

# CONVERGENCE AND DIVERGENCE: THE DUAL IMPACT OF ECONOMIC AGGLOMERATIONS ON DEVELOPMENT OF MICROREGIONS. BIHOR COUNTY STUDY CASE

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**Abstract.** *Economic agglomerations refer to the grouping of companies, services and institutions within a specific geographical area, leading to a growing concentration of economic activities. These agglomerations make it easier not only for the enhanced collaboration between companies, but also the sharing of knowledge and resources. The grouping of economic activities promotes a favourable environment for innovation, collaboration and competitiveness, contributing to the overall productivity of the region. This phenomenon can be observed in urban centers and industrial parks, where synergy between companies and the associated labour pool considerably improves economic performance.*

*Although economic benefits can feed sustainable growth, the social fabric of local communities can be impacted by the pressures carried out by agglomeration economies. This includes the potential degradation of community ties, cultural identity and social cohesion. As companies dispute resources, microregions can experience increased costs, potentially leading to economic inequalities.*

*In the county of Bihor, located on the internal EU border separating Romania and Hungary, the economic agglomeration emerged as a critical mechanism that facilitates regional development, such as the interaction of local businesses, labour markets and external economic influences moderate its growth trajectory.*

**Keywords:** *talent, global, management, cross-border, Japan, innovation, transformation*

## 1. UNPACKING AGGLOMERATION ECONOMIES: THEORETICAL FOUNDATIONS AND IMPACTS ON THE REGIONAL GROWTH

Agglomeration economies have emerged as a cornerstone of regional economic theory, offering a comprehensive framework to elucidate the benefits derived from the geographic clustering of economic activities.

The study of agglomeration economics traces its origins to Alfred Marshall, who emphasized that firms gain strategic advantages from geographic proximity – chiefly through a common labor pool, knowledge spillover, and access to specialized suppliers,

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collectively known as the "Marshallian trinity" (Marshall, 1920). Ciccone and Hall underscore the pivotal role of agglomeration economies in fostering urban development and driving economic growth in various contexts (Ciccone and Hall, 1993). Their analysis highlights how industrial concentration enhances productivity, propelled by mechanisms such as labor market pooling – which expands employment opportunities – and the exchange of knowledge among firms and individuals. These synergistic interactions not only reshape urban environments and invigorate local economies but also exert a profound influence on broader economic trajectories. Ciccone further illustrates that the advantages of agglomeration transcend mere cost efficiency, encompassing positive externalities like knowledge spillovers and technological progress (Ciccone, 2002). Understanding the interplay of these factors is essential for recognizing the competitive advantages that clusters can generate, as pointed out by Pessoa in his assessment of agglomeration versus comparative advantages (Pessoa, 2014). In this context, clusters become hubs for innovation, shaping the broader economic scenario. Porter connects the concept of agglomeration economies to competitive advantage through his research on clusters (Porter, 1990; Porter, 2000). These clusters embody agglomeration economies by enhancing productivity, fostering innovation, and encouraging the formation of new businesses. As a result, Porter's competitiveness concept has been applied to assess regional performance. Regions that successfully nurture these groups often experience higher productivity levels, as companies leverage the skills and technologies developed within the cluster to streamline operations and bolster their competitive advantage (Martin and Ottaviano, 2001; McCann and Van Oort, 2019).

The advantages experienced by companies and individuals when they are geographically grouped lead to increased productivity and innovation, as well as opportunities for knowledge exchange and labor market efficiency (Quigley, 2013; Hacker et al., 2013). The proximity of firms accelerates transactions and lowers operational costs, thereby improving overall productivity (Rosenthal and Strange, 2004; Liu et al., 2024). Fujita, Krugman and Venables demonstrate that increasing returns due to external economies of scale, transport costs, and the demand for manufactured goods can explain why economic activities tend to agglomerate in specific areas. Additionally, localization economies, which arise from industrial specialization and clusters, can also become significant in smaller regions (Fujita et al., 1999).

A fundamental aspect of agglomeration economies is the concept of space closeness, which enables companies to benefit from various synergies that improve their competitive advantage. Fujita illustrates that the formation and growth of economic agglomerations often result from the interaction of market forces and geographical factors (Fujita, 2008). Clusters emerge in specific locations due to the effective use of shared resources and services by companies. This grouping not only reduces costs, through shared suppliers and services, but also fosters an environment conducive to collaboration, innovation, and skill development.

The dynamics of economic agglomerations are influenced by infrastructure development, which plays a significant role in facilitating connections and accessibility (Graham and Kim, 2008). Infrastructure investments tend to enlarge agglomeration economies by reducing transaction costs and allowing companies to operate more efficiently. As urban agglomerations grow, the need for effective planning and governance becomes indispensable to adequately exploit these benefits, guaranteeing sustainable growth and competitiveness.

A contemporary perspective on agglomeration economies emphasizes cultural and ecosystem services relating to urban contexts. Scholars suggest that integrating cultural ecosystem service flows into the analysis of agglomerations can enhance the understanding of these phenomena by incorporating non-economic development metrics (Xiao et al., 2017). This approach broadens the conceptualization of urban environments and establishes a meaningful link between agglomeration economies and the discourse on sustainability.

However, while economic agglomerations have numerous advantages, they also encapsulate complexities and challenges for local communities and economies. The concentration of industries in urban areas, as a direct result of agglomeration economies, not only reinforces economic growth but also shapes regional disparities in development. Castells-Quintana and Royuela indicate that, although agglomeration economies serve as catalysts for accelerated growth in urban regions through greater productivity and innovation, these same processes can inadvertently deepen socio-economic divisions (Castells-Quintana and Royuela, 2014). As industries are grouped into urban centers, certain populations can benefit from the increase in employment opportunities and higher wages, while others, particularly those in peripheral or rural areas, may experience stagnation or decrease. This bifurcation is indicative of a broader trend in which the spatial concentration of economic activities creates winners and losers, often marginalizing less competitive regions.

Jacobs argued that diversity within groups is essential to creating a resilient economy, giving rise to the concept of *Jacobs's externalities* (Jacobs, 1969). This notion contrasts with the ideas of Krugman, which acknowledged that while agglomeration may lead to increased economic efficiency, it can also expose regions to vulnerabilities resulting from economic shocks (Krugman, 1991). These vulnerabilities induce socio-economic conflicts promoted by acute inequities and environmental challenges exacerbated by dense urban growth. Fujita and Krugman articulate that while grouping can promote regional growth, it can also lead to unforeseen negative externalities, such as environmental degradation and urban expansion, which present significant challenges for policy formulators. While the agglomerations bring benefits to certain regions, they can also exacerbate inequalities, since smaller cities and rural areas may have difficulty competing for resources and talents (Fujita and Krugman, 1995; Fujita and Krugman, 2004).

The examination of these academic contributions highlights the imperative for regional actors to not only advocate for the advantages of agglomeration economies, but also to actively confront the diverse challenges inherent in urban environments. The intricate relationship between agglomeration, innovation, and productivity underscores the need for comprehensive policy approaches that leverage these dynamics to foster regional growth. Consequently, effective development strategies must embrace the complexities of agglomeration, guiding regions toward sustainable and context-sensitive growth trajectories.

## 2. METHODOLOGICAL APPROACH

**Research Objectives and Hypotheses.** This study investigates the dual impact of economic agglomerations on regional development, with a particular focus on microregional dynamics in Bihor County, Romania. The central objective is to identify and analyze the factors that influence development trajectories by examining the

interaction between agglomeration economies, competitiveness, and sustainable growth. To guide this inquiry, the following research hypotheses are proposed:

*H1. Economic agglomerations shape the growth and development trajectories of microregions, through the interaction of economic and social forces*

*H2. The socio-economic structure of Bihor County represents a successful model of economic agglomeration, meeting the necessary conditions to function as regional competitiveness pole and a driver of economic growth*

**Research Design.** The study adopts a *qualitative case study design*, which enables an in-depth exploration of the complex and context-specific relationships between agglomeration economies and regional development. The case study method is particularly appropriate for examining convergence and divergence processes within microregions, as it allows for the integration of multiple data sources and analytical perspectives.

Bihor County was selected as the focal case due to its distinctive socio-economic profile and its strategic position within northwestern Romania. The region exhibits both the benefits and challenges associated with economic agglomeration, making it a suitable context for testing the proposed hypotheses. The case study approach facilitates a nuanced understanding of how local economic structures, governance mechanisms, and spatial dynamics interact to produce differentiated development outcomes.

The study is built on data collected from a mix of sources, including statistical indicators from national and regional databases, policy documents, regional development plans, and academic literature on agglomeration economies and microregional development. Spatial and economic data were also analyzed to assess patterns of industrial concentration, labor mobility, infrastructure investment, and socio-economic disparities.

The study also incorporates a *comparative dimension*, examining intra-county variations between urban centers (e.g. Oradea) and peripheral rural areas to assess the spatial distribution of agglomeration benefits and externalities. This approach enables the identification of policy-relevant insights for promoting balanced regional development.

### **3. INTERSECTING PATHWAYS: DYNAMICS OF MICROREGION CONVERGENCE AND DIVERGENCE**

The concepts of *convergence* and *divergence* in microregions are essential to understand the intricate nature of regional dynamics and the interplay of diverse influencing factors. *Convergence* describes the process through which microregions evolve toward greater economic, social, or political uniformity, often fostering a more cohesive regional identity. In contrast, *divergence* reflects the growing differentiation among microregional areas, leading to distinct socio-economic environments and uneven living standards.

The trajectory of convergence within microregions is profoundly shaped by economic, social, and political factors, each exerting distinct yet interconnected influences on development patterns and socioeconomic structures.

Economically, convergence is driven by business relations, investment flows, and labor mobility, particularly when positive externalities are harnessed or when policy frameworks actively promote regional cooperation. Conversely, divergent economic strategies or the uneven allocation of resources can deepen disparities, fostering economic isolation among microregions.

Social dynamics also play an essential role. Shared cultural heritage, common languages, and collective social practices can foster cohesion, encouraging collaboration and reinforcing a shared regional identity. In contrast, cultural heterogeneity may hinder cooperation, leading to fragmentation and the entrenchment of distinct local identities. These social dimensions are closely intertwined with political contexts, where governance

structures and policy choices can either facilitate cultural integration or perpetuate divisions.

Politically, the direction of convergence or divergence is contingent upon institutional capacity, policy coherence, and governance models. Political initiatives that prioritize regional integration – through collaborative policies, joint ventures, and investment facilitation – can strengthen economic convergence. However, political fragmentation and conflict, particularly when local governance favors autonomy over cooperation, may obstruct integration and reinforce divergence.

Economic agglomerations play a pivotal role in shaping the growth and development paths of microregions, creating intricate interdependencies across social, political, and infrastructural dimensions (Pike et al., 2016; Mdalose and Biyela, 2025). These interactions can yield both beneficial outcomes – fostering *positive convergence* – and adverse effects – intensifying *negative divergence*. The outcomes are influenced by the nature of externalities<sup>1</sup> and how effectively location-based resources and advantages are utilized (Jacobs, 1984; Krugman, 1991; Porter, 2003; Johansson, 2005; Fujita and Thisse, 2012).

By concentrating economic activities, agglomerations produce positive externalities that enhance local resilience and competitiveness, exerting a substantial influence on the socio-economic trajectories of adjacent microregions (Riain, 2010). Economic agglomerations derive their significance from a multifaceted ability to foster growth and drive convergence through various mechanisms.

A primary driver is *the improvement of the efficiency of labour markets*. When companies are located close to each other, they can benefit from a wider pool of work resources, shared infrastructure, and specialized services. Workers benefit from increased employment opportunities, while firms gain access to diverse skill sets, resulting in a more competitive labor market. This improved matching between employers and job seekers contributes to higher productivity levels (Glaeser and Resseger, 2009; Fujita and Thisse, 2012). Moreover, the concentration of companies attracts talent and expertise, cultivating an environment conducive to collaboration and innovation. This thriving labour market can subsequently stimulate spillover and knowledge sharing among companies, enhancing innovation and promoting a competitive advantage at both local and regional levels (Feldman, 2014).

*The spillover of knowledge* is also a driver of convergence. When companies operate in cluster environments the informal exchange of information can catalyze innovation (Audretsch and Feldman, 1996; Feldman, 1999). Close proximity facilitates the exchange of ideas and expertise, spurring innovation and technological advancement. Consequently, firms benefit from stronger collaborations, partnerships, and business relationships (networking opportunities).

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<sup>1</sup> The nature of externalities refers to positive externalities (such as spillover of knowledge or increased interaction between companies), and negative externalities (such as urban congestion or environmental degradation)

*Infrastructure development* is another critical aspect influenced by economic agglomerations. In urban contexts in particular, agglomerations can increase public and private investments in infrastructure, leading to better transport, public services and services, which further attract companies and qualified workers (Fujita and Thisse, 2013). Investing in infrastructure not only benefits companies in agglomerated areas but also enhances access to services for the workforce, thereby improving the quality of life and attracting further investments. These infrastructure improvements are often considered positive externalities of the economic agglomeration, promoting a wider regional development as they allow better connectivity and resources for the surrounding communities (Duranton and Puga, 2003).

*Economies of scale* are also integral to the discussion on agglomeration. As companies grow and cluster together, they can benefit from lower production and service costs. Additionally, they gain from shared infrastructure like transport and logistics, as well as customized support services for the needs of specific industries. The group effect encourages companies to layers of complementary skills and services, allowing greater productivity and the creation of new jobs. For example, industries such as technology and manufacturing often experience higher growth rates in urban centers due to the synergistic effects of proximity to suppliers, customers and competitors. (Glaeser and Resseger, 2009). This competitive advantage can lead to an increase in market share, attracting both national and foreign investments, which is fundamental for the economic vitality of micro-regions (Porter, 1998).

The concentration of economic activities also presents significant *challenges* that require careful examination. While agglomeration can yield substantial benefits, these advantages are often unevenly distributed, potentially deepening social and economic inequalities both within and across regions.

*Regional disparities* constitute a significant issue arising from economic agglomerations (Castells-Quintana and Royuela, 2014; Mukhlis et al., 2018). As cities attract companies and talent, the consequent economic polarization can exacerbate income disparities within the region, because wealth accumulates within certain sectors at the expense of others (Iammarino et al., 2019; Nijman and Wei, 2020). This divergence often results in limited access to resources, investment, and employment opportunities for the less agglomerated areas. The influx of highly qualified workers together with a growing cost of living can marginalize low-income people, creating wealth and poverty enclaves. As individuals of higher income are clustered in these environments, the demand for low qualification work can decrease, effectively marginalizing low-income residents. The consequences include *social tensions* and social exclusion, forcing these populations to move to less desirable or more remote areas (*social displacement*) (Floererkemeier et al., 2021).

Addressing these *inequalities* can be achieved through solutions such as improved transport networks, enhanced digital connectivity, the expansion of essential public services, and targeted investments in underdeveloped regions (Castells-Quintana and Royuela, 2014; Wei, 2015; Chen and Haynes, 2017).

Local communities often face significant *social and economic challenges due to infrastructure development*. These challenges can include the relocation of people, changes in traditional livelihood patterns, environmental impacts, and an unequal distribution of benefits (Cernea, 2000; Castells, 2002). Therefore, a thorough and balanced evaluation of these impacts is essential to ensure that infrastructure

development not only delivers economic advantages but also enhances social welfare and equity (Shrestha et al. 2022).

The economic agglomerations can create *a competitive disadvantage for small businesses*. As the largest companies consolidate their presence, smaller entities can have difficulty competing for resources and qualified work, resulting in an unequal distribution of employment opportunities within the agglomerated area (Rosenthal and Strange, 2010; Alcácer and Chung, 2014). This concentration of the industry can ultimately affect the resilience of local economies to economic recessions, since the excessive dependence of a few selected industries exposes them to systemic risks (Hassink, 2010; Smallbone et al., 2012).

Microregions can adopt policies that foster local entrepreneurship to counteract the external competitive pressures brought about by agglomeration. By supporting small and medium-sized enterprises (SMEs), the region can diversify its economic base, reducing reliance on the largest agglomerated companies that often dominate the economic landscape. Initiatives such as providing access to microfinance, establishing incubators, and facilitating networking opportunities can help cultivate an entrepreneurial ecosystem that thrives amidst the challenges of agglomeration.

In terms of *environmental implications*, economic agglomerations may present a double narrative. On the one hand, the concentration of economic activities can lead to negative externalities such as increased pollution and exhaustion of resources, negatively impacting local ecosystems (Liu et al., 2024). On the other hand, agglomerations can catalyse positive environmental initiatives. The close proximity of companies encourages collaborative efforts towards sustainable practices. This includes sharing resources, exchanging knowledge, adopting cleaner technologies, and developing regional policies that prioritize environmental well-being (Ahvenniemi et al., 2017; Ženka et al., 2019). Therefore, microregions can capitalize on the benefits of agglomeration to pursue more sustainable growth paths, enhancing both the quality of life for residents and the region's appeal to potential investors.

Economic agglomerations often act as double-edged swords, offering substantial benefits while also creating significant social challenges. On one hand, the influx of companies can boost local employment and stimulate economic activity, leading to higher wages and improved public services for residents. On the other hand, rapid industrial growth can exacerbate inequalities, cause urban displacement, increase social stratification, and lead to environmental degradation, with local governments struggling to keep up with infrastructure demands. These dynamics necessitate careful consideration and strategic policy interventions to ensure that the benefits of agglomeration are equitably distributed and contribute to the community's well-being.

#### **4. BIHOR COUNTY – MICROREGIONAL PATTERNS AND THE SPATIAL LOGIC OF ECONOMIC AGGLOMERATION**

Microregions offer key insights into localized patterns of social and economic change. This section explores the complex interplay between economic agglomerations and microregional development in Bihor County, Romania. It highlights the evolving dynamics of economic forces and emphasizes the critical importance of place-based growth strategies in adapting to broader economic trends and structural transformations.

Bihor County, situated in the north-western region of Romania, stands as a compelling example of economic agglomeration. Its strategic border position adjacent to Hungary, combined with a rich historical and multicultural heritage, has significantly

influenced its economic trajectory and strengthened its role as a catalyst for cross-border economic integration. In terms of economic performance, Bihor ranks as the second-largest contributor to GDP within the North-West Development Region and holds the 11th position nationally among Romanian counties in its contribution to the country's overall GDP (*Integrated Sustainable Development Strategy of Bihor County 2021–2027; North-West Regional Development Agency. Regional Development Plan 2021–2027*). The region illustrates the dynamic interplay between urban economic hubs – particularly in Oradea, the county's capital – and the surrounding areas, which frequently rely on the opportunities and growth spurred by these concentrated economic activities.

Economic agglomerations in Bihor County shape the region's socioeconomic landscape through a complex and multidimensional impact. These concentrations of economic activity not only enhance local economic performance but also generate far-reaching effects across sociocultural spheres, influencing migration trends and shaping patterns of community cohesion. Effective management of these changes requires the proactive engagement of relevant stakeholders to capitalize on emerging opportunities while mitigating the adverse consequences associated with accelerated development.

This section examines the strategies employed by county policymakers to *foster convergence, mitigate divergence* and enhance regional competitiveness by leveraging the benefits of economic agglomeration.

#### 4.1. Fostering convergence in Bihor County

The economic landscape of the region has undergone a significant transformation with the *establishment of industrial parks*. These hubs not only attract substantial investment but also generate employment opportunities and foster workforce development. Supported by local government policies, these infrastructure initiatives enhance the region's appeal by offering business environments conducive to innovation and entrepreneurship.

The development of industrial business parks exemplifies a form of competitive economic agglomeration, functioning both as a magnet for investment and a catalyst for multiplier effects. These parks offer a range of advantages, including lower infrastructure and investment costs, access to a skilled yet cost-effective labor force, and strategic proximity to key sales markets, suppliers, highways, airports, and railway hubs. The integration of modern production methods and the emergence of new companies within these parks have also stimulated growth in related service sectors, significantly expanding employment opportunities across the region. Consequently, these parks serve as key hubs for job creation, attracting both local and foreign investors.

**Table 1.** Industrial business parks in Bihor County (Source: Oradea Local Development Agency, *Activity Report 2024*)

			Surface	Companies (2024)	Occupancy rate
Industrial Park	Eurobusiness	Oradea I	144.73 ha	53	100%
Industrial Park	Eurobusiness	Oradea II	78.76 ha	46	100%
Industrial Park	Eurobusiness	Oradea III	17 ha	27	100%

Industrial Park Eurobusiness Oradea IV	6.51 ha	0	0%
Tileagd Industrial Park	9.3 ha	3	70%
Săcuieni Industrial Park	5.03 ha	0	0%
Tămășeu Industrial Park	6.87 ha	0	0%
<b>TOTAL</b>	<b>268.2 ha</b>	<b>129</b>	

Beyond the currently operational parks, the Bihor County Council has launched the development of four smart specialization parks<sup>2</sup>, offering significant new opportunities for investors. This initiative aims to generate employment across the county, ideally near residents' homes, fostering balanced growth in Oradea as well as in other parts of Bihor.

**Table 2.** Smart specialization parks in Bihor County (Source: Oradea Local Development Agency, *Activity Report 2024*)

	Surface	Parcels	Works' execution stage
Smart Specialisation Park Aleșd	8.5 ha	11	23%
Smart Specialisation Park Beiuș	17.5 ha	16	in development
Smart Specialisation Park Marghita	11 ha	9	51%
Smart Specialisation Park Ștei	13.6 ha	24	100%

Within these industrial parks, both domestic and foreign investors benefit from a range of administrative support and incentives. This includes proactive communication with local authorities, timely updates on state aid and EU funding programs, and guidance in navigating interactions with governmental and public institutions. Investors also gain access to tailored training programs, assistance with legal approvals and permits, and tax breaks designed to simplify procedures and accelerate implementation (Oradea Local Development Agency, *Board of Directors Activity Reports*).

In response to increasing competition among cities for investment, local leaders have adopted targeted strategies to enhance the region's attractiveness. These efforts include building residential complexes tailored to incoming professionals and establishing a multifunctional social center featuring a hotel, restaurant, conference rooms, fitness facilities, retail outlets, a medical office, parcel services, and early childhood education for employees' families (Oradea Local Development Agency, *Projects*).

The locational advantages of the industrial parks are twofold. First, Romania occupies a pivotal position along the emerging "new silk road" of economic growth, a transcontinental Eurasian trade corridor envisioned as a strategic platform for investment, infrastructure development, and international commerce. Second, the city of Oradea, situated in northwestern Romania near the Romanian-Hungarian border, benefits from enhanced accessibility to national transportation networks and direct integration into

<sup>2</sup> *The smart specialization park* is an industrial park that promote developments and investments with an innovative edge, focusing on smart development through cutting-edge technology and innovation at both the process and product levels

major European trade routes. This geographic positioning facilitates cross-border economic interactions and strengthens the region's connectivity within broader European supply chains.

Bihar county benefits from an attractive and competitive business climate, supported largely by industrial parks that act as development engines (Oradea Local Development Agency, *Investors in Oradea*; Oradea Local Development Agency, *Board of Directors Activity Reports*). The industrial parks contribute significantly to:

- *job creation* – over 20.000 of the 96.000 local jobs have been generated by companies investing in Oradea and its Metropolitan Area
- *business network diversification* – the presence of investors often attracts their suppliers and clients, reinforcing the agglomeration economy's multiplier effect
- *investment growth* – cumulative investments in the industrial parks have surpassed €580 million
- *regional economic expansion* – one-third of salary tax revenues are directed into the city's budget, fueling local development
- *boosting national economic contribution* – the region's growing output has led to increased participation in Romania's GDP
- *improving community well-being* – economic vitality has translated into enhanced quality of life for residents

Economic concentration serves as a *powerful driver of local business growth*, triggering a cascade of effects on entrepreneurship and innovation. The dynamic interplay among diverse industries encourages deep collaboration, sparking innovative ideas and business models that might not emerge in isolation. Moreover, the competitive environment cultivates a culture of continuous improvement, motivating local firms to enhance productivity and expand their service offerings. This agglomerated setting also facilitates robust networking among entrepreneurs, enabling small and medium-sized enterprises (SMEs) to scale up and integrate into broader supply chains, further embedding their operations within the regional economy.

According to the *City Index 2024*, Oradea – the county's development engine – exhibits the highest entrepreneurial density among Romanian cities with populations under 200.000 (RisCo, 2024). This indicator – closely associated with regional economic performance and development – is significantly shaped by progressive local governance. The city's entrepreneurial vitality is reflected in its dynamic business environment; by the end of 2022, Oradea reported 8 active enterprises per 100 inhabitants, positioning it third nationally in terms of entrepreneurial density. This thriving business climate contributes to the city's notably low unemployment rate and underscores the effectiveness of its localized economic model.

Oradea exemplifies a well-structured and supportive entrepreneurial ecosystem, characterized by access to financial instruments, strategic public policies, fiscal incentives, business development programs, and advanced infrastructure. These elements collectively foster innovation and promote sustainable economic growth.

In the domain of technological entrepreneurship, Oradea ranks fourth nationally among cities with active tech startup communities. The city is increasingly recognized as a hub for startup activity and innovation. Its upward trajectory was highlighted in the *Startup Ecosystem Report 2025* by Startup Blink, an internationally acknowledged authority on startup ecosystems (Startup Blink, 2025). In the latest report, Oradea advanced 15 positions in the global rankings compared to the previous year, registering

the highest national growth rate of 22.1%. The city currently holds the 729th position out of 1,000 cities worldwide.

The development of business and technology park incubators has played a pivotal role in attracting startups and nurturing innovation. The region's conducive environment continues to draw entrepreneurs, investors, and skilled professionals. Key sectors – including information technology, software development, e-commerce, renewable energy, and tourism – are experiencing accelerated growth. The local startup ecosystem is further energized by an expanding network of co-working spaces, incubators, and accelerator programs, notably the Bright Labs Incubator, supported by the *Make IT in Oradea* initiative (Make IT in Oradea). These efforts are successfully engaging young entrepreneurs from across the region and the Romanian diaspora.

Moreover, strategic collaboration between the local university and career-oriented training centers has facilitated the development of a workforce aligned with contemporary market demands. This synergy enhances business performance and contributes to the city's economic resilience and long-term sustainability.

Economic agglomerations in the region have played a crucial role in *attracting both national and foreign investments*. By fostering a supportive environment for entrepreneurship, these groups have successfully drawn investors looking to leverage the benefits of a concentrated business setting.

Bihor County has consistently demonstrated its capacity to attract foreign direct investment, thereby reinforcing its position as a prominent economic agglomeration within Romania. As of the end of 2023, the county hosted a total of 10,335 foreign-owned enterprises, ranking fifth nationally in terms of foreign company presence (Bihor Online, 2025). This performance is indicative of a dynamic and resilient local economy, supported by institutional frameworks that facilitate international business development. Furthermore, the value of subscribed social capital in Bihor County reached approximately €1.4 million, positioning the county fourth at the national level (Bihor Online, 2025) and underscoring the region's economic potential and its sustained attractiveness to foreign investors.

Collectively, these indicators highlight Bihor County's emerging role as a leading destination for international capital inflows, even in the context of broader national economic uncertainties.

The presence of established companies can also pave the way for new entrants, as the newest companies benefit from the existing supply chains, customer bases and market insights developed by their more experienced counterparts.

The *development of infrastructure* in the region has been vital in driving economic growth, advancing social progress, and strengthening regional connectivity. Bihor County has witnessed significant improvements in infrastructure, such as road networks and digital connectivity, thanks to targeted investments inspired by the benefits derived from existing agglomerations (*North-West Regional Development Agency. Regional Development Plan 2021–2027; Integrated Sustainable Development Strategy of Bihor County 2021–2027; Project Portfolio of the Bihor County Council, 2025*).

To achieve these development goals, the Bihor County Council has an ongoing project portfolio valued at over 880 million euros (as of 2024), with completed projects worth more than 340 million euros in key areas such as road, railway and gas infrastructure, education, business environment, culture, and environmental protection (Bihor County Council. *List of Support Projects*; Transilvania Business, 2025). Key achievements to date include:

- opening of 51 kilometers of county roads and beltways, along with 9 kilometers of the Oradea Metropolitan ring road now open to traffic
- delivery of major infrastructure projects such as the Oradea School Campus and the Science and Technology Park
- expansion of the regional natural gas distribution network
- significant upgrades to Oradea Airport, including a new passenger terminal financed with €40 million in European funds and a 420-meter runway extension
- establishment of Romania's first air cargo terminal in Oradea, directly linked to both the airport and the Eurobusiness II Industrial Park
- operationalization of the Vama Borș II motorway crossing point, enhancing regional mobility and establishing a strategic connectivity corridor between Romania and the broader European space—driving economic and social progress in Oradea and its surrounding areas

The infrastructure improvements represent positive externalities of economic agglomeration that foster regional convergence. The improved transport networks, including the continuous expansion of Route E60 and the proximity to Oradea International Airport, have facilitated better market accessibility and streamlined the movement of goods and services. Since the completion of these infrastructure updates, local companies have reported a 20% increase in operational efficiency, attributed to reduced logistics costs and improved supply chains. Additionally, this upgraded infrastructure has had a spillover effect, attracting even more investments to the region as companies increasingly seek locations offering efficient logistics advantages.

*Cross-border initiatives* have significantly contributed to the synergy between Romanian and Hungarian regions, fostering economic agglomerations that reinforce and energize the local economy. The initiatives launched during 2007-2013, 2014-2020, and 2021-2027 programming periods illustrate a progressive landscape for the county of Bihor, which actively shapes the regional economic environment through cooperative strategies (*Interreg Romania-Hungary Programme; Bihor County Strategy; Interreg VI-A Programme Romania-Hungary 2021-2027*). The joint actions aimed to enhance the quality of life for the population in the cooperating territories, with a focus on innovation, healthcare, education, employment, and labour mobility. These cross-border partnerships leverage shared resources, skills, and infrastructures, creating a favorable environment for sustainable economic growth, including new roads for trade, tourism, and investments (Șoproni, 2023).

EU funds have been instrumental in driving innovation and technological advancements within local companies. The programs have led to an increase in the number of startups in Bihor County and the adoption of modern technologies by established companies. This has resulted in higher productivity, enabling local businesses to integrate into larger networks and fostering a collaborative economic environment that enhances regional competitiveness. The influx of funding not only assists local governments in executing development plans but also fosters public-private partnerships, creating a robust network of stakeholders committed to the region's economic vitality.

The dynamics of the labor market are closely tied to cross-border cooperation. In Bihor County, the workforce benefits from increased employment opportunities as regional economies become more interconnected (*North-West Regional Development Agency. Regional Development Plan 2021–2027; Integrated Sustainable Development Strategy of Bihor County 2021–2027*). The mobility of labor between Romania and Hungary facilitates the transfer of skills and promotes a more qualified workforce that

can quickly adapt to the needs of local industries (Bădulescu et al., 2014). The ability of workers to move across borders not only expands job opportunities but also enhances the quality of life for those engaged in cross-border work.

#### 4.2. Mitigating divergence in Bihor County

In Bihor County, *economic polarization* is particularly evident between urban centers, especially Oradea, and the surrounding rural areas. Oradea serves as the county's economic engine, benefiting from its status as a regional center that attracts investment and promotes economic activity. Conversely, peripheral areas experience stagnation or minimum growth, characterized by high unemployment rates and limited access to resources and services (*Bihor County Statistical Yearbook 2024; Integrated Sustainable Development Strategy of Bihor County 2021–2027*). This dichotomy reflects broader trends observed internationally, where similar agglomeration models lead to pronounced inequalities (Boldea et al. 2012).

Moreover, these disparities have far-reaching effects beyond immediate economic performance; they impact social cohesion in the region. The inequalities create a divided economic landscape where opportunities are disproportionately available to those in urban agglomerations, leaving rural residents marginalized.

*Regional disparities* are exacerbated by limited public investment in the rural areas, as municipalities tend to prioritize funding for urban centers that promise faster economic returns. This results in a stark contrast in the quality and availability of essential services, such as education and healthcare, creating an environment where peripheral areas are often excluded from the economic cycle that fuels the growth of urban centers.

The impact of economic crises on regional disparities in Bihor cannot be overstated. Significant crises, including financial recessions and public health emergencies, have exacerbated regional inequalities (Antonescu and Florescu, 2024). During economic recessions, the vulnerabilities of peripheral regions are often magnified, as companies in less competitive and diversified sectors are more prone to failure.

The disparities in development within Bihor become evident when analyzing indicators such as income levels, employment rates, and industrial diversification in various urban and rural centers (*Integrated Sustainable Development Strategy of Bihor County 2021–2027; Bihor County Statistical Yearbook 2024; The Social and Economic Situation of Bihor County in the Year 2024; Monthly Statistical Bulletin of Bihor County – 2025*). Urban areas, like Oradea, have experienced solid economic growth, with increased investments in technology and services. In contrast, more rural areas, such as the eastern and western fringes of the region, have limited economic diversification and often rely on traditional sectors like agriculture. The lack of investment in these peripheral regions exacerbates the existing economic divide, leading to a scenario where urban fringe areas thrive while rural locations struggle.

*Income inequality* is particularly pronounced within Bihor County, as the economic benefits of agglomeration disproportionately favor those residing in the most developed urban centers (*Integrated Sustainable Development Strategy of Bihor County 2021–2027; The Social and Economic Situation of Bihor County in the Year 2024*). Urban areas enjoy the highest levels of investment, a better commercial climate, and greater accessibility to services, leading to higher average incomes. In contrast, peripheral rural areas often fall behind, suffering from decreasing economic opportunities and salary

stagnation. The persistent urban-rural income gap is a significant indicator of divergence, as populations in less favorable economic conditions may experience a decrease in living standards, exacerbating socio-economic challenges.

The labor market dynamics present several challenges. While the agglomeration of economic activities promotes job creation, it also leads to *disparities in salary levels and skill requirements*, exacerbating inequalities within the local workforce (*Integrated Sustainable Development Strategy of Bihor County 2021–2027; The Social and Economic Situation of Bihor County in the Year 2024*). The potential division between low and highly qualified workers necessitates specific political interventions to ensure that the benefits of economic agglomeration are distributed equitably. Addressing these disparities is crucial to maximize the positive impact of agglomeration on labor market dynamics, thereby contributing to a sustainable and inclusive regional development strategy.

These disparities extend beyond immediate economic performance. They affect social cohesion, lead to *socio-economic exclusion*, and result in decreased investment in education and skill development in rural micro-regions. This perpetuates cycles of poverty and hinders significant progress towards equitable development.

In light of these considerations, policies aimed at improving connectivity, accessibility and quality of life through infrastructure projects are essential to bridge the development gap within the county while leveraging the potential of urban agglomeration. Local authorities are pivotal in fostering economic agglomerations while mitigating their potential negative impacts on microregional development. Equally important is emphasizing the value of strategic, collaborative governance and cross-border initiatives to effectively tackle the challenges of uneven development (Șoproni, 2023; Chirodea et al., 2024; Pantea and Brie, 2020).

## **5. FINAL REMARKS. BIHOR COUNTY – FACING CHALLENGES, EMBRACING OPPORTUNITIES**

The dynamics of economic agglomeration in Bihor County reveal a dual impact on microregional development, serving as both a catalyst for growth and a source of structural challenges. Spatial analysis of economic activity underscores a marked concentration in urban centers, particularly Oradea, which benefits from agglomeration economies such as knowledge spillovers, resource sharing, and heightened competition. These factors collectively enhance productivity and position the county as a vibrant microregion within Romania's broader economic landscape (Șoproni, 2023).

The synergy between manufacturing, agriculture, and services, supported by responsive governance and collaborative initiatives, demonstrates the county's capacity for integrated development. Engagement among local governments, businesses, and civil society has fostered governance models tailored to regional needs, while cross-border cooperation amplifies the positive externalities of agglomeration, reinforcing Bihor's role in regional integration.

The study *confirms the first research hypothesis (H1): economic agglomerations are pivotal in driving regional development*. Their influence extends beyond conventional indicators like employment and income, contributing to the strengthening of social structures and community resilience. As businesses grow and sharpen their competitive edge, the demand for skilled labor intensifies, prompting educational institutions to adapt curricula to meet evolving market needs. This reciprocal relationship

between business and education creates a virtuous cycle that underpins sustainable regional growth.

Moreover, the density of companies within the region fosters robust knowledge exchange, which plays a pivotal role in shaping labor market trends. Through the circulation of innovative ideas and exposure to diverse technologies and practices, employees acquire broader skill sets. This enhancement of human capital not only addresses immediate labor market needs but also serves as a cornerstone for enduring economic prosperity.

*Bihor County exemplifies the transformative potential of economic agglomerations in fostering positive convergence outcomes, fulfilling the prerequisites to operate as a regional competitiveness hub.* Through a multifaceted strategy that integrates job creation, infrastructure development, and the attraction of investment capital, the county has cultivated a resilient framework for sustained regional growth. These interlinked dynamics underscore the strategic advantages of concentrated economic activity within microregions and *substantiate the second research hypothesis (H2).*

The boundary between the urban core and the surrounding areas highlights a dynamic relationship where the former drives economic activity and innovation, attracting both the workforce and resources from the peripheral regions. The presence of local and foreign companies in Oradea – the capital of the county – boosts employment opportunities in other areas, enabling residents to benefit from the economic vibrancy of the agglomeration. This integration fosters increased mobility, skill development, and a more resilient labor market.

While agglomerations can generate wealth and dynamism, they can also exacerbate inequalities and disadvantage areas that lack the infrastructural benefits of more urbanized regions. *The negative divergence* observed in Bihor County *underscores the importance of addressing regional disparities as a key aspect of development policy.* Comprehensive planning and political responses are needed to maximize potential benefits while mitigating adverse effects on local communities and economies.

Policymakers in the Bihor microregion have acknowledged the imperative to balance the benefits of economic agglomeration with inclusive approaches aimed at mitigating income disparities and economic marginalization. In response, they have adopted focused approaches such as infrastructure investment, the development of innovation ecosystems, and the enhancement of regional connectivity. These efforts have been carried out through a set of *coordinated initiatives* designed to promote positive economic convergence.

*1. Development of Smart Specialization Parks.* As part of the North-West Region's strategic vision to establish a regional innovation hub, smart specialization parks are being developed, extending into rural areas as well. These parks aim to broaden employment opportunities across the county, ensuring accessibility for local populations. Equipped with essential infrastructure, they enable businesses to create innovative products and services, leverage local resources, and promote circular economy principles.

*Anticipated Impact* – This initiative is expected to empower young people and local entrepreneurs to become key drivers of sustainable community development. By fostering innovation and economic vitality, it holds the potential to transform underdeveloped areas into dynamic centers of excellence.

2. *Development of Regional and Local Infrastructure.* These initiatives were designed to boost connectivity and accessibility across Bihor County. Improved transport links have delivered significant economic and social benefits, including stimulating growth, creating new jobs, and elevating overall quality of life.

*Key achievements* include the modernization and optimization of the public transport system – centered on building a contemporary, eco-friendly, and secure infrastructure in line with Europe's green and digital transition goals – upgrading Oradea Airport, digitizing public services, and enhancing Romania's integration with the wider European transport and communication networks.

3. *Enhancing Human Capital.* Cross-border programs have been leveraged to strengthen vocational training and promote educational exchanges, with the goal of aligning workforce skills more closely with labor market needs.

*Outcomes* – A notable rise in the pool of qualified professionals supporting local businesses, contributing to a more dynamic and competitive regional economy.

4. *Integrating Tourism into Regional Development.* Tourism has been strategically embedded into broader economic planning, with local assets – such as natural landscapes and cultural heritage – positioned as key drivers of diversification. Policymakers have increasingly recognized tourism's potential to stimulate growth and resilience.

*Outcomes* – Increased visitor numbers and investment flows have amplified the benefits of economic agglomeration, while also strengthening community involvement and fostering deeper collaboration within the local business ecosystem.

Given the multifaceted nature of economic agglomerations, their inherent duality becomes evident: while they can serve as engines of economic prosperity, they may also intensify social disparities and environmental pressures. Navigating this complex landscape requires balanced and adaptive policy approaches that seek to amplify the benefits of agglomeration while mitigating its adverse effects. To this end, policymakers must commit to ongoing research and proactive interventions to ensure that regional development strategies remain both inclusive and sustainable. Fostering collaboration among governmental institutions, private enterprises, and civil society is essential for crafting solutions that reflect diverse perspectives and local aspirations.

Drawing on the findings from Bihor County, our recommendations are intended to guide other microregions seeking sustainable and inclusive development. We highlight the importance of engaging local communities in development efforts, particularly by promoting inclusive mechanisms that enable meaningful public participation in decision-making. Policy frameworks should prioritize inclusive growth strategies that address the needs of underrepresented groups, including marginalized populations and rural communities. Such community-centered approaches are vital for strengthening social cohesion and enhancing local resilience. By enabling residents and businesses to jointly benefit from the economic opportunities generated by agglomeration, the microregion can position itself as a model for sustainable and inclusive regional development.

As a final reflection, Bihor County stands as a compelling microregional case through which the dual nature of economic agglomerations – convergence and divergence – can be critically examined. Its unique position within Romania's economic geography, characterized by both urban vitality and rural vulnerability, offers a rich terrain for understanding how concentrated economic activity can simultaneously drive growth and deepen disparities. The county's proactive policy environment, cross-border

engagement, and evolving governance models reflect a broader narrative of adaptation and resilience. By choosing Bihor as the representative study, this paper not only highlights the transformative potential of agglomeration economies but also underscores the importance of inclusive, community-centered strategies in shaping sustainable regional development. The lessons drawn from Bihor's experience provide valuable insights for other microregions seeking to harness the benefits of agglomeration while safeguarding social equity and long-term cohesion.

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