ANALYSIS OF REGIONAL INCOME INEQUALITIES
IN HUNGARY BETWEEN 2010 AND 2019

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Abstract: Research on social and economic development and regional competitiveness has long been a high priority area in the social sciences, both domestically and globally. Many dominant international models relate changes in regional competitiveness to the volume of investment, physical capital and improvements in the income situation of citizens. This suggests that the promotion and implementation of investment has the greatest impact on regional development, as it generates technological innovation and innovation in order to raise the skills of the available labour force, employ human resources at higher wages and thus raise living standards. In conclusion, the Hungarian regional competitiveness strategy should help improve the living standards of people living in local areas, so that life can become more attractive in regions that are currently less competitive from an economic point of view and can be considered peripheral. To achieve this goal, it is necessary not only to level out the living standards of those living in these areas and to improve certain competitiveness indicators, but also to change attitudes, so that income levels can be improved and territorial disparities reduced in the future. In this study, in order to show regional development disparities, we examine the population income inequality of the domestic districts (LAU1) for the period 2010-2019. Our aim is to show the income spatial structure and to explore the change in inequalities over time. In addition, in the context of the change in income relations, we delineate the competitive and less competitive income areas of Hungary and their interrelationships.

Keywords: territorial income inequality; living standards; regional development; spatial economy.

Introduction

Social and economic disparities have always been and will always be present in our lives, because the existence of spatial disparities and unequal development is a basic premise in everyday life, including in regional studies. It is impossible to reach a state of complete equilibrium, because whether we look at intellectual or physical goods, they will always show differences due to constant changes. In this context, we believe that the study of regional competitiveness, its interrelationships and its analysis are perhaps the most important spatial economic issues of our time [1]. In this context, the recognition of how to compete in the global economy provides a basis for analysing regional differences, such as the factors affecting inequality in the distribution of income. The context of competitiveness, which expresses the ability to compete, is now part of the basic processes of globalisation and specific features of global competition and has thus become a central concept in territorial studies. Several works have been published on territorial competition and its effects on inequality [2-5], but nevertheless, the constant spatial changes mean that further in-depth research and clarification of existing findings are needed to establish widely accepted positions.

Regional inequality is difficult to disentangle from the question of whether economic and social transformation has led to an increase in regional economic development activity in some parts of Europe and a decline in others. A further problem is that in most cases it is difficult to identify the cause or causes of change, making it difficult to cope with the consequences and to design new innovative competitive policies and measures. Many of these identified regional differences have a purely urban and a purely rural dimension [6; 7]. There is a general view that peripheral regions are threatened by depopulation and ageing. These trends can be attributed firstly to the availability of jobs and secondly to the cultural and social scarcity of available jobs. However, international research increasingly mentions internal emigration, i.e., emigration abroad, as a major factor hampering competitiveness. Today, it is clear that the older generation remaining in peripheral areas, unskilled labour and a lack of social and cultural links are the main causes of economic decline and social exclusion [9; 9].

The deepening of territorial differentiation is also a global phenomenon. It is particularly prevalent in regions with a steadily declining population (e.g., natural decline, high emigration, ageing), rapidly declining educational attainment, declining infrastructure, or income levels below the national average [10-12]. In the light of the above findings, it is necessary to base the development of innovative regional development strategies on intra-regional opportunities, the exploitation of endogenous potential, the renewal and development of local and regional strengths. However, even on this basis, there is no single

agreed framework for reducing territorial disparities. However, it is also important to take into account the prevailing conditions in the area, including strengths and weaknesses, and to take account of natural, economic, and social processes [16]. As most the EU's peripheral areas are located in rural areas, it is essential to define local economic development policies to make these areas more competitive [14-16]. The system of regional competitiveness can be positioned between the level of competitiveness of the micro- and macro-economy, which is gradually attracting increasing attention because, in a globalised world, the competitiveness of regions is one of the key foundations for economic growth and prosperity. The study of regional competitiveness is not only a matter of academic research, but also an arena for policy planning and action [17]. Studies have shown that most regions in an unfavourable socio-economic situation have not been able to become competitive and develop even with the help of numerous financial support measures, and that the development of regional development strategies based on endogenous resources could become even more important in the future [18; 19]. It is generally accepted that regions in peripheral situations have to 'cope' with the consequences of ageing, in addition to the continuing depopulation. These trends can be explained primarily by the number of job opportunities and jobs available, as the migration of population with a higher propensity to mobility – mostly young – towards the centre(s) is a daily trend. Both internal migration and emigration abroad are seen as negative factors affecting territorial competitiveness [11]. Since the situation of territorial disparities is shaped, and shaped by many factors, it is worth examining and interpreting the most important ones separately (e.g., analysis of income inequalities, analysis of the labour market situation, analysis of innovation capacity [9; 15].

Materials and methods

In our study, we analyse the annual income per permanent resident as the tax base for personal income tax and present the income structure. Our research was carried out at the district (LAU1) territorial level for the period 2010-2019. From a methodological point of view, it is important to mention that the district system in Hungary came into force in 2013, so the databases used were also extrapolated back to earlier years according to the most recent territorial division. In order to avoid bias, the data for Budapest (as the capital) were not included in the analysis due to their high bias, so 174 Hungarian districts were included in the analysis. The starting point for the methodology used in the analysis is the "Éltető-Frigyes Index", which can be described as the ratio of the average of above-average and below-average incomes. The measure expresses the ratio of the average income of those living above the median income to the average income of those living below the median income. If the value of the indicator is a real number greater than 1, it represents the income gap between the income levels of individuals with above average 'average' and below average 'average' incomes. The "Éltető-Frigyes Index" (1) can be calculated using the following formula:

$$D = \frac{\bar{y}_m}{\bar{y}_a} \qquad (1)$$

where D – "Éltető-Frigyes Index"
        $\bar{y}_m$ – average of above-average incomes;
        $\bar{y}_a$ – share of below-average incomes.

We also show the change between the two years under study, 2010 and 2019, through the percentage point change in each district income level. The data calculated using the index are presented in the table below.

Table 1

Changes in the „Éltető-Frigyes Index"
based on the average values of rural districts in Hungary

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Value of "D"	1.477	1.520	1.482	1.464	1.440	1.427	1.411	1.398	1.395	1.406

Note: D means the "Éltető-Frigyes Index"

Before presenting the results of the analysis, we feel it necessary to mention that the national average income of the districts increased from HUF 742 500 (about EUR 2 060) to nearly HUF 1.5 million (about EUR 4 160) in the 10 years under review, which is more than double the increase in nominal terms compared to 2010. However, when looking at the average of the 174 rural districts, it can be seen that existing income inequalities in Hungary have decreased over the period under review, with the value of the "Éltető-Frigyes Index" being lower in the last year of the period under review than in the first year (Table 1).

In the results of the study, the average per capita income per district (excluding Budapest) is plotted as a proportion of the national average, with a map. Budapest is excluded from the analysis because between 2010 and 2019, on average, more than 20% of annual income, more than 60% of taxes paid and more than 40% of Hungarian GDP is generated in the Hungarian capital city and would therefore have a large biasing effect in the analysis. Several methodologies (e.g., law of Zipf) can be used to detect this metropolitan centrality, however, due to scope limitations, we do not present these methodologies in this paper [20; 21]. The study districts are divided into 4 groups according to their income level.

- Number (1) of territorial units: below average – below average (Uncompetitive regions).
- Number (2) of territorial units: below average – above average (Lagging regions).
- Number (3) of territorial units: above average – below average (Catching-up regions).
- Number (4) of territorial units: above average – above average (Competitive regions).

Results and discussion

Academic works on differences in development and on the competitiveness of spatial units have often used the income indicator system to measure development. This is the starting point for our research.

Figure 1 shows the differentiation of income levels in 2010. In our analysis, we have compared the data with the national district average and with the below and above average averages. Our analysis shows that there is a large degree of spatial homogeneity between the income groups in 2010.

■ 380 - 593 (64) ■ 594 - 742 (50) ■ 743 - 870 (39) ■ 871 - 1 186 (21)

Thousand HUF/person
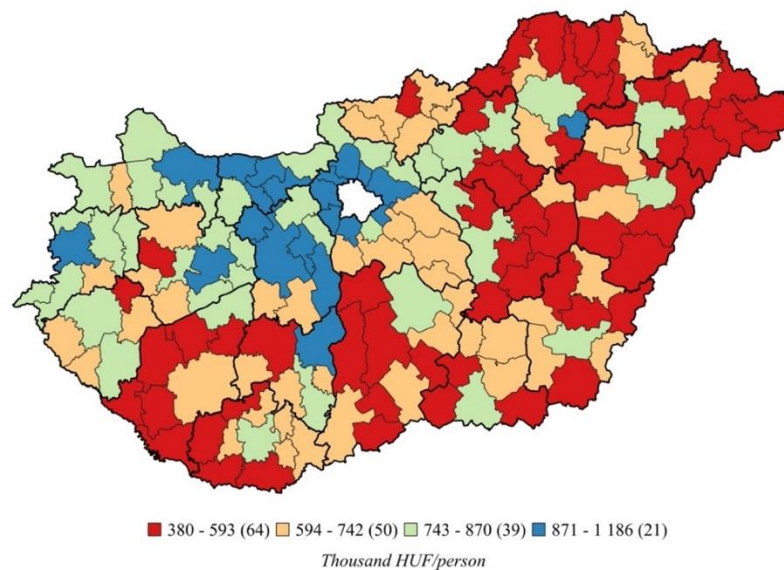
Note: Average national income at LAU1 level in 2010: HUF 742 500
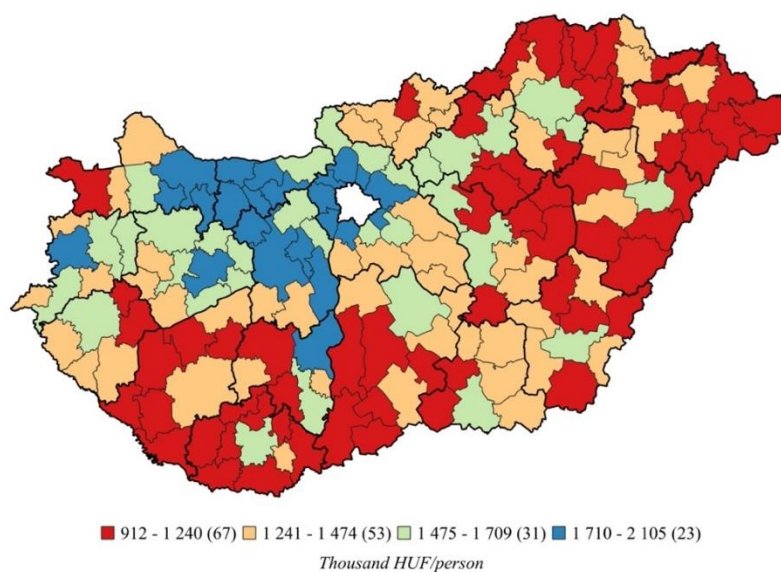
Fig. 1. **Annual per capita personal income taxable income (excluding Budapest values) at LAU1 territorial level in 2010 (thousands HUF/person)**

The majority of the (1) income status (Uncompetitive regions) territorial units are located along the northern, north-eastern, and eastern borders of the country. In addition to these, our analyses also show that there are internal income peripheries in the established system. According to our survey data, there were 64 districts with low-income status in Hungary in 2010. From our data we can conclude that among the examined districts, many territorial units belonging to the (2) income situation (Lagging regions) can be observed outside the border areas of the country, also in the inner districts. Spatially, a significant

proportion of them are located in the immediate vicinity of the income status (1) territorial units, thus showing the potential for the development of an internal periphery. In total, there were 50 such territorial units in Hungary in 2010. All in all, 114 territorial units had values below the national average in 2010, which is more than 65% of the total. In terms of economic aspects, the spatial polarisation also shows that income is highly concentrated in 30% of the territorial units studied, which is particularly pronounced in the capital's gravity zone.

Looking at the territorial units with an income level above the national average, the groups in income status (3) (Catching-up regions) are above but close to the national average (39 units), while income status (4) (Competitive regions) includes territorial units with an income level significantly below the average (21 units). Our study clearly shows the county centres as economic and social centres. In several cases, the analyses clearly show the economic development impact of the transport infrastructure, as the territorial units located along motorways and expressways demonstrate in several cases a more favourable income situation.

In the same way as the previous analysis, we have also carried out an analysis of the territorial units of the 2019 data (Figure 2).

■ 912 - 1 240 (67) ■ 1 241 - 1 474 (53) ■ 1 475 - 1 709 (31) ■ 1 710 - 2 105 (23)
Thousand HUF/person

Note: Average national income at LAU1 level in 2019: HUF 1 475 thousand

Fig. 2. **Annual per capita personal income taxable income (excluding Budapest values)
at LAU1 territorial level in 2019 (thousands HUF/person)**

Our survey results show that the number of territorial units in income status (1) has increased by three (67) compared to 2010, reflecting the growing territorial disparities. In terms of their territorial location, the majority of territorial units along the national border remained in income situation (1). The number of territorial units in income situation (2) also increased by three (53). All this suggests that the spatial variation in income over the interval under consideration shows a 5% increase in the number of territorial units below the national income average, which confirms the increase in inequality, while recognising the results that the number of people living in poverty in Hungary has fallen above the EU average.

The income distribution in 2020 is 5.24 in the EU and 4.16 in Hungary. This indicator is a measure of the inequality of income distribution. It is calculated as the ratio of total income received by 20% of the population with the highest income (the top quintile) to that received by 20% of the population with the lowest income (the bottom quintile). In 2020, this indicator ranked Hungary in the 10th place in the EU27, ahead of Germany (6.47), France (4.48), Italy (5.75), Spain (5.77) and other countries, too [22].

For the above average income territorial units (3-4), a spatial shift was observed. The number of units in income status (3) decreased by eight (31), while the number of units in income status (4) increased by two (23). Our analysis data also show an increase in the spatial disparities in income levels, as the figures show a strong convergence towards a decreasing income level, with a predicted decrease

in the number of above average territorial units. Our territorial analyses show that the absorption effect of the economic centre has been steadily increasing over the period under review, as can be seen in the distribution of incomes. Accordingly, the majority of the competitive districts in income status (4) belong to the capital (Budapest) and its gravity zone, which is also highly served by the motorway network (Budapest – Székesfehérvár – Győr), where the dominant economic centres are dominated by the leading companies of the multinational and national energy sector (Figure 2).

Conclusions

1. Our analysis shows that the LAU1 income level in Hungary more than doubled in the period under review (2010-2019), but despite the strong income growth, the income gap between the surveyed LAUs has continued to widen. Looking at the 174 LAU1 values using the inequality indicator applied, it can be seen that although the value of income inequality has decreased compared 2010 to 2019, there is a strong fluctuation in the interval of the period under review, with a renewed increase in inequality from 2017 onwards.

2. Our analysis suggests that the steady growth of the income status (4) of the territorial units has been further reinforced by their location in the capital's gravity zone, while the risk of falling behind has increased with increasing distance from the capital, which is a common threat for all four income status territorial units.

3. Overall, it can be concluded that a new territorial approach is needed, which calls for the development of a new regional paradigm. This should examine in detail the impact on competitiveness of the main elements of social and economic change. A key factor in regional competitiveness is the need to highlight the causes of regional heterogeneity and to carry out a comprehensive analysis of the decline in the role of regions in the development of the spatial economy, and hence to rethink the strategic direction of regional policy.

4. In order to increase the economic competitiveness of rural areas in Hungary, it is necessary to make rural life more attractive in the future (e.g., by encouraging investment and improving the infrastructure). In our view, current government initiatives (e.g., Smart Village Programme, Hungarian Village Programme) provide an adequate basis for the development of countryside in rural Hungary, but a number of further stimulus interventions will be necessary in the coming years.

5. To sum up, it is clear that a strategy to increase regional competitiveness can only be understood in the context of a complex economic and social framework which analyses the past, examines the present and plans for the future.

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