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Structural Dynamics of Local Economies in Bucharest-Ilfov Region

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Abstract. *The Bucharest-Ilfov region has recorded major structural changes in the local economy in recent decades, being the most dynamic region in Romania. The research aims to highlight the structural changes in the local economy, for the period 2000-2022, following two relevant indicators: turnover and number of employees, at the level of each economic sector, both for the municipality of Bucharest and for Ilfov County. The results highlighted the major structural changes, especially at the level of Ilfov County, where there was a constant increase in the values of the analyzed indicators. The modeling of the structural dynamics highlighted a series of very important aspects regarding the positioning of the Bucharest-Ilfov Region at national level, after 2015 the tendency being to concentrate economic activities with an increasingly high turnover.*

Keywords: local economy, turnover, employees, Bucharest-Ilfov.

Introduction

Metropolitan areas are the areas where the most important economic changes are taking place, where technology and innovation play an important role in the development of business sectors. These areas have disparities, from an economic point of view, within the national territory, and the causes are diverse (the existence of government policies, development plans, the structure of the workforce and population, the way of land use, etc.) (Neuvonen & Ache, 2017; Sadler et al., 2020).

The Bucharest-Ilfov metropolitan area has benefited in recent years from a fairly broad economic development, which has led to the appearance of discrepancies with the other areas of Romania visible at the level of gross domestic product (Toșa et al., 2018). However, it has been found that there is an index of economic complexity, which reflects to a greater extent the level of development (Fritz & Manduca, 2019), demonstrating high values in high-income areas.

The present paper aims to analyze the structure of the local economy at the level of the Bucharest-Ilfov Region through specific indicators, which corresponds to the Bucharest Metropolitan Area, so this concept will be used more often (the literature is built around this terminology).

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Literature review

Metropolitan areas have gone through different stages over time in which the economic profile has changed significantly depending on various factors.

Economic growth can be seen in all countries, but at different levels of development. For example, in the United States of America the economy was mostly made up of the manufacturing sector at the beginning of the twentieth century (e.g., metropolitan areas in the Midwest), but today it has moved towards technological and innovative development (Kang et al., 2022).

In general, the areas known for the production sector have experienced a significant decrease in it, leading to an accentuation of disparities and economic problems. These changes occurred from the desire to integrate technological aspects to increase production and execution efficiency (mostly in accounting, manufacturing industry) (Kang et al., 2022).

In the literature, economic growth in metropolitan areas has been analyzed over time through various indicators to observe trends: the income earned by residents within some neighborhoods in the metropolitan area (Kang et al., 2022), the structure of the workforce through the economic complexity index (Fritz & Manduca, 2019), the dynamics of employees during a pandemic (Sánchez-Moral et al., 2024), the level of economic specialization through the Gini and Krugman indices and a semiparametric model (Longhi et al., 2014), foreign direct investment, reflecting the level of influence of globalism on local economies, the changes produced in economic sectors through regression coefficients (Scott, 2008).

The structure of economic activities has changed over the last decades as a result of external factors with continental or global influence. In many European countries (especially Romania) there was a change in this profile after the fall of the communist bloc in 1989, which led to the shift from agricultural activities in peripheral areas, but also from industry to the development of trade and other sectors of activity (Urşanu-Popovici et al., 2024). Another problem that affected the structure of economies was generated by the COVID-19 pandemic that led to significant changes in the movement of goods and people, generating labor mobility (Sánchez-Moral et al., 2024) and the development of sectors through the use of artificial intelligence.

The structure of economic activities in metropolitan areas has changed over the years due to the relationships between the component localities (especially those existing between the central pole and the other settlements) (Dadashpoor & Ahani, 2019). The economics of better-developed systems focus on fairly diversified economic activities, while smaller areas are characterized by smaller industries, similar to those of other systems (Fritz & Manduca, 2019). However, there may be problems in terms of the evolution of companies and turnover, as those located within metropolitan areas have shown upward trends (Lee & Xu, 2020).

In recent years, the issue of relocating economic activities within metropolitan areas has arisen, starting from the central pole to the neighboring areas, to the periphery. However, the causes of these changes are related to the specialized workforce, as is the case in metropolitan areas in Poland (Rossi & Dej, 2020), although those in the United States of America focus on reducing some business maintenance costs (Mack & Wei, 2017). In another study (Lee & Xu, 2020) it is stated that, in general, some companies establish themselves within urban poles because there are no restrictions for making bank loans, and after a certain period of time to relocate to the peripheries of metropolitan areas.

The importance of studying the structural trends in the local economy of emerging systems, from a spatial perspective, is of particular importance due to the restrictions imposed by

the natural environment, which can affect the sustainability of long-term investments (Diaconu et al., 2017).

Methodology

Study area

The present study focuses on the analysis of local economies in the Bucharest-Ilfov Region (Figure 1). It includes the capital of the country, Bucharest and the localities that make up Ilfov County, respectively 8 urban settlements (Bragadiru, Buftea, Chitila, Măgurele, Otopeni, Pantelimon, Popeşti-Leordeni and Voluntari) and 32 communes.

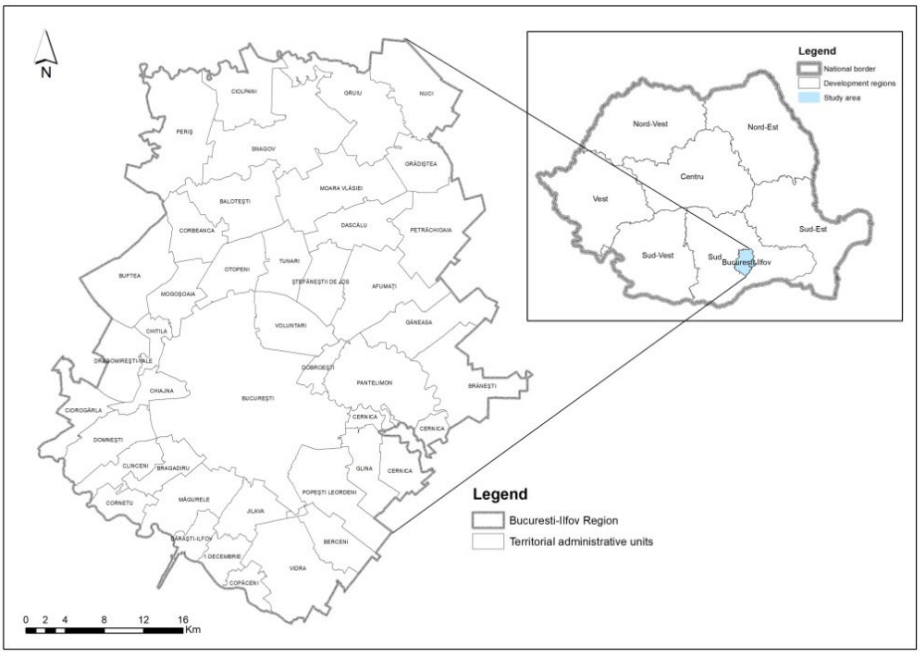

Figure 1. Location of the study area

Source: data processing https://geo-spatial.org/vechi/

Data and methods

The structural dynamics of local economies in the Bucharest-Ilfov Region were analyzed based on two reference indicators, the number of employees and turnover, analyzed for the period 2000-2022. Based on the two indicators, matrices of rank dynamics were made to highlight the position of each economic sector in relation to the other economic sectors, each year. In order to highlight the particularities in the spatial distribution of the economic sectors at the level of the Bucharest-Ilfov Region, a spatial model of the two indicators was developed for the year 2022, using the QGIS platform. The analysis was carried out at the level of the main economic sectors coded as follows: A-Agriculture, forestry and fisheries; B-Extractive industry; C-Manufacturing industry; D-Production and supply of electricity, heat, gas, hot water and air conditioning; E-Water distribution; sanitation, waste management, land decontamination activities; F-Construction; G-Wholesale and retail trade; repair of motor vehicles and motorcycles; H-Transportation and storage; I-Hotels and restaurants; J-Information and communication; K-Financial intermediation and insurance; L-Real estate transactions; M-Professional, scientific and technical activities; N-Administrative and support service activities; O-Public administration and

defense; public social security; P-Education; Q-Health and social care; R-Entertainment, cultural and recreational activities; S- Other service activities; T-Activities of private households as employers of domestic personnel; activities of private households producing goods and services for own consumption; U-Activities of extraterritorial organizations and bodies.

Results and discussions

Figure 2 highlights the trend in the evolution of turnover in each economic sector in Bucharest and Ilfov County, the graphic model highlighting the spectacular increases of the wholesale and retail trade sector; production and supply of electricity, heat, gas, hot water and air conditioning, information and communication, manufacturing industry and transportation and storage. These trends will be strongly influenced by public policies on the development of support infrastructure. In Figure 3, the indicator the evolution of the number of employees shows the growth trend of the sectors: wholesale and retail trade, administrative and support service activities, information and communication, manufacturing industry and construction.

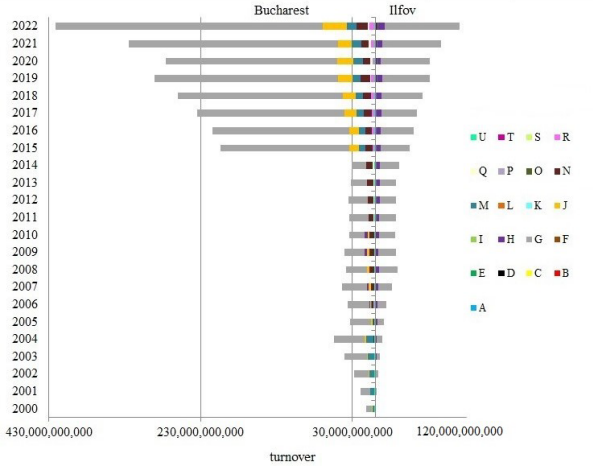

Figure 2. Turnover by sector of activity in Bucharest and Ilfov (2000-2022)

Source: CISA-ICUB.

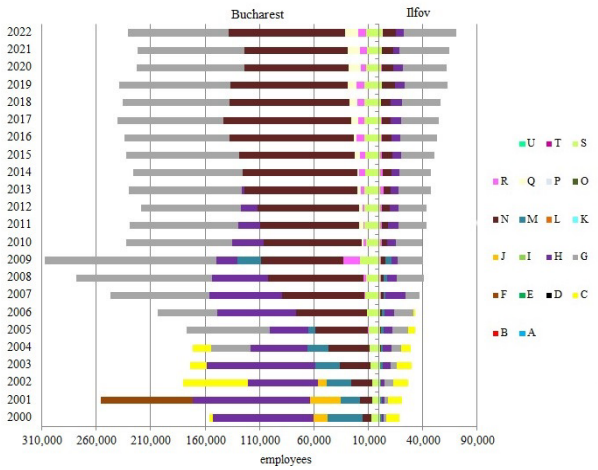

Figure 3. Employees by sector of activity in Bucharest and Ilfov (2000-2022).

Source: CISA-ICUB

A-Agriculture, forestry and fisheries; B-Extractive industry; C-Manufacturing industry; D-Production and supply of electricity, heat, gas, hot water and air conditioning; E- Water distribution; sanitation, waste management, land decontamination activities; F-Construction; G-Wholesale and retail trade; repair of motor vehicles and motorcycles; H-Transportation and storage; I-Hotels and restaurants; J-Information and communication; K-Financial intermediation and insurance; L-Real estate transactions; M-Professional, scientific and technical activities; N-Administrative and support service activities; O-Public administration and defense; public social security; P-Education; Q-Health and social care; R-Entertainment, cultural and recreational activities; S- Other service activities; T-Activities of private households as employers of domestic personnel; activities of private households producing goods and services for own consumption; U-Activities of extraterritorial organizations and bodies.

The validation of the evolution trends of the main economic sectors was achieved through the matrix of the dynamics of the ranks for turnover and the number of employees, both for the municipality of Bucharest and for the county of Ilfov. Tables 1, 2, 3, 4 highlight the sectors that followed an upward trend, as well as the sectors that went down in the hierarchy. This method of analysis allowed to understand the general trends of evolution of the economy of the Bucharest-Ilfov Region. Throughout the analyzed period, the two reference indicators register significant decreases for the sectors of agriculture, forestry and fisheries and extractive industry (the region is home to the headquarters of many companies in the field of extractive industry). Important increases are recorded for the following sectors: production and supply of electricity, heat, gas,

hot water and air conditioning, public administration and defense; public social security, health and social care, administrative and support service activities, education.

Table 1. Ranking matrix by turnover in Bucharest

Sector	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
A	10	10	11	11	12	11	10	9	13	9	9	13	13	11	13	14	14	14	14	14	15	15	21
B	3	6	4	7	6	13	13	12	11	14	14	14	14	15	14	8	8	8	8	8	8	7	20
C	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	4
D	7	4	6	4	5	4	9	8	8	8	8	8	8	8	9	3	3	4	4	4	5	2	2
E	13	15	14	15	15	15	14	11	10	12	11	10	10	10	10	15	15	15	15	15	14	14	13
F	8	8	7	8	7	3	3	3	4	5	4	3	3	6	5	5	5	6	5	5	4	5	5
G	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
H	5	7	8	6	8	6	4	4	5	3	3	4	4	4	3	7	7	7	7	7	7	8	7
I	12	12	13	13	13	12	11	10	9	10	10	9	9	9	8	11	11	11	11	11	12	12	9
J	4	5	3	3	3	5	5	5	3	4	5	5	5	5	6	4	4	3	3	2	2	4	3
K	15	13	12	12	11	10	15	14	15	15	16	15	15	14	15	16	16	17	16	17	16	16	14
L	9	9	9	9	9	8	8	13	12	11	12	11	11	13	12	10	10	10	10	10	10	10	10
M	6	3	5	5	4	7	6	7	7	7	7	7	7	7	7	6	6	5	6	6	6	6	6
N	11	11	10	10	10	9	7	6	6	6	6	6	6	3	4	9	9	9	9	9	9	9	8
O	19	19	19	19	18	16	17	17	16	17	15	16	16	16	16	17	17	16	19	16	17	17	15
P	18	18	18	18	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	19	17
Q	17	17	17	17	17	17	16	15	14	13	13	12	12	12	11	13	13	12	13	12	11	11	11
R	14	14	15	14	14	14	12	18	17	16	18	18	18	18	18	12	12	13	12	13	13	13	12
S	16	16	16	16	16	18	18	16	18	18	17	17	17	17	17	18	18	18	17	18	18	18	16
T	21	21	21	20	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19
U	20	20	20	21	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18
		Significant growth						Significant decrease															

Source: CISA-ICUB .

Table 2. Ranking matrix by turnover in Ilfov

Sector	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
A	6	6	5	5	5	5	6	6	7	7	7	6	6	6	8	9	6	6	7	8	9	9	18
B	12	13	13	13	14	15	16	15	15	15	14	14	13	14	14	14	15	18	18	18	18	15	19
C	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
D	17	15	15	15	15	14	14	14	13	14	13	13	17	12	12	12	13	13	15	17	16	18	11
E	9	10	10	9	8	8	8	8	11	11	10	11	11	9	10	10	11	9	9	11	10	8	9
F	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	4
G	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
H	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	3
I	8	9	12	12	12	13	13	13	12	12	12	12	12	13	13	13	12	12	12	12	12	13	12
J	11	11	11	10	10	11	10	11	9	8	9	8	7	8	7	8	9	10	10	9	8	10	8
K	14	12	6	8	9	10	11	12	14	13	15	15	14	18	17	18	18	17	16	15	15	16	16
L	5	5	7	6	6	7	7	7	6	6	6	7	9	10	9	7	7	8	8	7	7	7	7
M	7	7	8	7	7	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
N	10	8	9	11	11	12	12	10	10	9	8	9	8	7	6	6	8	7	6	6	6	6	6
O	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17
P	18	17	16	17	17	18	18	17	18	18	18	18	18	17	18	17	17	16	17	16	17	17	15
Q	16	18	18	18	18	17	17	18	17	17	16	17	15	16	15	15	14	14	13	13	13	12	13
R	13	14	14	14	13	9	9	9	8	10	11	10	10	11	11	11	10	11	11	10	11	11	10
S	15	16	17	16	16	16	15	16	16	16	17	16	16	15	16	16	16	15	14	14	14	14	14
U	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
		Significant growth						Significant decrease															

Source: CISA-ICUB

Table 3. Matrix of ranks by employees in Bucharest

Sector	2000	2001	2002	2003	2004	2005	2006	2007	2009	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
A	10	10	11	11	12	11	10	9	13	9	9	13	13	11	13	14	14	14	14	14	15	15	21
B	3	6	4	7	6	13	13	12	11	14	14	14	14	15	14	8	8	8	8	8	8	7	20
C	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	4
D	7	4	6	4	5	4	9	8	8	8	8	8	8	8	9	3	3	4	4	4	5	2	2
E	13	15	14	15	15	15	14	11	10	12	11	10	10	10	10	15	15	15	15	15	14	14	13
F	8	8	7	8	7	3	3	3	4	5	4	3	3	6	5	5	5	6	5	5	4	5	5
G	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
H	5	7	8	6	8	6	4	4	5	3	3	4	4	4	3	7	7	7	7	7	7	8	7
I	12	12	13	13	13	12	11	10	9	10	10	9	9	9	8	11	11	11	11	11	12	12	9
J	4	5	3	3	3	5	5	5	3	4	5	5	5	5	6	4	4	3	3	2	2	4	3
K	15	13	12	12	11	10	15	14	15	15	16	15	15	14	15	16	16	17	16	17	16	16	14
L	9	9	9	9	9	8	8	13	12	11	12	11	11	13	12	10	10	10	10	10	10	10	10
M	6	3	5	5	4	7	6	7	7	7	7	7	7	7	7	6	6	5	6	6	6	6	6
N	11	11	10	10	10	9	7	6	6	6	6	6	6	3	4	9	9	9	9	9	9	9	8
O	19	19	19	19	18	16	17	17	16	17	15	16	16	16	16	17	17	16	19	16	17	17	15
P	18	18	18	18	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18	19	19	19	17
Q	17	17	17	17	17	17	16	15	14	13	13	12	12	12	11	13	13	12	13	12	11	11	11
R	14	14	15	14	14	14	12	18	17	16	18	18	18	18	18	12	12	13	12	13	13	13	12
S	16	16	16	16	16	18	18	16	18	18	17	17	17	17	17	18	18	18	17	18	18	18	16
T	21	21	21	20	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	19
U	20	20	20	21	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	18
		Significant growth						Significant decrease															

Source: CISA-ICUB.

Table 4. Matrix of ranks by employees in Ilfov

Sector	2000	2001	2002	2003	2004	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
A	4	6	5	6	6	6	6	7	7	7	7	7	9	9	11	10	9	11	10	12	12	12	18
B	11	11	12	12	13	17	17	17	18	18	18	18	17	18	18	16	16	17	18	17	19	15	19
C	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
D	14	15	13	14	14	13	13	15	16	17	16	17	18	17	17	18	18	18	19	19	18	19	17
E	8	9	11	11	11	11	11	11	12	12	12	12	12	12	10	11	11	8	9	9	8	8	8
F	6	4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	4	4	4	4	4	3	3
G	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
H	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4
I	9	8	9	10	10	10	10	10	10	9	10	10	10	11	12	9	10	10	8	8	9	10	9
J	10	12	8	8	9	9	9	8	8	8	8	9	7	8	7	7	7	7	7	7	7	7	7
K	15	14	15	15	16	15	15	13	15	13	13	16	14	13	13	13	13	16	15	16	15	18	15
L	7	7	7	7	7	8	8	9	9	10	11	11	11	10	9	12	12	12	12	13	13	13	13
M	5	5	6	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	6	6	6
N	12	10	10	9	8	7	7	6	6	6	6	5	5	4	4	4	5	5	5	5	5	5	5
O	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	17	18	17	16	16
P	18	17	18	18	18	18	18	18	17	16	17	15	16	16	16	17	17	15	16	15	16	17	14
Q	16	16	16	17	17	16	16	16	14	15	15	14	15	15	15	15	15	14	13	14	14	9	10
R	13	13	14	13	12	12	12	12	11	11	9	8	8	7	8	8	8	9	11	10	10	14	12
S	17	18	17	16	15	14	14	14	13	14	14	13	13	14	14	14	14	13	14	11	11	11	11
U	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
		Significant growth						Significant decrease															

Source: CISA-ICUB

The turnover in 2022 (Figure 4) at the level of the component localities in the study area shows significant discrepancies between them. In most localities (including the capital) the activities are mostly focused on wholesale and retail trade, especially in the localities surrounding Bucharest, while in other localities manufacturing industry, transportation and storage and financial intermediation and insurance (this sector predominates only in Grădiștea) play an important role in the economic structure. According to the number of employees, the economic structure changes, as there are some sectors that go beyond the classic ones, namely administrative and support service activities professional, scientific and technical activities, construction, and in Bucharest the structure is very varied (Figure 5).

The study highlights the extent to which the emergence of new attractiveness generators of this type can contribute to increasing the structural dynamics of the local economy and generating long-term multiplier effects that lead to sustainable development, acting as catalysts for local economic development. The results obtained contribute to the development of established methodologies regarding the modeling of complex phenomena in emerging territorial systems (Peptenatu et. al. 2012; Ianoș et al. 2012; Pintili et al. 2015; 2017; Andronache et. al. 2016).

The importance of studying the development trends of the local economy is also important from the perspective of the development restrictions imposed by the natural environment, restrictions that can affect the competitiveness of investments in the medium and long term (Diaconu et al. 2017), as well as from the perspective of the development of specific economic activities, such as creative economies, which require specific approaches to urban development policies (Drăghici et al. 2015; Gruia et al. 2019; Peptenatu et al. 2020).

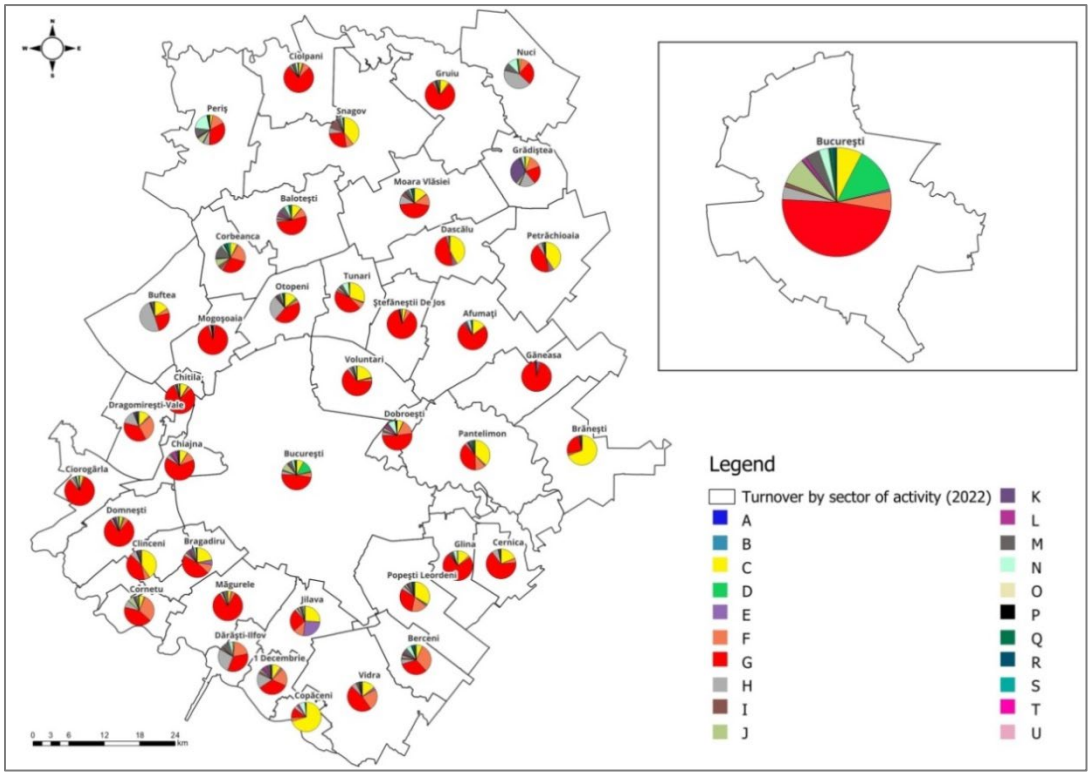

Figure 4. Turnover by sector of activity in the study area (2022)

Source: CISA-ICUB.

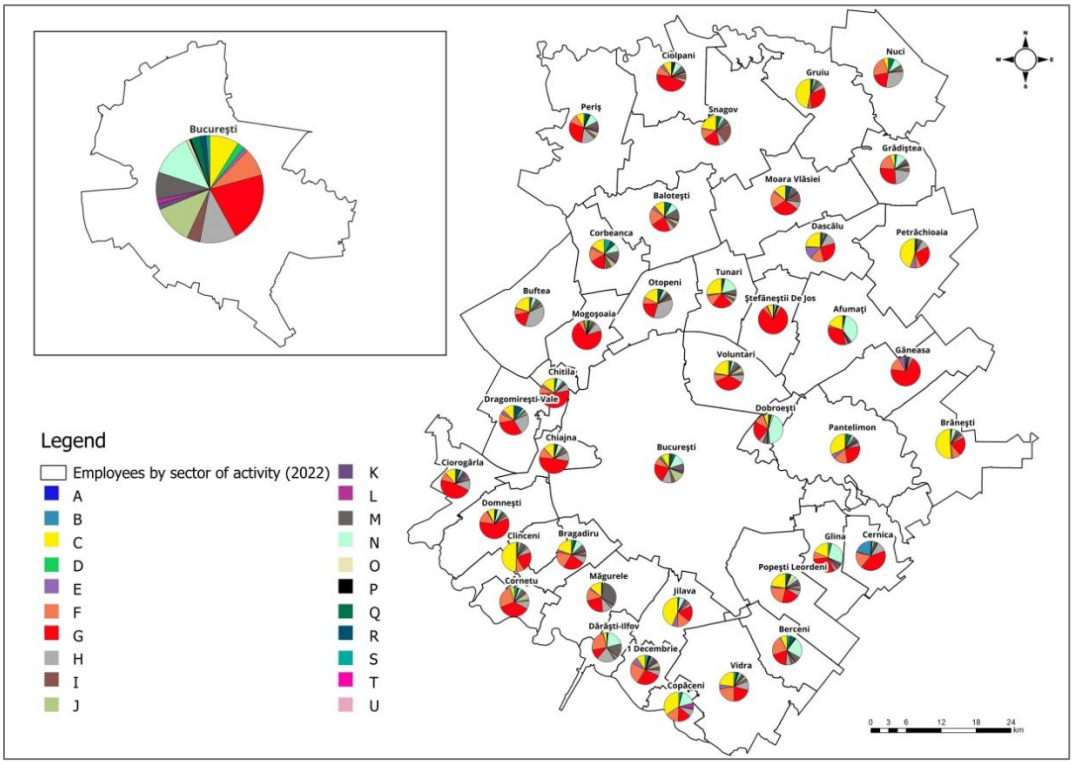

Figure 5. Employees by sector of activity in the study area (2022)

Source: CISA-ICUB

Conclusion

The results of the research show us that complex processes take place in emerging systems, evidenced by significant changes in the economic profile of the territorial administrative units. These changes take place due to the position held by the Bucharest-Ilfov Region at the national level, as well as the accelerated urban expansion, a result of accelerated residential and economic development, which puts considerable pressure on the way land is used. The present study shows us that this phenomenon has significant implications on land use, the environment and economic development.

The territorial administrative units that make up the Bucharest-Ilfov Region highlighted the fact that they have a varied economic structure, which reflects the relocation of some enterprises in the areas surrounding the capital, which led to positive consequences for them (increase in the number of employees).

Consequently, understanding the structural dynamics of local economies in the studied region is an important step in assisting decisions and requires a detailed analysis in order to achieve well-documented urban planning tools.

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