

TERRITORIAL DISCREPANCIES IN THE RURAL-URBAN FRINGE ZONE OF BUCHAREST

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Abstract: *The rural-urban fringe area of Bucharest is the most economically dynamic region of Romania, and, at the same time, is the one, which suffered the most from the recent economic decline. The article is focused on the analysis of inequalities of social-economic variables, including differences in their spatial patterns, before and after the 2008 economic crisis. We involved two methods of inequality analysis. Gini coefficient was used to determine the overall level of inequalities in the region. Comparison with the region's mean value was used for identification of spatial patterns of these inequalities. Our results highlight four trends in the overall level of inequality dynamics, while all the studied variables follow more or less accurately the same pattern of spatial dynamics. Our findings provide new arguments in support of the idea that the new processes in the Bucharest fringe zone follow the circular pattern, which privileges the northern part of the area, while south is the last to benefit from any new development.*

Key words: Territorial discrepancies; Rural-urban fringe; Bucharest.

JEL Classification Codes: C23, P25, R11.

1. INTRODUCTION

The contact between urban and rural areas does not represent a sharp line, but is rather a zone where rural and urban features overlap. The zone can have various limits, depending on studied processes and methods used to determine it: rural-urban interface, urban influence area, suburban zone, peri-urban area etc. We are applying the concept of rural-urban fringe zone. The fringe space enjoys modernized infrastructure (although not fully urban) as well as environmental quality, which is lower than in the deep countryside (Gallent et al., 2006). The advantage of this concept is that unlike other approaches it considers this marginal area from both views at the same time: rural-to-urban and urban-to-rural (Sîrodoev & Ion, 2014).

Influence of the main city is manifested differently in the fringe areas. Due to its double rural-urban nature, the fringe space bears characteristics of both environments with their positive and negative features (Ion, 2015a). On the one hand, fringe zones provide healthy environment for recreation of urban inhabitants and contain new residential and logistical facilities. Non-agricultural activities are abundant here. That is why, local communities in rural-urban fringe zones enjoy from more rigorous planning and increased revenues (CURE, 2002). On the other hand, rural-urban fringe zones contain dumps and informal waste deposits of the main city; brownfields are omnipresent (Filip & Cocean, 2012). The share of agricultural land use starts declining (Ion, 2014). Change in use of cropland resources at the Bucharest's outskirts represents an important consequence of urbanization and suburbanization that have increasingly developed since 2000 and until the beginning of economic crisis in 2008. In this period, the Romanian

village experienced numerous changes in its three components: territory, population and economy, being transformed, in such a way, from a village with predominantly agricultural activities in a multi-functional integrated settlement (Cândea et al., 2006).

The process of modernization of the Romanian village within rural-urban fringe zones does not follow a uniform pattern. Particularly, in the area around Bucharest urbanization and suburbanization processes have taken place with high intensity in the settlements located at the internal periphery of the rural-urban fringe area and in its northern half, comparing to the settlements at the external periphery and the southern half of the fringe area, where level of development is much lower. In the process of urban expansion there were “privileged” both settlements concentrated along major road axes and settlements, in which some urban functions (seeking more space or better environment) could have relocated: services, warehouses, manufacturing industry, housing, especially, for second residence with higher comfort (Ion, 2014). Improving road infrastructure has had an effect over the increasing attractiveness of main roads, which have become an important driver of space organization in the areas around Bucharest (Vânău, 2009).

Rural urban fringe zones are areas the most vulnerable to changes, which usually lacks any planning measures even in the most developed countries (CURE, 2002). Different views on urban planning in urban and rural-urban fringe areas lead to reciprocally incompatible land uses; this situation generates conflicts (Ianos et al., 2012a), which makes the relationship between main planning actors in these areas even more complicated. This increasingly complicated situation must be seen as both threat for achieving sustainable development goals and opportunity to achieve economic development targets. Planning measures meant to assist in addressing the challenges and in enjoying from successful use of the opportunities must be supported by a thorough scientific analysis.

Our paper is based on the up-to-date statistical evidences and methods of statistical modelling that have not been used earlier in the study area. We believe that our findings would serve as an impulse for local public authorities and regional planners to urge the development of new strategies in order to control urban expansion in the area.

2. STUDY AREA

Bucharest's periphery is an extremely dynamic area, composed of “classic” villages (Dascălu, Grădiștea, Gruiu, Nuci etc.), rural settlements recently obtained the urban status (Bragadiru, Chitila, Măgurele, Pantelimon, Popești-Leordeni and Voluntari) and urbanized rural settlements (Afumați, Balotești, Corbeanca, Mogoșoaia, Snagov, Tunari, etc.) (Ion, 2014).

While the internal limits of the rural-urban fringe zone are quite clear (urban built-up area of the main city), its external limit is very vague (Gallent et al. 2006). Some theories suggest that such an external limit for a city over 1 mil. inhabitants would be located 22 km away from its internal boundary (CURE, 2002). According to the literature, main characteristic of the fringe space is inter-penetration of urban and rural features, as well as alteration of “classical” rural features, such as reduced fragmentation of living space, increased number and density of inhabitants, higher shares of non-agricultural uses among the land use types, modernized infrastructure (although not fully urban), lower environmental quality than in deeper countryside and spaces for daily recreational activities (Gallent et al. 2006, CURE, 2002).

In order to define the rural-urban fringe zone of Bucharest (RUFZB), in the first phase, we picked up all the local administrative units (LAUs) located not far than 30 km away from the administrative boundary of Bucharest Municipality. This pool was composed of 128 LAU

(communes and towns). In the next phase, we applied a hierarchical agglomerative clustering to this pool, based on 8 criteria: number of villages in a commune/town, number of population, per cent ratio employed vs. person at the working age, population density, per cent ratio built-up area vs. agricultural area, ratio of non-residential vs. residential building permits (%), gas delivered through pipes (cubic metres per capita), number of certain tourist infrastructure (bungalow, tourist villas and pensions, agro-tourist pensions).

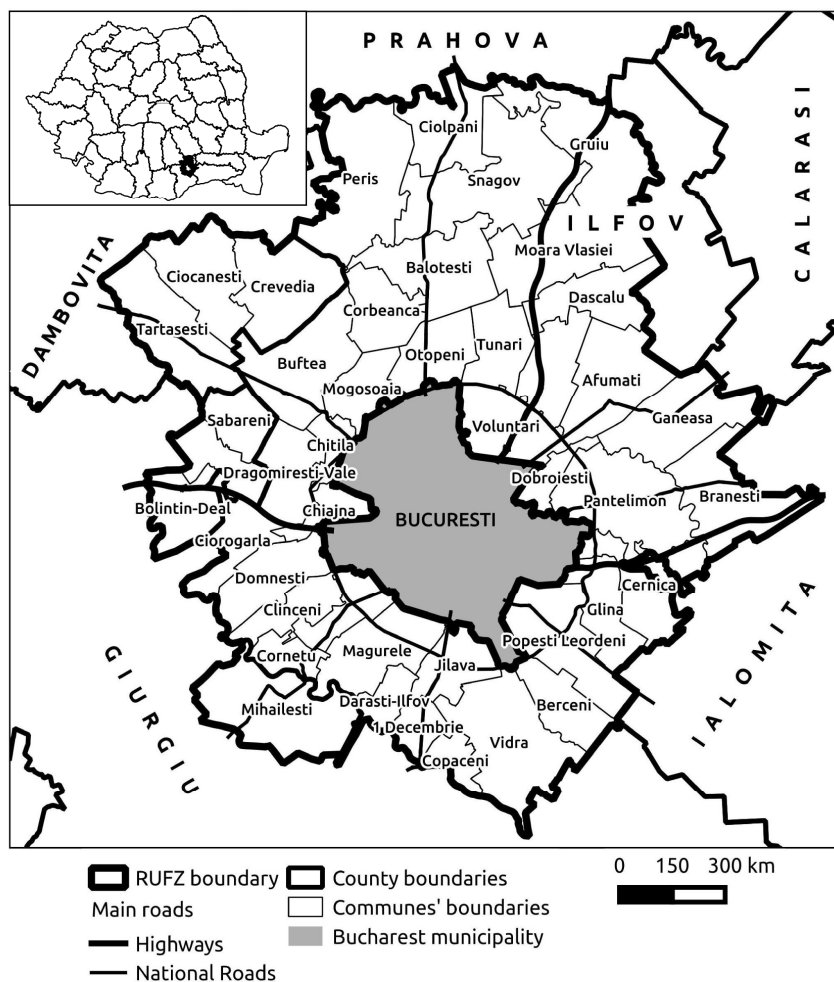


Figure 1. Rural-urban fringe zone of Bucharest (RUFZB) (Source: Ion, 2014)

Seven clusters resulted from our analysis, two of which being compactly located around Bucharest. These two clusters form a clear tentacle shape around the capital with the tentacles disposed alongside the main roads. In order to fill in the gaps between the tentacles, three communes (Copăceni, Săbăreni and Dascălu) have been added to the previous two clusters, in order to constitute a more compact RUFZB. In such a way, our study area (Figure 1) is formed of 44 LAU from three counties: Ilfov, Giurgiu and Dâmbovița. (Ion, 2014).

3. DATA AND METHODS

Our analysis of territorial discrepancies considers the dynamics of some of the indexes used to define the RUFZB and few other characteristic indicators: number of inhabitants (population), the ratio of persons moved-in vs. moved-out ones, number of employed persons per 100 able-bodied ones, area of non-agricultural lands, area of agricultural lands, non-agricultural

vs. agricultural lands ratio, number of authorization for residential real estate development, number of authorization for commercial real estate development, share of authorizations for commercial real estate development out of total residential and commercial real estate, per capita natural gas supply, number of some recreational facilities (number of bungalows, tourist villas, tourist and agro-tourist pensions). The raw data were provided by the National Institute of Statistics (NIS); indexes were computed by the authors based on these data.

We used two methods for the analysis of territorial discrepancies. The intensity of this process and its overall level in the entire study area was measured using Gini coefficient (Cowall, 2000). Spatial patterns in the distribution of the studied indexes were determined by comparing index figure in each LAU (local administrative unit) with the RUFZB's average figure. Particularly, we subtracted RUFZB's mean from each LAU's figure and weighted the results by this mean. The resulted values were multiplied by 100.

In order to make the results comparable across all three years, we adopted the following approach. For each index, we determined maximal and minimal figures among all the time-slices (2003, 2008, and 2013). The resulted unique range was divided in 6 segments, having the following limits (from the lower tail): minimum, half of the minimum, 15% of the minimum, zero, 15% of the maximum, half of the maximum, maximum. This unique classification scale was used to group the LAU in each of the time-slices.

4. RESULTS AND DISCUSSIONS

Our results identified different trends among the social-economic indicators in the RUFZB. Thus, we cannot say that all the studied processes tend to concentrate (or spread) within the study area. The overall situation, as shown by the Gini coefficient, allows us highlighting four different trend patterns. For two of them, the 2008 economic and financial crisis represented a turning point. The other two patterns point at the trends that were less (or at all) sensitive to the crisis (Table 1).

Concentration trend is characteristic to population dynamics and change in agricultural lands distribution. The processes that drive these two variables have not felt the crisis, keeping the direction before it.

De-concentration trend characterizes the variables that reflect increasing standard of living and spreading suburbanization processes: employed persons, non-agricultural lands, natural gas supply and recreational facilities. These variables have also proved to be insensitive to the crisis. Spreading of natural gas supply was the most remarkable thanks to its speed, while recreational facilities, although showing some spreading tendencies, are the most concentrated.

The V-trend describe the processes that changed their path from declining to growing, forming a V-shaped curve. Thus, all the variables reflecting number of authorizations issued for real estate development follow this path. Before 2009, new developments had tended to spread out within RUFZB. Since the beginning of the crisis, the developers focus on the limited number of projects in few LAU. High sensitivity of the studied variables on the crisis is confirmed by the fact that the post-crisis Gini index (in 2013) is even higher than the pre-crisis one.

The A-trend reflects the situation in which the path of the variables follows the A-shaped curve. This trend is characteristic to the variables that represent the ratios between newcomers and out-goers in the region, as well as between non-agricultural and agricultural lands. Before the crisis newcomers tended to settle in few LAU, whose location offered them the best conditions for living and working. At the same time, due to expansion of urbanization processes non-agricultural (especially, built-up) areas tended to replace croplands. Since the beginning of

the crisis, the region has been facing constant trend of increasing unemployment (Ion, 2015b), which has reduced the attractiveness of the region for the newcomers. At the same time, the aggression of the urban fabric over the agricultural lands (Ianoş et al., 2012b) diminished as well.

Table 1. Gini coefficients for studied variables within RUFZB between 2003 and 2013*

Variable	Year		
	2003	2008	2013
Population (no. of pers.)	0.293	0.318	0.337
Moving-in / moving-out ratio (difference between newcomers and outgoers per 1000 inhab.)**	-1.145	0.900	0.762
<i>Employed (number of employed pers. per 100 able-bodied pers.)</i>	<i>0.448</i>	<i>0.447</i>	<i>0.392</i>
<i>Non-agricultural lands (ha)</i>	<i>0.435</i>	<i>0.415</i>	<i>0.386</i>
Agricultural lands (ha)	0.244	0.286	0.293
Non-agricultural / agricultural lands ratio (%)	0.393	0.433	0.409
Number of authorization for residential real estate development	0.468	0.390	0.554
Number of authorization for commercial real estate development	0.785	0.690	0.886
Commercial real estate (share of authorization out of total residential + commercial, %)	0.696	0.654	0.939
<i>Natural gas supply (cubic m per capita)</i>	<i>0.788</i>	<i>0.523</i>	<i>0.377</i>
<i>Recreational infrastructure (no. of bungalows, tourist villas, tourist and agro-tourist pensions)</i>	<i>0.976</i>	<i>0.937</i>	<i>0.902</i>

* Variables with constant concentration trend are given in **bold**; variables with constant de-concentration trend are given in *italic*; fluctuated trends are shown normally.

** Negative mean value in 2003

Source: own calculus based on NIS data

The studied variables show different spatial patterns, depending on the general trend, which is reflected by the Gini coefficient, as well as on other factors. Here in the article we show just few maps, representing samples of the most characteristic spatial trends. Thus, population (Figure 2) tends to concentrate on the inner periphery of the RUFZB, especially, in its northern part, which has recently extended in east and south-east.

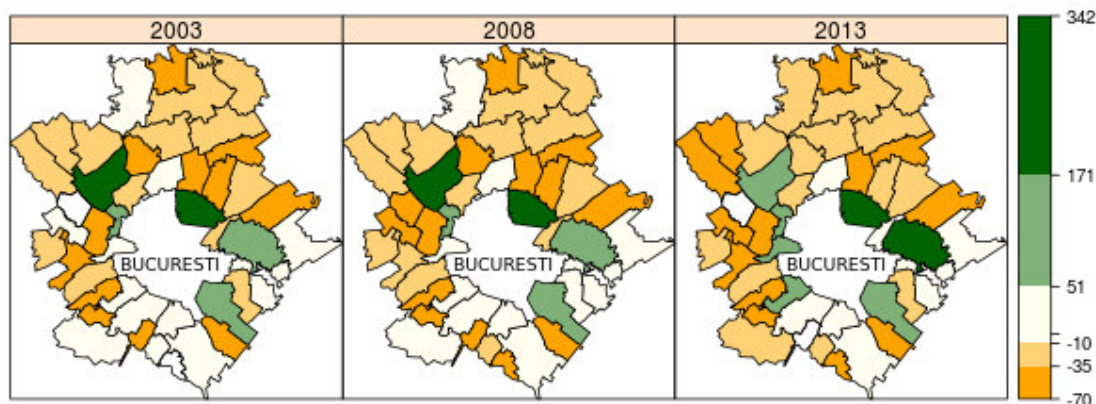


Figure 2. Total population of RUFZB

(Notes: on this and the following figures the legend represents deviation (per cent) of the variable in each LAU from the RUFZB's mean, weighted by the RUFZB's mean; LAU names are given in Figure 1)

Natural gas supply is an example of another pattern (Figure 3), which privileges the northern part of the RUFZB. We see that in 2003 just inner LAU on the internal periphery enjoyed gas supply over the region's average, mainly, those LAU related to industrial activities (especially in the south). However, in 2013 we see strong extension to the north, into the new residential areas of the new, rich, suburb dwellers (Șirodoev, Ion, 2014). While, southern part has lost much of its share in gas supply in the area. After the northern part will have been fully covered by gas supply systems, the southern one will increase its share in the region's space.

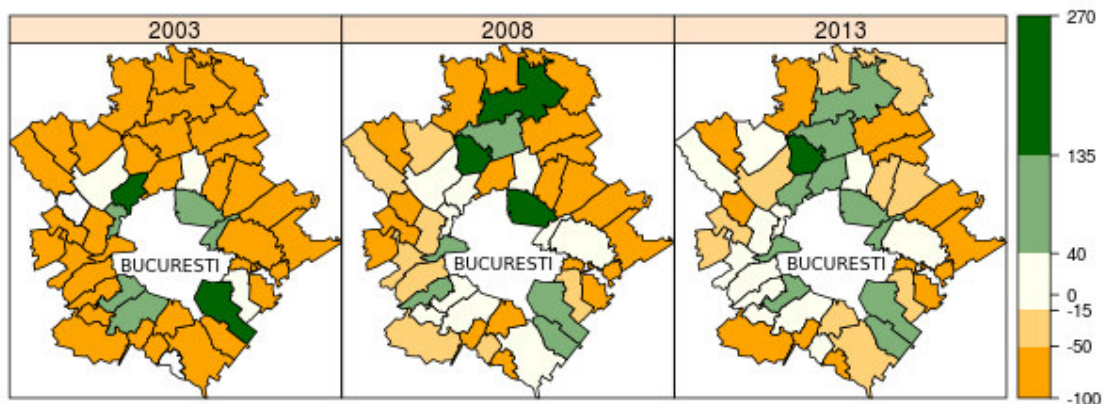


Figure 3. Natural gas supply per capita for home use in RUFZB

(Note: for legend see Figure 2)

Authorizations issued for new residential real estate development (Figure 4) are the most accurate indicators of how suburbanization processes moves within RUFZB and around Bucharest Municipality. In 2003, northern part of the inner periphery was the first to experience the building boom. As of 2008, when land market of the northern inner periphery exploded, new developments moved south bypassing the Bucharest Municipality along its eastern and western boundaries. In 2013, new residential real estate developments are mainly concentrated in two southern LAU, also located at the inner periphery of RUFZB.

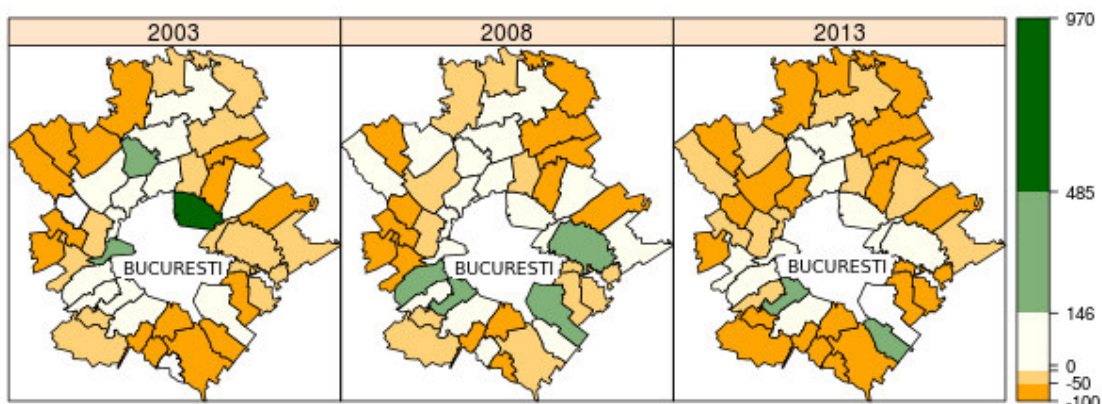


Figure 4. Number of authorization for residential real estate development in RUFZB

(Note: for legend see Figure 2)

We could see that certain long-term processes that reflect re-arrangement of system's elements within the general framework of transformation of centrally planned economy into the market one have not been sensitive to the crisis. It is especially related to the processes which

accompany the transformations of rural characteristics into suburban and urban ones (Sîrodoev, Ion, 2014). Thus, suburbanization, which occurred and developed naturally in Western Europe and North America, was forcibly stopped by communist government in Romania (Ianos et al., 2012a). Since the beginning of the economic transition period, this process has followed a constant trend of spreading urban fabric and urban standard of living across the rural space. None of the crises could stop it: they managed just to adjust its speed, but not to turn it away from its target.

At the same time, the 2008 economic crisis has severely affected some variables related to the economic activity of the enterprises, such as real estate developers etc., which were forced to drastically reduce their costs (Diaconu, Dutu, 2014). Subsequently, the trend of their dynamics was turned down to the opposite direction.

As revealed by the analysis of spatial patterns in the dynamics of the studied variables, the urbanization and suburbanization processes were evenly distributed neither in time, nor in space. There were discrepancies in territorial distribution of the processes. However, we could identify one new common trend, following certain stable circular pattern. Thus, any new process is first located in the northern part of the inner periphery of RUFZ (the first strip of communes). Then, after the saturation of the market, it starts spreading along the Bucharest's Municipality border eastward and westward, in order to finally close the circle somewhere in the south. This feature has been observed in the analysis of other indicators as well, such as land use change (Ion, 2014).

Some of the processes, like new authorizations issued for residential real estate development, have almost completed the circle. Others are somewhere in the middle of their way towards south. When the market (either labor, or land market) of the first strip of LAU will be entirely saturated (the first mature suburbanization belt (Sîrodoev, Ion, 2014) will be completely closed), then the turn of the next strip will come. As suggested by the spatial pattern illustrated by natural gas supply map (Figure 3), among the LAU of the second strip of RUFZB, the northern part strip will be the one to first experience the development of any new processes.

5. CONCLUSIONS

In our paper we point out at the fact that the rural-urban fringe zone of Bucharest is experiencing different, frequently, divergent paths of the dynamics of social-economic indicators. Some indicators keep going forward towards increasing concentration, while others show strong spreading trend, both with little sensitivity to economic fluctuations. There are other indicators, that follow a clear V-shaped or A-shaped paths, for which the 2008 economic crisis represented the turning point. These variables reflect processes with high sensitivity to the fluctuations of the economic conditions, and, especially, to crises. If general concentration trends of the studied, the most characteristic, variables follow different paths; their spatial patterns are quite similar. The first strip of local administrative units is the one to experience the newest trends. Appearance, and, implicitly, concentration, of the new process starts in the northern part of the strip. Then, the process spreads eastward and westward along the administrative boundary of Bucharest Municipality; these two branches of the movement meet in the south. Northern communes are those to be the first to experience appearance of the new processes in the second strip of local administrative units.

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