SPATIAL DIFFERENTIATION OF INVESTMENTS AND GROSS DOMESTIC PRODUCT (GDP) IN HUNGARY

Levente KOMAREK

Abstract: After the regime change and later, following the accession to the European Union, there were significant regional development differences in Hungary. For this reason, analysations are needed to answer what positive or negative changes occurred in this field in recent years. The analysis examines the differentiated development of the 20 territorial units of Hungary (19 counties and Budapest) in terms of investments and gross domestic product (GDP), for which mathematical-statistical methods (rank-ratio, relative rank, correlation) were applied. With the help of different mathematical-statistical methods it is possible to present the main tendency of the changes of the last years, with special regard to the extent and direction of the changes. In this study, I investigate which regions have developed and which have been disadvantaged, and what factors may have contributed to the development or decline of each region.
Keywords: investment, gross domestic product (GDP), territorial differentiation, development, Hungary

1. INTRODUCTION

Over the past decades, especially after the regime change, and then the accession to the European Union, the analysis of the territorial development has been increasingly emphasized in Hungary. Due to the importance of this topic, many researchers working in the field of regional science have dealt with the various aspects of development. Investigations on territorial development play an important part in regional research today. (Abonyiné et al. 2005, 2007, 2009, Dobosi 2003).

Due to the appreciation of territorial analyses, the methods of measuring development have been changing over the last decades. The change in methods followed the global economic and social processes, the Hungarian and international trends and the development of statistical databases. Development-related analyses continue to focus on territorial differences, the exploration of the factors of development and the

suggestions made to reduce territorial differentiation (Abonyiné et al. 2010, 2015, Tóth 2013).

The gross domestic product (GDP) is often used to analyse territorial development (Bruckner et al. 1999, Farkasházi 1998, Kovács 2002, Nemes Nagy 1995, 2009). Many Hungarian researchers have analysed territorial differences based on gross domestic product (GDP), gross domestic product (GDP) per capita, and the order of development of the counties and regions of Hungary (Bruckner et al. 2003, Cserháti et al. 2005; Kása 2006).

To illustrate the regional differences, Hungarian experts often use the development of investments by area units, which can be studied in many aspects. We can analyse the volume, sector, product group, product structure, territorial structure, or the distribution by capital, by size and by sector (Abonyiné et al. 2011, Komarek 2011, 2012a, 2012b, 2013a, 2013b, 2013c, 2017).

All in all, the regional development surveys always claim that there is a west-east "slope" and the capital-country (rural areas) opposition, and the analyses mostly confirmed each other and demonstrated the development of Western and Northern Transdanubia, at the same time the mixed picture of the Great Plain, and the unfavourable position of South Transdanubia and Northern Hungary (Abonyiné et al. 2015, Tóth 2013).

2. MATERIALS AND METHODS OF RESEARCH

For the analysis, I used the statistical data available by the Central Statistical Office (KSH) as a data source. From the data, I developed indicators that allowed us to make time and territorial comparative analysis of Hungary's development and the presentation of the main trends of the changes that took place. The analysis focuses on the territorial development of investments and gross domestic product (GDP).

After the regime change and later, following the accession to the European Union, there were significant regional development differences in Hungary. These changes make it necessary to carry out studies and analyses that give answers if there were positive or negative changes in the regional (county) level of development and the extent and role of which unit or units increased or decreased in recent years. To answer these assumptions, I applied mathematical-statistical methods (rank-ratio, relative rank, correlation) for my analysis.

3. RESULTS AND DISCUSSION

The development of a region is significantly influenced by the volume of investments. Investment is the main source of economic growth, development, competitiveness, sectoral and territorial structure change. Due to the multiplier effect of the investment, its size, time distribution and territorial development are not indifferent. Areas that enjoy a long-term privileged position due to the long-lasting, dynamic development and expansion of investments tend to become dynamic areas, while those not receiving anything from these development resources or just to a limited extent, or perhaps less effectively, will permanently lag behind. It is also very important that economic policy and (or) economic practice prefer the most optimistic, prospective branches of industry.

In case of investments, it can be stated that the leading role of the capital has been steadier, based on the range-ratio and the relative range. There are more significant differences between the two indicators. In case of the range ratio and the relative range, the capital, Budapest had the maximum results, while the minimum was Nógrád County (K_{2008} = 42.7; K_{2017} = 28.7; Q_{2008} = 5.7; Q_{2017} = 5.5). If we look at the volume of investments, it can be concluded that in 2008, 28.6% of the investments was concentrated in the capital city and in the 9-year perspective, this situation changed only slightly, as in 2017, 28.0% of the investments were in Budapest (Figure 1, Figure 2).

The upper extreme of the counties was reached by Pest County. The Transdanubian counties were the most prominent (e.g. Győr-Moson-Sopron, Fejér). In addition to the Transdanubian counties, significant investments took place in Borsod-Abaúj-Zemplén County during the examined period.

There was no significant change in the lower extremes group in this area. During the examined period, Nógrád County was the last one, followed by Békés and Tolna, with Zala County in the end.

Of the six counties in the Great Plain, only Bács-Kiskun and Hajdú-Bihar Counties was able to move forward. The rest of the counties were mainly characterized by stagnation after a short boost, and in some cases a decline in investment (e.g. Csongrád County).

If the range-ratio and the relative range are examined without the capital, Budapest, regarding the 19 counties, then significant territorial differences can be observed. In this case, Pest County represented the maximum, while Nógrád County alternately had the minimum (K_{2008} = 17.3; K_{2017} = 11.5; Q_{2008} = 2.2; Q_{2017} = 2.1). In this case, there is also a significant difference between the two extreme values.
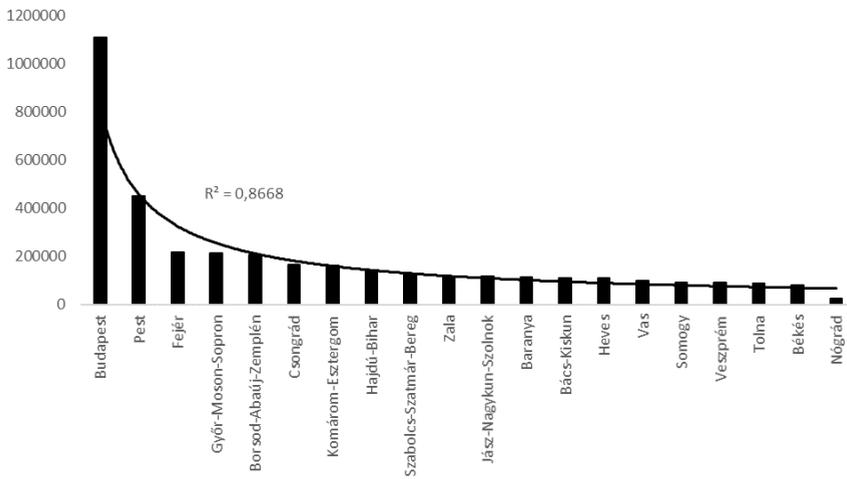
Figure 1. Regional rank of domestic investments (million HUF) (2008)
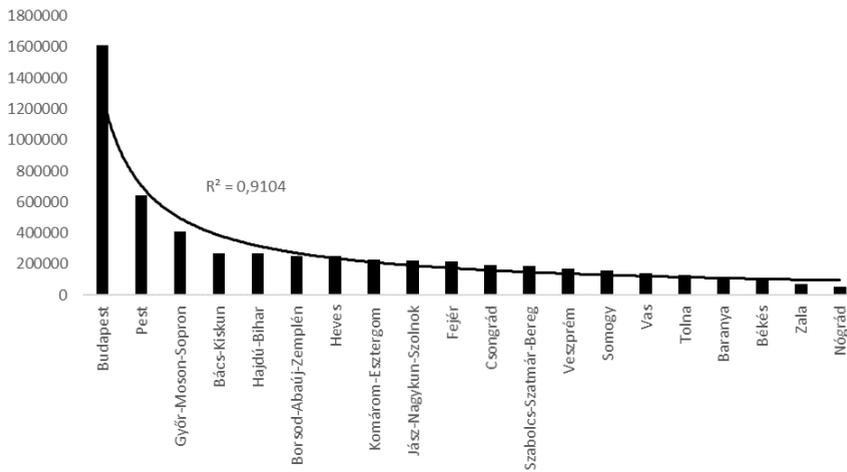*Source: Author's calculations, based on KSH data*

Figure 2. Regional rank of domestic investments (million HUF) (2017)
Source: Author's calculations, based on KSH data

Differences in territorial development can be characterized by several statistical indicators. Of these indicators, the most commonly used is the development of gross domestic product (GDP) at territorial level. When analysing the volume and the specific values of gross domestic product (GDP), several critical observations arise as to its objectivity. At the same time, there are no better indicators for determining the complex development of the regions.
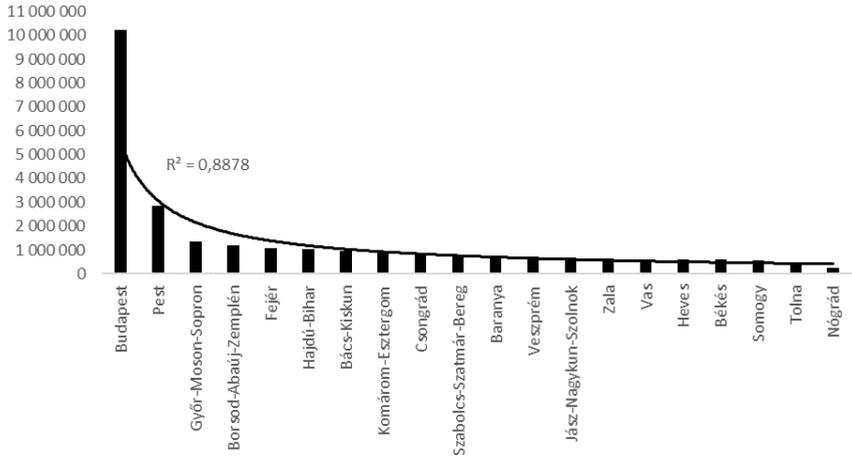
Figure 3*. Regional rank of domestic GDP (million HUF) (2008)*
Source: Author's calculations, based on KSH data

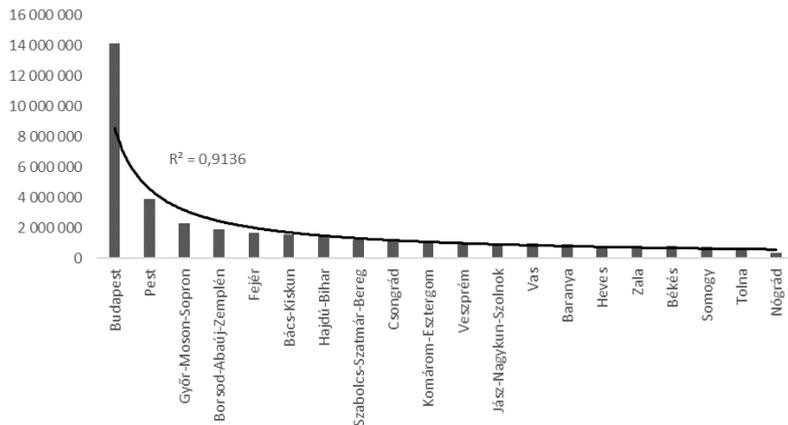***Figure 4.*** *Regional rank of domestic GDP (million HUF) (2017)*
Source: Author's calculations, based on KSH data

During the examined period the prominent role of Budapest has not only been stabilized, but also increased dynamically. The range ratio increased, and the relative range is decreased, where Budapest had the maximum and Nógrád County had the minimum ($K_{2008} = 39.2$; $K_{2017} = 43.8$; $Q_{2008} = 7.3$; $Q_{2017} = 7.2$) (Figure 3, Figure 4).

Out of the counties, the upper extremity was formed by Pest County. Among the most prominent counties there were the Transdanubian Counties (e.g. Győr-Moson-Sopron, Fejér), while Borsod-Abaúj-Zemplén County can be highlighted among the counties east of the Danube.

There was no significant change in the lower extremity groups either. During the examined period, Nógrád County was always the last one. In addition to Nógrád County, Somogy and Tolna Counties were also lagging when regarding gross domestic product (GDP).

Except for Bács-Kiskun County, the other six counties on the Great Plain stagnated (e.g. Békés and Csongrád Counties) or slid backwards (Hajdú-Bihar County) in the national field.

When the range ratio and the relative range are analysed for the 19 counties without Budapest, a strong differentiation can be identified. In this case Pest County had the maximum, while Nógrád County had the minimum ($K_{2008} = 10.9$; $K_{2017} = 12.0$; $Q_{2008} = 1.9$; $Q_{2017} = 1.9$).
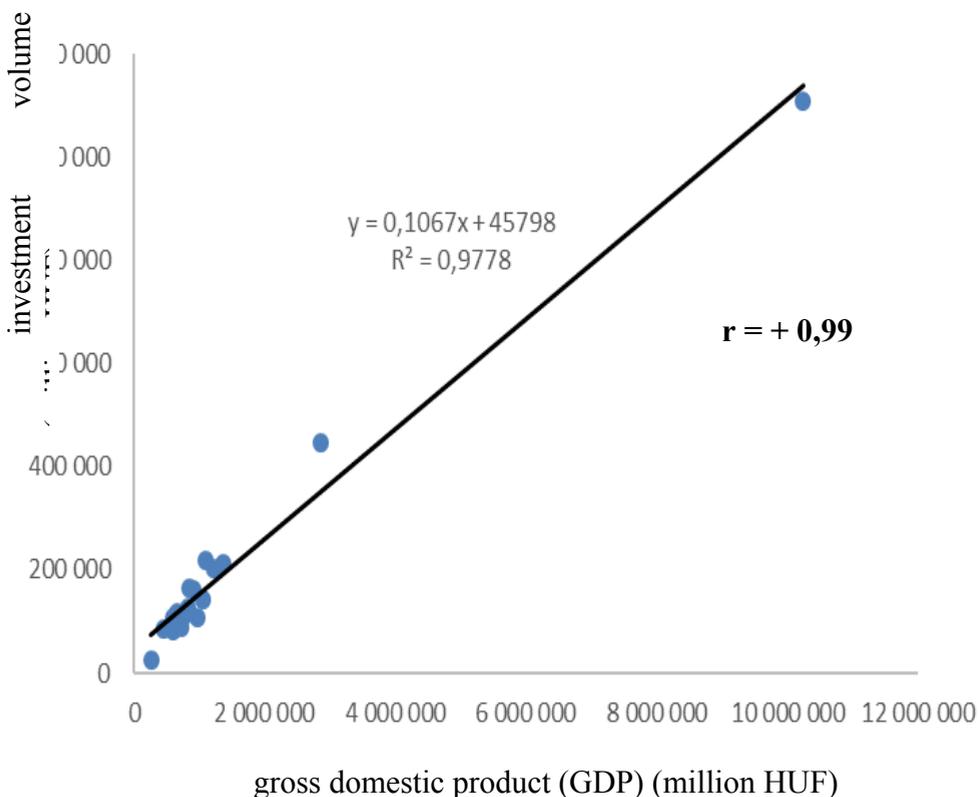

Figure 5. Regional relationship between domestic GDP and investments (2008)
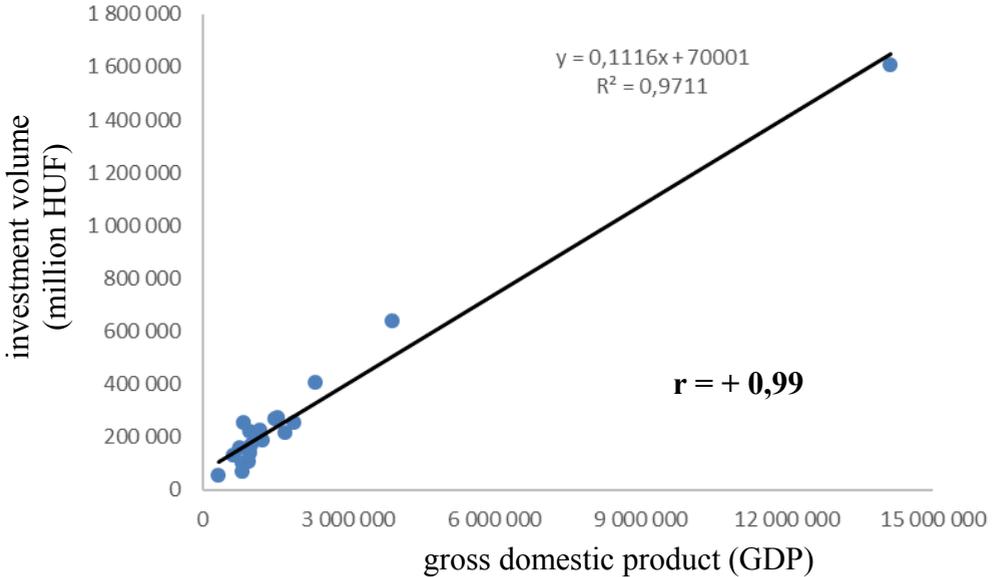*Source: Author's calculations, based on KSH data*

Figure 6. Regional relationship between domestic GDP and investments (2017)
Source: Author's calculations, based on KSH data

I also examined the correlation between the gross domestic product (GDP) and the volume of investments, and as a result, I can conclude that there was a close positive correlation between the two quantitative criteria ($r_{2008} = +0.99$; $r_{2017} = +0.99$) (Figure 5, Figure 6). Consequently, in regions (counties) where the volume of investment is high there is usually a high gross domestic product (GDP) as well.

4. CONCLUSIONS

Based on the analysis, it can be concluded that the dominant position of the capital and primarily the West and Central Transdanubian counties remained. By contrast, most of the counties in Northern Hungary and the Great Plain have suffered from backlogs and disadvantages. The examined criteria play an important role in determining the territorial development, affecting each other. In regions where there is significant investment higher, there is usually higher gross domestic product (GDP), resulting in dynamic development in these areas.

It can be concluded that investments have a very significant impact in the present and future development of an area. Therefore, when the

regions strive for equalization in their territorial development level, attention must be paid particularly to capital investments. The underdeveloped regions possibly can catch up only by receiving more intensive development resources. If the investment is territorially uneven, the regions that have a long-term privileged position as a result of the long-term expansion of investment, generally become a dynamic area, while those having fewer or less efficient sources are permanently lagging. Krugman (2003) says that there is tugging between the centripetal and centrifugal forces of the spatial concentration of the economy and its spread. There are winners and losers of this development in opposite directions. Winners of the coming years include the counties of Transdanubia (e.g. Komárom-Esztergom-Tatabánya-Doosan, Zala-Zalaegerszeg-Flex), and Bács-Kiskun and Hajdú-Bihar Counties from the Great Plain counties. The former is Mercedes (Kecskemét) and the latter thanks to the billions of HUF investment of BMW and Continental (Debrecen). The completed, new investments and those that will be realised soon can help to advance the dynamic development of the given areas.

The growth of investing willingness and its efficiency can further increase the growth of gross domestic product (GDP) in the counties, thus contributing to the development of the regions.

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NOTES ON THE AUTHORS

LEVENTE KOMAREK (Dr. habil. PhD. PhD) associate professor, University of Szeged, Faculty of Agriculture, Institute of Economics and Rural Development, Andrássy street 15. 6800 Hódmezővásárhely, Hungary; e-mail: komarek@mgk.u-szeged.hu