability and reducing the attractiveness of offshore sourcing. The model is tested empirically using Italian firm-level data from IMEFAS, combined with ORBIS data on offshore outsourcing and FDI. Firms are aggregated at the Local Labour Market Area (LLMA)-industry level. A Linear Probability Model with fixed effects estimates the differential impact of the various risk prevention strategies on the likelihood and extent of offshore outsourcing by both MSEs and larger firms, and examines under which conditions regional production systems are more likely to converge toward a low-investment equilibrium or, alternatively, to shift toward a high-prevention equilibrium.

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SME strategic behaviour in different economic contexts: A global review of themes and theories

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S50-1 Entrepreneurial SMEs and territorial contexts: strategies, impacts, and dynamics, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

We examine the strategic behaviour of small and medium-sized enterprises (SMEs) across developed, emerging, and developing countries by combining a bibliometric analysis of the scientific literature with a systematic review. The purpose of this study is to identify the dominant research themes, conceptual frameworks, and reported patterns of SME strategies across different economic contexts. The study addresses the following questions: what are the main characteristics and trends in SME scholarship across developed, emerging, and developing economies; whether differences exist in the research lines explored in each context; what theoretical frameworks underlie the SME literature in these groups of countries; and to what extent these frameworks consider potential heterogeneity of SME strategic behaviour across contexts.

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Self-Employment and Regional Development in Disruptive Times - Germany 1895 - 2020

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S50-2 Entrepreneurial SMEs and territorial contexts: strategies, impacts, and dynamics, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

We examine the long-term relationship between regional levels of self-employment and economic performance. Regional self-employment rates are highly correlated over long time periods exceeding a century. Persistently high and increasing levels of self-employment are significantly associated with relatively high current levels of Gross Value Added per capita. That such a relationship cannot be found for East Germany is likely due to forty years of an anti-entrepreneurial socialist regime after World War II in this part of the country. We also find a positive relationship between self-employment and patenting that may provide an explanation for the relationship with Gross Value Added.

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In the Middle of the Urban-Rural Divide: Entrepreneurship for Growth Dynamics in Sweden's Micropolitan Regions

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S50-2 Entrepreneurial SMEs and territorial contexts: strategies, impacts, and dynamics, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

This paper examines the role of entrepreneurship in shaping growth dynamics in Sweden's micropolitan regions, municipalities located between metropolitan cores and rural peripheries. Using longitudinal data for all 290 Swedish municipalities from 2007 to 2023, we estimate dynamic panel models to assess how entrepreneurial activity, primarily measured by new firm entry and micro-firm prevalence, affects population, employment, productivity, and wage growth. Our findings reveal that micropolitan regions exhibit distinct growth patterns. Moreover, a higher share of micro firms is robustly associated with population expansion, while entry rates show limited short-run effects on structural upgrading. These results underline the importance of entrepreneurship for extensive growth margins in intermediate regions and highlight how local conditions mediate its impact, offering insights for place-based strategies aimed at inclusive regional development.

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The Vendée Uprising through the Lens of Everett Hagen's Theory of Social Change: From Historical Trauma to the Post-WWII "Miracle Vendéen"

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S50-2 Entrepreneurial SMEs and territorial contexts: strategies, impacts, and dynamics, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

This paper examines the long-term socio-economic trajectory of the 'Military Vendée' region in France through the psychological-sociological framework of Everett Hagen. By applying Hagen's theory of the 'withdrawal of status respect,' the authors analyze how the historical trauma of the Vendée Uprising (1793–1794) served as a catalyst for the region's unique post-WWII economic surge, known as the 'Miracle Vendéen.'

Hagen's model suggests that significant social change occurs when a well-entrenched group is disparaged by a dominant power, leading to a multi-generational shift in personality structures. The study identifies the French Revolutionary government's suppression of the Vendée—marked by the execution of the King and the violent Levée en Masse—as the 'precipitating event.' This conflict resulted in a demographic catastrophe, with an estimated 20% to 25% of the population killed. Following this trauma, the region entered a prolonged 'retreatist' phase. For several generations, the Vendée population internalized their frustration, developing an apathy toward national values while reinforcing a distinct, localized identity. Hagen posits that this retreatism serves as a necessary incubation stage, eventually giving rise to 'innovative personalities' who seek to regain status through entrepreneurial activity rather than political integration.

The paper analyzes how this psychological shift culminated in the 20th century. Driven by a 'self-help' culture and a refusal to rely on the central state—which had historically marginalized them—the region developed a highly resilient industrial model. Central to this is the 'Choletais system,' a territorial network characterized by: 1) social cohesion (an absence of class rivalry and a strong consensus around the value of the enterprise); 2) disciplined competition (a network of Small and Medium Enterprises (SMEs) that cooperate locally while competing globally); 3) productive excellence (a focus on labor-intensive, "low-tech" sectors (textiles, footwear, agri-food) that have successfully integrated modern robotics and digital tools.)

Statistical evidence from INSEE and geographical analysis confirm that the Vendée has maintained a high 'productive' core, outperforming other French regions in resilience, particularly following the 2008 financial crisis. The authors conclude that the Vendée's development is essentially a 'form of culture'—a generational response to historical 'othering' that transformed a disparaged identity into a powerful engine for technological and social change.

The effects of entrepreneurship on income inequality in developed countries: In search of mechanisms

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S50-2 Entrepreneurial SMEs and territorial contexts: strategies, impacts, and dynamics, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 27, 2026, 15:00 - 17:00

This paper contributes to the identification of mechanisms through which entrepreneurship reduces income inequality in developed countries. It shows that higher-quality (innovative, opportunity-driven, or growth-oriented) entrepreneurship reduces inequality by reducing the income share of the upper tail. This could be attributed to Schumpeterian creative destruction. Higher-quality entrepreneurship additionally increases the income share at the lower tail. A possible mechanism could be job creation. Necessity entrepreneurship has contributed less to reducing inequality, by contrast. A striking result is that the creative destruction mechanism weakened significantly after 2010s, pointing toward a declining role of entrepreneurship in reducing income inequality.

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Lifestyle-related health risks as an emerging labour market challenge affecting firm productivity and competitiveness

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S50-3 Entrepreneurial SMEs and territorial contexts: strategies, impacts, and dynamics, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

In the European Union, approximately 90% of deaths are attributable to non-communicable diseases (NCDs) such as cardiovascular diseases, cancer, diabetes, and chronic respiratory conditions, largely driven by unhealthy lifestyle factors including smoking, poor diet, physical inactivity, harmful alcohol use, and sleep disorders. These risks display marked territorial disparities across Europe, with substantially higher obesity prevalence, cardiovascular mortality, and cancer in Central and Eastern Europe compared to Western and Northern regions. In ageing societies facing shrinking working-age populations, workforce health has become a strategic economic resource. For small and medium-sized enterprises (SMEs), which rely heavily on locally available labour, lifestyle-related health risks can directly affect productivity, innovation capacity, and competitiveness.

This study addresses a gap at the intersection of entrepreneurship research, labour economics, and public health by analysing how employees' lifestyle-related health risks influence employee well-being and firm-level financial performance. While individual health consequences are well documented, less attention has been paid to firm-level outcomes, as well as to the mediating and moderating contextual factors shaping these relationships. Furthermore, evidence on the financial effectiveness of workplace health promotion (WHP) programmes remains inconclusive.

Using a mixed-method design, the study combines a systematic literature review synthesising international empirical evidence with an in-depth case study of a Hungarian SME. Preliminary findings indicate consistent and economically significant negative associations between poor employee health and firm-level financial indicators. While comprehensive WHP programmes can reduce absenteeism and improve productivity, financial returns are highly context-dependent.

The findings suggest that lifestyle-related health risks are measurable determinants of firm performance and, when aggregated, influence regional competitiveness and resilience. By conceptualising workforce health as a territorially embedded dimension of human capital quality, the study contributes to entrepreneurship research and highlights population health improvement as a strategic economic development priority in demographically challenged regions.

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The presence of a business enterprise and its impact on the experience of home in Tuuri village, Finland

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S50-3 Entrepreneurial SMEs and territorial contexts: strategies, impacts, and dynamics, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

The presentation focuses on the interaction between a small village community (Tuuri in South Ostrobothnia, Finland) and a medium-size enterprise (Keskisen kyläkauppa), Finland's largest department store that is located, not in Helsinki but in a rural area. The enterprise runs large-scale business in a South Ostrobothnian village with fewer than 800 inhabitants. Such business activity leaves both tangible and intangible traces in its environment and heavily shapes the landscape. The main interest lies in the physical manifestations of business activities that are changing the social and cultural environment and the whole experience of home for both people and enterprise. The villagers do not always appreciate the pace and direction that these changes have taken; but still, they are able to feel themselves at home in the changed environment. Over the course of three generations, the company and its home have evolved into a functioning entity. This relationship may be a key factor explaining why Tuuri village has prospered and why the business activities have thus flourished. The analysis of the relationship between the village community and the large company operating in the village is based on relevant literature, ethnographic observation and five elicited discussions with the villagers. The data were collected in a research project (The Dynamics of Localities and Enterprises, DoLE) realized by the University of Helsinki Ruralia Institute in 2020–2024 and funded by the Research Council of Finland.

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The Paradox of Commercial "Gentefication": How Latino-owned SMEs Shape and are Shaped by the Territorial Politics of Gentrification

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S50-3 Entrepreneurial SMEs and territorial contexts: strategies, impacts, and dynamics, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

This paper investigates the reciprocal relationship between entrepreneurial small and medium-sized enterprises (SMEs) and their territorial contexts through the lens of commercial gentrification. While traditional literature on commercial gentrification emphasizes how economic transformation and urban renewal facilitate the entry of external corporations and "boutique" businesses—often leading to the displacement of local, minority-owned small firms—this study complicates the discourse by focusing on the phenomenon of commercial "Gentefication."
Derived from la gente ("the people" in Spanish), commercial gentefication describes a process where ethnic minority (Latino) entrepreneurs spearhead redevelopment within their own marginalized neighborhoods. This raises a critical question: does this phenomenon challenge the exclusionary nature of commercial gentrification, or does it merely replicate and reproduce its displacement dynamics?
Drawing on qualitative case studies from three distinct territorial contexts in the United States—Boyle Heights (Los Angeles), Barrio Logan (San Diego), and Pilsen (Chicago)—the research explores how the geographical, cultural, and political characteristics of these territories shape the strategic behaviors of Latino SMEs. I argue that these entrepreneurs do not merely operate within a market; they actively politicize their businesses as a strategic response to the threat of cultural displacement. The study identifies seven main strategies employed by these firms—ranging from the establishment of "political businesses" and the politicization of cultural products to engaging in independent spatial policing. Through these actions, SMEs attempt to foster community resilience and ethnic empowerment. However, the findings reveal a profound territorial tension. While entrepreneurs frame their strategies as acts of solidarity, local residents and activists often contest these narratives, characterizing them as "community-washing" intended to legitimize the entrepreneurs' presence and profits. In their view, these SME strategies lead to internal fragmentation, cultural commodification, and the further displacement of lower-income groups. By analyzing these conflicting discourses, the paper contributes to the session's goal of understanding how local institutional and social contexts influence SME trajectories. It demonstrates that while SMEs can drive the structural transformation of their territories and serve as anchors of territorial identity, the process remains highly contentious.
Keywords: Commercial Gentrification, Gentrification, SME Strategic Behavior, Territorial Politics, Latino Entrepreneurship, Community-washing, Place-based Identity, Social Polarization

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The Geography of the French Silver Economy

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S50-3 Entrepreneurial SMEs and territorial contexts: strategies, impacts, and dynamics, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 27, 2026, 17:30 - 19:30

Almost every country in the world is experiencing sustained growth in both the number and share of older persons in its population. As age structures shift, aggregate consumption patterns change, increasing the relative importance of goods and services tailored to older consumers, including assistive technologies, housing adaptations, teleassistance, digital connectivity, care services, financial products, and tourism. The expansion of entrepreneurial activity targeting these needs has given rise to the “silver economy,” a heterogeneous set of activities that cuts across traditional sectoral boundaries.

Economic geography has traditionally emphasized supply-side explanations for the spatial distribution of entrepreneurship, focusing on agglomeration economies, knowledge spillovers, labor pooling, and industrial clustering. Entrepreneurship research similarly tends to treat demographic structure as a supply-side characteristic affecting the availability and quality of entrepreneurial human capital. However, demographic change may also operate through demand. Regions with different age compositions exhibit different market potentials for age-specific goods and services. In this sense, ageing can reshape opportunity structures by generating localized demand signals (Priem et al., 2012). Evidence from innovation economics shows that innovation responds to demographic shifts in market size (Acemoglu & Linn, 2004), suggesting that ageing may redirect entrepreneurial activity.

Yet the geography of ageing does not necessarily coincide with established innovation and economic hubs. Because silver economy is not a homogeneous market but a constellation of overlapping submarkets reflecting diverse needs, this creates a potential tension between demographic demand and supply-side agglomeration forces: while ageing regions may generate strong market signals, firms may still prefer urban regions offering complementary capabilities and entrepreneurial ecosystems.

This study examines this tension in France, which formally institutionalized the silver economy through a dedicated contrat de filière. Crunchbase and the French national business directory is used to compile data on silver-economy establishments. The resulting dataset includes 406 silver-economy establishments created between 2015 and 2025, merged with regional demographic and economic indicators at the NUTS-3 level.

Initial empirical results rely on Poisson count models. They show that regions with a higher share of older residents host more silver establishments per capita, consistent with a demand-pull effect. Industrial diversity matters in pooled models but loses significance under region fixed effects, suggesting it operates as a structural condition rather than a short-term driver. Overall startup activity remains strongly associated with silver entry. These findings indicate that the geography of the silver economy reflects the interaction between demographic demand, structural regional capabilities, and entrepreneurial dynamics.

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Towards Just Hydrogen Transitions? A Critical Energy Justice Appraisal of Italy's National Hydrogen Strategy

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S51-1 Inequality and Territorial Cohesion in the Energy Transition: Towards Fair and Inclusive Low-Carbon Pathways, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 28, 2026, 09:00 - 10:30

Hydrogen has moved to the centre of Europe's decarbonisation agenda, framed as a solution for hard to abate sectors, an industrial opportunity and a geopolitical hedge. Italy's Strategia Nazionale H2 (SNI, 26 November 2024) follows this logic, projecting an expansion of hydrogen demand from about 1.5 Mtep today, almost entirely industrial, to 1.7 Mtep in 2030 and to 6 to 12 Mtep by 2050, driven mainly by industry and especially transport. The strategy also explicitly contrasts two 2050 "limit cases" for supply, a domestic production prevalent case (70% domestic, 30% imports) and an import prevalent case (20% domestic, 80% imports), which imply sharply different requirements for electrolysis and renewables deployment and therefore very different regional development footprints.

This paper provides a justice oriented assessment of the SNI using the canonical energy justice triad of distributional, procedural and recognitional justice, enriched by the philosophical critique of equality developed by Pellegrini Masini, Pirni and Maran (2020). It combines systematic qualitative content analysis of the SNI with a focused reading of key implementing instruments that territorialise hydrogen through the Italian Recovery and Resilience Plan, notably the ministerial decree implementing PNRR Mission 2, Component 2, Investments 3.1 and 3.2 (hydrogen valleys in industrial brownfields and hydrogen use in hard to abate sectors). The analysis is interpreted through a regional lens that links hydrogen deployment logics to pre existing territorial divides and socio economic vulnerability.

Findings indicate that the SNI's transition benefits are likely to concentrate in industrial and logistics corridors and gateway regions, particularly where ports and import infrastructure such as the SoutH2 Corridor are positioned as strategic levers. Procedurally, the strategy emphasises implementation speed and competitive allocation mechanisms, while providing limited detail on enforceable participation and transparency safeguards. Recognitionally, renewable hydrogen is prioritised but technological openness remains, while energy poverty and differentiated household impacts are not foregrounded.

The paper proposes justice oriented innovations including progressive cost recovery with targeted protection for vulnerable consumers, regional equity triggers to support lagging and inner areas, stronger transparency and accountability in funding allocation, and mandatory equity impact assessment clauses for subsidised projects.

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Hydrogen as a Policy-Constructed Market: Transition Governance, Structural Change, and Regional Implications

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S51-1 Inequality and Territorial Cohesion in the Energy Transition: Towards Fair and Inclusive Low-Carbon Pathways, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 28, 2026, 09:00 - 10:30

Hydrogen has moved to the centre of European and global decarbonization strategies, yet its emergence does not follow conventional models of endogenous market formation. Rather than arising through price signals and decentralized innovation, the hydrogen economy is being actively shaped through public intervention, institutional design and anticipatory governance. It can therefore be interpreted as a policy constructed market assembled to pursue climate neutrality, energy security and industrial competitiveness under conditions of uncertainty and infrastructural indivisibility.
Scaling renewable hydrogen requires coordinated investment in electrolysis, transport infrastructures, industrial adaptation and demand aggregation. These activities are capital intensive, network dependent and territorially embedded, making spontaneous market development unlikely. Drawing on insights from the Multi-Level Perspective, Technological Innovation Systems, Mission Oriented Innovation Policy and Transition Management, hydrogen emerges as a process of institutional construction that reshapes industrial trajectories and spatial economic structures.
The resulting structural transformation unfolds unevenly across Europe. Regions combining renewable resources, industrial capabilities and governance capacity are better positioned to capture value along emerging hydrogen value chains, while less developed territories risk marginalization without coherent place-based strategies. Hydrogen thus represents not only an energy transition, but a reconfiguration of structural and territorial dynamics shaped by policy sequencing and institutional capacity.

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From Hydrogen Risk to Hydrogen Justice: Building a UK Hydrogen Transition Vulnerability Index

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S51-1 Inequality and Territorial Cohesion in the Energy Transition: Towards Fair and Inclusive Low-Carbon Pathways, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 28, 2026, 09:00 - 10:30

Green hydrogen is central to the UK's net-zero strategy, yet most projects are still in planning. This makes it difficult to evaluate "hydrogen justice" using observed public exposure or survey evidence. This paper develops an ex-ante, spatially explicit Hydrogen Transition Vulnerability Index (HTVI) for the UK from the perspective of communities and households located in potential hydrogen-development areas—an index that identifies places where hydrogen development is most likely to generate unfair burdens or exclusion, given current social, environmental, and governance conditions. Conceptually, we translate socio-ecological risk mechanisms highlighted in recent energy justice research—exclusion (limited participation), enclosure (competition over land/water/energy resources), and externalization (shifting environmental and social costs onto particular communities) into measurable indicators and organise them using a Capability Approach. Empirically, the HTVI is constructed at local-area scale by combining open UK datasets on fuel poverty and deprivation, housing efficiency and heating exposure, local energy demand, environmental burdens, and procedural capacity. We apply an entropy-weighting index method with transparent robustness checks against alternative weighting schemes. To capture early-stage deployment dynamics, we use machine learning to estimate a hydrogen transition pressure score from observable siting fundamentals and policy pipeline signals, which represents the expected likelihood and intensity of near-term hydrogen project development across places. We combine it with baseline vulnerability to map expected justice risks. The resulting HTVI identifies hotspots that may need extra safeguards, including engagement, benefit-sharing, and environmental protections, before large-scale hydrogen build-out.

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Who Bears the Burden? Deconstructing Regional Vulnerability to Europe's Green Transition

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S51-2 Inequality and Territorial Cohesion in the Energy Transition: Towards Fair and Inclusive Low-Carbon Pathways, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 28, 2026, 11:00 - 13:00

The green transition is reshaping regional development trajectories, yet existing approaches to measuring vulnerability focus narrowly on industrial exposure—systematically mischaracterising regional risk by treating territories as passive recipients of decarbonisation pressures rather than as differentiated systems with varying capacities to absorb and respond to structural change. This paper develops the Regional Green Transition Vulnerability Index (RGT-VI), a multidimensional framework grounded in the interactionist logic of the Intergovernmental Panel on Climate Change's vulnerability architecture: exposure identifies which regions face structural pressure from decarbonisation; sensitivity determines how severely that pressure translates into socio-economic strain; and adaptive capacity governs whether regions can adjust in ways that mitigate harm or capture emerging opportunities. Applied to European NUTS-2 regions, the index reveals distinct spatial patterns of vulnerability. A negative correlation between sensitivity and adaptive capacity reveals a "double burden" concentrated in Eastern and Southern Europe: regions most susceptible to socio-economic strain are simultaneously those least equipped to absorb and respond to it. Meanwhile, a metropolitan effect emerges across all three pillars, with capital cities and major urban centres displaying systematically lower vulnerability than surrounding territories. Cluster analysis identifies five vulnerability archetypes—each reflecting a distinct pillar combination—that illustrate why uniform transition policies may be poorly suited to the diversity of regional challenges. By capturing the full causal chain from transition pressure to adjustment potential, the RGT-VI enables ex-ante identification of at-risk regions before vulnerabilities crystallise into entrenched distress—creating space for preventive, place-sensitive intervention rather than reactive remediation.

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Challenges of a low-carbon transition in regional fossil fuel-dependent economies: the case of Santa Catarina and Rio Grande do Sul in Brazil

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S51-2 Inequality and Territorial Cohesion in the Energy Transition: Towards Fair and Inclusive Low-Carbon Pathways, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 28, 2026, 11:00 - 13:00

The transition toward a cleaner and more sustainable future requires far more than incremental technological adjustments; it demands a profound rethinking of economic activities and the reorganization of societies upon new, sustainable foundations. In this context, the formulation of coherent public policies and territorially sensitive development strategies becomes central to achieving regional sustainability. Transforming local and regional economies is not limited to the diffusion of greener products or the expansion of clean energy sources. Rather, it entails confronting conflicting intersectoral interests, cognitive misalignments among stakeholders, insufficient or misdirected investments, institutional fragmentation, and entrenched power disputes that shape regional development trajectories.
This paper analyzes the Climate Plan (Plano Clima) as a strategy for the energy transition toward a low-carbon economy, focusing on the impacts and challenges in the coal-mining regions of Santa Catarina and Rio Grande do Sul. Based on a comparative case study that combines document analysis, economic and environmental series, the study investigates the institutional capacities, governance arrangements, and socioeconomic barriers that hinder the implementation of decarbonization policies. The results indicate that, although the Climate Plan offers relevant technical guidelines and goals aligned with emission reductions, its effectiveness is limited by insufficient multiscale coordination, targeted funding, and productive reconversion strategies appropriate to regional specificities. The historical dependence on coal accentuates vulnerabilities in employment and income, requiring social protection policies, professional retraining, and incentives for economic diversification. A set of integrated measures is proposed — regional transition funds, participatory governance committees, retraining programs linked to green job creation goals, and monitoring instruments — to enable a just and territorially sensitive transition. The study contributes to the debate on how to articulate innovation, social inclusion, and environmental sustainability in contexts of economic restructuring.

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Assessing the value of cybersecurity and data protection in the electricity sector: a choice experiment approach in the Italian context

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S51-3 Inequality and Territorial Cohesion in the Energy Transition: Towards Fair and Inclusive Low-Carbon Pathways, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 28, 2026, 15:00 - 16:30

Energy systems, such as electric power networks, are increasingly digitalized. In consequence of this fact makes the concern for cybersecurity is constantly growing. The implications of cybersecurity, data protection and digital sovereignty are many: economic, political and social. Aim of this work is to investigate the economic value of cybersecurity, and in particular its spatial implications, through an apt methodology that takes in account its specific features. From the methodological point of view this work relies on a choice experiment: choice experiments belong to the general group of Cost-benefit analysis methodologies, and more in specific to Stated preferences methodologies. The present one is based on a wide Italian sample of 770 respondents. The sample is balanced in terms of age and geographical macro area. Besides questions investigating the socio-economic and demographic features of the interviewees' households, two sections contain the core part of the survey. The first one of the two presents to each interviewee four scenarios inquiring the will for monetary compensation in change for a blackout of a defined length of time that may incur. In turn, the second one presents to each interviewee three scenarios, relative to the choice of receiving a monetary compensation in change for a data theft of different gravity. The obtained data have been analysed with the aid of an econometric analysis following a utility function approach. Acceptance rates vary strongly between the different scenarios. High acceptance rates are obviously related to the combination of highest compensation and the lowest level of disturbance in terms of blackout or data theft. In general respondents are sensibly less willing to accept a data theft scenario with respect to the case of a blackout. Coming to the econometric analysis, in the simplified model the only statistically significant variable is the age of respondents. A more refined model introduces regional characteristics variables. In this case black out data show that geographic peculiarities do not influence significantly the attitude towards the risk of blackout, notwithstanding the Italian regional characteristics. Generation divide is the only relative gap emerging from survey data. Regarding data theft scenarios, the variables that play a strongly significant effect are those measuring previous internet use and data theft experience.

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Acceleration without Convergence?

Territorial Capabilities and the Uneven Scaling of Biomethane in the European Union

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S51-3 Inequality and Territorial Cohesion in the Energy Transition: Towards Fair and Inclusive Low-Carbon Pathways, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 28, 2026, 15:00 - 16:30

This paper examines whether EU biomethane targets function as spatially neutral acceleration instruments or whether their effects are conditioned by territorially embedded capability structures, potentially reinforcing pre-existing asymmetries across Member States. Under REPowerEU and the revised Renewable Energy Directive, biomethane has been assigned a strategic role in supporting decarbonisation and reducing fossil fuel dependency, with an EU-wide production target of 35 bcm by 2030. While target-based governance is commonly viewed as a mechanism for reducing uncertainty and mobilising investment, transition processes unfold within uneven institutional and economic geographies, raising questions about their territorial distributive effects.
Drawing on regional development and innovation systems literature, we conceptualise territorial capability structures as systemic configurations shaping the capacity of territories to mobilise and scale transition technologies. These include sectoral composition and related variety, institutional quality, innovation and absorptive capacity, and energy-system maturity. We introduce the concept of capability-contingent scaling, defined as the conditional ability of territories to translate uniform acceleration policies into technological deployment depending on their capability endowments.
Empirically, we construct a country-level panel dataset for the EU-27 covering 2015–2023 and estimate dynamic fixed-effects models linking biomethane production to territorial capability indicators, including interactions with a post-REPowerEU dummy capturing policy intensification. Additional dispersion analyses examine whether cross-country inequality in biomethane production evolves in the post-policy period.
By integrating acceleration governance with territorial capability theory, the paper advances a spatially sensitive framework for analysing EU-wide quantitative targets and their implications for uneven technological scaling.

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When Equality Is Not Enough: Gendered Realities of Climate Governance

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S51-3 Inequality and Territorial Cohesion in the Energy Transition: Towards Fair and Inclusive Low-Carbon Pathways, Auditorium 148 - Central corpus - Faculty of Classical and Modern Philology, agosto 28, 2026, 15:00 - 16:30

The transition toward a climate-neutral society is increasingly framed as a question of fairness and inclusion, yet formal commitments to gender equality do not automatically ensure equal experiences of climate governance in everyday life. While policy frameworks often assume that equal legal rights and participation opportunities are sufficient for inclusive climate action, lived realities are shaped by care responsibilities, housing affordability, energy vulnerability, and broader socio-economic pressures. Gender equality must therefore be understood alongside the structural conditions that influence both perceptions of inequality and the practical capacity to engage in climate-related behaviour. This study examines how structural and socio-economic factors shape gendered perceptions of inequality, experiences of energy vulnerability, and climate-related behavioural intentions within a single integrated framework.

The analysis is based on original survey data collected at the end of 2025 from a representative sample of Lithuania's adult population using probabilistic sampling to ensure proportional representation by gender, age, and place of residence. The dataset includes perception-based and behavioural indicators related to labour market equality, unpaid care constraints, participation in climate decision-making, energy limitation and expenditure patterns, and willingness to adopt climate-mitigating behaviours. Explanatory variables capture demographic and socio-economic characteristics alongside structural support factors such as unpaid working hours, perceived availability of public services, housing cost burden, and digital access. Ordered logit models are employed to analyse how these factors shape reported perceptions, constraints, and behavioural intentions.

The findings show that gender inequality is most visible in labour market perceptions and unpaid care responsibilities. Women are more likely to report discrimination and to question equal pay and career opportunities, while unpaid care duties, especially in households with children, limit participation in work and social life. Stronger public services and digital access help mitigate these constraints. In contrast, energy vulnerability is driven mainly by housing cost burden and broader socio-economic conditions rather than gender alone. Climate-related behavioural intentions are shaped primarily by education and institutional context: higher education increases willingness to reduce energy consumption and support renewable energy, whereas weaker perceived public services reduce acceptance of higher transition costs. Overall, the results suggest that achieving a just and inclusive climate transition requires addressing structural inequalities, particularly housing affordability, care infrastructure, public service provision, and digital inclusion, rather than relying solely on formal gender equality commitments.

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Do Tourists' Inflows Affect Gender Wage Gap? Evidence from Italy

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S52 Opportunities, risks and challenges of digital transformation in tourism: ICT, local development, environment and the human factor, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 26, 2026, 17:00 - 19:00

This paper investigates whether tourist inflows affect the gender wage gap (GWG)in Italy. While tourism is often promoted as a driver of local economic development, its consequences within labor markets remain underestimated. We examine whether increases in tourism demand alter gender wage differentials, particularly in provinces with strong exposure to the hospitality sector. Using a province-level panel dataset covering the period 2009–2016, we exploit variation in tourist inflows across Italian provinces and over time. Data on GWG is sourced from the Italian Labor Force Survey. To address endogeneity concerns arising from reverse causality and omitted local shocks, we implement an instrumental variable strategy based on a shift-share (Bartik-type) instrument constructed from historical tourism settlement patterns and exogenous changes in tourist flows by origin area.

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Digital Technologies and Circular Economy Innovations:

Evidence from Manufacturing Firms in Emilia-Romagna and Veneto

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S52 Opportunities, risks and challenges of digital transformation in tourism: ICT, local development, environment and the human factor, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 26, 2026, 17:00 - 19:00

The twin transition represents the concurrent advancement of digitalization and environmental sustainability, compelling firms to align with these dual forces to maintain competitiveness and regulatory compliance. This paper investigates this synergistic evolution by examining how Digital Technology (DT) drives Circular Economy Innovations (CEIs). Using a novel dataset of 1,549 manufacturing firms in the Emilia-Romagna and Veneto regions, we combine theoretical and empirical analyses to comprehensively describe the relationship between DT and CEIs. A key contribution of this study is that, by utilizing micro-survey data rather than relying solely on patents, we are able to capture the informal innovation performance of SMEs, thereby offering a more grounded and accurate reflection of their behaviors.
Specifically, this study examines the impact of DT on CEIs using Logit, OLS, and Negative Binomial models, complemented by an instrumental variable (IV) approach to address endogeneity concerns. Our empirical strategy mainly includes three steps:First, we assess how DT affects three distinct CEIs, Reduce, Reuse, and Recycle. Second, we decompose DT into eight technological categories (e.g., AI, IoT, and Big Data) to identify which digital technologies most effectively drive heterogeneous CEI. Third, we conduct subgroup analyses to explore whether these effects vary across firms with different levels of R&D intensity and GHG emissions.
Our findings indicate that DT significantly catalyzes CEIs, with the most pronounced impact observed in Reduce-type innovations, followed by Recycle and Reuse. Specifically, Internet of Things (IoT) and Big Data emerge as the most robust drivers, followed by Robotics. However, frontier technologies like Artificial Intelligence (AI) have yet to demonstrate a statistically significant effect in the current sample. These results reveal a clear technological and functional heterogeneity: while DT effectively optimizes resource efficiency (Reduce), its role in complex product life-extension (Reuse) remains limited.
Overall,this study contributes to a deeper understanding of the strategic role of digital technologies in advancing circular economic innovation, generating important implications for both firm-level innovation strategies and broader industrial policy design.

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Sharing hospitality: The relationship between Airbnb, the accommodation industry and new touristic flows.

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S52 Opportunities, risks and challenges of digital transformation in tourism: ICT, local development, environment and the human factor, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 26, 2026, 17:00 - 19:00

The purpose of this work is, firstly, to provide a determination of the magnitude of the tourism sharing economy phenomenon and its various components for an Italian tourism destination. The second goal is to evaluate the relationship between the tourist sharing economy (or sharing hospitality) and the hospitality managed professionally in terms of direct / indirect competition. Furthermore, the analysis of the turnover associated with different types of accommodations that can be booked on portals will lead to the evaluation of the percentage of "core sharing" in the business of the portals and to an esteem of new tourist flows generated by these tools. The updating of these issues was framed in the situation experienced by the tourism sector following the outbreak of the CoVid-19 and the second year of pandemic. The work therefore also questions the - contrasting - effects of the CoVid-19 on sharing hospitality. An in-depth analysis was carried out on Airbnb which, although not the only active portal in the area analyzed, is generally considered to be the one capable of developing the greatest traffic for the tourist facilities present therein. The analysis shows that, typically, only 20% of the turnover recorded by Airbnb in the metropolitan area of Bologna can be associated with the "pure" sharing economy, while the remaining 80% has different degrees of professional management which, in many cases, undermine the peer-to-peer relationship of the transaction established between the parties involved. Of this 80% of turnover, while 44% is associated with facilities that can be considered in direct competition with hotels, 36% is made up of tourist accommodations which, to varying degrees, play an indirect competition with hotels, thus activating new tourist flows to the destination's area. While this abstract is being presented, the analysis is being updated and expanded using the most recent data. The work also investigates the various consequences of the spread of tourist sharing in urban and extra-urban areas, highlighting the risk of displacement of habitual inhabitants from the most touristic parts of the cities and the permanent destination of the latter at the service of mass tourism, resulting in adverse social reactions.
In the moment this abstract is presented, a complete revisiting of the work is undergoing to integrate new data-set.

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Does Tourism Drive Energy Retrofits In the Building Stock? Evidence from Tuscany

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S52 Opportunities, risks and challenges of digital transformation in tourism: ICT, local development, environment and the human factor, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 26, 2026, 17:00 - 19:00

In recent years, the tourism sector and the residential construction sector have shown increasingly significant interconnections, particularly with respect to the energy efficiency of housing. The study investigates the role that a territory's tourism attractiveness may play as an incentive to improve the energy efficiency of the building stock. In particular, it aims to assess whether the tourism supply influences decisions to carry out energy retrofits, with specific attention to the residential sector and to dwellings used for short-term rentals or second homes.
The estimates suggests that areas with a strong tourism vocation tend, on average, to have a more energy-efficient building stock.

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Measuring the impact of accessibility to different types of bus, metro and train stations on the use of public transport in France

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S53 Accessibility and Inequality in the Context of Transport and Urban Form, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

Transport is the world's largest source of CO_2 emissions. In France, the transportation sector accounts for about one-third of CO2 emissions, 53% of which are attributable to passenger cars (Format Secten, Citepa, 2022). The car remains the dominant mode of transport for everyday journeys in general, and for commuting in particular. It accounts for 69% of commutes, compared with 15% for public transportation (INSEE, RP 2022). In response to climate challenges and other negative externalities, public policies are focused on expanding public transportation to reduce this dependence on cars, particularly by improving its accessibility and service coverage.
While the literature has extensively documented the determinants of public transportation use, most of this research has been conducted at the urban level. By utilizing INSEE's housing database at the national and IRIS levels, this paper aims to measure the combined effect of socioeconomic and spatial factors on public transit use in France. Particular attention is paid to accessibility and service coverage, distinguishing between different levels of service (subway, tram, BRT, and types of stations).Several models were successively applied: a logistic regression, two multilevel models, and then a within-between model.
Preliminary results show that the biggest barrier to public transit use is owning one or more vehicles, particularly in rural areas. Conversely, the presence of a subway system reduces car dependence, with a particularly marked benefit for those with lower levels of education. Furthermore, when other factors are held constant, women and those with higher levels of education are significantly more likely to use public transportation. However, this trend among women diminishes as population density decreases, particularly in rural areas. The distance of the commute plays also a decisive role: the longer
the commute (involving a change of municipality, department, or region), the greater the likelihood of using public transportation.
Accessibility plays an important role in the use of public transport for work-related journeys, with varying effects depending on the different types of railway stations and transport stops:
- High-traffic, unconnected suburban stations: these stations are most effective for travel within the department and, even more notably, for intra-regional trips.
- Urban regional stations connected to a major network: These stations are highly effective for medium-distance travel within the department and for intraregional trips. However, they are less effective for very long-distance interregional trips.
- Small local stops: These are effective only for short-distance trips within the department.
The results highlight the need to improve access to public transport, including at stations serving inter-departmental and inter-regional connections where the train is a strong competitor to the car. The regional metropolitan transport service (SERM) projects in France are fully in line with this approach.

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Impact of cycle lanes and public bike parking on bicycle commuting: Complementing French census with spatial data for policymaking

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S53 Accessibility and Inequality in the Context of Transport and Urban Form, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

Despite its well-documented benefits, cycling accounts for only 5% of home-to-work journeys of less than 5 km in France. Toward sustainable transportation, the French government is embarking on a national target of 12% modal share by 2030. However, the limited knowledge of the quantitative impact of additional bicycle infrastructure on bicycle commuting and heterogeneity in municipalities makes it difficult to achieve an equitable nationwide distribution of bicycle infrastructure. To fill these
gaps, this study investigates the impact of additional cycle lanes and public parking spaces on bicycle commuting in mainland France. Census data with 6.7 million observations are enriched with spatial information to build four clustered standard error logit models with municipality correlated randomeffects.
The results show that a one-unit increase in the rate of cycle lanes increases bicycle commuting by approximately 21% and 15% in the municipality of residence and work, respectively. A one-unit increase in public parking space increases bicycle commuting by 5% and 1% in the municipality of residence and work, respectively. From a policy perspective, there are several conclusions: (1) there is potential for cycling in high-density areas given additional cycle lanes and parking spaces in the municipality of work; (2) medium and low-density areas would require more infrastructure in the municipality of residence; (3) reaching the national target would require jointly increasing the supply of cycle lanes and parking spaces by twofold. If treated as mutually exclusive, the target is achievable by increasing the length of the cycle lane 2.3 times or the parking spaces 17 times. These findings provide a strong policy basis for additional national bicycle infrastructure according to population density and cycling patterns.

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Revealing the Spatial Mismatch between Heat Vulnerability and Shelter Provision under Extreme Heat

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S53 Accessibility and Inequality in the Context of Transport and Urban Form, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

While extreme heatwaves may be experienced as a temporary inconvenience by some, they constitute a life-threatening crisis for vulnerable populations, particularly older adults and individuals with chronic illnesses. When dwellings lack adequate cooling or households are constrained by energy poverty, public heat shelters become essential lifelines for survival. As heatwaves increase in both frequency and intensity, cities have expanded heat relief networks to mitigate heat exposure and safeguard at-risk citizens. Yet the question of whether these facilities are equitably accessible remains insufficiently examined. In practice, heat relief networks often evolve as an ad-hoc patchwork rather than through strategic, proximity-based planning. This pattern raises urgent environmental justice concerns, particularly regarding whether life-saving resources effectively reach those who need them most. To address this gap, this research introduces a robust analytical framework to evaluate the accessibility equity of heat shelters. The methodology adopts a building-level accessibility measure to enable a more precise assessment, moving beyond traditional planning approaches based on coarse census-tract representations. The findings expose significant spatial mismatches within the study area, demonstrating that vulnerable populations continue to be disproportionately underserved. This study provides a policy-relevant toolkit to assist cities in optimizing facility siting and designing adaptive emergency strategies. In doing so, it advocates for a shift toward proactive, justice-centered climate adaptation capable of protecting those most at risk from intensifying environmental hazards.

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Walking as a Spatial Experience: Developing Pedestrian Accessibility Standards through Survey-Based Evidence

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S53 Accessibility and Inequality in the Context of Transport and Urban Form, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

This paper presents the findings of a survey study examining walking as a lived spatial experience, with particular attention to pedestrian accessibility and everyday mobility practices. The study was conducted as part of a broader project aimed at developing accessibility standards, including standards for pedestrian infrastructure. The survey results constitute an integral component of the standard-setting process, providing empirical evidence to inform the formulation of pedestrian accessibility guidelines.

The research is grounded in the assumption that walking is not merely a mode of transport, but a fundamental dimension of spatial experience shaping perceptions of safety, comfort, orientation, autonomy, and social inclusion. From the perspective of regional development and spatial planning, pedestrian accessibility plays a crucial role in fostering inclusive and resilient environments, influencing both the functional performance and the social quality of space.

The survey gathered responses from a diverse group of users, enabling the identification of perceived infrastructural, organisational, and informational barriers, as well as subjective assessments of the quality, continuity, and legibility of pedestrian routes. Particular attention is given to the relationship between spatial design and perceived accessibility, highlighting how everyday walking practices reveal structural conditions and inequalities embedded in the built environment.

The presentation discusses the most frequently reported challenges and recurring patterns in the evaluation of pedestrian spaces, drawing conclusions relevant to the development of pedestrian accessibility standards and to broader debates on inclusive design and user-oriented regional development.

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Between urban and rural: A car ownership perspective on suburbanisation in post-socialist cities

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S53 Accessibility and Inequality in the Context of Transport and Urban Form, Auditorium 252A - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

The systemic transformation in Poland and other post-socialist CEE countries involved not only political and economic changes but also profound transformations of urban space. The abandonment of central planning and the emergence of market-driven forces fundamentally altered this pattern. In this context, Polish households began relocating from city centres to newly developed residential areas in the suburbs. This process was largely chaotic and poorly regulated and was not accompanied by the expansion of public transport or the provision of essential services. As a consequence, suburban residents became highly dependent on individual mobility, which was reflected in increasing levels of car ownership. While car ownership rates in suburbs and cities were very similar two decades ago, suburban levels are now substantially higher than those in large cities and comparable to those observed in rural areas. The aim of this study is to verify the determinants of high car ownership in the suburbs of Polish cities and to compare these determinants with the factors driving car ownership in urban and rural areas. Using econometric modelling and data on more than 13.5 million registered cars across nearly 2,000 spatial units, we empirically examine the effects of income, population density, household size, public transport policy, workrelated commuting and time accessibility to service facilities. The results indicate that, despite their spatial proximity to and functional integration with core urban areas, suburban areas in Poland resemble rural areas more closely than urban areas in terms of mobility patterns and car ownership.

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Does Regional Diversity Matter? Spatial Spillovers and Complementarity in Regional Wellbeing

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S54 Beyond GDP: Rethinking Progress and Well-Being in Regions and Cities(RP), Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

In pursuit of liveability, policymakers increasingly rely on wellbeing reports, surveys, and composite indices to monitor progress toward becoming desirable places to live. These instruments typically focus on the overall level of wellbeing within a region (e.g., life satisfaction) and on local sources of wellbeing such as health, housing, and the environment. Yet regions do not exist in isolation: residents may benefit from wellbeing resources in neighbouring regions or suffer from negative externalities. While spatial spillovers are well established in regional science, wellbeing monitoring frameworks largely treat neighbouring regions as benchmarks for comparison rather than as contributors to wellbeing itself. Ignoring these interdependencies may lead to suboptimal policy decicions in which regions attempt to optimise all domains internally instead of considering complementarity. For example, an urban municipality with limited green space may achieve higher life satisfaction when located next to a rural municipality rich in environmental amenities than when surrounded by similarly dense urban areas. This raises the question: does the diversity of soucres of wellbeing across neighbouring regions enhance overall wellbeing?

This paper examines the spatial interdependence of wellbeing across Dutch municipalities using the Dutch “broad prosperity” framework, which comprises seven wellbeing domains. We estimate domain-specific spillovers using a Spatial Durbin Model, allowing us to decompose life satisfaction into contributions arising from local conditions and from neighbouring municipalities. We further construct a domain-based dissimilarity index to assess whether variation in neighbouring municipalities’ wellbeing profiles is associated with higher life satisfaction outcomes.

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Subjective Well-Being and Urban Capabilities: A Perception-Based Analysis of Romanian Cities

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S54 Beyond GDP: Rethinking Progress and Well-Being in Regions and Cities(RP), Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

Recent literature on urban liveability emphasizes its multidimensional and relational character, going beyond the traditional approach based on economic conditions and performance. It is the result of complex interactions between the opportunities offered by cities and their vulnerabilities, both economically, socially and environmentally, between perceptions and structural urban performance, between objective and subjective determinants. In this perspective, cities are not only engines of growth, but also spaces of common convention and conviviality, as well as of unequal distribution of opportunities and vulnerabilities, in which well-being depends on access to economic, social and institutional capabilities (Sen, 1999; Golubchenko et al., 2024; OECD, 2020); Samavati, 2024; Uchida, 2024; Vittersø, 2025).

Specifically, in Central and Eastern Europe, post-socialist transformation processes have generated differentiated patterns of urban development, characterized by socio-economic polarization, digital divide, various forms of gentrification and infrastructural disparities (Lang et al., 2015), which are still insufficiently analyzed and known, as a key condition of urban transformability in contemporary development processes.

The present study aims to contribute to reducing this knowledge gap, by investigating the relationship between subjective well-being and capabilities, using survey data collected in 10 cities in Romania (over 130,000 inhabitants, excluding Bucharest) and urban structural indicators. The research conceptualizes liveability as a dependent variable resulting from the interaction between urban opportunities and structural vulnerabilities and highlights the particularities and inequalities of urban development in Romania. Well-being is operationalized through a composite index derived from items on general life satisfaction, existential meaning, work-life balance, energy level and perception of control over one's life. The perception analysis is carried out according to 4 clusters of determinants.

Methodologically, the research is focused on exploratory factor analysis to validate the cluster structure, associated with multivariate regressions and hierarchical models (HLM) to estimate the relative contribution of each cluster to determining well-being. To highlight inequalities, interactions between clusters and socio-demographic variables (income, education, age) are included, as well as inter-city comparisons based on standardized scores. The existence of cumulative or compensatory effects between dimensions is also tested (for example, whether digital performance can mitigate economic vulnerabilities).

The research identified specific patterns of liveability, inter & intra-city differences, and highlights the mechanisms through which economic, digital and environmental inequalities translate into well-being gaps. The main contribution lies in the development of an integrated empirical framework that allows the assessment of structural determinants and their unequal distribution in urban space, from the perspective of perceived well-being.

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Years where decades happen: a comparative static analysis of regional welfare disparities in Brazil

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S54 Beyond GDP: Rethinking Progress and Well-Being in Regions and Cities(RP), Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

Since the late 1990s, Brazil has experienced some important economic developments such as a macroeconomic stabilization, the expansion of social programs and a sustained economic growth supported by favorable external factors. These transformations motivated extensive research on topics such as inequality and poverty, but there has been given less attention to welfare analysis per se. Since conventional metrics such as GDP, nominal income and expenditure often miss key dimensions of household well-being, this absence translates into a gap in the welfare economics literature.

This study contributes to this literature by constructing a spatially adjusted Welfare Index that addresses these limitations commonly associated with traditional metrics. We define a welfare-enhancing consumption bundle, apply equivalence scales to account for household composition and economies of scale and estimate a spatial price deflator using the weighted Country-Product Dummy (CPD) method, a hedonic regression approach widely used for regional Purchasing Power Parity adjustments to correct metropolitan price differentials for different locations.

Using microdata from the Household Budget Surveys (POF) for the years 2002–2003, 2008–2009 and 2017–2018, we employ First and Second-Order Stochastic Dominance tests and Growth Incidence Curves (GIC) to analyze welfare dynamics across time, regions and income brackets. We find significant welfare dispersion across metropolitan regions, highlighting how income disparities translate into welfare inequalities. In an intertemporal perspective, results indicate a first-order dominance relationship between periods, characterizing Pareto-improving growth that was strongly pro-poor. These dynamics exhibit high regional heterogeneity. To conclude, we perform some sensitivity analyses regarding different equivalence scales, deflation methods and consumption bundles. Through a robustness matrix and first-order dominance relations, we show that results are robust to different equivalence scales and deflation methods and are sensitive to the composition of the consumption bundle, which reinforces the importance of properly defining welfare indices to study welfare dynamics rigorously.

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From Territorial to Consumption-Based Metrics: Assessing the Predictive Power of Environmental Performance and Ecological Footprint on Global Happiness

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S54 Beyond GDP: Rethinking Progress and Well-Being in Regions and Cities(RP), Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

This paper investigates whether consumption-based environmental indicators explain cross-national differences in happiness better than traditional territorial measures. While GDP has historically dominated development assessment, increasing attention is now given to multidimensional measures of well-being such as the Happiness Index. Simultaneously, globalization has altered the geography of environmental impacts, allowing developed economies to externalize carbon-intensive production through international trade.

Using a longitudinal panel dataset covering more than 140 countries between 2012 and 2024, the study integrates subjective well-being indicators from the World Happiness Report with environmental variables including territorial and consumption-based CO2 emissions, Environmental Performance Index (EPI), Ecological Footprint (gha per capita), and the Natural Environment pillar of the Legatum Prosperity Index.

The empirical analysis relies primarily on Fixed-Effects panel regressions to control for unobserved country-specific heterogeneity. The models also incorporate standard determinants of happiness, including GDP per capita, social support, healthy life expectancy, freedom of choice, and perceptions of corruption.

Preliminary findings indicate that environmental quality indicators, particularly EPI and Natural Environment scores, are positively associated with higher happiness levels. In contrast, Ecological Footprint effects weaken significantly once environmental governance variables are introduced. Most importantly, consumption-based CO2 emissions demonstrate stronger explanatory power than territorial emissions, suggesting that contemporary well-being is increasingly linked to globalized consumption structures rather than domestic production alone.

The paper contributes to regional science by highlighting spatial inequalities embedded in global production-consumption systems and by proposing a framework for evaluating sustainable well-being within planetary boundaries. The findings support the argument that environmental governance and ecological efficiency are essential components of resilient and inclusive regional development.

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Macro Drivers of Regional Labour Market Transformation in the Twin Transitions: Evidence and Policy Implications

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S56-1 Uneven geographies of job creation and job destruction in the context of green and digital transitions(RP), Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

European regional labour markets are undergoing profound restructuring, driven by decarbonisation, digitalisation and geopolitical and economic uncertainty. These 'twin transitions' generate simultaneous processes of job creation and destruction (JCD), which reshape sectoral structures, occupational profiles and regional development pathways unevenly and in a path-dependent manner. This paper proposes a regional analytical framework that examines gross labour reallocation, structural adjustment dynamics, and emerging skill mismatches, moving beyond net employment change. By conceptualising the twin transitions as interacting macro-drivers, the study explores the joint influence of technological upgrading, industrial restructuring, and decarbonisation policies on employment volatility and regional resilience. A review of cross-regional data has produced an analysis that shows differentiated adjustment pathways for European regions, finding that the regions that contain a diversified economy, have a vibrant innovation ecosystem and have proactive governance of the labour market are likely to have more adaptive capacity than those regions that are mono-industrial and reliant upon coal, which are at a higher risk to experience transitional unemployment and long-term scarring effects. The paper concludes that managing the twin transitions requires place-based strategies that integrate reskilling systems, anticipatory skill intelligence and coordinated industrial and labour market policies. The paper contributes to our understanding of regional labour market transformation by highlighting the structural and territorial dimensions of Europe’s green and digital transitions.

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Electromobility – an opportunity and a threat for economies and the labour market in Poland and other Central and Eastern European countries.

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S56-1 Uneven geographies of job creation and job destruction in the context of green and digital transitions(RP), Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

One of the strongest sectors of the economy in Central and Eastern European countries, responsible for hundreds of thousands of jobs, is the automotive industry. This sector is currently facing a major challenge in the form of electromobility – the gradual shift away from traditional petrol and diesel engines in favour of low- and zero-emission drives.
The aim of the presentation is to present the opportunities and threats that electromobility presents for economies and labour markets in Poland and Central and Eastern Europe.
On the one hand, new investments and new plants are emerging: producing new electric vehicles, batteries and chargers. The market for the sale and servicing of electric vehicles is opening up, as well as the possibility of processing and recycling used batteries.
On the other hand, many plants producing traditional vehicles and components for them (especially those related to combustion engines) are being closed down or reducing their workforce. Also, the future of jobs in companies dealing with the import and repair of used cars is uncertain. The competitiveness of the automotive industry, which is heavily dependent on exports to Western European markets, is threatened by a number of factors: from rising labour and electricity costs, through environmental regulations, to imports of cars and car parts from China (which have significantly lower production costs and at the same time control the entire value chain in electromobility).
Trends in the production of vehicles and electrical equipment (including batteries and chargers) in Poland and Central and Eastern Europe, as well as employment in corresponding sectors of the economy, will be presented using an analysis of existing sources: statistical data and industry reports. Then, the presentation will show results of interviews with motorisation experts and major companies representatives. Case studies will be used to present examples of new companies or those that have successfully exploited the trend towards electromobility for their development. Examples of threats in the form of closures of production plants associated with traditional combustion engines or reductions in employment in some of them will also be presented. Finally, scenarios for the development and effective adaptation of enterprises and labour markets to the trend of electromobility will be formulated.

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Regional job creation and destruction across industries in Europe in the context of the green and digital transitions

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S56-1 Uneven geographies of job creation and job destruction in the context of green and digital transitions(RP), Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 09:00 - 10:30

The green and digital transitions are reshaping national and regional economies across Europe. Efforts to decarbonize energy systems, transform production processes by further digitalization, and redesign value chains are changing the structure of industries and the geography of jobs. Jobs may be generated to alleviate environmental pressures through technological advancements, others may be reallocated from energy-intensive industries to more circular activities, while some jobs may be lost without being replaced. However, these shifts evolve unevenly, varying across industries and regions, raising concerns about winners and losers and the fair transition of the labour market. Studies on the process of Job Creation and Destruction (JCD) have analyzed the transformation of labour markets in the current transitionary period, although the largest body of literature on JCD and its effects focuses on the national level. Thus, they relatively overlook lower-scale geographical variation due to the regionally specific socio-economic context. This paper analyzes the geographically uneven effects of job creation and destruction in the context of the green and digital transitions across industries and European regions. It presents findings of the ISABEL project (https://isabelproject.eu/) on the JCD procedure in the context of the green and digital transitions. Using secondary data on JCD from the CompNet database, it analyzes job creation, job destruction, and gross employment growth in EU NUTS2 regions (plus the UK and Serbia) by industry at the NACE 2-digit level.

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Living Labs as Instruments of Policy Co-Creation in Regional Labour Market Transitions

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S56-2 Uneven geographies of job creation and job destruction in the context of green and digital transitions(RP), Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

The green and digital transitions are reshaping regional labour markets across Europe, generating simultaneous processes of job creation and destruction and creating significant territorial disparities. These dynamics challenge traditional policy design approaches, which often rely on top-down planning and limited stakeholder engagement. In response, participatory and place-based approaches are increasingly recognized as essential for designing effective and socially inclusive transition policies. This paper presents a methodological and analytical framework for understanding Living Labs as instruments of policy co-creation in regions undergoing labour market restructuring. Living Labs are conceptualized as open innovation ecosystems in which policymakers, firms, workers, educational institutions, and civil society collaboratively identify challenges, design solutions, and test interventions in real-life settings. The paper argues that such environments improve the relevance, feasibility, and legitimacy of policy measures by incorporating diverse forms of knowledge, including local experience, institutional expertise, and labour market intelligence. The analysis draws on evidence from the ISABEL project, which establishes Living Labs in multiple European regions to address job creation and destruction and skills transitions in the context of the green and digital transformations. The proposed framework highlights three key mechanisms through which Living Labs contribute to policy design: structured stakeholder engagement, iterative experimentation and feedback loops, and the integration of qualitative and quantitative evidence. These mechanisms enable the identification of region-specific labour market challenges and the co-development of context-sensitive policy responses. The findings suggest that Living Labs can serve not only as research environments but also as governance instruments that strengthen multi-level coordination and support place-based policy innovation. By bridging the gap between policy formulation and implementation, Living Labs provide a structured pathway for translating territorial knowledge into actionable strategies, contributing to more resilient and inclusive regional labour markets.

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Making Sense of the Twin Transition: A Gioia-Based, LLM-Enhanced Analysis of European Labour-Market Policies

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S56-2 Uneven geographies of job creation and job destruction in the context of green and digital transitions(RP), Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

The twin green and digital transition has become a central organising principle of contemporary European policymaking, particularly in the domain of labour markets and skills. Yet, despite the proliferation of strategies, action plans, and regulatory instruments, there is limited understanding of how policy actors themselves conceptualise labour-market change, risk, and intervention across governance levels. This paper addresses this gap through an inductive, theory-building analysis of European, national, and regional policy documents using Gioia methodology supported by large language models (LLMs).

Empirically, the study analyses a large corpus of policy texts related to employment, skills, education, and industrial transformation. LLMs are used to assist first-order coding by identifying recurring policy concepts, framings, and narratives at scale, while preserving traceability to original texts. These first-order categories are subsequently interpreted through the Gioia approach to develop second-order themes and aggregate dimensions that capture dominant policy logics and underlying assumptions about labour-market adjustment in the twin transition.

The analysis reveals systematic differences in how labour-market challenges are framed across governance levels, ranging from competitiveness- and innovation-driven narratives at the European level to more place-sensitive and inclusion-oriented framings at national and regional levels. At the same time, tensions emerge between policy aspirations for coordinated twin-transition strategies and fragmented approaches to skills, reskilling, and worker protection.

The paper contributes to the literature in three ways. First, it advances methodological innovation by integrating LLMs into Gioia-based qualitative analysis of policy systems. Second, it offers a multi-level conceptualisation of labour-market policymaking under the twin transition. Third, it provides theoretical insights into policy coherence, institutional sensemaking, and the governance of labour-market transformation in Europe.

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Managing Labour Market Transformation in a Coal Transition Region: Evidence from the Western Macedonia Living Lab

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S56-2 Uneven geographies of job creation and job destruction in the context of green and digital transitions(RP), Auditorium 242 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 11:00 - 13:00

The accelerated phase-out of coal and lignite under the European Green Deal is generating significant labour market disruptions in coal-dependent regions. Western Macedonia in Greece—one of Europe's fastest decarbonisation cases—offers a critical setting to examine how labour market restructuring can be managed under conditions of structural vulnerability and policy urgency. This paper presents empirical evidence from the Western Macedonia Living Lab, established within the Horizon Europe ISABEL project, as a platform for stakeholder engagement and place-based policy experimentation. Drawing on interviews, participatory workshops, and regional labour market analysis, the study explores employment dynamics, job displacement risks, emerging skill needs, governance capacity, and the effectiveness of transition measures. Particular attention is given to institutional coordination, social acceptance, and gender implications. Findings suggest that although strategic frameworks and funding instruments such as the Just Transition Fund provide essential support, uncertainties persist regarding job creation, skill alignment, and governance inclusiveness. The paper argues that effective labour market transformation requires place-based governance, sustained stakeholder engagement, and adaptive institutional capacity, demonstrating the value of Living Lab methodologies for evidence-based decision-making in just transition contexts.

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Exploring Socioeconomic Drivers of Entrepreneurial Activity and Survival in Hungarian districts

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S58 Entrepreneurial Ecosystems in Transformation: Digitalisation, Agency, and Regional Value Creation, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

This study explores the socioeconomic factors that shape entrepreneurial activity and firm survival in Hungarian subregions. Building on prior research, the study recognises entrepreneurship's vital role in fostering economic growth, productivity, and innovation. It highlights that both internal business characteristics and external regional factors affect the trajectory of new ventures at each phase of their life cycle. Using frameworks like the Entrepreneurial Ecosystem Index and the Regional Entrepreneurship and Development Index (REDI), the study systematically analyses the environment in which Hungarian firms operate.
The empirical analysis uses company-level data from the Hungarian Central Statistical Office for 2011–2019, categorising firms annually as entrants, exits, or operating businesses. This allows calculation of survival rates for various business types at the district level. Additional data on labour markets, education, and transportation are used to capture the broader socioeconomic context. Several regression models are estimated to identify which ecosystem components most influence firm survival, with year-fixed effects included to control for temporal changes.
Preliminary results indicate that survival rates are higher in more urbanised districts. The research points to the need for more refined measurements of the local business environment and acknowledges the challenges of evaluating institutional quality at a fine-grained regional level. By comparing district-level data to national averages and examining patterns beyond simple averages, the study uncovers distinct regional drivers of entrepreneurial success. Ultimately, this research deepens the understanding of how regional socioeconomic environments interact with entrepreneurship and offers a detailed map of Hungary's entrepreneurial landscape.

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Does Digitalization Shape Country-Level Female and Male Entrepreneurial Potential Differently?

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S58 Entrepreneurial Ecosystems in Transformation: Digitalisation, Agency, and Regional Value Creation, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

This study investigates the impact of digitalization on the entrepreneurial potential of women and men across 78 countries at the national level. Building on an adaptation of the Global Entrepreneurship Index (GEI) methodology, we employed distinct indices for female and male entrepreneurial potential: Female Entrepreneurship Index (FEI) and Male Entrepreneurship Index (MEI). Our findings indicate that digitalization positively influences both FEI and MEI, underscoring its overall role in fostering entrepreneurship. However, in countries where male entrepreneurship potential exceeds female entrepreneurship potential (FEI<MEI), digitalization exerts a stronger positive impact on male than on female entrepreneurship. Conversely, in countries where female entrepreneurial potential surpasses male entrepreneurial potential (FEI>MEI), digitalization does not significantly affect the MEI-FEI gap. Further analysis reveals that factors such as economic development (GDP per capita) and gender inequality (women's political empowerment) interact with digitalization to support entrepreneurship for both genders. Notably, digitalization enables women to compete more effectively for resources and access markets in highly competitive environments. These findings highlight the varied effects of digitalization on male and female entrepreneurship across countries, suggesting that policies should adopt a nuanced approach to effectively promote gender-balanced entrepreneurial potential at the national level.

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Long-term Dynamics of Regional Self-employment – What makes a leapfrogger?

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S58 Entrepreneurial Ecosystems in Transformation: Digitalisation, Agency, and Regional Value Creation, Auditorium 2455 - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Regional entrepreneurial activity can have strong historical roots. Recent research for a number of countries has shown that regional differences of self-employment and new business formation can be rather persistent, but there are also regions that show considerable change. Analyzing the development of regions that experienced a pronounced increase in entrepreneurship, the 'leapfroggers', could indicate important policy levers to initiate an increase in regional entrepreneurial activity. Likewise, studying regions with declining levels of entrepreneurial activity, the 'plungers', could help policy makers identify the forces that cause deterioration of entrepreneurial activity. In contrast, regions that remain permanently at the top or bottom of the league table offer only relatively limited opportunities to learn how to initiate change.
The paper investigates the development of regional self-employment and new business formation in Germany. The analysis of self-employment spans a period of nearly 130 years, from the late 19th century to the present. The data on new business formation that we analyze are for West Germany from 1978 to 2024, a period of 46 years. The analysis focusses on the following questions:

- How significant are changes in regional entrepreneurial activity?
- What characterizes regions that show a substantial increase in the level of entrepreneurial activity (entrepreneurial leapfroggers)?
- What are the characteristics of those regions that experienced a significant decrease in the level of entrepreneurial activity (plungers)?

Based on these findings we discuss recommendations for a policy that is aimed at fostering regional entrepreneurship.

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How digital entrepreneurship ecosystem explain startup formation? The comparison of three methodologies

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S58 Entrepreneurial Ecosystems in Transformation: Digitalisation, Agency, and Regional Value Creation, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

Digitalization has fundamentally transformed the structure and dynamics of entrepreneurial ecosystems. While the entrepreneurship ecosystem (EE) literature emphasizes systemic interactions among institutions, finance, talent, and culture, the emergence of Digital Entrepreneurship Ecosystems (DEE) integrates digital infrastructure, platforms, user participation, and distributed entrepreneurial agency into a unified framework. Despite conceptual advances, empirical measurement of DEEs remains methodologically fragmented. Composite indicators are widely used, yet different aggregation techniques embed distinct assumptions about substitutability, complementarities, and systemic coherence. As a result, ecosystem rankings and policy implications may vary substantially depending on methodological choice.

This paper examines how alternative composite indicator methodologies shape the measurement of digital entrepreneurial agency and its relationship to startup formation. Focusing on the Digital Technology Entrepreneurship (DTE) component of the DEE Index, we analyze four key agency pillars—finance providers, key employees, support organizations, and digital technology providers. Using panel data for 40 European countries between 2017 and 2022, we compare three aggregation approaches: Principal Component Analysis (PCA), the Benefit-of-the-Doubt (BOD) model, and the Penalty for Bottleneck (PFB) method. Europe provides an ideal empirical setting due to its substantial heterogeneity in digital infrastructure, venture capital intensity, and institutional quality within a partially harmonized regulatory framework.

The analysis proceeds in two stages. First, we compare country rankings and score dispersion across aggregation methods. Second, we estimate fixed-effects panel regressions linking composite DTE scores to startup formation and technology-oriented startup activity using Crunchbase data.

Results indicate significant methodological divergence. PCA and BOD produce systematically higher and more dispersed ecosystem scores, reflecting compensatory aggregation logic. In contrast, PFB penalizes structural bottlenecks and generates more conservative but systemically coherent assessments. Importantly, PFB-based scores exhibit stronger and more stable associations with technology startup formation, particularly during the pandemic period. Ecosystems characterized by balanced agency configurations demonstrate greater startup resilience than those with uneven but compensatory strengths.

These findings suggest that digital startup formation depends more on systemic balance than on isolated excellence. For regional policy, the results underscore the importance of addressing ecosystem bottlenecks holistically rather than prioritizing single-pillar interventions.

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The impact of public funding and the university-centred entrepreneurial ecosystem on the development of Hungarian university spin-off companies

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S58 Entrepreneurial Ecosystems in Transformation: Digitalisation, Agency, and Regional Value Creation, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 26, 2026, 17:00 - 19:00

The purpose of the submission is to explore, on the one hand, the impact of the university-centred entrepreneurial ecosystem (EE) that has developed over the past decade and, on the other hand, the impact of a specific R&D grant scheme aimed specifically at university spin-off companies. This is because one of the primary goals of both the university-centred entrepreneurial ecosystem and the related grant programs is to support the creation and growth of academic spin-off companies.
The results obtained from examining the effects of interventions aimed at supporting spin-off companies can also be useful from a policy perspective, for the planning and development of new support programs (Bellucci et al. 2019). We intend for this research to contribute to a better understanding of the formation, operation, and development of USOs, and to provide useful lessons for policymakers involved in the support and development of university-related spin-off companies and university-centred entrepreneurial ecosystems for the planning of future interventions (Szerb et al. 2020).
We use both quantitative and qualitative methods in our ongoing research. The quantitative analysis is largely based on publicly available financial, economic, and industrial property rights data on beneficiary spin-off companies (94 firms), but we also rely on data provided by the grant management office. Databases based on publicly available information are used to assess economic and financial performance and map ownership structures. Our research examines the geographical embeddedness of the spin-off enterprises included in the study on several scales: on the one hand, at the NUTS2 regional level of the European Union, and on the other hand, based on the regional typology of the Hungarian National Smart Specialization Strategy (S3) for 2021-2027, which corresponds to the NUTS3 level.
We expect that, in terms of regional differences, the S3 region types will provide greater explanatory power than the analysis based on NUTS2 categories. On the one hand, S3 denotes smaller territorial units on average than NUTS2 regions, and therefore typifies more homogeneous geographical areas based on certain criteria. On the other hand, S3 territorial units are specifically based on differences in RDI performance, which is the focus of the research, and assign specific objectives to the region types (e.g., strengthening the university-centred innovation ecosystem in knowledge regions; knowledge diffusion in industrial production zones; strengthening openness and adaptation in regions with more moderate RDI intensity).

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Friends or Foes? Investigating the Relationship Between Collective Intellectual Property Rights and Regional Innovation in the EU Wine Industry

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S59 Innovation Beyond the Frontier: Alternative Approaches for Understanding Regional Innovation, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 26, 2026, 11:00 - 13:00

This paper investigates the relationship between collective intellectual property rights, geographical indications and collective trademarks, and regional innovation, proxied by individual trademark registrations, in the EU wine industry. Drawing on Ostrom's commons governance framework, we argue that the same collective IP instrument can function as either a coordination device enabling innovation or a rent-seeking mechanism inhibiting it, depending on regional institutional conditions. Using a Poisson Pseudo-Maximum Likelihood estimator with high-dimensional fixed effects and a Bartik-style instrumental variable based on viticultural suitability, we find that the average negative association between GI registration and trademark activity masks a fundamental institutional asymmetry: GIs are associated with significantly lower innovative output in weak-governance regions but with significantly higher output where formal institutional quality is strong. Collective trademarks exhibit distinct dynamics, showing positive effects primarily in peripheral regions with limited alternative institutional support. A semantic novelty analysis using BERT-based sentence embeddings further reveals that formal institutions and social trust serve structurally different governance functions, while formal institutions promote individual differentiation in market signalling, trust facilitates collective convergence around shared reputational conventions. These findings reframe the policy debate from whether CIPRs are good or bad for innovation to the conditions under which they enable it, with implications for place-sensitive IP policy across heterogeneous European regions.

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Institutions and the Complexity-Relatedness Nexus: A New Analytical Lens for Smart Specialization Strategy

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S59 Innovation Beyond the Frontier: Alternative Approaches for Understanding Regional Innovation, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 26, 2026, 11:00 - 13:00

The Smart Specialization Strategy (S3) has become a central pillar of European regional policy, encouraging regions to diversify into domains that are technologically related to their existing knowledge base and possess high complexity. However, while the theoretical importance of institutional quality is widely acknowledged, current analytical frameworks typically treat governance as an external context rather than an endogenous determinant of diversification. This study addresses this gap by integrating institutional capacity directly into the core of the complexity-relatedness framework. We propose that institutional quality is not merely a background condition but a decisive factor that defines the feasibility of translating technological opportunities into economic outcomes. To operationalize this, we construct a novel institution-conditioned composite index. This metric combines a region's technological capability, calculated as the arithmetic mean of technological complexity and relatedness density derived from OECD REGPAT patent data, with governance scores from the European Quality of Government Index. A key methodological contribution is the use of a geometric mean for this aggregation, which penalizes imbalances between technological potential and institutional readiness, reflecting the theoretical reality that advanced innovation strategies cannot materialize in weak governance environments. The empirical analysis covers 235 NUTS-2 regions across 22 European Union member states, utilizing patent and economic data spanning 1996-2022. Using logit models to predict technological entry and twoway fixed effects panel regressions to assess economic performance, we demonstrate that the composite index significantly outperforms the two dimensional complexity-relatedness framework. The results indicate that institutional capacity magnifies the returns to technological capabilities. Regions scoring high on the composite index are nearly five times more likely to develop new technological specializations. Furthermore, this tripartite capability is a robust predictor of medium-term growth in GDP, Gross Value Added, and employment rates. The study also identifies distinct spatial dynamics, revealing positive spillovers from strong national institutional environments but competitive effects among immediate administrative neighbors.

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Beyond Upstream Invention: A Supply-Chain Perspective on Measuring Agrifood Innovation

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S59 Innovation Beyond the Frontier: Alternative Approaches for Understanding Regional Innovation, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 26, 2026, 11:00 - 13:00

Innovation in agrifood systems remains unevenly captured by conventional STI-based indicators. This bias stems from several structural characteristics of the sector. First, production relies on a fragmented base of adopters, where change emerges through the distributed actions of many small producers. Second, innovation in agrifood systems is diverse, ranging from high-tech food and agricultural technologies to more practice-based and experimental forms. Moreover, innovation confined to production alone is insufficient to generate systemic change, as outcomes must be translated across downstream stages and accepted by markets through intermediary actors such as retailers and distributors.

To address these limitations, this paper conceptualises agrifood innovation as a multi-stage process unfolding across interconnected supply-chain activities, including input supply, primary production, processing and manufacturing, logistics and distribution, retail, consumption, and disposal. Empirically, it integrates publications, patents, EU-funded research projects, trademarks, and standards for European countries over the period 1996–2024. Using text-based NLP methods, innovation activities are identified and positioned across supply-chain stages based on their semantic content. The geo-localised and organisation-based nature of the data further allows the identification of spatial patterns and regional heterogeneity in agrifood innovation across Europe, thereby extending measurement beyond upstream technological invention.

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Mapping Regional Innovation systems: The Role of Universities in Patenting Activity

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S59 Innovation Beyond the Frontier: Alternative Approaches for Understanding Regional Innovation, Auditorium 64 - South Building - Faculty of Pedagogy, agosto 26, 2026, 11:00 - 13:00

Innovation plays a crucial role in the economic development and competitiveness of regions. The creation of innovations is increasingly understood as the result of collective efforts involving multiple institutions. Several studies have focused on identifying overall patterns of innovation activities and typologies of regions, but more detailed views are lacking that consider the analysis of the internal institutional structure of these regions and the different contributions of individual actors to the innovation process. One of the important actors is universities.

The aim of our article is to examine the typology of regions with an emphasis on the role of universities in regional innovation systems, focusing on their patent activity in relation to the overall patent activity and the activity of companies in a given region, and subsequently to create a typology of regions that will point out the different positions of individual innovation actors in the process of innovation creation measured by their patent activity.

To achieve the aim, the paper use OECD REGPAT and SCOPUS publication data, augmented with ETER and Eurostat, we identify university-owned and university-invented patents and geolocate inventors and owners at regional levels. To access the importance of different inovation actors, indicators of academic and non-academic patenting intensity, academic share, the share of university-invented patents, and multiple patent-quality metrics were used. A K-median cluster analysis (Manhattan distance) were conducted lead to four different types of regions in Europe.The study's typology of regions highlights the diverse roles universities play in different innovation ecosystems, revealing that their contribution to regional innovation varies considerably depending on the regional context. The results show that in most RIS universities account for only a small share of innovation, but in a few RIS they account for an extremely large share. In regions where firms patent the most, the contribution of universities is lower and vice versa. The research shows the importance of universities especially in less developed and peripheral regions, where firms fail to innovate sufficiently.

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The Cost of Distance: Perceived Difficulty as a Pathway Linking Peripheral Location to SME Workforce Reduction in Crisis

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S60 Innovation at the service of the traditional economy, Auditorium 218 - North Building - Juridical Faculty, agosto 26, 2026, 09:00 - 10:30

Regional crisis policy often assumes that financial losses are the main driver of employment cuts; however, evidence on the mechanisms linking spatial disadvantage to small and medium-sized enterprise (SME) adjustment remains limited. Drawing on regional resilience research and New Economic Geography, this study examines whether peripheral location is associated with workforce reductions among Israeli SMEs during the COVID-19 crisis and whether this relationship operates through turnover losses or perceived difficulty. Using survey data from 492 Israeli SMEs collected during the COVID-19 pandemic, with workforce outcomes observed for 205 employer firms, we estimate indirect effect models linking location, crisis experiences, and workforce reductions.
The results indicate that perceived difficulty constitutes a more proximal intervening variable than financial loss. Peripheral SMEs reported significantly greater perceived difficulty, which was in turn associated with greater workforce reductions, while the indirect pathway through turnover losses was not statistically distinguishable from zero. Evidence consistent with baseline equivalence prior to the crisis suggests that spatial disparities in perceived difficulty and employment adjustment emerged during the crisis rather than reflecting pre-existing gaps.
These findings challenge crisis interventions centered solely on liquidity support and suggest that addressing the perceptual and managerial burden of peripheral entrepreneurs, which may reflect both structural constraints and cognitive appraisal processes, may be important for safeguarding employment and strengthening regional resilience. Conceptually, the study contributes to regional science by identifying perceived difficulty as a micro-level pathway through which spatial disadvantage shapes firms' employment responses during systemic shocks

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The Innovation Trap of Small Businesses

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S60 Innovation at the service of the traditional economy, Auditorium 218 - North Building - Juridical Faculty, agosto 26, 2026, 09:00 - 10:30

This paper analyzes the "Innovation Trap" of Small and Medium Enterprises (SMEs), which constitute a central pillar of the Israeli economy, yet are characterized by low productivity and low rates of innovation adoption. The theoretical model developed in this paper offers a micro-economic explanation for this phenomenon, based on the interaction between two complementary constraints: the financial constraint, relating to the difficulty in raising capital for the required fixed investment, and the managerial time and attention constraint, reflecting the opportunity cost of the entrepreneur's time.
The model predicts an inverted-U relationship between profitability and innovation: businesses at the lower end of the profitability distribution are hindered by a lack of funding sources, while businesses at the upper end refrain from investing due to the high shadow price of managerial time. Consequently, a systemic market failure emerges, leading to under-investment in innovation. This failure is exacerbated in the periphery due to infrastructure gaps, which increase both direct financing costs and the learning and time costs required for technology adoption.
To address this market failure, the paper proposes an applied policy tool: the Innovation Agents program. The program, to be operated in collaboration with the Small and Medium Business Agency, is based on training Economics and Management students within a new academic track for Innovation Economists and Consultants. Implementing this program is expected to increase productivity and reduce economic and regional disparities within the economy.

Innovation at The Service of The Traditional Economy

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S60 Innovation at the service of the traditional economy, Auditorium 218 - North Building - Juridical Faculty, agosto 26, 2026, 09:00 - 10:30

Innovation at the Service of the Traditional Economy
Abstract
Raphael Bar-El
While innovation is widely recognized as a major driver of economic growth, large segments of the economy remain unable to fully benefit from its potential. These include a broad range of activities based on traditional production processes that lack the capabilities required to adopt or integrate innovative tools and practices. The primary objective of this study is to assess the appropriate growth policy for a traditional economy and derive the required policy measures for its implementation and adaptation to the needs of robust sustainable development.
We focus on three main relevant populations. One is the population of traditional economic activities within low or medium or even high income regions that lack the ability to absorb and adapt new innovative processes that could increase their productivity. The second is the population of peripheral regions, within medium or high income countries, that encounter significant difficulties in competing with the metropolitan or central regions in their country for the attraction of innovative activities. The third is the population of low-income countries that lack the appropriate conditions and innovation ecosystem factors for the assimilation into the innovation trend.
We use the data of the Global Innovation Index (GII) for the distinction between knowledge creation and knowledge implementation, and for the identification of the different relevant ecosystem factors. We further use selected case studies in order to identify the potential of using innovation measures for the improvement of productivity in traditional activities.
Some of the measures identified are the nomination of Regional Innovation Agents in peripheral regions, the adoption of a Reverse Mentoring system in small and medium traditional enterprises, the technological support to agricultural activities.

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Progressive Cities, Divided Neighbourhoods: Labour and Migration Preferences in Italy

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S61 International migration and local communities, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

Large cities are often portrayed as uniformly progressive, yet this “progressive-city” narrative embeds sharp divides between neighbourhoods, including “left-behind” areas marked by socio-economic disadvantage and disengagement. Building on this insight, the paper exploits a unique electoral setting: the Italian abrogative referendums held on June 2025. Unlike typical studies that infer issue preferences indirectly through party vote shares, this consultation functions as a cleaner, issue-specific signal because it directly asked voters to take positions on two policy domains commonly associated with progressive agendas—workers’ protections and migrant inclusion—within a single electoral event.
The referendums comprised four questions on labour regulation to increase workers’ protection and one question on citizenship that proposed reducing the legal residence requirement for non-EU adults from ten to five years. While none of the referendums reached the validity quorum (turnout around 30%), the vote remains empirically salient for analysing spatial variation in policy preferences. The analysis adopts large cities’ neighbourhoods as the unit of observation to study the spatial distribution of multidimensional progressivism, i.e. the simultaneous occurrence of pro-migrant attitudes and pro-labour attitudes. Our findings reveal a strong polarization of preferences for migration and labour within cities.

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Persisting Disadvantage: Job Loss and the Immigrant-Native Earnings Gap

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S61 International migration and local communities, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

Most of the existing literature and policy programs on immigrant economic integration focus on encouraging foreign-born individuals to enter the labor market. Relatively less attention is paid to understanding the long-term development of their work life. In this paper, we focus on the labor market outcomes of foreign-born individuals who have entered the Swedish labor market but lose their jobs due to firm closures. We use geo-coded longitudinal matched employer-employee data for all workers in Sweden who lose their employment during 2003-2018 and we follow them 3 years prior to - and 5 years post job loss. Our identification strategy relies on firm closure as an exogenous event unrelated to individual worker productivity. In addition, we employ a two-stage matching strategy to ensure the comparability of treated workers and the control group. First, the results indicate that foreign-born workers are more likely to be affected by displacement than comparable natives. In addition, relying on event study analysis, we find that they are more negatively affected by job loss, with lower future earnings and lower probability of getting a new job. In the second part of the paper, we analyze the underlying mechanisms behind these findings, with a specific focus on the role of geography and geographical mobility in mitigating or exacerbating the negative effects of job loss.

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Do co-ethnic commuters disseminate labor market information? Evidence from geocoded register data

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S61 International migration and local communities, Auditorium 245Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 09:00 - 10:30

This article provides causal evidence of the significant role ethnic networks play in facilitating labor market integration by reducing information frictions. Using full population geocoded employer-employee matched Swedish register data, we investigate how co-ethnic commuters influence the work location of immigrants for their initial employment. We argue that these ethnic peers transmit job specific information from their places of work to fellow ethnic peers within the same residential neighborhood who seek jobs. We find that each additional commuter from the same ethnic network increases a new immigrant's probability of finding employment in a specific neighborhood by 2.3%.

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Inertia, Attractiveness and Policy Shocks: Residential Mobility between Rural and Urban Areas in France

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S62 Rural areas: attractiveness, policies and development paths(RP), Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

This paper examines residential migration between rural and urban areas in France using a structural gravity framework applied to exhaustive inter-municipal (EPCI-level) migration flows from the French population census over 2012–2020. We estimate Poisson Pseudo-Maximum Likelihood models with origin-year, destination-year and dyadic fixed effects to assess the relative importance of spatial frictions, economic conditions, housing markets and environmental risks in shaping territorial attractiveness. We also explore heterogeneity between rural and urban territories and compare pre- and post-Covid patterns to evaluate whether recent shocks altered established mobility structures.

Our results reveal a very strong degree of spatial inertia. Once high-dimensional fixed effects are included, more than 95 percent of the variation in bilateral migration flows is absorbed. Geographic distance and the crossing of inter-municipal borders remain the dominant determinants, while most time-varying push and pull factors display limited explanatory power. Housing market variables show more consistent associations with flows than income or labor market indicators, but their effects remain modest. Environmental exposures, including flood and heatwave risks, are not associated with large-scale migration responses.

Overall, the gravity structure of mobility remains remarkably stable, including around the Covid-19 period. These findings suggest that rural development trajectories are shaped more by persistent territorial structures than by short-term shocks, with important implications for place-based regional policies.

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Flexible Working Arrangements and their Influence on Location Choices and Mobility in Europe

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S62 Rural areas: attractiveness, policies and development paths(RP), Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

This paper examines the relationship between flexible working arrangements and residential location choices in Europe using data from the MOBI-TWIN survey of approximately 9,000 respondents across EU countries. We employ a two-stage modeling approach: first-stage probit models estimate relocation intentions within a five-year horizon, while second-stage multinomial probit models analyze destination preferences among capital regions, larger cities, smaller towns, and rural villages. Results show that flexible working arrangements significantly increase relocation intentions, controlling for individual socio-economic characteristics. However, the presence of children, life satisfaction in the current place of residence, and commute time from current residence to workplace reduce mobility propensity. Second-stage models reveal that flexible work support availability in potential destination communities is negatively associated with rural village preference. Our findings suggest that flexible work increases geographic mobility but does not uniformly promote non-urban relocation, challenging assumptions about remote work enabling rural resettlement. These results highlight the complex interplay between work flexibility and location preferences, with important implications for European policies addressing regional imbalances.

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Spatial Inequality and Rural Decline: The Determinants of Internal Mobility in Spain

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S62 Rural areas: attractiveness, policies and development paths(RP), Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

In this study, we explore the determinants of internal mobility in Spain, focusing on ruralurban disparities. Using microdata from the Estadística de Variaciones Residenciales (EVR) from INE, we built a novel origin and destination matrix dataset on migration flows at the municipal level for Spain. We exploit this database by elaborating an internal migration model based on gravity analysis. We also use breakthrough data on income levels per capita at the municipal level from the Atlas of Income Distribution elaborated by the Instituto Nacional de Estadística (INE), which serves as a proxy for PIB per capita at the destination over the period from to 2016-2021. We then evaluate the role of income, infrastructure, renewable energy, and housing rent in shaping these flows using a Poisson Pseudo-Maximum Likelihood (PPML) approach with extensive destination and origin-year fixed effects. Our findings show that income per capita acts as a significant pull factor, whereas distance and housing rent act as push components. We document substantial heterogeneity by urban-rural and immigrantnative origins, which provides relevant insights for policies oriented toward reducing regional disparities.

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Measuring attractiveness with FLAIR : French Localities Attractiveness IndicatoR

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S62 Rural areas: attractiveness, policies and development paths(RP), Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 11:00 - 13:00

Territorial attractiveness has become a central concept in French spatial planning policy, yet existing measurement tools remain poorly adapted to local realities: most indices operate at the regional scale, focus on observed flows rather than intrinsic territorial assets, and systematically neglect the needs of existing residents in favour of capturing mobile populations. To address these gaps, this paper introduces the French Localities Attractiveness IndicatoR (FLAIR), a composite index covering all 34,842 municipalities of hexagonal France and Corsica. Conceptualizing attractiveness as the set of territorial assets that enable residents to emancipate and flourish, rather than competitive advantages designed to attract outsiders, the FLAIR aggregates 50 indicators from French open administrative data into six dimensions: Infrastructure and Services, Social Cohesion, Local Economy, Tourism, Housing, and Risk Exposure. The construction follows the OECD Handbook on Constructing Composite Indicators, with spatial smoothing using travel-time buffers calibrated to urban-rural typology, min-max normalization, and geometric mean aggregation to ensure partial non-compensability across dimensions. The findings reveal a continuous gradient of attractiveness rather than a binary territorial fracture, with intermediate urban municipalities outperforming both metropolitan centres and very low-density rural areas. The dimensions most differentiating high- and low-performing municipalities are social cohesion, residential environment, and service access, not economic performance, challenging dominant competitive narratives and pointing toward a reorientation of territorial policy around habitability.

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Socioeconomic and distributional impacts of different energy transformation paths in a regional modelling framework

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S66 The spatial, regional and urban dimensions of circular economy, Auditorium 218 - North Building - Juridical Faculty, agosto 27, 2026, 09:00 - 10:30

Achieving climate neutrality requires deep structural change in the energy system, particularly in residential heating and renewable energy deployment. This study investigates how the socioeconomic impacts of the energy transition differ across German regions and how these variations can be assessed through an integrated, model-based framework. Linking the macroeconomic model Panta Rhei with the regional model LÄNDER and the district-level input–output model RIMES, the approach consistently captures sectoral interdependencies, regional heterogeneity, and distributional effects.
Scenario analyses for Germany compare a reference path with a climate neutrality (CN) scenario that accelerates the heat transition through more rapid diffusion of heat pumps and district heating. While the CN pathway raises national GDP by up to 0.2% in 2030 and creates about 20,000 additional jobs, regional outcomes vary systematically. Rural and peripheral districts with strong construction sectors and renewable energy potential tend to benefit more, whereas urban and industrial regions experience neutral or slightly negative relative effects. Nonetheless, the regional distribution of value added remains stable, indicating that an ambitious, investment-led transition does not exacerbate spatial inequalities.
The results demonstrate the importance of accounting for subnational diversity in energy and economic modelling. They also highlight the need for targeted regional policies—such as skills development, infrastructure investment, and support for vulnerable households—and for communicating findings through interactive, regionally accessible information systems that enable local adaptation of the energy transition.

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Towards the green transition in the European regions. Assessing eco-efficiency in greenhouse gases emissions

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S66 The spatial, regional and urban dimensions of circular economy, Auditorium 218 - North Building - Juridical Faculty, agosto 27, 2026, 09:00 - 10:30

A key objective of the green transition is to minimise the environmental impact of human activity while ensuring sustained and inclusive economic progress. Achieving this balance is particularly challenging given the strong heterogeneity in economic structures, development levels, and environmental pressures across European territories. Efficiently allocating policy resources therefore requires accurate and policy-relevant indicators capable of capturing the complex relationship between economic performance and environmental impact. Eco-efficiency indicators provide a suitable framework for this purpose, as they assess the ability of territories to generate economic value while minimising environmental damage.

This paper computes regional eco-efficiency scores for European Union regions in 2023, focusing specifically on greenhouse gas emissions, which represent the main driver of global warming and a central target of European climate policy. Using a non-parametric frontier approach, the analysis evaluates regional performance relative to best practices within the EU. The results reveal substantial disparities both between and within countries. Nordic and Western European regions generally emerge as the most eco-efficient, while regions in Central and Eastern Europe tend to display the weakest performance. Moreover, significant within-country heterogeneity highlights the importance of adopting a regional perspective.

In a second stage, the paper investigates the determinants of regional eco-efficiency. The findings indicate that higher levels of economic development, stronger government quality, and greater social capital are associated with better eco-efficiency outcomes. In contrast, a large industrial sector negatively affects performance. These results underline the need for place-based policy interventions that promote technological upgrading, industrial diversification, and innovation, while reinforcing governance quality and social capital to support sustained improvements in eco-efficiency.

3

From Global Chains to Local Loops: How Circular Economy Territorialises Production Networks

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S66 The spatial, regional and urban dimensions of circular economy, Auditorium 218 - North Building - Juridical Faculty, agosto 27, 2026, 09:00 - 10:30

This article explains how circular economy (CE) practices territorialise global value chains (GVCs) by creating place-bound control points within otherwise international production networks. Drawing on two qualitative case studies in France's construction and textile sectors, we analyse 77 semi-structured interviews (construction: 50 interviews conducted between 2022 and 2024 in Occitanie; textiles: 27 interviews conducted in 2024 across South-West France and national/EU actors), complemented by documentary sources and field notes. We ask how circular practices reconfigure chain architecture and governance, and why circular anchoring stabilises in some places but not others.

We first show where circularity reshapes chain organisation, identifying four place-sensitive CE nodes that concentrate reverse flows and localise coordination: (i) sorting and preparation, where heterogeneous inflows are graded into usable outflows; (ii) testing, assurance, and traceability, where protocols, laboratories, and audits secure liability and claims; (iii) repair and second-life retail, which bind service work and near-use logistics to local labour markets; and (iv) short remanufacture loops, where prepared inputs are transformed into components or materials for proximate users. Across both sectors, these nodes function as territorial "hinges" that convert diffuse returns into predictable, quality-assured circuits.

Second, we explain how reconfiguration unfolds through territorial intermediaries who relocate coordination from distant lead firms toward regionally embedded actors. Intermediaries operate as promoters (shaping expectations, skills, and demand), facilitators (matching supply and demand, sequencing timelines, and stabilising data routines), and enablers (aligning infrastructure, rules, and finance, including procurement and risk-sharing). Their actions lower transaction costs, make quality portable, and render exchanges insurable and financeable—conditions for moving from pilots to routine operations.

Third, we identify four structural conditions that account for uneven territorialisation outcomes: material (mass, heterogeneity, contamination risks, acceptable quality loss), capability (specialised skills, equipment, laboratories, repair know-how), governance (standards, protocols, insurance, certification, trace systems), and market (predictable local demand and matching platforms). Taken together, the findings show that circularity drives selective re-regionalisation: it does not reverse global integration, but re-centres key decision rights and value capture around place-bound nodes embedded in regional ecosystems.

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Embedding Social Justice in Twin Transition Research:

Systems Inquiry for Transformative Policy in Energy, Housing, and Transport

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S69 Embedding Eco-Social Justice in Europe's Twin Transition: Multi-Method Approaches for Policy Innovation(RP), Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

The European twin transition is widely framed as both an economic opportunity and a sustainability imperative. Yet without deliberate intervention, transition policies risk reproducing or deepening structural inequalities, particularly in essential systems such as energy, housing, and transport. This paper presents the methodological framework developed within the FITTER-EU project to systematically embed social justice into twin transition research and policymaking. It advances an integrated approach combining systems inquiry, risk assessment, and impact assessment within a human rights-based framework.

The paper has two objectives. First, it introduces a structured methodology for embedding distributive, recognitive, and participatory justice into climate and digital transition policies. Second, it demonstrates how systems inquiry enables policymakers to move beyond mitigating harms toward redesigning the structures that generate ecological overshoot and social inequality.

The contribution lies in operationalising justice within complex socio-technical systems. Rather than treating fairness as an ex-post consideration, the FITTER methodology integrates human rights principles, climate justice, and systems redesign into policy appraisal. This provides a practical toolset for anticipatory governance amid accelerating climate risks and uneven digitalisation.

Conceptually, the framework is grounded in a human rights-based approach, drawing on international and European legal standards to anchor policies in universality, non-discrimination, participation, and accountability. Justice is situated within a systems trilemma linking ecological limits, socio-economic reproduction, and political structures. Business-as-usual pathways are incompatible with climate targets and equity, requiring systemic transformation rather than incremental optimisation.

Methodologically, three components are combined: (1) systems inquiry, (2) risk assessment, and (3) impact assessment. Systems inquiry unfolds in three stages: challenging dominant paradigms, analysing system dynamics, and identifying high-leverage interventions, using tools such as causal loop diagrams and leverage point analysis. Risk assessment evaluates adverse impacts on disadvantaged groups, extending conventional analysis to structural drivers of inequality. Impact assessment examines distributional, gendered, and intersectional effects to ensure equitable sharing of benefits and burdens.

The framework is applied to case studies across six European countries in renewable energy, electric mobility, and climate-resilient housing. Findings reveal common structural dynamics. Decarbonisation without redistributive design can intensify energy poverty; housing financialisation undermines affordability; and transport policies centred on private electric vehicles risk reinforcing car dependency. Across sectors, technological substitution alone addresses symptoms rather than root causes. High-leverage interventions reshape incentives, rules, and power relations.

The twin transition is not inherently just. Integrating systems inquiry with rights-based risk and impact assessment is analytically necessary to achieve a fair and sustainable transition in Europe.

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The impacts of low-carbon transition on the competitiveness of European industries and the performance of green energy sectors: A spatial general equilibrium assessment at national and NUTS2 levels

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S69 Embedding Eco-Social Justice in Europe's Twin Transition: Multi-Method Approaches for Policy Innovation(RP), Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

The transition toward carbon neutrality presents both challenges and opportunities for European industries. The expansion of clean fuels, the uptake of climate-friendly production technologies, improvements in energy efficiency across residential and commercial buildings, and the electrification of transport are fostering the emergence of new markets for goods and services. At the same time, increasing international competition—particularly from China—underscores the need for a policy framework that combines targeted incentives with protective measures to support the competitiveness of European industries. Recent EU initiatives, including the Carbon Border Adjustment Mechanism (CBAM) and the Clean Industrial Act, aim to provide such a framework. Using the GEM-E3-R computable general equilibrium model, this study evaluates the impacts of the latest EU policy packages on the performance of key industrial sectors at both the national and NUTS2 regional levels.

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A Methodology to Address Perceived Hazards from the Twin Transition Among Disadvantaged Groups: A Nine-Step Ordinal Modelling Approach with Survey Evidence from Six European Countries

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S69 Embedding Eco-Social Justice in Europe's Twin Transition: Multi-Method Approaches for Policy Innovation(RP), Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

This paper outlines a framework for identifying and prioritizing hazards linked to the green and digital transitions by integrating harmonized surveys with Bayesian-network modeling. Following the FITTER-EU project guidelines, we utilize translated questionnaires across six countries to assess the likelihood and severity of 26 hazards in three sectors: Energy, Housing, and Transport. Our methodology incorporates EU-SILC-inspired socio-demographic stratification to generate indices for disadvantaged groups (DGs). The analysis involves three stages: predicting hazards using Naïve Bayes and regression, conducting ANOVA for socio-demographic patterns, and employing Bayesian Networks to model dependencies and assess policy effectiveness. Our approach innovatively combines participatory data collection with explainable AI to foster anticipatory governance for an inclusive transition. Future developments aim for scalability, technical integration with the FITTER platform, and external validation for effective policy implementation.

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Anticipating the future: A pedagogical policy-making process guided by AI.

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S69 Embedding Eco-Social Justice in Europe's Twin Transition: Multi-Method Approaches for Policy Innovation(RP), Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 26, 2026, 17:00 - 19:00

The European policy discourse increasingly recognises the need to embed eco-social justice within the governance of sustainability transitions. However, translating justice principles into operational policy reasoning remains difficult. Policymakers must assess multi-dimensional impacts across economic, social, environmental, and fundamental rights domains, while navigating uncertainty, institutional constraints, and competing interests. This paper presents a pedagogical framework from the FITTER-EU project that harnesses conversational probing—an interactive process where a large language model (LLM) iteratively questions and refines a policymaker's reasoning about specific policies. Applied to Energy, Transport, and Housing sector across six European countries (Ireland, Spain, Portugal, Germany, Italy, Hungary), the framework is enabled by an AI / LLM powered FITTER Digital Platform for structured impact evaluation and mitigation co-development. Early implementation shows that conversational probing enhances systemic awareness, surfaces intersectional blind spots, and fosters more nuanced, equity-sensitive policy reasoning.

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Does Fear of Crime Affect Entrepreneurship?

Dr. Emma Lappi[1]
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S70 Uneven Prosperity: Spatial Polarisation, Social Vulnerability, and In-Work Poverty, Hall 1 - South Building, agosto 26, 2026, 11:00 - 13:00

For some time, crime, stretching from disturbing behavior, petty theft, to more grave encroachment, has been reported to have become one of the most severe problems for business activities. The annual costs for enterprises exceed 100 billion SEK, i.e., twice the cost of the Swedish armed forces (Swedish Federation of Industries 2023). Using novel, previously unexploited forensic survey data collected by the Swedish police between 2005 and 2023 (Polisen 2023), we examine how local disorder and criminal activity affect residents' entrepreneurial activity. The questionnaire has been directed towards a representative sample of approximately 75 000 individuals each year in 58 municipalities in southern Sweden. The data encompasses various levels of verbal and physical disturbances to which individuals have been exposed. We combine this data with population register data to evaluate whether the decline in trust, perceived insecurity, latent threats, and committed crimes are related to entrepreneurial activities. Our preliminary results show that unsafe neighborhoods push individuals to start poorly performing new firms. The results indicate a mechanism of how neighborhood culture and local institutions can hamper unproductive entrepreneurial outcomes.

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Managing uneven development in a cross-border region: tourism-based good practices from the Komárom–Komárno twin cities

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S70 Uneven Prosperity: Spatial Polarisation, Social Vulnerability, and In-Work Poverty, Hall 1 - South Building, agosto 26, 2026, 11:00 - 13:00

The presentation draws on the results of a three-year Horizon 2020 international project, SPOT, implemented by a consortium of 14 European countries and Israel. The aim of the research project was to explore the potential for developing cultural tourism in touristically problematic (disadvantaged or suffering from over-tourism) areas in each partner country. The Hungarian research team examined the characteristics of cultural tourism development in the Komarom-Komarno cross-border area. The town of Komárom lies along the Hungarian-Slovakian border, 100 kilometres from the Hungarian capital, Budapest; it was divided by the Trianon Peace Treaty in 1920 and became "forgotten" during the decades of socialism, despite its significant cultural heritage dating back to ancient times.
Despite a shared history, language, and culture, the two towns have distinct identities due to their different historical development paths. Despite efforts, the area cannot be considered a single tourist destination. In the long term, there is little or no development cooperation; however, Hungary's and Slovakia's membership of the European Union enhanced both territorial and cross-border cooperation, which was used to foster connectivity and Europeanisation. Recently, considerable developments were achieved in the Komarom-Komarno area related to cultural tourism and transport, e.g., significant building reconstructions were undertaken for tourism purposes, bicycle routes and a cross-border public bicycle rental system were developed, and cultural playgrounds were constructed in a cross-border context. These main recent cultural tourism development projects were studied in depth through interviews and field trips; as a result, good practices were identified and described. According to our findings, the attractions of the two sides should be organised into a unified offer to transform the current national/regional attractiveness into a European-level offering.

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Assessment of polycentricity and spatial structure of Hungary through the analysis of small commuting centres

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S70 Uneven Prosperity: Spatial Polarisation, Social Vulnerability, and In-Work Poverty, Hall 1 - South Building, agosto 26, 2026, 11:00 - 13:00

The number and share of employees who commute daily are growing across Europe, and these mobility patterns are a sensitive indicator of the spatial restructuring of regions and states. Our study examines whether economic transformation and growth have led to a shift towards polycentric development in Hungary, a country characterised by an extremely monocentric spatial structure, over the past two decades. What is new about our approach is that we do not examine the medium-sized urban centres directly, but rather the structure and dynamics of the small centres surrounding them as a quantitative and qualitative imprint of the development of the given urban region. We consider small centres to be settlements that receive fewer than 5,000 commuters.
Our analysis is based on census data from 2001, 2011, and 2022, combining commuters' residence and workplace data with socio-economic indicators for workplace settlements and their labour catchment areas. Using cluster analysis, we identified nine types of small centres that differ markedly in terms of quality and regional location. The most important dividing line is between "agglomeration" and "rural" small centres. The spatial pattern of the types sensitively reflects the transformation of the country's spatial structure. It provides a more nuanced picture of the development of medium-sized cities than the examination of the cities themselves.
According to our results, the monocentric nature did not weaken but strengthened during the period under review: Budapest and its agglomeration are increasingly concentrating commuting. Only a few medium-sized cities have seen significant agglomeration development, mainly in the northwestern part of the country, where cross-border relations—especially the influence of the Vienna and Bratislava agglomerations—are also evident. In contrast, in the southern and southeastern parts of the country, the spatial structure is more rural, with medium-sized cities not standing out significantly from smaller centres. Overall, the results suggest that economic growth alone did not lead to a polycentric restructuring, but rather to a further strengthening of the capital's dominance.

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Shifting industrial strategy in the UK – lessons for CEE countries from a post-Covid perspective

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S70 Uneven Prosperity: Spatial Polarisation, Social Vulnerability, and In-Work Poverty, Hall 1 - South Building, agosto 26, 2026, 11:00 - 13:00

Persistent territorial inequalities in wealth, productivity and life chances remain one of the most pressing challenges in advanced economies. The case of the United Kingdom is particularly instructive: despite decades of regional policy interventions, substantial intra-national disparities endure, with several regions exhibiting socio-economic indicators comparable to lagging areas in parts of Central and Eastern Europe. These patterns reflect broader processes of social-spatial polarisation and peripheralisation, in which certain territories and their populations risk being structurally “left behind.”
This research examines the drivers and policy responses shaping the uneven distribution of prosperity in the UK, focusing on the evolution of its contemporary industrial strategy within a context marked by post-Brexit restructuring, technological change and renewed state activism. Particular attention is paid to the emergence and subsequent partial marginalization of the foundational economy approach, which foregrounds everyday essential services and infrastructures as pillars of inclusive, territorially embedded development. The analysis interprets recent “levelling up” initiatives against the tension between mission-oriented competitiveness strategies and the objective of reducing place-based deprivation.
Empirically, the research analyses spatial inequalities at the NUTS2 level after the global financial and economic crisis, drawing on regional productivity, income and employment indicators. The methodological framework focuses on exploratory analysis and a comparative approach. The preliminary findings suggest that the coexistence of growth-pole-oriented competitiveness agendas and rhetorically inclusive territorial development objectives reflect a structural incoherence in the UK’s current industrial policy model. In the absence of a consistent and institutionally embedded territorial framework, policy interventions risk reinforcing spatial concentration dynamics, thereby limiting their effectiveness in addressing deprivation and breaking entrenched cycles of regional inequality. The results contribute to broader debates on social justice, spatial polarisation and the capacity of place-based strategies to mitigate uneven development in advanced economies.

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What Drives Tourism Demand Resilience in European Union Regions? A Spatial Econometric Analysis

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S74 Tools for Measuring Regional Tourism Flows (RP), Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

Recent research in economic geography and regional science increasingly focuses on regional resilience and the role of tourism within it. Tourism is viewed either as (1) a system reacting to shocks, (2) a driver of broader regional resilience, or (3) a potential source of vulnerability requiring resilience in other systems. Within this debate, two strands dominate: “tourism-induced resilience,” examining tourism’s contribution to regional economic resilience, and “tourism resilience,” focusing on the sector’s ability to withstand and recover from shocks. This study contributes to the latter by analyzing determinants of tourism resilience in EU NUTS-2 regions.
Using data for 242 EU NUTS-2 regions from Eurostat (2024) and the EU Tourism Dashboard (2024), tourism resilience is measured relative to the EU average, distinguishing between resistance (change in overnight stays in 2020) and recovery (changes in 2021–2022 compared to 2019). Explanatory variables include tourism demand indicators (e.g., domestic/international shares, average stay, seasonality), supply factors (e.g., capacity, employment, heritage sites), and controls (innovation, urbanization, specialization, governance).
Results show that longer stays and a higher share of domestic tourism enhance resistance, while strong dependence on international tourism reduces it. Conversely, international orientation supports faster recovery. Supply factors, including tourism capacity and UNESCO heritage presence, matter mainly during recovery. Determinants differ between resistance and recovery phases, and resilience exhibits positive spatial spillovers. The findings provide policy-relevant insights for strengthening tourism resilience across EU regions.

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Economic contributions of tourism: From national to regional analysis

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S74 Tools for Measuring Regional Tourism Flows (RP), Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

The Tourism Satellite Account (TSA) is a methodologically coherent and analytically relevant framework for analysing the characteristics of tourism activity and quantifying the direct contribution of tourism to the economy (Frechtling, 2010). Despite its analytical relevance, the use of the Tourism Satellite Account for tourism policy formulation faces several limitations, partly due to its focus on the national level. This limitation is particularly relevant in the presence of regional asymmetries in the distribution of tourism flows and the intensity of tourism activity. As a result, methodological approaches for developing regional TSAs have emerged, involving the adaptation of the TSA to the regional level in terms of concepts, content, methods, and data sources.
The purpose of this paper is to examine the methodological framework for assessing the direct and indirect economic contribution of tourism at the regional level, using a selected region in the Republic of Croatia as a case study and applying a top-down approach. The main contribution of the paper is a systematic evaluation of the strengths and limitations of methodologies used to measure regional tourism impacts based on the regionalisation of national data. This contribution is particularly relevant given the prevailing focus of the existing literature on the estimation of tourism's direct contribution through TSA regionalisation.
The analysis of the gap between available and required data, together with the characteristics of the applied methods, reveals several methodological limitations, particularly concerning the intertemporal harmonisation of data sources, the consistency of product/activity classifications between the regional TSA and the input–output table, and the feasibility of adapting the national input–output table to the regional level. Nevertheless, the results provide clear guidance for improving available data sources, especially in countries and regions where tourism represents a key driver of overall economic activity. This is particularly important because more accurate regional estimates of tourism's economic contribution enable policymakers to design targeted and context-specific interventions and enhance the capacity to anticipate and mitigate tourism-related pressures.

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The Developmental Limits of Tourism-Led Regional Economies

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S74 Tools for Measuring Regional Tourism Flows (RP), Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

This paper engages with the tourism-led growth hypothesis, which posits that tourism can act as a significant driver of economic development, particularly in regions rich in natural and cultural resources. However, the concept of regional development traps complicates this narrative, as regions may become overly reliant on tourism, thereby increasing economic vulnerability and widening social disparities. A regional development trap refers to a situation in which certain regions fail to sustain economic growth and development due to structural, institutional, or resource-related constraints (Iammarino et al., 2020; Diemer et al., 2022; Rodríguez-Pose et al., 2024). In this context, excessive specialization in tourism may generate diminishing returns, since the sector is often labour-intensive and characterized by limited technological progress (Deng et al., 2014). Tourism may therefore either alleviate or reinforce development traps, depending on how it is embedded within the broader regional economy. This raises questions about the sustainability of tourism-led growth and the risk that regions may become locked into dependency patterns that impede diversification.

Although the tourism-led growth hypothesis has been widely studied—especially at the national level—empirical evidence and theoretical discussion remain limited with respect to regional dynamics and the traps that may emerge from tourism dependence. Addressing this gap calls for a more regionally grounded approach that accounts for spatial interdependence, the possibility of economic lock-in, and the need for disaggregated analysis. Against this background, the study investigates the relationship between regional development traps and tourism specialization.

To do so, a modified regional development trap index is calculated for NUTS 2 regions and combined with measures of tourism specialization in a spatial econometric framework to examine how tourism specialization relates to regional economic performance. The study contributes to a clearer understanding of how tourism can operate as both a source of growth and a potential constraint, highlighting the need for balanced and sustainable regional development strategies that harness tourism’s benefits while mitigating its structural risks.

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Paradise with Limits? Tourism and Development Traps on Croatian Islands

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S74 Tools for Measuring Regional Tourism Flows (RP), Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 15:00 - 17:00

The concept of the development trap has recently gained prominence as a framework for identifying territories that struggle to sustain economic dynamism relative to national and European peers (Iammarino et al., 2020; Diemer et al., 2022; Rodríguez-Pose et al., 2024). While previous research has emphasized the structural and institutional underpinnings of such traps, far less attention has been devoted to their manifestation within local sub-national units, particularly within geographically constrained island contexts.
This paper examines development traps across Croatian islands, with a specific focus on the role of tourism in shaping island development trajectories. Although more than four decades of island tourism research exist, the field remains comparatively underdeveloped and characterized by important knowledge gaps related to small-island dynamics (Garrod et al., 2024, McLeod, 2025). Using a unique longitudinal dataset covering 48 municipalities and towns on Croatian islands over the period 2011–2022, a timeframe marked by major shocks including the aftermath of the global financial crisis, Croatia's accession to the European Union and the COVID-19 pandemic, we apply a standardized multi-period framework to identify two forms of development traps. The first, a stable trap (DT1), captures local units that remain persistently confined to the same segment of the national income distribution without upward mobility. The second, a downward trajectory trap (DT2), reflects monotonic stagnation or decline in standardized income over time.
Our findings reveal substantial heterogeneity in island development paths and challenge simplistic narratives of tourism as an automatic engine of convergence. While tourism intensity is associated with higher income levels in some island municipalities, it is also linked to structural dependence and heightened vulnerability to external shocks, conditions that may entrench rather than alleviate development traps. By bridging development trap theory with island tourism scholarship, this study provides new evidence on the limits of tourism-led development and highlights the need for place-sensitive, diversification-oriented policy approaches to foster resilient and inclusive island economies.

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From Energy Poverty to Collective Power: A Coordination Game Approach to Community-Based Renewable Transitions

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S75 Urban Environmental Transitions: Communities, Policies, and Practices, Hall 1 - South Building, agosto 26, 2026, 17:00 - 19:00

The global shift toward decentralized renewable energy is expanding the role of energy communities from passive consumers to active stakeholders. Yet local initiatives often fail even when technologies are feasible, because adoption depends on coordination under conditions shaped by culture, trust, and institutional fit. This study develops an analytical framework explaining how structural, cultural, and institutional conditions shape coordination incentives and collective adoption of decentralized microgrids. Using a mixed methods design that integrates qualitative fieldwork, techno economic modeling, and game theoretic analysis, we examine an empirically informative case of approximately 65,000 households in dense urban neighborhoods that rely on unregulated diesel generators for electricity on Sabbaths and religious festivals. This practice deepens energy poverty and generates over 136,000 tonnes of CO2 emissions annually.

We conducted 23 semi structured interviews with stakeholders from government, local authorities, academia, and the energy sector, alongside four focus groups with Ultra Orthodox heads of household. Thematic analysis identifies three binding conditions for adoption: affordability, perceived safety, and alignment with community norms and internal authority structures. These recurrent themes are operationalized into an asymmetric simultaneous coordination game capturing strategic interactions among households, local authorities, and national institutions. The model admits two equilibria: a non cooperative status quo characterized by fragmented incentives and persistent generator reliance, and a Pareto superior cooperative transition supported by affordability thresholds, cultural legitimacy, and trusted intermediaries. Techno economic estimates show that storage based electricity can substantially reduce the effective cost relative to generator supply, with implications for lowering the share of household income devoted to energy and reducing energy poverty in low income deciles.

By translating empirically grounded social mechanisms into explicit participation constraints and equilibrium conditions, the study offers a transferable socio strategic lens for analyzing decentralized transitions in culturally cohesive and weakly regulated settings, and for designing locally anchored policy interventions that enable just and inclusive energy transitions.

Keywords: renewable energy, microgrid, coordination game, energy affordability, decentralized energy systems, energy poverty

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When Wildfires Hit the Market: Detecting Shock Patterns in Insurer Stocks Using an ML Framework

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S75 Urban Environmental Transitions: Communities, Policies, and Practices, Hall 1 - South Building, agosto 26, 2026, 17:00 - 19:00

Sudden climate disasters can destabilize insurers, with knock-on effects for recovery capacity and long-term sustainability. However, tools to detect or predict such financial stress in real time are limited. We examine how extreme U.S. wildfires affect the stock returns of property-liability insurers and whether key return properties remain stable during these shocks, when uncertainty is highest. We introduce Structural Return Features (SRFs), metrics that summarize the shape of return trajectories, and develop a data-driven framework that combines SRFs with machine learning and a placebo event design. By benchmarking true wildfire windows against shifted placebo periods, we isolate event-specific patterns from calendar and market regimes. Results show that that predictive performance does not, on average, worsen during wildfire shocks. We discovered that nearly all of the strongest predictive results occur when wildfire-day price moves are among the largest gains rather than the largest losses, implying that post-shock upside moves can be more predictable than drawdowns. We also found that, across features, skewness is the most consistently predictable trait, and we observed that for a subset of patterns predictability improves during wildfire windows, indicating that shocks can induce structured dynamics rather than pure noise. These predictive signatures provide an early-warning layer for insurers and regulators by flagging conditions under which solvency pressures may intensify, supporting more pro active risk management under escalating climate extremes.

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Mixology As a Regional Field: Stakeholder Configuration and Field-Level Stabilization in Israel's Urban Cocktail Scene

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S75 Urban Environmental Transitions: Communities, Policies, and Practices, Hall 1 - South Building, agosto 26, 2026, 17:00 - 19:00

Despite growing scholarly attention to gastronomy as a driver of urban differentiation and regional competitiveness, sub-fields within the culinary economy remain analytically under-theorized. Mixology, in particular, has emerged as a visible component of urban cultural life, yet little is known about how its internal actor configuration shapes its regional role and capacity to operate under conditions of disruption.

This study conceptualizes mixology as a relational regional field and develops the notion of field-level stabilization as an outcome of distributed stakeholder configuration under stress. Drawing on qualitative fieldwork conducted within Israel's urban cocktail scene-including semi-structured interviews with bartenders, venue owners, importers, producers, and other key actors, alongside participant observation - the analysis applies Bryson's (2004) stakeholder identification and analysis framework to systematically map influence, interests, and interdependencies within the field.

Rather than offering a purely descriptive account, the study analyzes how specific stakeholder constellations shaped responses to major external shocks, including the COVID-19 pandemic and the ongoing war. Interview evidence highlights cases in which customers initiated efforts to sustain local mixology bars, including cooperative structures and community-backed support mechanisms. Importers described investments in mentoring programs and professional competitions as ways of maintaining the broader professional ecosystem. In parallel, within wider civic and sectoral initiatives to support regional agriculture during the war, linkages between local farmers and selected cocktail bars intensified. New producer initiatives that emerged during the pandemic and wartime period further enriched the regional beverage landscape and encouraged experimentation with domestically sourced ingredients - particularly citrus varieties. These developments did not replace global supply chains, but they expanded local circulation channels and strengthened connections between urban establishments and regional producers.

These patterns indicate that stabilization was not centralized but emerged from horizontal coordination across consumption, distribution, and production layers. The study challenges resilience accounts that privilege formal institutions, demonstrating instead how informal relational architectures within cultural economies generate adaptive capacity. While grounded in Israel's urban cocktail scene, the analysis offers a broader lens on how niche cultural economies contribute to regional stabilization under prolonged disruption. By identifying how inter-actor configurations shape economic continuity and local embeddedness, the paper contributes to debates on sustainable regional economies and the micro-foundations of resilience in urban systems.

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Strategizing for Sustainability: Cognitive Architecture and Regional Governance in Voluntary Renewable Energy Participation

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S75 Urban Environmental Transitions: Communities, Policies, and Practices, Hall 1 - South Building, agosto 26, 2026, 17:00 - 19:00

Strategizing for Sustainability: Cognitive Architecture and Regional Governance in Voluntary Renewable Energy Participation
The global transition to renewable energy increasingly depends on voluntary citizen participation within regionally structured energy systems. While renewable capacity has expanded worldwide, sustained regional deployment requires not only infrastructure investment but also effective behavioral governance mechanisms. Voluntary green electricity programs represent one such policy instrument, yet participation rates remain persistently modest across jurisdictions.
This study uses the United States, and specifically Texas, as a regulatory case study that provides an empirical platform for advancing theoretical insights into regional renewable energy governance. Texas constitutes a distinct institutional context of electricity market liberalization and decentralized energy governance, characterized by regulatory heterogeneity, retail competition, and the coexistence of voluntary green pricing schemes within a single regional energy system. This institutional structure enables a systematic examination of how regional regulatory design and market differentiation shape the interaction between citizen cognition and renewable energy adoption.
Building on the Theory of Planned Behavior (TPB), the model distinguishes between Environmental Knowledge (EK), conceptualized as abstract environmental literacy, and Green Pricing Program Knowledge (GPPK), defined as institutional operational knowledge regarding program design, enrollment procedures, and pricing structures. Structural Equation Modeling indicates that environmental knowledge strengthens attitudes and norms but operates indirectly. In contrast, program specific knowledge substantially enhances perceived behavioral control, which emerges as the strongest direct predictor of renewable electricity purchasing behavior.
The study contributes by advancing a cognitive institutional explanation of voluntary renewable energy participation within regional governance systems. It shows that barriers to adoption do not primarily stem from a lack of environmental commitment, but from a gap between institutional design and the way citizens perceive their ability to act within it. The findings reposition decentralized renewable energy development as a governance design challenge and emphasize that institutional clarity constitutes a central enabling condition for behavioral activation. By integrating behavioral theory with regional energy governance, the study offers a structured framework explaining when and how decentralized systems succeed in facilitating renewable energy adoption.

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From Simulation to Insight: How Policy Timing and Fleet Composition Shape Electrification Outcomes

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S75 Urban Environmental Transitions: Communities, Policies, and Practices, Hall 1 - South Building, agosto 26, 2026, 17:00 - 19:00

The accelerating transition toward battery electric vehicles (BEVs) supports global decarbonization goals but simultaneously erodes the fuel-tax revenues that traditionally finance road infrastructure. As governments seek long-term alternatives, mileage-based user fees (MUFs) are increasingly considered a viable replacement. However, MUFs are not technologically neutral: their impacts depend strongly on regulatory timing and on whether plug-in hybrid electric vehicles (PHEVs) are present in the fleet. Because PHEVs respond differently to cost signals and may substitute for BEVs under higher per-kilometer charges, their presence can reshape both environmental outcomes and the fiscal base from which MUF revenues are collected.

This study develops a large-scale agent-based model (ABM) calibrated to U.S. market conditions to examine the joint effects of BEV subsidies and MUFs across different stages of electrification. The model simulates heterogeneous consumers choosing among BEVs, PHEVs, and conventional vehicles (CVs); infrastructure investors adapting between gasoline and charging stations via evolutionary learning on a small-world network; and a government applying two subsidy structures (five-year unlimited vs. ten-year gradually declining) and introducing an MUF either early (at 30% BEV penetration) or later (after BEVs exceed 50%). Policy outcomes are evaluated using complementary environmental and fiscal indicators, including an emission-retention measure that captures how much of the subsidy-induced emission reduction persists once an MUF is added, and a fiscal-recovery rate quantifying the share of subsidy expenditures recouped through MUF revenues. A PHEV mediation index isolates how PHEVs alter the effectiveness of the combined policy package.

Results reveal a clear timing, composition trade-off. Early MUF implementation strengthens fiscal recovery, often achieving full or near-full subsidy repayment at moderate MUF levels—but at the cost of weaker environmental performance in mixed fleets, where higher BEV operating costs slow BEV adoption and induce substitution toward PHEVs. Delayed MUF introduction, in contrast, preserves BEV diffusion and maintains high emission reductions, but generates slower and less complete fiscal recovery because PHEVs dilute the taxable mileage base. Across scenarios, PHEVs consistently weaken fiscal recovery yet help moderate environmental losses only when MUFs are introduced early.

Overall, the findings show that effective road-finance reform must explicitly account for technological composition and regulatory timing. MUFs introduced before BEVs reach market maturity risk locking consumers into hybrid-dominated equilibria, whereas MUFs introduced later can stabilize revenues with minimal disruption, highlighting the need for coordinated design of subsidy structures and distance-based pricing.

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Does the “beaten path” break? Spatial distribution of Ukrainian immigrants and refugees

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S76-1 Migration – Trends, challenges and opportunities, Conference hall 2 - North Building, agosto 27, 2026, 15:00 - 17:00

International migration is often a self-reinforcing process since migrant networks create persistent “beaten paths” linking specific origin and destination countries. While this process is well documented for voluntary migration, much less is known about whether similar mechanisms take place in case of forced migration, especially at subnational level. Therefore, the aim of this paper is to analyse the within-country primary allocation of forced migrants and study the role of network effects for such spatial patterns. To do so, we focus on Ukrainian refugees who were not restricted by government-led allocation policies and could choose their place of residence. By using the administrative data on Ukrainian refugees and immigrants’ location at province (NUTS 3) level, we show that subnational geographies of these two groups are related but do not fully coincide. Refugees preferred to settle in some provinces of Northern and Central Italy, while being relatively less attracted by large metropolitan areas and some provinces in Southern Italy with a sizeable Ukrainian immigrant community. Thus, the “beaten path” feature of voluntary migration seems to be only partially reflected in the forced migration context. By further investigating this phenomenon with the primarily collected data, we confirm that refugees’ allocation is a complex decision-making process. In addition to network-related motives, such factors as job opportunities, study-related purposes, and safety considerations also play a role.

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International and Internal Migration to Remote Rural Spain: Profiles, Drivers and Regional Impacts (2021–2025)

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S76-1 Migration – Trends, challenges and opportunities, Conference hall 2 - North Building, agosto 27, 2026, 15:00 - 17:00

Many European regions are facing profound demographic change, characterised by population ageing, labour shortages and increasing territorial disparities between metropolitan cores and peripheral rural areas. In Southern Europe, and particularly in Spain, long-standing patterns of rural depopulation have generated structurally fragile territories with shrinking labour markets, declining service provision and limited demographic renewal. Yet, the period 2021–2025 reveals emerging migration dynamics that challenge the narrative of irreversible rural decline in some of the most remote municipalities.

This paper examines the social profiles and regional impacts of new residents settling in remote rural Spain during this recent period. The analysis focuses on identifying the groups contributing to these population changes and assessing their differentiated effects on demographic sustainability across highly peripheral territories.

The study relies on quantitative analysis of municipal-level demographic data from official statistics, including annual population registers and residential mobility records. Special attention is paid to age structure, nationality, and spatial patterns of settlement across different degrees of rural isolation. By comparing recent population trends with long-term historical trajectories, the paper evaluates whether observed gains represent temporary fluctuations or structural demographic shifts.

The results identify three distinct profiles among new rural residents. First, retirement returnees who relocate to their municipalities of origin at the end of their working lives, contributing modestly to population figures but reinforcing ageing dynamics. Second, domestic “neo-rural” migrants, typically of working age, who relocate from urban areas and concentrate in relatively accessible rural municipalities, often within commuting distance of metropolitan regions. Third—and most significant for demographic renewal—international migrants of working age with ongoing family projects, who are settling even in the most remote and ageing municipalities. Unlike other groups, this profile shows a measurable capacity to stabilise or reverse long-term depopulation trends, particularly in areas previously considered demographically unsustainable.

The paper discusses the implications of these findings for regional disparities and labour market dynamics, highlighting the role of international migration in sustaining agricultural production, care services and local economic activity in peripheral regions. By distinguishing between internal and international migration flows and their differentiated spatial impacts, the study contributes to debates on migration selectivity, human capital redistribution and the capacity of migration to mitigate demographic and economic imbalances in peripheral European territories.

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Regional labor market integration of refugees in Germany: patterns and determinants

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S76-1 Migration – Trends, challenges and opportunities, Conference hall 2 - North Building, agosto 27, 2026, 15:00 - 17:00

Over the last 10 years, a large number of refugees has arrived in Germany. While the primary task of the asylum system is to provide protection from war, persecution, and displacement, integration into the labor market is also very important. If the refugees get a job, they might contribute to overall economic production, taxes, and social security contributions, while at the same time lowering the fiscal burden from transfer payments. In addition, refugees might help reduce labor shortages that are reported in many economic sectors. However, to become integrated into the labor market in a sustainable manner, a number of obstacles like language skills, but also housing and childcare issues have to be overcome in advance. Moreover, the labor market situation as well as the qualification and occupational structure of labor demand in a region play a role. Restrictions in mobility and in selecting the region of living together with regional differences in the attractiveness of regions can have an impact on the success of refugees' integration into the labor market.
The present paper provides novel insights into the labor market integration process of refugees in Germany by specifically taking on a regional perspective. While for Germany as a whole, there is a growing body of evidence based mainly on survey data, evidence on a spatially more disaggregated level is still sparse. We utilize comprehensive administrative data at the individual level on a daily basis from the Institute of Employment Research (IAB). The Integrated Employment Biographies (IEB) enable to analyze labor market trajectories covering spells of unemployment, the participation in labor market programs, vocational training, or employment at a disaggregated spatial level. We consider individuals who have been in contact with an employment agency or job centre and who were recorded as entering Germany for the first time between 2015 and 2019. We trace their labor market trajectories until 2024, from their arrival in Germany until they find employment or vocational training. Event history analyses are used to econometrically examine the relationship between selected individual and regional characteristics and the time taken to find employment subject to social insurance contributions or a dual vocational training programme. The results for employment uptake are then compared with labor shortages in the respective occupations, regions and years. In all analyses, we explicitly differentiate between men and women, as the two sexes show profound differences in labor market success.

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Foreigners in management positions: A descriptive analysis for German firms

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S76-1 Migration – Trends, challenges and opportunities, Conference hall 2 - North Building, agosto 27, 2026, 15:00 - 17:00

In Germany, about 5 percent of all employees, working subject to social security contributions, hold a management position. Focussing on foreigners, that proportion is relatively lower, giving concerns of frictions. Relative to natives, differences in qualification and skills, language-related issues, discrimination and glass ceiling may hinder foreigners to achieve management positions. However, we observe foreigners holding management positions. So, the question is, in which characteristics these foreign managers differ from Germans in management positions?
From a firm-management perspective foreigners bring in other skills and qualifications, different problem-solving abilities and approaches to address problems that need to be solved. From a profit-maximisation point of view, foreigners may have less bargaining power and accept lower wages. These arguments might be in favour of hiring foreigners and potential gains of the emerging cultural diversity may be capitalized. On the other hand, language barriers, cultural conflicts etc. might be less beneficial for firms and therefore, foreigners are not hired.
These arguments are not necessarily in favour of holding a management position. In this paper, the focus is set on differences in characteristics of acting managers with respect to being a foreigner or a native. Our underlying hypothesis is build on language barriers, that firms may overcome to promote a foreigner, who speaks both languages – the foreign one and German. Although we cannot measure the power of speech (in German), we hypothesize that if there is an increasing share of workers of a specific nationality in a specific 3-digit occupation the likelihood to observe a manager with the same nationality increases. The manager may act as a language transmitter and therefore mitigates language barriers within the firm.
Because the presence of foreigners is skewed towards metropolitan areas, into specific occupations and industries, we control for vast sorting-related characteristics, individual characteristics, and firm characteristics. The sample considers a Panel of managers from 2012-2023 and we explain of being a foreigner or German manager. Based on a logit model and after controlling for statistical “artefacts” (i.e. with a higher share of foreigners in the firm, the likelihood observing a foreigner in a management position increases) we can support the hypothesis. The foreign managers differ in qualification, i.e. they are on average less qualified, giving additional support for language-related channel. Even more, the evidence suggests that foreigners work more frequently in supervision positions and less frequently in the top management.

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Cultural connectedness and economic resilience: Investigating the role of te reo Māori proficiency among migrant communities in Aotearoa New Zealand

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S76-2 Migration – Trends, challenges and opportunities, Conference hall 2 - North Building, agosto 27, 2026, 17:30 - 19:30

As the migrant population of Aotearoa New Zealand grows, understanding the factors that shape migrant integration and resilience is increasingly important. This study examines whether proficiency in te reo Māori is associated with social capital, wellbeing, and economic resilience among overseas-born residents. We frame Indigenous language proficiency not only as symbolic cultural engagement, but as a potential resource for belonging, support, trust, and adaptation in a migrant-built society with a bicultural foundation.

Using pooled New Zealand General Social Survey data for 2016, 2018, 2021, and 2023 accessed through the Stats NZ Integrated Data Infrastructure, we analyse 7,812 migrant respondents, excluding overseas-born respondents of Māori ethnicity. Among them, 714 (9.1%) report at least basic te reo Māori proficiency. Outcomes include a sense of belonging, emotional and practical support, institutional and generalised trust, life satisfaction, material wellbeing, financial comfort, income adequacy, and ease of bill payments. To reduce observable differences between migrants with and without te reo Māori proficiency, we use propensity-score overlap weighting; continuous outcomes are estimated with overlap-weighted OLS, while binary outcomes are estimated using overlap-weighted linear probability models, with logistic average marginal effects and nearest-neighbour propensity-score matching used as robustness checks.

Results show that te reo Māori proficiency is positively associated with social connectedness. Migrant speakers report a stronger sense of belonging and greater emotional support, with weaker but positive evidence for practical support; these patterns are robust to matching. However, the results do not indicate greater economic resilience. Material wellbeing and financial comfort are lower among migrant speakers, while income adequacy and ease of bill payments show no overall advantage. Trust outcomes are mixed: trust in police and courts is lower, while generalised trust and trust in several institutions are not significantly different. Overall, the findings suggest that engagement with te reo Māori is linked to social connection, but not to clear economic advantage. The estimates should be interpreted as partial correlations rather than causal effects.

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Is it worth coming back? Wage returns of higher education graduates' mobility patterns

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S76-2 Migration – Trends, challenges and opportunities, Conference hall 2 - North Building, agosto 27, 2026, 17:30 - 19:30

his paper examines how labour mobility shapes early-career wage outcomes for higher education graduates in Portugal, drawing on EUROGRADUATE microdata for the 2016/2017 and 2020/2021 cohorts. Motivated by growing evidence of heterogeneous returns to higher education in massified systems, the study applies internationally established mobility typologies—particularly those of Faggian et al. (2006), Di Cintio and Grassi (2013), and Kazakis and Faggian (2017)—to the Portuguese context. These typologies distinguish between non-migrants, university stayers, late movers, return migrants, and repeat movers, capturing distinct combinations of home, study, and work regions. This framework is particularly suitable for the Portuguese context, marked both by persistent regional disparities and by a higher education network that, while geographically widespread, varies significantly in opportunities and perceived quality.

Using the Portuguese edition of the EUROGRADUATE survey, the study benefits from detailed information on individual characteristics, academic backgrounds, fields of study, job attributes and regional identifiers at the NUTS III level. Wage equations are estimated for each cohort using a Mincer-type OLS specification, with hourly wages as the dependent variable. Controls include demographic, academic and job-related variables, complemented by job-region fixed effects to capture local labour-market conditions. Robustness checks rely on alternative regional aggregation and sample restrictions. The analytical samples include 4,757 graduates from 2016/2017 and 5,206 from 2020/2021. Given potential self-selection into mobility trajectories, results are interpreted as conditional associations.

Preliminary findings indicate that university stayers and repeat movers consistently exhibit a statistically significant wage premium relative to non-migrants, even after controlling for institutional and regional factors. Contrary to previous international evidence, late movers do not show a significant wage premium in the preferred specifications. Return migrants initially display a wage penalty, although this diminishes after incorporating additional controls. These patterns suggest that mobility trajectories capture mechanisms beyond regional wage premia or higher-education institution effects, potentially related to labour-market matching or individual preferences.

Although the empirical work is still progressing, the patterns emerging so far underline the relevance of examining mobility in a more differentiated way. The richness of the EUROGRADUATE dataset—particularly its combination of regional, academic and labour-market variables—helps shed light on how movements across home, study and work regions shape early-career wages.

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Estimating Net Migration by Level of Education in European NUTS3 Regions

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S76-2 Migration – Trends, challenges and opportunities, Conference hall 2 - North Building, agosto 27, 2026, 17:30 - 19:30

Although migration of people with various educational levels is essential for regional development all over Europe, very few European countries have available data at the regional level on migrations by age, sex and educational level.
In this study, we have developed methods for estimating net migration for all EU's NUTS3 regions by level of education. The methods essentially combine different sources of information together at the national and regional level, using iterative proportional fitting to estimate the educational distribution for regional populations, and demographic accounting principles to estimate the resulting net migration estimates from these population estimates.
We start by estimating the population shares with high, medium and low education in each NUTS3 region, by sex and 5-year age groups. Data from the Netherlands and certain other European countries are used to estimate and test a logit model where explanatory variables are the NUTS2 educational distribution and a regional economic index that includes Gross Regional Product and unemployment as indicators. The model provides prior distributions of educational shares, which through iterative proportional fitting are aligned with existing, partial data. Second, from these population estimates we use demographic accounting principles to calculate net migration from/to each of EU's NUTS3 regions, by age, sex and level of education. This is done for the 5 year periods 2010-2015, 2015-2020, and for projections up to 2040.

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Will Places Survive Disasters? Learning from Recovery Policies through AI-Based Tools for Regional Planning

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S79-1 Advancing Data-Based Policy-Making for Sustainable Urban and Regional Development, Hall 2 - North Building, agosto 27, 2026, 15:00 - 17:00

Natural hazards are increasing in frequency and magnitude, and while prevention and risk reduction phases are increasingly supported by global policy frameworks, the post-disaster phase still presents several challenges for coherent and transferable policy design. Recovery processes are often fragmented, strongly context-dependent, and influenced by institutional capacity, socio-economic conditions, and local reconstruction cultures, making comparison and learning difficult across territories.

This paper aims to provide a data-driven tool for national and local policymakers that learns from previous recovery plans, explicitly taking into account different reconstruction cultures worldwide and their territorial outcomes. Rather than proposing a single optimal recovery model, the approach is grounded in past experiences and seeks to support scenario-based reasoning in the early stages of post-disaster planning.

Our methodology relies on three main stages. First, disasters are categorized in terms of their impacts on human societies, based on past events and observed recovery trajectories. Second, a worldwide text-mining analysis is performed on post-disaster recovery plans produced by both governmental and non-governmental actors, focusing on their effects on regions and other sub-national administrative territories, with particular emphasis on recovery timing and sequencing of interventions. Finally, these results are implemented in an interactive tool that combines regional resilience indicators with hypothetical budget categories and expenditure timing, providing insights into potential impacts across different economic and social dimensions.

The proposed tool is intended to support learning-oriented recovery planning, helping policymakers explore trade-offs, timing effects, and place-based vulnerabilities in post-disaster contexts.

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Proposal Success in a European Call for Digital Innovation Intermediaries: A Text Analysis of Applications

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S79-1 Advancing Data-Based Policy-Making for Sustainable Urban and Regional Development, Hall 2 - North Building, agosto 27, 2026, 15:00 - 17:00

This study examines how document features influence grant proposal success in competitive research funding. Analyzing proposals submitted to the European call for digital innovation intermediaries, we investigate whether proposal success depends on content alignment with agency priorities and communication quality, measured through document structure, text readability, and linguistic tone. We find that proposals with greater emphasis on conceptual content, higher readability, and less constraining language achieve significantly higher evaluation scores and more favorable funding outcomes. Technological diversification reflecting applicants' capabilities and alignment with policy objectives affects expert scores but not final funding decisions, while visual elements show the opposite pattern, suggesting distinct cognitive stages in the evaluation process. Our findings indicate that how ideas are communicated matters as much as what is communicated, with practical implications for proposal preparation and evaluation design. Improvements in communication quality could yield substantial gains in proposal success.

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Academia as a Driver of Data-Based Policy-Making: Bibliometric Insights for Sustainable Urban and Regional Development

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S79-1 Advancing Data-Based Policy-Making for Sustainable Urban and Regional Development, Hall 2 - North Building, agosto 27, 2026, 15:00 - 17:00

This paper builds on the concept of the institutional paradox in regional development—situations in which the need for cross-sector coordination is highest precisely where institutional capacities are weakest—and positions smart specialisation as a practical pathway for institutional "leapfrogging" through evidence-based priority setting. Conceptually, the paper treats the academic community as an intermediary and agenda-setter that can anticipate emerging development needs and translate them into policy-relevant knowledge, especially in regions facing coordination failures. Methodologically, it operationalises data-based policy-making through bibliometric mapping, using network, overlay, cluster, and density analyses to reveal how knowledge structures and thematic emphases evolve over time, and how these shifts can inform sustainable urban and regional development strategies.
The aim of this paper is to examine how long-running academic conference outputs can serve as a data source for policy intelligence that supports sustainable urban and regional development and smart specialisation design. Drawing on avaliable papers and topics presented at regional-development-oriented conferences organised by relevant scientific institutions in Serbia, the analysis identifies a clear thematic transition from macro-fiscal and crisis-related agendas to contemporary sustainability-related domains (e.g., circular economy, tourism, gender equality, local development and public sector topics), the emergence of place-sensitive focus (including increased attention to South-East Serbia), and strategic "white spaces" where policy demand is rising faster than institutional recognition (e.g., AI, ESG, circular economy). By translating these empirical patterns into implications for priority setting, stakeholder alignment, and policy sequencing, the paper demonstrates how academic knowledge ecosystems, aligned frameworks and smart specialisation logic, can strengthen data-based policy-making capacity in contexts marked by institutional constraints.

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Connecting the Divided City: A Space Syntax Analysis of Belfast and Its Policy Implications

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S79-2 Advancing Data-Based Policy-Making for Sustainable Urban and Regional Development, Hall 2 - North Building, agosto 27, 2026, 17:30 - 19:30

As research on segregation as a dimension of urban social sustainability has grown, Northern Ireland's capital, Belfast, has been subject to sustained scrutiny from this perspective. It has become closely associated with the notion of the 'Divided City', reinforcing the need of social sustainability. The city's divisions 'peace walls' are structured along sectarian lines that divide neighbourhoods with different ethno-national and religious identities. On one side are communities variously identified as Unionist, Loyalist, British, or Protestant – often overlapping in definition. On the other side are Nationalist, Republican, Irish, or Catholic communities, likewise intersecting in identity.
This study investigates the spatial and socio-economic characteristics of neighbourhoods that stand out in terms of residents' national-identity composition. It does so by applying a Space Syntax analysis to Belfast. Analysing pedestrian movement potential during both daytime (open gates) and nighttime (closed gates) offers insight into the functioning of Belfast's mobility system as a whole, with indications of land-use as a socio-economic indicator. Understanding the segregation of Belfast through the peace walls to identify opportunities and challenges for its desegregation is therefore a formidable challenge. As in any urban context, residential geographies are shaped by a complex interplay of housing markets, economic opportunity, transport and mobility systems, neighbourhood characteristics, and both personal and collective identities. Yet Belfast's spatial configuration is distinctive: sectarian separation overlays much of the urban fabric, structuring the urban landscape/street network system through territorially defined communities. Nevertheless, important exceptions exist. While the underlying drivers of segregation are relatively well documented, potential pathways toward desegregation remain open to debate. Examining areas that diverge from dominant patterns may therefore yield valuable insights. Therefore, this study seeks to address the following research questions:
(i) To what extent does Belfast's spatial centrality – and thus pedestrian movement potential – vary between daytime and nighttime across the urban system as a whole and within community interface areas?
(ii) Can higher levels of strategic visibility at peace wall gates support increased socio-spatial interaction and voluntary residential mixing across divided communities?
(iii) How can insights into temporal variations in spatial centrality, pedestrian movement and strategic visibility at peace wall gates inform sustainable policy interventions aimed at advancing the desegregation and social integration of Belfast?

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From Fragmented Data to Territorial Intelligence: Strengthening Evidence-Based Urban and Regional Policy in Serbia

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S79-2 Advancing Data-Based Policy-Making for Sustainable Urban and Regional Development, Hall 2 - North Building, agosto 27, 2026, 17:30 - 19:30

Contemporary urban and regional development is increasingly shaped by intertwined economic, technological, demographic, and environmental transitions, which amplify uncertainty and policy complexity. In this context, the expansion of digital data, spatial analytics, and modelling tools enables a shift from fragmented, experience-based decision-making toward evidence-based territorial governance—supporting more transparent, adaptive, and evaluative policy cycles. Regional science highlights that integrating socio-economic, environmental, and administrative datasets, alongside network perspectives (transport, institutional, knowledge, and economic linkages), can improve how territories diagnose challenges, prioritize interventions, monitor sustainability and resilience outcomes, and address regional disparities. However, in many post-socialist and catching-up contexts, these opportunities remain constrained by data gaps, interoperability limitations, uneven institutional capacity, and weak translation of analytical insights into actionable policy design. This paper examines Serbia as an illustrative case of a transition economy where data-based policy-making is both urgently needed and unevenly implemented. The aim of the paper is to assess the current landscape of data availability and usability for urban and regional policy, the institutional and technical barriers that hinder systematic uptake of spatial analytics and digital decision-support, and practical pathways to strengthen policy design, implementation, and evaluation through improved data governance and capacity building. Empirically, the paper presents and interprets key findings from the research conducted for the purpose of creating Best City report in Serbia, using them to illustrate how evidence can be operationalized into actionable policy insights at the city and regional level. Based on these results, we draw conclusions on priority governance and capacity-building measures needed to move from fragmented information toward “territorial intelligence,” with particular emphasis on interoperable indicator systems, monitoring of sustainability and resilience outcomes, and clearer mechanisms for translating analytical outputs into policy decisions in structurally transforming regions.

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Regenerative economy, Resilience and Network Connectivity in the Western Balkans

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S79-2 Advancing Data-Based Policy-Making for Sustainable Urban and Regional Development, Hall 2 - North Building, agosto 27, 2026, 17:30 - 19:30

Long-term population dynamics in regenerative economic systems depend not only on a region's ability to absorb and adapt to structural pressures, but also on how interurban network connections transmit competitive and complementary effects across space. Using longitudinal census data (primarily 2011–2021) for 65 urban areas in the Western Balkans, we examine population change as an indicator of long-run regional development within a spatial interaction framework. Road-network accessibility is derived from OpenStreetMap, while contextual urban indicators—including infrastructure density, cultural, financial, child-oriented amenities, and regenerative economy capacities—are generated using GIS-based kernel density methods.

We estimate three weighted least squares regressions corresponding to alternative spatial interaction formulations (negative exponential, log-normal, and inverse distance decay), where origin–destination relationships are weighted by destination population size. Results show that the log-normal specification, emphasizing medium-distance interactions, provides the strongest explanatory power for cross-national population change. Local amenities and regenerative economy capacities at origin cities are associated with greater resilience, while destination-city characteristics exhibit mixed and often competitive effects. Shared language significantly moderates network effects by reducing spatial and institutional frictions.

Overall, the findings highlight the importance of integrating regenerative economies, network connectivity, and spatial interaction into the analysis of long-term regional adjustment processes. The proposed approach offers a transferable framework for studying long-term regional dynamics in data-scarce international contexts.

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Localising the Sustainable Development Goals in Post-Transition Urban Contexts: The Case of the First Voluntary Local Review of the City of Niš

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S79-2 Advancing Data-Based Policy-Making for Sustainable Urban and Regional Development, Hall 2 - North Building, agosto 27, 2026, 17:30 - 19:30

This paper explores the pioneering experience of the City of Niš in conducting the first Voluntary Local Review (VLR) in Serbia during 2023–2024, marking a significant step towards localising the Sustainable Development Goals (SDGs) in a post-transition urban context. The VLR evaluated 26 indicators across 12 SDGs, providing a structured assessment of the city's progress and establishing a framework for translating global sustainability agendas into local development priorities. As Serbia's inaugural VLR, the initiative offers valuable lessons on how municipalities in post-socialist settings can integrate international sustainability standards into local planning and decision-making processes.

The research analyses the institutional and methodological processes behind the preparation of the VLR, including data collection, indicator selection, interdepartmental coordination within the local administration, and stakeholder engagement. Particular attention is given to the role of the VLR as a governance mechanism that enables municipalities to translate global sustainability goals into locally measurable development priorities.

The case of Niš is situated within the broader context of regional disparities and development challenges in Serbia and the Western Balkans, where post-socialist institutional legacies, uneven economic development, demographic decline, and limited local data capacities continue to shape territorial development outcomes. In this context, voluntary reporting mechanisms such as VLRs represent an emerging tool for strengthening evidence-based policymaking and improving coordination between local development strategies and global sustainability agendas.

By examining both the governance and analytical dimensions of the VLR process, the paper identifies key opportunities and limitations of SDG localisation in post-transition urban contexts. The findings highlight the importance of strengthening local data systems, institutional coordination, and multi-level governance in order to address territorial inequalities and support more inclusive and sustainable development pathways.

Finally, the paper reflects on how the experience of Niš can inform the development of more structured analytical frameworks for monitoring and evaluating SDG implementation at the local level, contributing to broader debates within regional science on place-based development and territorial governance.

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Local Revenues, Autonomy and Development Capacity in a Transition Economy: Evidence from Polish Communes

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S80 Local revenues and economic development, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

Local governments play a pivotal role in shaping economic development by providing public services, infrastructure, and an institutional environment conducive to growth. In transition economies, however, this role is increasingly conditioned by fiscal arrangements that may weaken local autonomy. This paper examines the relationship between local revenue structures, financial autonomy, and development capacity in Poland, a post-transition country that initially pursued strong decentralisation reforms but has experienced growing tendencies toward fiscal re-centralisation.

The main objective of the study is to assess the evolution of local government autonomy in Poland between 1991 and 2020, with particular emphasis on financial autonomy as a prerequisite for effective local development management. The analysis addresses three interrelated questions: whether fiscal decentralisation has increased local governments' role in public spending, whether this has translated into greater financial autonomy, and how changes in revenue structures affect local governments' capacity to stimulate and manage economic development.

Using comprehensive data covering almost the entire population of Polish communes, drawn from Statistics Poland and the Ministry of Finance, the study applies four types of measures of financial autonomy. To capture effective revenue sovereignty, the analysis distinguishes between formally defined own revenues and genuinely controllable own-source revenues by excluding centrally regulated shares in personal and corporate income taxes.

The results reveal a clear divergence between expenditure decentralisation and revenue autonomy. While local governments account for a growing share of public expenditure, their financial autonomy has systematically declined across all commune size categories. Increasing reliance on centrally controlled taxes and targeted intergovernmental grants weakens the fiscal link between local economic performance and municipal budgets, thereby reducing incentives for proactive, development-oriented policies. Borrowing constraints further limit local governments' ability to finance long-term investments.

The paper concludes that Poland illustrates a broader challenge in transition economies: decentralisation of responsibilities without adequate decentralisation of revenue authority undermines local governments' role as autonomous development actors. Strengthening genuine own-source revenues while preserving effective equalisation mechanisms is essential to enhancing place-based development capacity.

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From Passive Recipients to Active Developers: The Role of Local Taxation in Place-Based Policy

Dr. Benedikt Herrmann

S80 Local revenues and economic development, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

This paper examines how place-based policies influence economic outcomes under varying local fiscal incentives. We measure fiscal incentives by the share of locally raised taxes tied to local economic performance, which captures the extent to which local governments benefit directly from expanding their tax base. In the context of the EU Cohesion Policy, we show that regions with stronger incentives at municipal level experience significantly higher investment and employment growth when receiving transfers, while regions with weakly incentivised municipalities see limited or no effects. Mechanism analysis reveals that municipalities with strong incentive structures direct funds toward growth-enhancing sectors and technological innovation, whereas less-incentivised recipients channel transfers more toward consumptive expenditures and status-quo investments. These results underscore the importance of local fiscal incentives in shaping the efficiency and long-term impact of place-based policies, and suggest that strengthening fiscal incentives could enhance the effectiveness of future EU funding instruments.

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Local Property Tax Incentives for Wind Farm Development: Evidence from Finland

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S80 Local revenues and economic development, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

Local governments play a key role in the siting of renewable energy infrastructure, yet often face weak incentives to host projects that generate primarily national benefits while imposing local externalities. This paper examines whether strengthening municipal fiscal incentives can influence the development of wind farms. A 2018 reform in Finland raised the maximum property tax rate applicable to wind turbines, substantially increasing the potential revenue municipalities receive per turbine. We leverage cross-municipal heterogeneity in the resulting fiscal incentive, combining a stacked machine-learning estimator for siting probabilities with matched difference-in-differences and event-study methods. The reform led municipalities with larger fiscal gains to become markedly more likely to permit wind farm construction. We also show that new turbine tax revenue induces adjustments in municipal tax policy, with municipalities shifting tax burdens from residents toward turbines. Together, the results demonstrate that local fiscal incentives can meaningfully stimulate the expansion of renewable energy.

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Corporate Income Tax, Formula Apportionment, and Multi-regional Firms

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S80 Local revenues and economic development, Auditorium 252Б - North Building - Faculty of Geology and Geography, agosto 27, 2026, 17:30 - 19:30

We examine the determinants of the corporate income tax system when firms operate in multiple regions and local governments use a formula apportionment (FA) system to allocate the firms' corporate income across regions. When a firm, such as a multi-regional firm (MRF), has business activities in multiple regions, measuring income earned in each region raises a complex conceptual and administrative problem. In the FA regime, the MRF's taxable income is determined using a formula that considers the company's capital, sales, and labor shares at each location. The present paper develops a theoretical framework that generalizes the analysis of Pinto (2007). In our setup, a MRF has a presence in two regions, and regional governments strategically decide the weights in the formula. The MRF produces a homogeneous good in one or two regions, and the good can be sold domestically or shipped to the subsidiary in the other region. Domestic prices are endogenously determined. We derive the decentralized FA system when regional governments consider the formula's impact on the welfare of domestic consumers, tax revenue, and the MRF, and compare these outcomes with those of centralized solutions.

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Estimating cross-border connectivity and commuters using enhanced gravity models

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S81-1 All Eyes on Border Regions: Enhancing Cross-Border Cooperation through Data-Driven Policy Support, Auditorium 224 - North Building - Juridical Faculty, agosto 28, 2026, 09:00 - 10:30

This study presents a gravity-based methodological framework for estimating cross-border connectivity and potential commuter flows between regional labour markets. The proposed Gravity-Based Commuter Proxy Model provides a policy-relevant analytical approach for analysing functional labour interactions in situations where observed commuting statistics are incomplete or unavailable. The method supports evidence-based regional analysis by translating socioeconomic indicators into spatial interaction patterns that approximate labour mobility dynamics. The framework conceptualises commuting as a response to structural imbalances between labour supply and employment opportunities across regions. Areas characterised by surplus working-age population generate outward commuting pressure, while regions offering stronger labour demand and higher economic attractiveness act as employment destinations. These relationships are operationalised through a spatial interaction model in which the intensity of commuting increases with economic opportunity and decreases with spatial separation. The methodological workflow combines a conceptual labour-market model, a gravity-based interaction formulation, and a geospatial implementation environment. Labour surplus in origin regions and employment capacity in destination regions form the primary drivers of interaction, while wage conditions represent economic attractiveness and geographic distance introduces spatial friction. Estimated commuting flows are distributed proportionally among alternative destinations and subsequently balanced to maintain consistency between labour supply and demand constraints. Model outputs include regional indicators describing commuter departures, arrivals, and populations without accessible employment opportunities, alongside directional flow networks representing predicted commuting linkages. The methodology is implemented using harmonised regional socioeconomic data and automated spatial processing procedures, producing spatially coherent commuting structures aligned with established principles of regional economics. Metropolitan regions emerge as primary labour attractors, suburban areas demonstrate balanced exchange dynamics, and rural regions predominantly function as labour-exporting territories. Cross-border commuting patterns concentrate along economically integrated neighbouring regions, reflecting wage differentials, proximity, and labour market complementarities. The results demonstrate that cross-border commuting represents a structural component of regional labour market integration rather than a marginal phenomenon. The proposed framework offers a transparent, scalable, and transferable tool for analysing labour mobility in data-scarce environments and supports policymaking in regional development, transport planning, and cross-border cooperation by providing an interpretable representation of functional economic connectivity across territorial scales.

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How Cross-Border Shopping Contributes to Functional Cross-Border Regions: Evidence from Mobile Big Data from Europe

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S81-1 All Eyes on Border Regions: Enhancing Cross-Border Cooperation through Data-Driven Policy Support, Auditorium 224 - North Building - Juridical Faculty, agosto 28, 2026, 09:00 - 10:30

One of the main objectives of the EU is to enhance integration and cohesion within internal border regions by strengthening political, economic, and social ties through cross-border cooperation and governance. While institutional and economic ties across borders are well examined and understood, people's perspectives are less well known. Beyond potential access to cross borders, people's actual interactions and cross-border practices are challenging to capture. Yet these social interactions contribute to the (re)production of functional cross-border regions. Besides cross-border commuting, one significant yet overlooked interaction relates to routine cross-border shopping and the use of services. To provide new insights into how shopping and service use create functional cross-border regions, we use human mobility as a tool to capture this phenomenon.
Here, we use a mobile big data source to reveal people's cross-border mobility behaviour and examine movements across state borders linked to shops and shopping centres in Europe. By separating flows from both sides of a border, we show how the proportion and directionality, temporal rhythms, and spatial extent of cross-border mobility flows enable us to characterize functional border regions from the perspective of shopping and service use. We compare workdays and weekends, and statistically examine which regional characteristics are associated with functional cross-border regions from the perspective of shopping and service use. Our initial findings suggest different types of cross-border shopping behaviour, both in temporal rhythms and spatial patterns. We conclude by addressing how shopping and the use of services across state borders contribute to functional cross-border regions as one important layer, and we discuss ways of using mobile big data to support policy and planning in border regions in the European Union and beyond.

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Beyond Commuting:

A Multi-Service Accessibility Approach to Cross-Border Functional Urban Areas

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S81-1 All Eyes on Border Regions: Enhancing Cross-Border Cooperation through Data-Driven Policy Support, Auditorium 224 - North Building - Juridical Faculty, agosto 28, 2026, 09:00 - 10:30

Functional Urban Areas (FUAs) are widely used in urban and regional analysis to capture the functional reality of cities beyond administrative borders. The EU–OECD methodology defines FUAs based on urban centres and commuting zones, but this approach relies heavily on commuting data and national administrative units. In cross-border regions, such delineations often fail to reflect everyday realities, as residents may cross national borders not only for work but also for shopping, leisure, or healthcare. Traditional commuter-based classifications therefore capture only one dimension of cross-border interaction.
Recent research has attempted to integrate a cross-border dimension into FUA delineation, using indicators such as population distribution, accessibility of border crossings, or mobile big data flows. However, these approaches face challenges related to data availability, comparability, and reproducibility. In response, this paper proposes a complementary accessibility-based perspective that focuses on the potential to reach services across borders within defined travel time thresholds. We develop a multi-service accessibility framework using a rapid realistic rooting tool that analyses access to healthcare facilities, leisure and cultural amenities, and major shopping agglomerations. Using a rapid realistic routing tool, accessibility is calculated for different transport modes and differentiated by demographic groups to identify potential age-related disadvantages. By disaggregating service categories and population groups, we reveal overlapping and diverging spatial patterns of cross-border functional integration.
The French–German border region serves as a case study. Building on existing classifications and previous analyses, we compare accessibility-based functional areas with national spatial categories and stakeholder perceptions collected during previous workshops in the Eurodistricts Saar-Moselle and Oberrhein. Preliminary results show multiple potential cross-border functional areas depending on service type and modal split. By overlaying objective accessibility measures with subjective perceptions, the study highlights convergences and mismatches between data-driven delineations and lived spatial realities.
The paper argues that integrating multi-service accessibility into FUA delineation enriches existing methodologies and supports more nuanced cross-border planning and governance.

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Assessing spatial discontinuities in housing markets of EU cross-border regions

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S81-2 All Eyes on Border Regions: Enhancing Cross-Border Cooperation through Data-Driven Policy Support, Auditorium 224 - North Building - Juridical Faculty, agosto 28, 2026, 11:00 - 13:00

Country borders present both challenges and opportunities across multiple domains, including labour markets, trade and cross-country integrations. Yet the impact of borders on housing prices and affordability remains underexplored, particularly within the context of the EU single market. Our contribution explores the housing market across EU internal borders, where local and regional socioeconomic dynamics transcend international boundaries. We analyse the discontinuities generated by the presence of a border in the housing markets of cross-border regions, shedding light on the great diversity of situations across the EU. By analysing (rental and sale) housing prices and affordability at the Local Administrative Unit (LAU) level within a 25 km buffer zone on both sides of each EU internal border, this study provides new elements to better understand the specificities and complexities of housing markets in EU's border areas.

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Cross-border Housing Markets – Evidence from the ESPON HOUSE4ALL project

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S81-2 All Eyes on Border Regions: Enhancing Cross-Border Cooperation through Data-Driven Policy Support, Auditorium 224 - North Building - Juridical Faculty, agosto 28, 2026, 11:00 - 13:00

With freedom of movement in the European Union and roughly one third of Europeans residing in border regions, housing markets increasingly transcend national boundaries. Particularly in metropolitan border areas, borders may function as resources that structure labour mobility, residential choice, and investment patterns. At the same time, differences in income levels, supply constraints, transaction costs, and welfare systems can generate pronounced disparities in affordability across borders. Against the backdrop of Europe's intensifying housing affordability crisis, this paper examines cross-border housing dynamics through evidence from the ESPON HOUSE4ALL project.

The paper first presents comparative data on advertised sales and rental prices per square meter in European border regions, drawing on affordability mapping conducted within the project. It then explores methodological opportunities for developing cross-border housing market indicators, building on insights from ESPON BIG DATA: Cross-border housing markets in Europe. Adopting the definition proposed therein, cross-border housing markets are understood as functionally integrated areas where a critical mass of households live and work across borders, generating new spatial relations between employment and residence.

The paper then focuses on the Luxembourg case study within the Greater Region. Luxembourg, a major financial centre and host to European institutions, features the highest wage levels in the EU and a substantial share of cross-border commuters. Median sales prices per square meter are approximately three times higher than in neighbouring Belgium, Germany, and France, while rental prices are roughly double. By modelling affordability using both local and Luxembourgish incomes on either side of the border, the analysis reveals strong spillover effects, particularly in adjacent French and German regions. These findings demonstrate how cross-border income differentials reshape local affordability and housing opportunities.

By integrating European-wide mapping with a detailed cross-border case study, the paper advances conceptual and empirical approaches to measuring housing affordability in integrated border regions and highlights the need for more coordinated cross-border housing governance.

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The potential of web scraping for border regional analyses: The example of real estate data

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S81-2 All Eyes on Border Regions: Enhancing Cross-Border Cooperation through Data-Driven Policy Support, Auditorium 224 - North Building - Juridical Faculty, agosto 28, 2026, 11:00 - 13:00

Data availability in border regions remains a pressing issue – in particular with regard to harmonisation issues. In the absence of harmonized data, so called new data can be a helpful solution. Digitalisation comes along with a series of new data sources and allows for new approaches to study the dynamics of cross-border regions. Useful data can be collected via various methods, including web scraping and openly available data products supplied by data owners (e.g., travel information from private companies). Web scraping is a method that allows for automatic extraction of relevant information from online media (websites, application platforms, open databases). This is an important complement to traditional data collection methods (e.g., surveys, census).
In our paper, we explore the potentials and limitations of web scraping for border regional analyses with the example of real estate data. Through web scraping, absolute and relative price indicators and quality related indicators can be taken on board. Differentials and integration patterns will be revealed regarding rental and buying costs, both in relation to distance to the border. In addition, the number of offers gives an indication of the housing market dynamics. This data can be a proxy to understand dynamics and drivers of cross-border commuting, particularly in border regions with urban centres in close proximity to the border.
Data are taken from the research project on “The potential of new data sources for border-related knowledge gaps (BorderData)” funded by the Bavarian-Czech Research Agency (BTHA), focussing on the Bavaria/Czech region. The presentation reflects a) technical options and barriers in organising automated data retrieval, b) on data quantity and availability, c) on data quality and potential corrections and calibration options.

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Europe, We Have a Problem!

Local Economic Winners and Losers of Border Closures

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S81-3 All Eyes on Border Regions: Enhancing Cross-Border Cooperation through Data-Driven Policy Support, Auditorium 224 - North Building - Juridical Faculty, agosto 28, 2026, 15:00 - 16:30

In response to the COVID-19 pandemic, Schengen countries temporarily reintroduced internal border controls, reversing a decades-long trend of European integration. While existing research has focused mainly on national-level effects of border closures, localized economic consequences remain underexplored. This paper leverages the disruption of cross-border mobility as a natural experiment to study the short-run economic impacts of border closures on European municipalities. Using monthly nighttime lights data, we find that border closures reduced economic activity in border municipalities by approximately 2% relative to interior municipalities. The effects are highly heterogeneous. Small municipalities, Eastern border municipalities, and Western municipalities bordering Eastern countries experienced losses, whereas Western border municipalities bordering other Western countries benefited from increased domestic demand. Importantly, we show that the economic impact of cross-border mobility depends on why people cross borders. When mobility supports production - by providing labor, services, or inputs - border closures disrupt supply chains and local economic activities suffer (productive mobility). However, when mobility is mainly for leisure or social visits, restrictions tend to redirect spending toward domestic alternatives, creating localized benefits (discretionary mobility). These findings highlight the importance of place-sensitive policy responses in times of crisis.

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“Imagine that’s no border”: The case of transnational floods

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S81-3 All Eyes on Border Regions: Enhancing Cross-Border Cooperation through Data-Driven Policy Support, Auditorium 224 - North Building - Juridical Faculty, agosto 28, 2026, 15:00 - 16:30

This paper investigates the economic resilience of Central European regions to large-scale flood shocks, focusing on the major transnational flood of 2013. The event affected multiple countries across the Danube and Elbe basins and provides a natural experiment to study how heterogeneous regional economies respond to a common shock. We focus on the role of national borders in shaping recovery dynamics. Using a triple difference-in-differences model, we investigate whether affected NUTS-3 regions located along national borders exhibit different medium-term recovery patterns compared to non-border affected regions. The results indicate that the 2013 floods exerted a negative and statistically significant effect on GDP growth. Border regions exhibit a modest but positive resilience premium, especially when the adjacent cross-border region is also affected. These findings highlight how cross-border exposure can activate cooperative mechanisms that mitigate the economic costs of natural hazards.

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The impact of tax sharing agreements on local fiscal policy:

Evidence from the Belgo-Luxembourg border

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S81-3 All Eyes on Border Regions: Enhancing Cross-Border Cooperation through Data-Driven Policy Support, Auditorium 224 - North Building - Juridical Faculty, agosto 28, 2026, 15:00 - 16:30

We study how tax-sharing agreements shape local fiscal policy in cross-border labor markets. In the Belgian–Luxembourg border region, the bilateral tax treaty assigns taxation of frontier workers' labor income to the country of employment. As a result, Belgian municipalities cannot levy their main local income tax surcharge on residents who work in Luxembourg, even though these commuters continue to rely on municipal services in Belgium. To compensate municipalities for this treaty-induced loss of tax base, Luxembourg introduced the Fonds des Frontaliers (FdF) in 2004. The scheme is designed as a matching mechanism linked to municipalities' foregone local income tax revenue and has undergone several reforms, most notably an expansion and retargeting in 2015 that increased the degree of compensation while tightening eligibility.

Using panel data on municipal tax rates, grant allocations, commuting exposure, and socio-demographic characteristics, we estimate the effect of the FdF on local tax setting. Our empirical strategy compares municipalities with sustained exposure to frontier work to other Belgian municipalities and we assess dynamics around the introduction and reform episodes. We find that the introduction of the fund is associated with a relative decline in local income tax rates, consistent with a budgetary relief effect. In contrast, subsequent reforms that increased the compensation rate are followed by relative increases in local income tax rates, consistent with incentives embedded in the matching design: higher statutory surcharges mechanically raise measured "lost revenue" and hence grant receipts. We find little evidence of comparable adjustments in local property tax rates, which apply irrespective of the place of work. The results highlight how the design of cross-border compensation schemes can alter local fiscal incentives and, by extension, the distribution of tax burdens in border regions.

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The Impact of "Innovative SME" Certification on Financial Performance and Innovation: Evidence from Italy with Regional Perspectives

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YSS1-Digital transformation, firm dynamics and regional innovation, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 11:00 - 13:00

This paper investigates the causal effects of the Italian "PMI Innovativa" (Innovative SME) certification on firm performance across multiple dimensions, including intangible assets, patenting activity, R&D investment, and equity capitalization. Using a comprehensive panel dataset of Italian small and medium-sized enterprises from 2015 to 2023, we employ a Difference-in-Differences (DiD) estimation strategy to identify the treatment effects of certification, controlling for firm-level characteristics and unobserved heterogeneity through firm/sector and year fixed effects.

Importantly, this study explores the spatial heterogeneity of innovation policy effects by analyzing the geographical distribution of certified firms across Italian regions. We examine whether regional factors—including the concentration of industrial clusters, regional R&D intensity, local institutional quality, and economic development levels—moderate the impact of the PMI Innovativa certification. Our regional analysis incorporates NUTS-2 regional fixed effects and investigates potential regional clustering of innovation outcomes.

Our findings reveal that PMI Innovativa certification generates significant positive effects across all outcome variables. Certified firms experience an average increase of €307.2 thousand in equity compared to the control group, alongside substantial gains in intangible assets, R&D expenditure, and patent activity. The regional analysis indicates significant spatial heterogeneity, with Northern Italian regions—particularly Lombardy and Emilia-Romagna—exhibiting stronger certification effects, likely due to denser innovation ecosystems and more developed financial markets. Placebo tests confirm the validity of our identification strategy, showing no significant pre-treatment effects for most outcomes. These results have important implications for regional innovation policy, suggesting that the effectiveness of SME certification programs depends substantially on the local economic and institutional context. Policymakers should consider complementary regional interventions to maximize the impact of national innovation policies in less developed areas.

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Digital Government, Incumbent Innovation and Firm Entry

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YSS1-Digital transformation, firm dynamics and regional innovation, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 11:00 - 13:00

Firm entry is widely recognized as an important source of industrial dynamism and regional economic growth, as new firms introduce novel technologies, business models, and competitive pressures. However, firm entry also poses potential threats to incumbent firms, which may respond by increasing innovation investment to strengthen their technological advantages and raise entry barriers. While such innovation activities can enhance productivity, they may simultaneously deter potential entrants by signaling intensified competition and reduced market accessibility. Consequently, innovation by incumbent firms constitutes a key obstacle to new firm entry.
Recent studies suggest that digital government can facilitate firm entry by improving the business environment, reducing information asymmetries, and lowering transaction costs. Through digital platforms, potential entrants can gain better access to policy information, government services, and market opportunities. Nevertheless, these benefits are not exclusive to new firms. Incumbent firms may also leverage digital government to access public information and policy resources more efficiently, potentially reinforcing their innovative advantages and crowding out potential entrants. This paper examines the ambiguous effects of digital government on firm entry by explicitly considering the role of incumbent firms' innovation. Using China's Internet Plus Government Services initiative as a quasi-natural experiment, we construct a theoretical framework that links digital government, incumbent innovation, and firm entry. Employing panel data from Chinese prefecture-level cities over the period 2010–2024, we provide empirical evidence on how digital government influences firm entry both directly and indirectly through incumbent firms' innovation activities. The findings provide critical policy insights for global digital governance, emphasizing the need to balance the promotion of institutional efficiency with the prevention of innovation-based exclusion to ensure sustainable and inclusive regional growth.

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Balancing Productivity and Employment in the Digital Age: Empirical Evidence from Italy's Transition 4.0 Program

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YSS1-Digital transformation, firm dynamics and regional innovation, Auditorium 241 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 11:00 - 13:00

This study evaluates the impact of the Italian National Recovery and Resilience Plan (NRRP) funds targeting the Transition 4.0 on firm-level productivity and employment. Leveraging firm-level data and employing a combination of panel event studies and continuous two-way fixed effects models, we find evidence that NRRP funds positively influence both total factor productivity (tfp) and employment. Firms receiving Transition 4.0 support experience an average tfp increase of 16.9–17.8% and an employment growth of around 15.2–15.8%. We also discuss that investments in employee training and upskilling may represent the mechanism through which firms achieve tfp and employment gains. Sectoral heterogeneity reveals that ICT and Wholesale Trade firms benefit the most. Importantly, machine learning-based feature importance analyses validate the role of NRRP funding as a key driver of performance improvements. These findings challenge the trade-off between automation and employment, showing that the Transition 4.0 can boost both competitiveness and employment. The results offer policy-relevant insights for designing inclusive and productivity-enhancing digital transformation strategies.

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Drivers of territorial competition in the circular economy

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YSS2-Green and circular transitions, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 11:00 - 13:00

The transition toward the circular economy is presented as a lever enabling territories to move beyond linear development models and reduce their dependence on primary resources. At the territorial scale, this transition is accompanied by a paradigm shift in the status of waste, which is now considered a strategic resource. However, in a context marked by growing demand for secondary raw materials, unequal geographical distribution of deposits, and limited availability, competitive dynamics may emerge between actors and between territories. These dynamics remain insufficiently addressed in industrial and territorial ecology, which primarily emphasizes cooperation mechanisms.

This study aims to analyze the factors driving the emergence of competitive dynamics in the implementation of circular economy strategies. The objective is to identify the conditions under which these dynamics arise in order to better understand them and to propose ways to integrate them into territorial planning approaches for waste management.

The methodology relies on a deductive approach based on a literature review. Fifty articles from environmental sciences, economics, and social sciences were analyzed. The analysis identified 124 elements, grouped into 20 emergence factors. Resource-related factors include the unequal geographical distribution of deposits, limited quantities available, quality degradation, seasonality, and the coexistence of multiple uses. Economic factors relate to the increasing value of secondary materials, rising prices of virgin materials, production and transport costs, and growing demand. Finally, additional factors are linked to the coexistence of multiple actors within the same territory and their strategies to secure resource supply.

While cooperation is a core principle of the circular economy, competitive dynamics also constitute an inherent component. Taking these dynamics into account could help avoid conflicts, territorial inequalities, and inefficiencies in resource allocation. Further research, based on interviews with territorial stakeholders, will make it possible to validate the identified factors and analyze their effects. Ultimately, this research aims to contribute to the development of indicators to characterize the level of competition at the territorial scale and to strengthen the robustness of circular economy planning processes.

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The possibility of applying Artificial Intelligence in Solid Waste Management in the developing countries towards building smart cities: Jordan as a case study

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YSS2-Green and circular transitions, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 11:00 - 13:00

Rapid urbanization and increasing waste generation are intensifying pressure on Solid Waste Management (SWM) systems in developing countries, where limited resources, static planning practices, and operational inefficiencies remain prevalent. Although Artificial Intelligence (AI) is frequently promoted as a transformative solution for urban services, empirical evidence of its effectiveness and institutional applicability in resource-constrained SWM systems remains scarce. This study addresses this gap by conceptualizing AI as a decision-support tool that complements, rather than replaces, conventional waste management practices. Using the Radwan neighborhood in Amman, Jordan, as a case study, the research develops and evaluates an AI-supported waste collection framework integrating Internet of Things (IoT) sensing, geospatial data, and heuristic optimization. The methodology incorporates qualitative analysis of an existing SWM system as well as quantitative simulation of AI-based routes for waste collection vehicles as well as capacities. Real-time levels of fill, spatial data from a Global Positioning System (GPS), as well as capacities of waste collection vehicles, are incorporated in order to create optimized routes. Performance of the system is evaluated through a comparative analysis of conventional and AI-optimized routes, whereby performance metrics are based on evaluation of distance travelled, route duration, and fuel consumption, as well as carbon produced. Importantly, the study demonstrates the institutional feasibility of AI adoption through a human-in-the-loop configuration that preserves municipal control and aligns with existing governance structures. The findings provide empirical evidence that AI can function as a practical lever for enhancing efficiency and sustainability in SWM systems without requiring costly infrastructure overhauls. The study offers actionable insights for Jordanian municipalities and other municipalities in comparable contexts and contributes to advancing sustainable urban planning objectives aligned with the Sustainable Development Goals (SDGs). Moreover, the study offers a foundation for future research on AI applications in urban sustainability and circular economy transitions.

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Enablers of Green Growth in European Union: The role of Green Technology and Green Energy

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YSS2-Green and circular transitions, Auditorium 243 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 11:00 - 13:00

Enablers of Green Growth in European Union: The role of Green Technology and Green Energy

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Abstract
Purpose: Climate change has become a serious threat to human life, both socially and economically. If this problem continues at this pace, it will damage many lives and cause significant economic losses. The European Union is also affected by climate change. The world is moving toward green growth, which helps improve environmental quality and supports living standards. Many scholars have investigated the connection between green growth and other variables, but there is still a gap regarding the impact of green technology, green energy, and control variables (resource rents and economic growth) on green growth. This research aims to fill this gap by investigating the impact of green technology, green energy, and control variables (resource rents and economic growth) on green growth in European regions.
Research Methodology: This research uses the ARDL econometric technique to investigate the long-run and short-run relationships between green growth and other explanatory variables in the European Union from 2000 to 2025. This research applies different unit root tests along with the ARDL bounds test. Likewise, it employs different proxies for measuring green growth and uses diagnostic tests to ensure the validity of the research outcomes. The main sources of data are the WDI, the OECD, and the OWID.
Results: The ARDL model results show that green technology, green energy, and economic growth have a positive impact on green growth, while resource rents have a negative impact on green growth. Diagnostic tests ensure that there are no problems in the research model or its outcomes. These research outcomes provide value to both policymakers and the academic community. Stakeholders can use the findings to design and implement policies that strengthen environmental sustainability and foster green growth, while scholars may apply the proposed framework and indicators to examine other regions, either through replication or by adapting alternative measurement approaches.

Key words: Green Growth, Green Technology, Green Energy, Resource Rent and Economic Growth
Jel Classification: F43, F63, O32, Q42, Q32 and O44

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Citizen Science Platforms and the Reconfiguration of Urban Ecological Governance: Policy and Planning Implications from South Korea

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YSS3-Urban ecological governance, innovation and resilience, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 11:00 - 13:00

Digital platformization is reshaping how urban environmental knowledge is produced, shared, and mobilized in governance processes. While citizen science has expanded rapidly through online platforms, existing research has primarily focused on data accuracy or participants' learning effects, paying limited attention to how platform-mediated data practices may reconfigure local ecological governance and planning. This study aims to examine how citizen science platforms structure ecological monitoring practices and to analyze their potential to reshape urban ecological governance, with a focus on policy and planning implications. Drawing on a qualitative case study of the Uiwang Community Ecology Research Group in South Korea, the research combines semi-structured interviews with 15 members and the group leader and participant observation of regular monitoring activities (August 2025–January 2026). The analysis is guided by a three-stage conceptual framework linking (1) offline ecological observation and data production, (2) platform mediation through standardized data formats, interaction features, and gamification elements, and (3) the translation of accumulated data into public assets connected to local governance. The findings reveal three main results. First, the platform transforms dispersed individual observations into standardized, cumulative datasets, enabling their reinterpretation as collective ecological resources used in local education programs, environmental festivals, and community reports. Second, interactive features such as species identification requests, comments, rankings, and challenges enhance sustained participation, facilitate peer learning, and enable cross-validation, thereby improving data reliability and reinforcing participants' ecological identities. Third, accumulated citizen-generated data functions as a "language of collaboration" in interactions with local authorities, supporting recognition of ecological monitoring as formal volunteer work and providing potential evidence in development–conservation conflicts. However, despite these emerging governance linkages, the institutional integration of citizen science data into formal planning instruments remains limited, and systematic verification and administrative feedback mechanisms are underdeveloped. The study contributes to urban and regional planning debates by conceptualizing citizen science platforms not merely as data-collection tools but as governance devices that mediate relationships between citizens and municipalities in the context of digital transformation. It suggests that strengthening institutional pathways for data validation, feedback systems, and integration into environmental assessment and planning procedures is essential to realizing the adaptive potential of platform-mediated ecological governance.

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Optimizing Urban Green Spaces Using a Decision-Support Model for Carbon Sequestration and Ecological Connectivity

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YSS3-Urban ecological governance, innovation and resilience, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 11:00 - 13:00

Urban green spaces (UGSs) are vital for enhancing urban ecological health and resident well-being. However, their diverse functions need to be balanced in consideration of limited space and varying stakeholder preferences. Integrated planning approaches are needed to exploit the multiple benefits of UGSs. This study introduces a multi-objective decision-support model designed to optimize UGS planning by simultaneously addressing carbon sequestration, ecological connectivity, and cost constraints. The model incorporates the non-dominated sorting genetic algorithm II to identify Pareto-optimal solutions for tailored decision-making strategies balancing different priorities. The model indicated that ecological connectivity can be improved by 7.57% while meeting carbon-reduction and budgetary targets. The model effectively balanced trade-offs, underscoring the importance of not only the quantity of green space but also its strategic placement. This decision-support framework empowers decision-makers to rapidly simulate and validate optimal scenarios, effectively balance competing objectives, and provide a scientific basis through verifiable feedback, ultimately promoting the development of sustainable urban environments.

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Technological Innovation and Regional Resilience: a Composite Index approach to assess Regional Vulnerability

Mr Paolo Palladino

YSS3-Urban ecological governance, innovation and resilience, Auditorium 247 - North Building - Faculty of Classical and Modern Philology, agosto 27, 2026, 11:00 - 13:00

Despite many years of social scientific research into innovation and emerging technologies, and their recent rise in the public and political 'visibility', key researchers such as Autor (2024), Acemoglu, Restrepo (2019) and Goos (2018) continue to argue that our understanding of the future impacts of new technologies remains limited. Dorn (2015) questions whether technological progress will continue at the same rate or are we reaching a saturation point in the next years. In this era of constant transitions and transformations, consumer expectations and the ongoing environmental pressure, along with the increasing globalisation, are redefining the competitive environment in which firms operate (Song et. al, 2022). Within this scenario, innovation is no longer an option, it is a necessity. In recent years, the increasing spread of new digital technologies has radically transformed the competitive environment in which companies operate (Brynjolfsson and McAfee, 2014). Emerging technologies, such as artificial intelligence and automation, are redefining how we work, learn and relate. These dynamics are highly relevant, as they play a crucial role in both the ongoing economic transformation and efforts to maintain social and territorial cohesion (European Commission).

The European Commission, among its main activities, promotes the implementation of cohesion policies in order to stimulate competitiveness, innovation and green and digital transition also at regional level. In this regard, it clearly confirms the existence of significant regional gaps within the European Union, and cohesion policies are one of the main instruments to address them. The idea that regions develop unevenly is not new (Myrdal, 1957). In fact, regions have always been characterised by different economic and structural systems. These differences are related to many aspects, including employment, environment, infrastructure and so on. This phenomenon has also been amplified by increasing globalisation (Puga, 2002; Autor et. al, 2013). Indeed, Sassen (2001) notes that globalisation favours the concentration of wealth and innovation in large cities and metropolitan areas, creating strong regional disparities. Rodriguez- Pose, Tomaney (2006) confirm how globalisation has made inequalities between regions more visible. However, even where cohesion policies act (e.g. EU structural funds), the reduction of regional disparities is slow and uncertain (European Commission, 2024).
Alexopoulos et al. (2025) analysed the effects of the EU Cohesion Fund and the results indicate that the positive effects are concentrated in the first seven years after a region's inclusion in the programme, but with an uneven distribution where poorer regions tend to benefit more, while richer ones show smaller effects. Even though progress has therefore been made in reducing disparities, significant differences within countries persist (OECD, 2016). Within this context, the risk that the process of technological innovation accentuates existing regional gaps, making some areas more vulnerable in terms of innovation and development, must be considered. While most of the literature has focused more on the impact of technology at the macroeconomic level (Aghion, Howitt, 1994; Acemoglu et. al, 2000), mainly considering impacts on GDP and employment, this study aims to provide a more detailed perspective for geographical areas where we already find important foundations of some research (Saxenian, 1994; Boschma, 2005; Moretti, 2012; RodrÅLıguez-Pose, 2013; Iammarino et. al, 2020) expandable for future academic debate. These presented studies highlight two fundamental aspects. Firstly, new technologies risk increasing inequalities by creating a new "geography of vulnerability" in which some regions respond better than others. Numerous

works in the literature show how European regions have reacted differently over the years to exogenous shocks and crises (Crescenzi et. al., (2016); Martin et. al., 2016; Bristow, Healy, 2018; Faggian et al., 2018). Regional resilience also depends on institutional, social and local governance factors (Sensier et. al., 2016). While in some regions economic and educational progress will provide new opportunities, others may be more affected.

Secondly, regional disparities mean that regions respond differently to external shocks caused by technology (Martin R, 2012). The ability of a region to respond to exogenous shocks is a fundamental concept, referred to as economic resilience, and represents the readiness and effectiveness with which an area is able to absorb, adapt to and recover from unforeseen external events. An authoritative theoretical framework is provided by Martin and Sunley (2015) in which they define the four dimensions of regional resilience: resilience, recovery, reorientation and renewal. It is therefore evident that the impact of technological innovation within the labour market remains a central concern within the scientific community, with several critical issues yet to be resolved. Several contemporary scholars point out that there are substantial gaps in our understanding of technological evolution, particularly with regard to artificial intelligence and automation (Acemoglu, 2023; Brynjolfsson, McAfee, 2014; Autor, 2015). Autor (2024) argues that the direction that new technologies take will depend mainly on political, institutional and cultural choices, not necessarily on technological fate. New technologies don't have a predetermined fate and require extensive redevelopment. In order to respond, it is important to propose new training paths and investments that lead to the achievement of complementarity between human labour and AI (OECD, 2022). For this reason, it will be crucial monitor and evaluate the socio-economic impacts of new technologies, through the assessment of the effectiveness of public policies in order to propose adaptive and responsive frameworks, with a specific attention to sustainability and equity. Considering this scenario, this research project aims to analyse how the introduction of new emerging technologies in the labour market, particularly automation and artificial intelligence (AI), can impact the economic resilience at the regional level. Despite the extensive literature on the impacts of automation and AI in relation to regional economic resilience, there is a lack of an integrated framework linking the responsiveness of territories with the divergent effects of new technologies. This study uses a composite index approach to classify regions in terms of vulnerability and investigate the impacts of new technologies in the main sectors. The analysis intends to consider six components within the index: economic structure, labour market, financial system, governance and institutions, economic performance, environmental factors and sustainability. The derived outputs will define a regional vulnerability parameter useful for classifying regions with the aim of expressing the stages of resilience described by Martin and Sunley (2015) for those regions that lag behind. Although there are wellknown studies in the literature that use the composite index as a methodological tool, those usually have many indicators or are based on indicators already developed at European level (e.g. RCI). The index proposed in this study is characterised by a more selective process useful to analyse the adoption of new technologies. In addition, this study is useful to provide differentiated policy recommendations for different geographical areas, which are often generic or aggregated by broad categories. The analysis will focus within the European Union (NUTS-2 regions) and will reveal: (i) the impacts of technological innovation at regional level, considering the significant heterogeneity of territories and key sectors (ii) the importance of regional policies for economic resilience and new differentiated guidelines.

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Job Attributes and Turnover: The role of local labour market tightness

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YSS4-Labour markets, employment trajectories and wellbeing, Auditorium 80 - South Building - Faculty of Geology and Geography, agosto 27, 2026, 11:00 - 13:00

We show how dissatisfaction with different job attributes relates to workers' job mobility. We distinguish between salary, tangible work arrangements and intangible attributes., using ten waves of the Dutch Working Conditions Survey (2014-2023) linked to administrative records covering over 400.000 workers. We find that dissatisfaction with intangible attributes (interesting work, learning opportunities and supervisors) is the strongest and most robust predictor of job separation, associated with a rise in the separation rate of three to five percentage points on a mean of 20.5%. Different sources of dissatisfaction are associated with different mobility behaviours: salary dissatisfaction predicts job-to-job transitions, dissatisfaction with interesting work predicts exits into unemployment, and dissatisfaction with supervisors predicts transitions from wage employment into self-employment. These responses are partly cyclical: the relationship between intangible dissatisfaction and turnover is stronger in tighter labour markets. Overall, we show that the type of job attributes a worker is dissatisfied with matters both for the likelihood of leaving and for the kind of labour market transition that follows.

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Where Instability Hurts: The Spatial Contingency of Employment Trajectories and Wellbeing across European Regions

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YSS4-Labour markets, employment trajectories and wellbeing, Auditorium 80 - South Building - Faculty of Geology and Geography, agosto 27, 2026, 11:00 - 13:00

Does the same employment trajectory produce the same wellbeing consequences everywhere? The employment–wellbeing literature presents an implicit assumption of spatial invariance. This paper argues that the relationship between employment instability and wellbeing is fundamentally shaped by spatial context—specifically, the regional development condition and the national institutional setting. Place is not merely where instability happens, but a constitutive force that conditions how it translates into material hardship and subjective suffering. We integrate two previously isolated literatures—the macro-level 'geography of discontent' literature and the employment–wellbeing literature, by asking: how do urban–rural contexts and European welfare regimes moderate the wellbeing penalty of disadvantageous employment trajectories?

We advance three competing hypotheses. The amplification hypothesis predicts that unstable trajectories carry larger wellbeing penalties in rural and small-town settings, where thin labour markets limit recovery options—consistent with the "places that don't matter" thesis. The buffering hypothesis predicts smaller penalties in rural areas due to lower living costs and informal support networks. The decoupling hypothesis predicts divergent patterns across wellbeing dimensions: urban contexts may amplify economic costs (high living expenses) while buffering psychological costs (anonymity), whereas rural contexts may buffer economic costs but amplify psychological harm (community stigma).

We use EU-SILC longitudinal microdata covering approximately 20–25 European countries. Exploiting the underutilized monthly activity calendar, we construct 48-month employment sequences for working-age adults across multiple entry cohorts. Wellbeing outcomes, including economic and psychology dimensions, are measured in the final year of the 48-month sequence period to address reverse causality. We then apply optimal matching and cluster analysis to identify a typology of monthly employment trajectories. Finally, we estimate the impact of various employment trajectories on individual wellbeing and how the association varies with regional background and country differences.

This paper makes three contributions. First, it provides the micro-level transmission mechanism linking regional development conditions to individual wellbeing through spatially contingent employment trajectories. Second, it redirects heterogeneity analysis from individual characteristics to spatial attributes, extending static regional wellbeing gaps with dynamic employment processes. Third, it tests whether spatial moderation is a universal structural feature or is itself conditioned by national welfare regimes. The findings carry direct implications for the EU's place-sensitive social policy agenda.

Labor Market Scale, Firm Premia, and the Gender Pay Gap: Evidence from Hungarian Districts

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YSS4-Labour markets, employment trajectories and wellbeing, Auditorium 80 - South Building - Faculty of Geology and Geography, agosto 27, 2026, 11:00 - 13:00

Local labor-market scale in Hungary is associated with a widening of gender inequality. Using the Admin3 linked employer-employee administrative panel (2003–2017), which covers a 50% sample of the Hungarian population, this study investigates how local economic factors shape the adjusted gender pay gap (GPG) across the full urban hierarchy of 197 districts.

The analysis identifies the structural drivers of spatial wage disparities in two stages. First, the study estimates wage models that recover district-by-gender adjusted gaps and assesses how their cross-district dispersion changes once firm wage premia are absorbed. The variance of district-level adjusted GPGs falls sharply when firm fixed effects are included: approximately 72% of the cross-district dispersion is accounted for by firm-specific pay premia and the spatial allocation of firms and workers. This suggests that firm composition and within-firm pay-setting are the primary sources of local gender-inequality differences.

Second, an individual fixed effects model is used to estimate wage returns associated with changes in local labor-market scale. By observing individuals who relocate across districts, the model identifies the district-size premium while controlling for time-invariant worker heterogeneity and spatial sorting. Given the log-transformed outcome, the results indicate a stark gender divergence in the benefits of urbanization: men capture a significant urban wage premium, whereas women receive almost no gains. Specifically, a 10% increase in district employment is associated with an approximate 0.19% wage increase for men, compared to a negligible 0.02% increase for women. Consequently, the adjusted GPG expands by 0.17 percentage points for every 10% growth in local employment scale.

These findings suggest that urban growth disproportionately rewards temporal flexibility. The results demonstrate that agglomeration is not gender-neutral, and address socio-spatial inequality requires both firm-level pay reforms and targeted urban policies, such as expanded childcare and improved transport connectivity, to ensure that the benefits of market scale are distributed equitably.

534

Where Institutions Fail: Corruption and the Territorial Foundations of Distrust in Europe

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YSS5-Territorial inequality, trust, protest and migration politics, Auditorium 68 - South Building - Faculty of Philosophy, agosto 27, 2026, 11:00 - 13:00

Declining trust in political institutions and the territorial clustering of political discontent have become defining features of contemporary Europe. While distrust is often analysed at the national level, far less attention has been paid to how subnational institutional environments shape citizens' evaluations of governance. We argue that institutional trust is formed within places: it reflects not only corruption levels, but how corruption is experienced in territorially and historically embedded contexts. To test this, we link harmonized regional measures of grand and petty corruption to individual-level data from Rounds 1–10 of the European Social Survey (2000–2020), employing cross-classified multilevel models that account for regions, countries, and birth cohorts. We find that grand corruption exerts a substantially stronger negative effect on trust than petty corruption, underscoring the importance of systemic signals of elite misconduct. The corruption–trust relationship is further conditioned by urban–rural location and regional economic trajectories, with stronger effects in economically lagging and rural regions. Cohort and country effects also matter, indicating that institutional trust reflects path-dependent expectations shaped by shared regime exposure. Together, the results show that distrust is neither purely contemporaneous nor purely national, but produced within territorially differentiated and historically conditioned institutional environments.

39

Local wealth inequality linked to political protests across the Global South

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YSS5-Territorial inequality, trust, protest and migration politics, Auditorium 68 - South Building - Faculty of Philosophy, agosto 27, 2026, 11:00 - 13:00

The political consequences of inequality have become a matter of mounting concern. Relative deprivation theory posits that frustration arising from comparisons with proximate reference groups can fuel protests. Yet research has concentrated overwhelmingly on the Global North, notwithstanding the acute wealth disparities experienced by the majority of the world's population in the Global South. To address this gap, we assemble novel, fine-grained estimates of relative wealth at the 2.4 km x 2.4 km grid level to derive measures of local wealth inequality, which we link to over 645,000 georeferenced protest events recorded from 2014 to 2018. Exploiting variation within subnational regions, we document a robust, positive association between local wealth inequality and protest incidence. We show that the inequality–protest relationship is anchored in individuals' immediate surroundings. As the spatial radius defining 'local' expands, the association weakens, highlighting the primacy of experienced inequality. We also find that the inequality-protest link is mediated by national characteristics. The study advances the social sciences by furnishing novel empirical evidence on the micro-geographic underpinnings of political instability, demonstrating that inequality's political effects hinge on proximity, local class structure and national institutional environment.

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Electoral Campaigns and Attitudes toward Immigration: Evidence from Germany

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YSS5-Territorial inequality, trust, protest and migration politics, Auditorium 68 - South Building - Faculty of Philosophy, agosto 27, 2026, 11:00 - 13:00

In recent years, support for far-right and anti-immigrant parties has risen across many advanced democracies, raising concerns about the evolution of public attitudes toward migration. At the same time, a growing body of empirical evidence suggests that individual attitudes toward immigration are remarkably stable over time. This apparent tension between political volatility and attitudinal persistence raises a central question: under which conditions do immigration attitudes change? Electoral campaigns represent one potential mechanism. Campaign periods intensify political communication, amplify media coverage, and increase issue salience, potentially affecting how individuals evaluate immigration. This paper studies how federal election campaigns influence immigration worries in Germany. We ask whether immigration concerns move systematically in the months before and after elections and whether election-cycle effects became stronger after the 2015 refugee crisis, which marked a structural break in the politicization of migration. We exploit longitudinal data from the German Socio-Economic Panel (SOEP) over the period 1998–2024 and focus on German-born respondents aged 18–82. Our identification strategy leverages quasi-random variation in interview timing relative to federal elections. Because the SOEP is fielded continuously throughout the year, individuals are interviewed at different distances from election days for reasons unrelated to their political preferences. Combining within-year timing variation with individual fixed effects and election–non-election year pair fixed effects, we identify election-cycle effects from within-individual changes in reported immigration worries. We document three main findings. First, we find a statistically significant negative pre-election effect: individuals interviewed within 120 days before a federal election are approximately three percentage points less likely to report being worried about immigration. This result suggests that campaigns do not mechanically intensify anti-immigrant concerns and may temporarily shift issue attention or evaluative frames. Second, election-cycle effects become more pronounced after 2015, indicating that increased politicization heightened the sensitivity of attitudes to electoral proximity. Third, substantial regional heterogeneity emerges: campaign effects vary systematically with baseline migrant shares, AfD vote shares, and the East–West divide, highlighting the importance of local political and demographic contexts. Overall, our findings show that immigration attitudes in Germany are broadly stable yet responsive to electoral dynamics within individuals. The interaction between electoral competition and public opinion appears conditional rather than mechanical, shaped by both temporal shocks and regional patterns of politicization.

723

The Effects of Population Aging on Public Services in Romania: An Econometric and Spatial Approach

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YSS6-Demographic change, ageing and social vulnerability, agosto 27, 2026, 11:00 - 13:00

Demographic transformations represent one of the major challenges facing European states in the 21st century, and Romania is confronted with a particular intensity of these phenomena: accelerated demographic decline, massive emigration, and structural aging — processes that have overlapped within a relatively short period. Declining fertility, the emigration of young populations, and increasing life expectancy have generated structural imbalances in the ratio between the active and dependent population, with direct implications for the financing of essential public services.

This study aims to evaluate the impact of depopulation and demographic aging on the functioning and sustainability of public services in Romania, by integrating classical econometric analysis with spatial statistics methods. The specific objectives focus on analyzing the evolution of the demographic dependency ratio and the aging index over the period 1990–2023, investigating the relationship between these indicators and per capita public expenditure on health and social services, testing for spatial autocorrelation, and estimating spatial regression models to capture regional interdependencies.

The methodology draws on a database aggregated at the NUTS 3 level, enabling the capture of territorial demographic and economic heterogeneity. The baseline econometric model is estimated using the OLS method, with verification of classical assumptions. The spatial dimension is analyzed through the GeoDa platform, employing Moran's I for global spatial autocorrelation and LISA for the identification of local High-High and Low-Low clusters.

The results are expected to confirm the presence of positive spatial autocorrelation in the demographic dependency ratio, with the formation of persistent regional clusters of aging and depopulation concentrated in rural areas of the North-East, South-West Oltenia, and South Muntenia regions. The econometric analysis is anticipated to reveal a positive and statistically significant relationship between demographic indicators and public expenditures, moderated by GDP per capita — with counties of lower economic development simultaneously facing an older population and more limited budgetary resources, a paradox of compound vulnerability.

The strategic relevance of the study lies in providing a rigorous empirical foundation for decisions regarding public resource allocation and social service planning, at both central and local levels, as well as for the optimal use of European structural and cohesion funds aimed at reducing regional disparities. The integration of econometrics with spatial statistics transcends the limitations of uniform national approaches and underscores the need for territorially differentiated public policies, grounded in the specific demographic realities of each region.

425

Characteristics and regional differences in healthcare utilisation for people experiencing homelessness in Hungary, 2015–2021

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YSS6-Demographic change, ageing and social vulnerability, agosto 27, 2026, 11:00 - 13:00

Homelessness became a significant social issue in Hungary following the political transition of 1989. People experiencing homelessness (PEH) face numerous diseases and disabilities in addition to housing insecurity, creating challenges not only for social services but also for the health care system. Their treatment often generates conflicts within public health care, while the professional background and regional distribution of specialised services remain incomplete.
The aim of this paper is to examine the health care utilisation of people experiencing homelessness in Hungary between 2015 and 2021, focusing on regional differences and the main characteristics of their health status. The study also examines the role and territorial distribution of specialised health care providers for people experiencing homelessness.
The research applies a mixed methodology, combining quantitative and qualitative approaches. The literature review provides an international overview, primarily focusing on Eastern-Central Europe, as well as summarises relevant Hungarian antecedents, and content analysis examines the legal interpretation of homeless status. Descriptive statistical analyses assess morbidity patterns, health service utilisation, and institutional data on specialised services.
The database of the National Health Insurance Fund of Hungary (NEAK) includes 11,857 registered homeless individuals entitled to health services during the study period, along with a fivefold control group (59,285 persons) matched by gender and age. Regional analysis covers settlement (LAU 2), county (NUTS 3), and national (NUTS 1) levels. Qualitative data derive from semi-structured interviews with experts (N = 7) and homeless individuals (N = 6), conducted in 2023–2024.
Results show that problems related to social security eligibility are the most decisive barriers to accessing health care. Treatment for PEH is often both a medical and social task. They frequently experience multiple co-occurring severe health conditions — including psychiatric and substance use disorders as well as infectious diseases — which constitute a high level of multimorbidity. Significant regional inequalities exist: specialised services are concentrated mainly in the capital and county seats, and access decreases with settlement size.
The findings support policy proposals aimed at improving health care access for people experiencing homelessness in Hungary.

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The Effects of Drought on the Marriage Market: Forces of Delay and Forces of Acceleration

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YSS6-Demographic change, ageing and social vulnerability, agosto 27, 2026, 11:00 - 13:00

This study examines how climate shocks reshape the timing of women's marriage in Nigeria, treating marriage as a two-sided market in which forces of delay and acceleration coexist. While the climate–marriage literature has focused on child marriage and on the bride's side alone, we ask how growing-season drought affects adult women's first marriage when a covariate shock reaches both the bride's and the groom's families.
Using four waves of the World Bank's LSMS-ISA Nigeria Panel (2010–2019; 26,186 person-years from 6,259 women) merged with high-resolution CHIRPS precipitation data, we estimate a discrete-time hazard model with two-way (individual × year) fixed effects. On balance, drought delays marriage: an additional growing-season drought month in the previous year lowers the annual marriage hazard by about eight to nine per cent, a result robust to placebo tests and to fixed- versus random-effects specifications. Decomposing marriage-market flows locates the adjustment on the bride's side—fewer daughters leave to marry, while the rate at which households take in brides is unchanged.
The net delay masks opposing forces: a fall in the local bride price and the unaffordability of the wedding push marriage back, while bride price as a coping asset, the collapse of a daughter's own farm income, and household vulnerability pull it forward in particular subgroups. These findings suggest that delayed marriage under drought should not be read as improved opportunity or empowerment, but as a marker of household hardship and disruption in a central social institution on which women's security depends.

465

Who stays, who pays? Local Housing Market Adjustments to Immigration in Spain

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YSS7-Place, mobility, housing and urban experience, agosto 27, 2026, 11:00 - 13:00

Spain faces an unprecedented demographic challenge. Declining birth rates and rapid population aging threaten the sustainability of public finances, economic growth, and the efficient allocation of resources. In this context, immigration has emerged as a key driver of population dynamics, with the foreign-born population growing by nearly \textbf{48\%} between 2014 and 2025. This resurgence in immigration flows has sparked an intense public and political debate about the consequences of immigration, not only for the labour market but also for the housing market. This concern is particularly pressing given that, over the same period, housing supply has remained highly inelastic relative to the construction boom of the early 2000s, leaving local housing markets with limited capacity to absorb demand shocks. In this context, and at a time when the government has announced new regularisation measures for 2026, housing has become a focal point of the social and political agenda.

We study how local housing markets adjust to immigration using a novel municipal-level panel that offers substantially greater spatial detail and measurement accuracy than existing evidence for Spain, which largely operates at the provincial (NUTS 3) level and often relies on listing or appraisal values. Our analysis draws on a balanced panel of 699 municipalities (LAU 2 level), those municipalities with more than 10,000 inhabitants, excluding Vasque Country, Navarra, Ceuta and Melilla due to data limitations.), combining administrative population registers (Padrón Continuo) with transaction-level housing data from the Portal Estadístico del Notariado for the period 2014--2025. Housing variables include the average transaction price per square metre and the average transaction price per dwelling.

Our IV estimates show that a one percentage point increase in the local immigration rate raises housing prices by 0.7\% in the short run, with the effect growing to 2.36\% in the long run. These estimates are robust to the use of alternative price measures, including appraisal values and rental prices, although the effects are smaller in those cases.

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Decoding Place Functionality: Identifying Emerging Third Places and the Drivers of Remote Work Visitation via Human Trajectories

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YSS7-Place, mobility, housing and urban experience, agosto 27, 2026, 11:00 - 13:00

The COVID-19 pandemic has reshaped urban dynamics by disrupting the traditional "home-work-third place" triad, giving rise to a new "home-third place-home" spatial pattern. In this structure, 'third places' (i.e. non-traditional work places such as coffee shops and public libraries) increasingly function as workplace (office) substitutes, decentralizing professional activity and potentially driving local housing demand. While classic urban economics links local amenities to increased house prices, the specific impact of remote-work-compatible amenities remains under-researched due to identification complexities. This study develops a novel methodology to identify these emerging third places in the Tel Aviv Metropolitan Area (TAM) and measures their heterogeneous impact on residential housing demand. Utilizing an extensive GPS-signal dataset (2019–2023) mapped to Points of Interest, we adapt the Natural Language Processing Word2Vec model to analyze residents' daily trajectories. This approach successfully identifies new behavioral trends, such as work from home, as well as physical locations that have semantically shifted toward a 'work' concept in the post-pandemic era. We validate the list of detected third places against a ground-truth sample augmented with Google Places reviews. Next, we link this final list of venues with visitor behavioral profiles and local spatial externalities to construct a comprehensive cross-sectional dataset. To understand the spatial distribution of these third places and the drivers behind remote workers' location choices, we estimate two models: an Ordinary Least Squares (OLS) regression for the former, and a Multinomial Logit (MNL) discrete choice model for the latter. The results are communicated to policymakers via an interactive dashboard and mapping tool, allowing users to observe the impact of different location characteristics on the emergence of third places. By providing empirical evidence on changing urban mobility patterns, this research offers policymakers novel, data-driven tools for identifying and quantifying real-time shifts in the increasingly complex relationship between the place of work and residence.

384

Spatial Herfindahl–Hirschman Index (sHHI): A New Density-Aware Market Competition Index Separating Inter-Type Rivalry from Intra-Type Cannibalisation

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YSS8-Rural development, agrifood systems and market organisation, agosto 27, 2026, 11:00 - 13:00

We introduce a new spatial competition index that blends the classical Herfindahl–Hirschman Index (HHI) with ideas from ecological competition. The metric is density-aware: it uses Voronoi catchments to assign population to the nearest unit (e.g., store or school) and summarises concentration at both the unit and type levels. We also extend the index to separate inter- and intra-type competition. As a proof of concept, we use simulations to test the behaviour of the index for different numbers of units and population-density schemes. The simulations show intuitive patterns: concentration rises when units are sited unevenly or when people are clustered; doing both amplifies the effect. Case studies from Warsaw—Żabka as a monopoly-like network, the Biedronka–Lidl duopoly, and public primary schools—are based on real data and serve as an empirical proof of concept. We also frame location choice as a practical optimisation problem for planners (minimise concentration) and managers (strengthen a focal type), showing how a density-aware approach changes the diagnosis and guides siting decisions. Results are robust across data and modelling choices and are reproducible with open data.

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Territorial embedding of agri-food companies in the inner periphery. A comparative case study of two neighbouring Hungarian districts

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YSS8-Rural development, agrifood systems and market organisation, agosto 27, 2026, 11:00 - 13:00

In the last thirty years, while the public debates about rurality have centered on economic decline and unemployment, these areas are still described as the primary space for the agri-food value creation. From a socio-economic perspective, this kind of specialization should not be seen as a negative trend.
This study analyses the impact of agri-food firms on their regions and subjective perception of peripherality. Drawing on ongoing field research and the functional characteristics of the agri-food value chain (AFVC), I identify six categories of firms: input suppliers, agricultural producers, food or beverage processors, dual-profile agri-food producers, wholesalers, and multinational branch plants. To assess territorial embeddedness, the study evaluates five key dimensions (Economic, Social, Institutional, Scientific-Educational, and Environmental-Infrastructural) through methodological triangulation: (1) Academic literature and locally authored scholarly monographs; (2) Annual financial reports of the firms; (3) Semi-structured interviews. The geographical scope of this study is the Mezőtúr and Szarvas districts. Although they belong to different counties (Jász-Nagykun-Szolnok and Békés), these regions are linked by Körös River in the heart of the Great Hungarian Plain.
According to the results so far, the investigated regions show two distinct behaviours. Firms in the Mezőtúr district have become highly dependent on global input suppliers and large food/beverage corporations. In contrast, the Szarvas district has more diverse actors within the AFVCs, although these actors currently operate in parallel rather than cooperating with each other.

641

Tourist Spending Capacity and Greenhouse Gas Emissions: Evidence from European NUTS2 Regions

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YSS9-Tourism, sustainability and place-based development, agosto 27, 2026, 11:00 - 13:00

This paper studies how tourism intensity relates to greenhouse gas emissions across 238 NUTS2 regions in the European Union over the period 2014 to 2023. Using regional accounts, productivity indicators, and emissions data combined with regional tourism statistics, we estimate panel models with region and year fixed effects to isolate within region changes over time. A key contribution is to treat tourism as heterogeneous by distinguishing tourism segments with different spending capacity. We proxy higher spending tourism with nights spent in hotels and lower spending tourism with nights spent in other short stay accommodation such as bed and breakfasts, hostels, and camping sites. This distinction allows us to test whether the composition of tourism flows matters for regional emissions, beyond the overall level of economic activity and structural characteristics.
The empirical specifications control for the scale of economic activity using real GDP and its square, for economic structure using value added in agriculture and in industry and energy, and for technology and efficiency using labour productivity. Because emissions are spatially clustered across neighbouring regions, we also estimate spatial panel specifications that capture interregional dependence through a nearest neighbours weighting scheme, considering both spatial error and spatial lag formulations. This approach accounts for correlated shocks and potential spillovers in emission outcomes across space.
Across specifications, hotel nights are associated with slightly lower total emissions, while nights in other accommodation types display a positive but less precisely estimated relationship. Sectoral regressions suggest that differences between the two tourism segments are most evident for building related emissions, indicating that the accommodation channel plays an important role in the aggregate pattern. In contrast, higher spending tourism correlates positively with transport and waste emissions, consistent with mobility and consumption channels that may offset building related reductions. Emissions from agriculture, industry, and public use energy show weaker and less precisely estimated links to tourism flows.
Overall, the results indicate that the tourism emissions relationship is not uniform across sources and depends on the composition of tourism demand. The findings point to targeted policy priorities, combining energy efficiency measures in accommodation with transport and waste management strategies, and highlight the value of spatial coordination given the presence of interregional dependence.

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Place Based Research for Sustainable Development Policies. A global / local view of world countries using Generalized Q Analysis

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YSS9-Tourism, sustainability and place-based development, agosto 27, 2026, 11:00 - 13:00

The aim of this paper is to analyse the evolution and structural interdependence of Sustainable Development Goals (SDGs) across 130 countries over the period 2019–2023, with a specific focus on the role of digital readiness in shaping sustainable development trajectories. Using a Generalized Q Analysis (GQA) framework, the study integrates ten normalized SDG indicators-including dimensions related to capital accumulation, growth, and digitally mediated capacities-into a multidimensional structure, generating 2^{10} = 1,024 possible development profiles and 650 country-year observations. The results reveal a strongly polarized two-dimensional structure. The first component-interpreted as Digital and Capital Readiness-accounts for nearly 90% of the total variance and reflects the joint accumulation of natural, human, productive, and digitally enabled institutional capital. The second component-associated with Short-Term Economic Stability and Growth Dynamics- explains about 5% of the variance and captures cyclical movements in growth, employment, and inflation. The first component is significantly stronger in developed economies characterized by higher institutional quality and digital capacity. By contrast, the second component exhibits greater volatility over time and is more pronounced in low-income countries, where growth dynamics are less supported by digital and institutional complementarities.
Overall, the findings highlight that contemporary sustainable development is increasingly shaped by digitally mediated interactions between capital accumulation, institutional capacity, and economic growth, and that digital transformation plays a critical role in determining both the resilience and direction of national development paths.

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