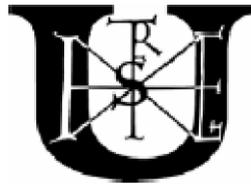


SZENT ISTVÁN UNIVERSITY  
GÖDÖLLŐ



PhD DISSERTATION THESIS

**Major spatial economic coherences of the Hungarian least-developed  
micro-regions**

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## INTRODUCTION

*„A siker fenntartásáért nap, mint nap meg kell küzdeni – csak a hanyatlás megy magától.”  
(ENYEDI, 1998)*

The examination of disadvantaged regions goes back to a long history, which is greatly influenced by the ever-changing **natural, economic and human resources**. Consequently, while examining the disadvantaged areas, we face new systems of coherences. Today's regional policy also needs to answer the question whether the spatial development funds of the past have been efficient or not and whether the land use distribution influences the spatial competitiveness or not. These issues occur every day while analyzing the efficiency of the past 20 years' regional policy.

### **The actuality of the topic, raising the question**

In my opinion, the topic is actual, since there are **significant territorial differences** in most of the EU countries in and out of the borders. The gap between the urban and rural areas is also significant. The focus of my research is to examine the economic and social dimensions of the spatial imbalances, concerning the land-use relations. The main reason for the creation of spatial differences is that the economic and social processes are always restructured in the space and time (HARSÁNYI et al., 2005, RITTER, 2008). This restructuring can be observed in **Hungary**, in the **Carpathian basin**, in **Central-Eastern-Europe**, as well as in the **European Union and in the world**. In order to get a real picture about today's spatial processes, it is necessary to learn the processes resulting in the spatial imbalances as well as their impacts on the change of spatial structure. These discrepancies can be observed at various territorial levels. During micro-regional investigations researchers carry out researches in larger areas than the town-village dichotome, however, in a narrower territory compared to the West-East investigations (MOLNÁR, 2007).

In my opinion, the topic is timely because the usefulness of the research is important ranging from **rural development**, to spatial planning and the **elaboration of local and regional development strategies**. Spatial discrepancies in Hungary cause the disadvantage of rural areas, contributing to their lagging behind compared to the urban areas (MISKÓ, 2006).

Disadvantaged rural areas are the location of agricultural farming and forestry, therefore I considered it important to investigate land-use distribution.

Past years' regional policy has also put great emphasis on the development of the disadvantaged rural areas and the efficiency of distribution of funds, established also by the **Barca report** published in 2009 (BARCA, 2009). **Fabrizio Barca, Italian economist** highlights the fact, in a direct and indirect way, that the funds should be channeled to the old (developed) member states. Regarding my topic, it is important whether the Hungarian least-developed micro-regions or the more-developed ones should be supported in the future in order to achieve dynamic development.

The general features of the disadvantaged areas are the low **infrastructural supply**, low **quality of services**, and there are **shortages of jobs**. As a consequence, there is high unemployment rate and the wages are low. It is also a common phenomenon that young people migrate from these disadvantaged rural areas, contributing to the aging population in long terms (KÁPOSZTA et al., 2010).

The change in the economic structure starting in the 1990s also contributed to the territorial inequalities to a large extent, since **dynamically developing centres and peripheral territories lagging behind** have been created (DUSEK, 2001). The targets of my research, i. e. the least-developed micro-regions are also located on these peripheral areas. Hungary is a one-centered country, there are only few large or middle-sized town and there are a lot of small villages in the countryside.

Due to the lack of roads and highways the accessibility of rural areas is difficult, so they are isolated from the major economic and social streamlines. As it has been mentioned before, the least-developed micro-regions are the places of agricultural farming and forestry, raising the question **what breaking out potentials they have in Northern-Hungary, Northern-Great Plain, Southern-Great Plain and Southern-Transdanubia?** While evaluating the land-use and the agricultural economy of Hungary, we can state that our most important natural resource is the **agricultural land**.

The **basic resources of agricultural farming** (labour force, tools, land) still mean comparative advantages that can be exploited in the future especially in the least-developed micro-regions (SZÜCS, 1994, HARSÁNYI, 2004).

It is important to see that the share of agriculture in GDP has decreased to less than one-fourth between 1990 and 2008, while to one-third in the export and employment. By now, its share within the GDP is surprisingly low (about 3.5%) (KSH, 2011). Despite of it, the role of agriculture in the national economy and in society is increasingly important, especially in the areas with low quality of human resource.

If we examine the least-developed micro-regions, we can see that their development is primarily determined by the most important natural resource, i. e. the **agricultural land**. It is important to highlight that the land-use of an area needs to be adjusted to the local conditions (PESTI, 2009). In addition to the natural endowments, the economic, human conditions, the accessibility of the areas and the local conditions influencing the standard of living all contribute to the existing territorial imbalances. The micro-regional differences can be evaluated based on these factors.

After Hungary's EU accession new space-use definitions have been used, which affect significantly the agricultural land-use as well. Therefore, nowadays agricultural land-use does not only mean **traditional land-use** (e.g. arable land use), but including the related sectors (e.g. supplying sectors: food industry, tourism, energy management, landscape protection etc.), namely the **agribusiness**.

In my opinion, it shows clearly that the agricultural land-use covers a wider field than the conventional agriculture. The expression of **agribusiness** can be well used while planning the long-term competitiveness, thus in my dissertation I examined the actual land-use highlighting the importance of optimal land-management.

The abovementioned thoughts encouraged me to focus on the agricultural land-use within the land-use. Spatial development and rural development programs of the past years have turned the focus to the micro-regions were not able to break out of their stagnating status **despite of the development programs and funds available**. While examining the least-developed micro-regions, a question raises what micro- and macro-factors play key roles in the stagnating and breaking off. In my dissertation I point out the coherences between the social and economic factors of the 47 least-developed micro-regions and introduce the directions of change in the competitiveness for the years 2007 and 2009, with special focus on the coherences between the efficiency of support and land-use.

## **Aims of the dissertation and the starting hypotheses**

In the first part of the dissertation I have overviewed the related literature, introducing the **creation of territorial imbalances**, the **territorial competitiveness**, spatial development strategies and the up-to-date issues of the **national land-use**. I highlighted the basic issues of the demand- and supply-oriented strategies, the major coherences of the territorial competitiveness models as well as the basic characteristics of the agricultural land. In this chapter I also call the attention to the NUTS system, as the classification system of the fund-allocation

The territorial categories of the NUTS system changed on 1 January 2008, which are reflected by the EUROSTAT data. The Hungarian classification is based on the **Parliamentary provision No. 2007/67** and the **Governmental Act No. 2007/311**, which both are detailed in the dissertation. Since I carried out a **competitiveness analysis** for the 47 least-developed micro-regions of Hungary, I also put great emphasis on the theoretical background of competitiveness. In the last part of the literature review I dealt with current land-use issues, considering the land as a resource, with special focus on its national economic role and function.

In the material and method chapter, I introduced the methods applied. After processing the literature, I decided to find answers to the questions below:

1. What economic and social characteristics can be observed in the 47 least-developed micro-regions concerning their competitiveness?
2. Which are the economic and social factors that led to the stagnation or breaking off of these areas?
3. Is there a relation between the spatial competitiveness ranks, the efficiency of support, the social diversity and the human resource available in the micro-regions examined?
4. Are there LDCDP micro-regions which could break out from their current category?

### **In order to answer the above questions, I have set up the following hypotheses:**

**H1:** In my opinion, the peripheral territories near the borders constitute a uniform zone because of their similar economic and social structural problems.

**H2:** According to my hypothesis, the fundamental factors of social break off had significant role in the accumulation of negative tendencies.

**H3:** According to my hypothesis, the average data for the period 2007-2009 resulted in similar territorial links concerning competitiveness.

**H4:** Based on my hypothesis, there is a cluster among the 33 LDCDP micro-regions which is able to break out from its current "*least competitive*" classification due to the gravitation zones of larger cities and targeted development programs.

As a result, I defined four new research findings which show the territorial differentiation of the 47 least-developed micro-regions and provide explanation for its interpretation. After introducing the results, I listed up my conclusions and recommendations, detailing the breaking out potentials that could help with overcoming the current stagnating or even breaking off situation.

## MATERIAL AND METHOD

The aim of this chapter is to define the **time- and spatial-scope** of the research, to **compile the necessary database**, as well as to **introduce the applied statistical methods briefly**.

I am introducing the possible methods to carry out territorial competitiveness analyses regarding the land-use, for which I collected the data from the **TeIR** electronical database and the yearly published **Spatial statistics yearbooks**. These databases include most of the statistical data at settlement and micro-regional level. In the case of such indicators, where there were no micro-regional indicators available, I had to aggregate the settlement data before the statistical analysis. During my investigation, I used the following data:

- Agricultural Economics Research Institute (AKI)
- Central Statistical Office (KSH)
- National Tax and Customs Authority (NAV)
- National Employment Service (NFSZ)
- Agricultural and Rural Development Authority (MVH)
- VÁTI Kht.

While collecting the data, it was clear that there are data which are collected by several institutions at the same time. However, they apply different methods for calculating the data, therefore they are various. In my research I found different definitions for the unemployment rate at the National Employment Service and the Central Statistical Office<sup>1</sup>, but I used the data from the former one, saying that the unemployment rate is the rate of people within the active population (15-74 years)<sup>2</sup>.

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<sup>1</sup> Spatial Statistics Yearbook 2007-2009. definition

<sup>2</sup> [www.afsz.hu/statisztika](http://www.afsz.hu/statisztika)

## **Time-scope of my research**

I tried to carry out my examinations based on the latest data available. While defining the time-scope I took into account the **ever-changing territorial classification of Hungary** (the number of micro-regions are always increasing and decreasing). At the time of our accession, there were 150 micro-regions, while their present number is 174. While planning my research I decided to start the investigations from the year of 2007, since there have been 174 micro-regions from 1 January 2007. As overviewing the database of TeIR, we can state that the necessary information is available at settlement level for the years 2007, 2008 and 2009. The latest data available is for the year 2009, because the spatial data for 2010 were supposed to be published at the end of 2011. Therefore I carried out my investigations for the years **2007, 2008 and 2009**. As for the number of operating enterprises, I need to mention that there are no data for the year 2007. However, I considered it important to involve that data in the examination, since the number of registered enterprises often 3-times or 4-times higher than the operating ones. Operating enterprises are viable businesses which take part in the improvement of the competitiveness<sup>3</sup>.

## **Territorial scope of the research**

In my research I focused on the **47 least-developed micro-regions**, with special focus on the **33 ones requiring complex development programs**. As mentioned above, I carried our research at both micro-regional and settlement level. In the period given, there were 3152 settlements with data available.

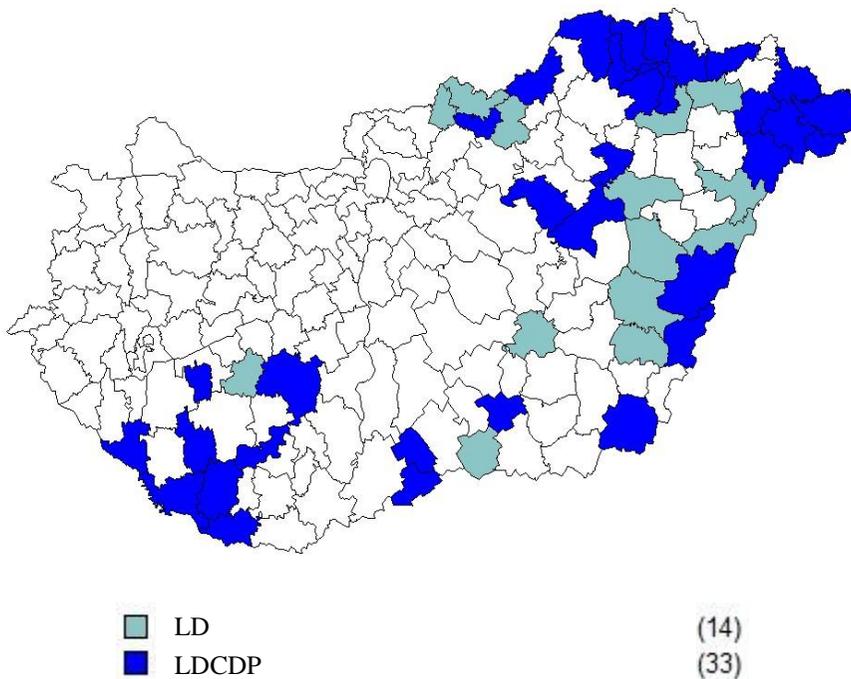
According to the Act 2007./CVII., there are 174 statistical micro-regions in Hungary, thus I collected the basic data for the least-developed micro-regions according to the categories of the Parliamentary provision No. 2007/67 and Governmental regulation No. 2007/311. The 33 LDCDP micro-regions are located in 4 regions and in 12 counties as it can be seen on the map below.

LD: least-developed micro-region

LDCDP: least-developed micro-region requiring complex development program

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<sup>3</sup> Spatial Statistics Yearbook, 2009. Operating enterprise: a business, which had income through the year or had employees.



**Figure 1: The location of the Hungarian LD and LDCDP micro-regions**

*Source: own editing based on CSO data (2011), 2011.*

### **The database of the research**

The factors of territorial competitiveness and land-use which can be analyzed are determined by the availability of data. In my dissertation I intended to collect wide range of data for the micro-regions in question, avoiding the shortage of data if possible. I tried to complete the database with estimated data where necessary. There were only two cases where it was necessary to use estimated data (operating enterprises in 2007, number of cars in 2008), therefore they do not distort the final results.

Data have been collected in the following categories:

1. Demographic indicators
2. Infrastructural indicators
3. Economic activity indicators
4. Unemployment and human capital indicators
5. Tourism and trade indicators
6. NHDP and NHRDP funds
7. Land-use indicators

The dissertation is based on the processing of **secondary data** originating from TeIR database and CSO spatial statistics yearbooks as well as the **practical experience of mine**. I managed to collect nearly 70 indicators for the 47 micro-regions in the abovementioned categories. I tried to collect all the data that can influence the territorial competitiveness. I **created basic indicators** from the data available that helped to compare the various territories. In most cases I weighted the basic indicators with the **number of population and size of area**. I created basic indicators for each year and each micro-region. With creating basic indicators my aim was to create such a group of indicators that enables the selection of the final indicators to reflect the competitiveness.

## Methods applied during my research

I have carried out the investigations for the period 2007-2009, as mentioned earlier. My aim was to see the **changes of the indicators** for the least-developed micro-regions. I calculated the average of the three years' data mentioned above (see Figure 2).

**Step 1:** Collecting secondary data, 70 raw indicators



**Step 2:** Creating basic indicators, 42 indicators



**Step 3:**  $(2007+2008+2009)/3$

**Step 4:** Main-component analysis

**Step 5:** Interpreting the main components

**Step 6:** Cluster analysis



**Step 7:** simple weighting, scenarios: 5-10-15%



Creating an economic development index for the LD micro-regions

**Figure 2: The major steps of my research**

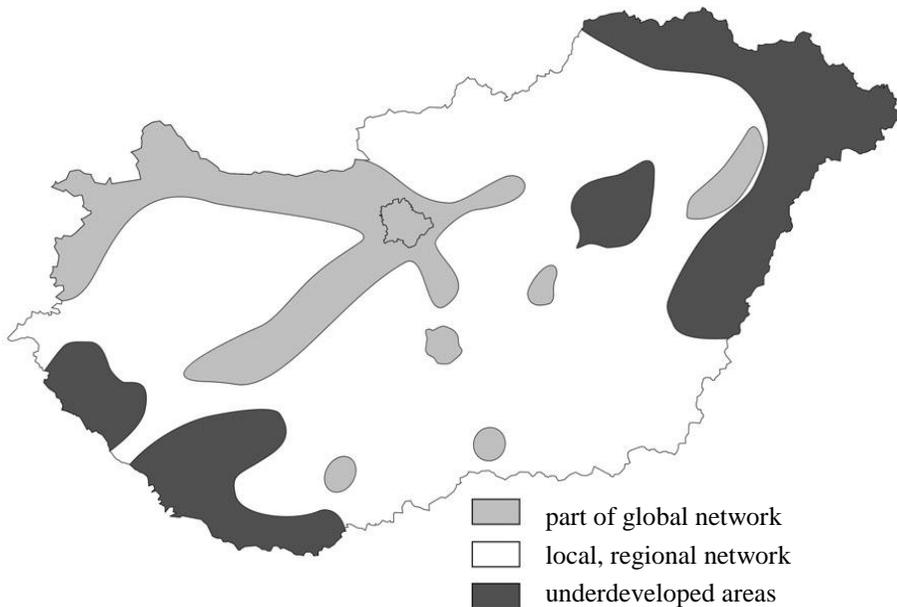
*Source: own editing, 2011.*

## RESULTS

My research covers the period of 2007-2009. It was backed by the work of ENYEDI (2004), who has already defined the least-developed micro-regions based on nearly 10 years' data (Figure 3). In my investigation I wanted to find out whether his definition and the current least-developed micro-regions cover the same area or not.

In 2004, ENYEDI made the following classification for the space structure:

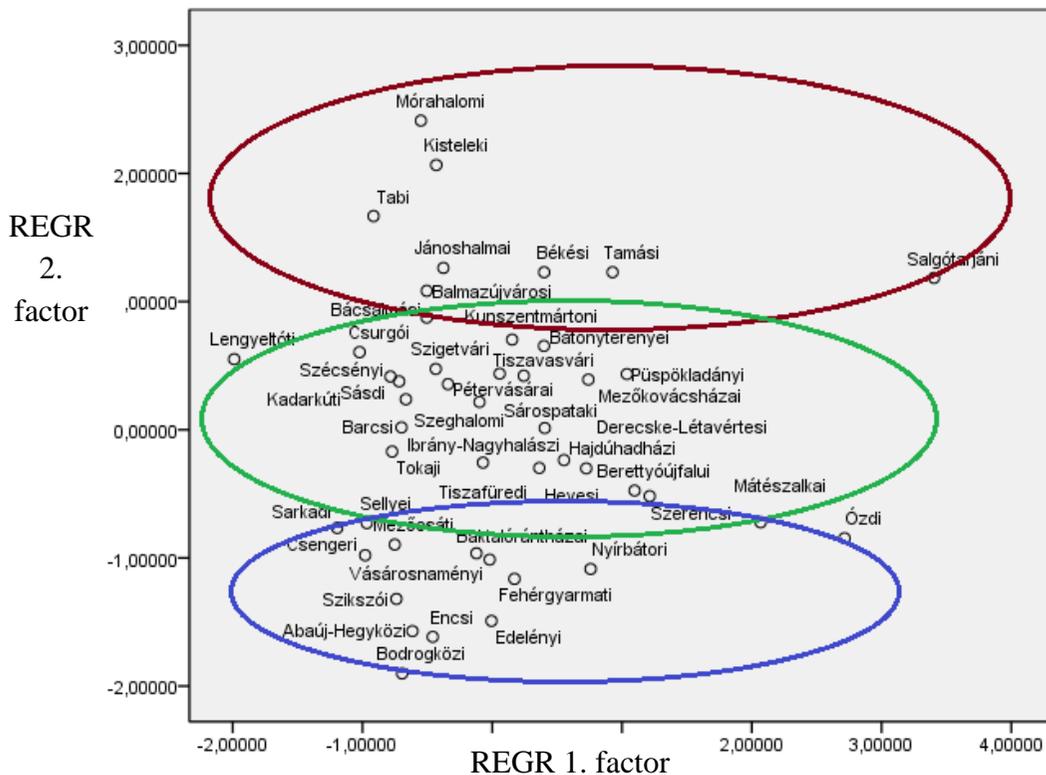
1. The penetration of global network into the Hungarian settlement-network,
2. Smaller regional networks,
3. mainly underdeveloped villages, out of the networks, restricted to the areas between dynamic axis (ENYEDI, 2004).



**Figure 3: Three major parts of Hungary**

*Source: ENYEDI editing, 2004.*

I think that the main-component and the cluster analyses point out the problems included in the general situation assessment. The major aim of my research was to find out which LDCDP micro-region could improve its situation and which LD has such economic and social situation that would require complex development help.



**Figure 4: The results of main-component analysis**

*Source: own editing with the application of PASW 18 program, 2011.*

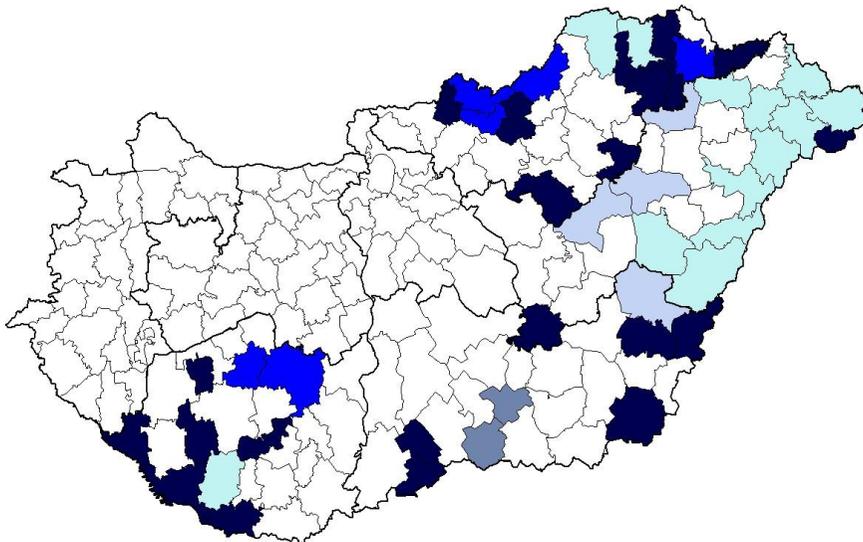
In the main-component analysis for the average of the three years I found out that the micro-regions can be put into three categories (Figure 4).

**Category No. 1 (developing micro-regions):** the ones located in the upper ellipse of the Figure. 10 micro-regions belong to this category, having the best competitiveness potentials. Mainly LD micro-regions constitute this group (7), however, there are micro-regions (Tamási, Jánoshalmi, Bácsalmási) which are at the moment in the LDCDP category.

**Category No. 2 (stagnating micro-regions):** the ones in the middle ellipse of the Figure. The category consists of 23 members with moderate competitiveness factors. The category includes both LD (6) and LDCDP micro-regions (17).

**Category No. 3 (micro-regions lagging behind):** the ones located in the below ellipse. The category consists of 14 micro-regions with the poorest competitiveness potentials. There are 13 LDCDP micro-regions and 1 LD (Ózdi). This highlights that the competitiveness in the Ózdi micro-region has decreased so much that it might slip to the LD classification to the LDCDP one if a new classification is elaborated in the near future.

The results of the cluster-analysis can be seen on the following map, displaying that the first cluster includes 6, the second 22, the third 2, the fourth 4, the fifth 13 micro-regions. The elements of the first cluster are those which I considered the most competitive, those of the fifth are the least-competitive among the least-developed 47 micro-regions. The white ones are those which do not belong to the 47 least-developed micro-regions. The dark blue ones are the most competitive, while the light blue ones are the least competitive ones.



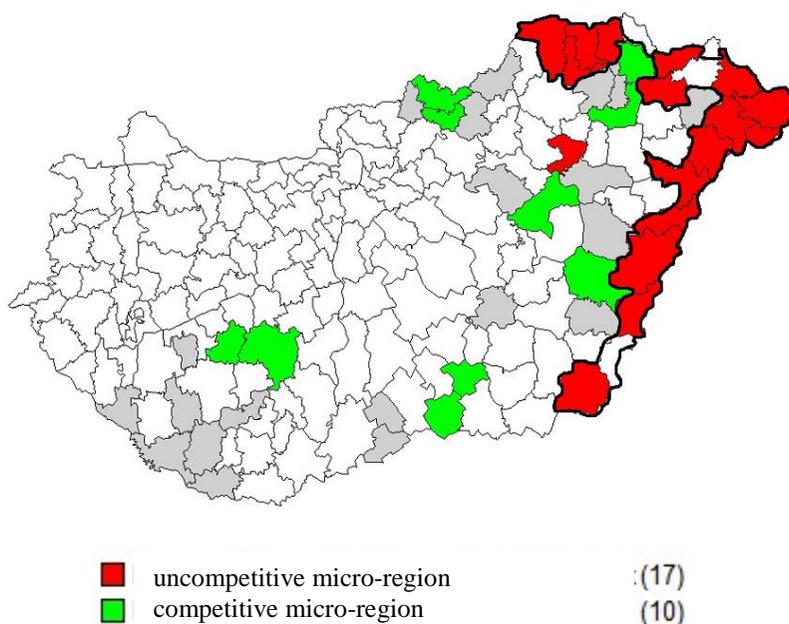
**Clusters of the 47 LD micro-regions**

□	not examined	(127)
■	Cluster No. 1	(6)
■	Cluster No. 2	(22)
■	Cluster No. 3	(2)
■	Cluster No. 4	(4)
■	Cluster No. 5	(13)

**Figure 5: Clusters of the 47 LD micro-regions**

*Source: own editing based on CSO data (2011), 2011.*

After carrying out the main-component analysis, I have got the indicators which influence the territorial competitiveness of the micro-regions the most. Therefore, I continued with an analysis concentrating only on those indicators. I increased the determining factors' values by 5-10-15%, which can reflect the change in the competitiveness. The weighted indicators are used in the cluster analysis.



**Figure 6: Territorial competitiveness of the least-developed micro-regions**

*Source: own editing based on CSO data (2011), 2011.*

At first, the analysis was carried out for all the 47 micro-regions, then only for the 17 least-competitive ones. Before detailing the results, I considered it important to list up the indicators that were modified with the abovementioned percentages in the cluster analysis:

1. Number of operating enterprises
2. Difference in migration rates
3. Businesses in the service sector
4. Share of those receiving regular social benefits
5. Unemployment rate
6. People over 60
7. HDI

Based on my research results, the economic development index of the least-developed micro-regions can be identified with the formula below. In order to create the formula, I needed part-indices for which I standardized the indicators based on NEMES-NAGY (2005). I used the average and the deviation to standardize the indicators:

$$Z_i = \frac{x_i - \bar{x}}{S_x}$$

where

$\bar{x}$  = average of the data set

$S_x$  = deviation of the data set

The average of the standardized variable ( $Z_i$ ) is 0, its deviation is 1.

$$\overline{GI} = \frac{f_1 * \frac{(x + y + z)}{3} + f_2 * \frac{(h + i)}{2} + f_3 * \frac{(j + k)}{2}}{\sum f_i}$$

where

$f_1 = 0,6$

$f_2 = 0,3$

$f_3 = 0,1$

$\sum f_i = 1$

$x$  = active enterprises part-index

$y^*$  = migration part-index

$z$  = service-type enterprises part-index

$h$  = regular social benefit recipients part-index

$i^*$  = unemployment part-index

$j$  = aging part-index

$k$  = human development part-index

\* in these cases the part-index value of 1 subtracted

The weighting was carried out in a subjective way on the basis of former research results related to the topic as well as the results of the main component analysis.

In the economic development index the businesses of the service sector have the highest significance, thus these indicators can urge the largest positive achievement in the micro-regions in question. The higher is the economic development index, the more competitive is the micro-region. Due to my research results, I could get 17 LDCDP micro-regions which have the least-favorable economic and social conditions. In my further investigations I focused on these micro-regions.

*The results of the cluster analysis for the 17 micro-regions (with weighted indicators):*

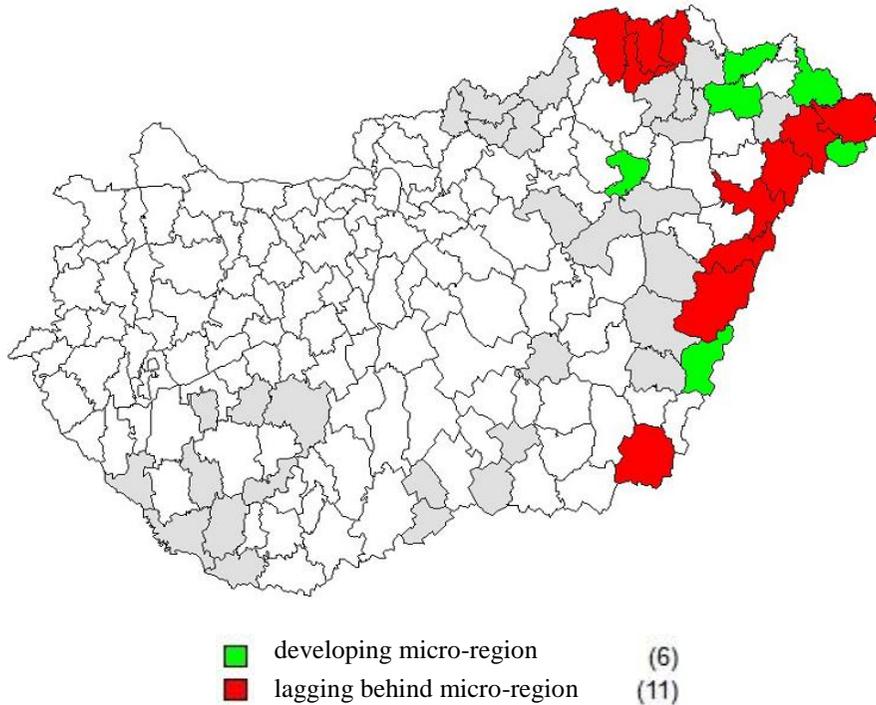
In the last phase of my research I wanted to find out which micro-regions could break out from the downward tendency from the **least competitive, mainly multi-peripheral** areas.

I have carried out the cluster analysis in three different cases (similarly to the former investigations):

1. I have modified the values of the key indicators by 5 %.
2. I have modified the values of the key indicators by 10 %.
3. I have modified the values of the key indicators by 15 %.

As a result of the modified indicators, the following micro-regions show developing tendency regarding competitiveness: Sarkadi, Ibrány-Nagyhalászi, Mezőcsáti, Csengeri, Vásárosnaményi, Bodrogközi (Figure 7). The results of the cluster analysis show the same picture in each case (5-10-15%), there is no difference between the clusters. As a conclusion, out of the least competitive, multi-peripheral micro-regions there are only 5, where the improvement of the indicators resulted positive effects.

In other micro-regions the accumulated negative conditions are so serious that even 15% improvement cannot result positive effect. In my opinion, the situation is even worse due to their unfavorable geographical location (peripheral areas, out of the gravitation zones of large cities), the aging population and the poor quality of the human resource.



**Figure 7: The change of the most and least competitive micro-regions after modifying their key indicators**

*Source: own editing based on CSO data (2011), 2011.*

Based on all these, we can state that I have created an **economic development index** specialized for the least-developed micro-regions with the following elements/part-indices: operating enterprises, businesses in the service sector, human development, migration, those receiving regular social benefit, unemployment, aging. Therefore, these factors determine the most the competitiveness of the Hungarian least-developed micro-regions.

## NEW SCIENTIFIC FINDINGS

1. I have proven in my research that there are LDCDP micro-regions which could **step up to an upper category** within the micro-regions, while there are ones which **would require complex development assistance**.
2. With the help of statistical methods used (main-component analysis, cluster-analysis), I have created an **economic-development index**, which had been tested on the least-developed Hungarian micro-regions.

$$\overline{GI} = \frac{f_1 * \frac{(x + y + z)}{3} + f_2 * \frac{(h + i)}{2} + f_3 * \frac{(j + k)}{2}}{\sum f_i}$$

$$f_1 = 0,6 \quad f_2 = 0,3 \quad f_3 = 0,1$$

$$\sum f_i = 1$$

*x = active enterprises part-index*

*y\* = migration part-index*

*z = service-type enterprises part-index*

*h = regular social benefit recipients part-index*

*i\* = unemployment part-index*

*j = aging part-index*

*k = human development part-index*

*\* in these cases the part-index value of 1 subtracted*

3. During my research I have defined in the space those **multi-peripheral areas**, which had not been influenced by the economic development programs.
4. With the help of my research I have proven that there is spatial link among the least-competitive territories due to their location and similar economic and social conditions. I have also proven that these defined micro-regions have negative multiplication effect on one another, therefore their break off can be predicted. In order to define these areas, I have created the expression of **multi-peripheral boomerang**.

## CONCLUSIONS AND RECOMMENDATIONS

The key priority of the EU is to establish the economic, social and territorial cohesion, thus to reduce the territorial imbalances. Related issues are raised as key tasks to be done at both the EU and national level. The literature and the research results also prove that there is a need for a thorough investigation on the Hungarian least-developed micro-regions. As a general conclusion, we can state that the least-developed micro-regions are on the periphery of the country and it is necessary to prevent their economic and social break off. The classification in the Governmental Act No. 2007/311 requires a review. My research has highlighted that there are micro-regions which do not belong to the least-developed micro-regions any more, while there are some which would require complex development assistance.

Based on my research findings, it is clear that they lag well behind the national average regarding both economic and social indicators. In my opinion, the following factors have contributed much to their break off:

1. **The low quality of human resource**
2. **High rate of migration**
3. **Bad infrastructure**
4. **Problems of the social groups**

As a result of my researches, I make some recommendations (strategic guidelines) how to improve the competitiveness of such micro-regions in long-terms, which are, at the moment, stagnating or breaking off.

1. In my opinion, **such investments should be carried out in these areas which create jobs and require human work**, providing job opportunities for the local active population. Just a few examples: **the creation and development of industrial parks, energy forests**, the collection and use of **forestry products**. I believe that the rate of migration may be reduced due to such activities.
2. I think that the **development of human resource** should be a key priority in their future strategies. If the human resource is developed, it encourages the investments, the absorption of funds and the submission of project proposals. At the moment, in several micro-regions the qualified human resource is not available, which is required for the efficient use of EU and national funds. The development of vocational trainings should also be a key priority as well as the start of trainings dealing with family assistance and drug- and alcohol-prevention.

3. Based on my research it can be seen that micro-regions which are located in the **gravitation zone** of pole-cities (e.g. Miskolc, Debrecen, Nyíregyháza, Szeged, Békéscsaba, Vásárosnamény, etc.), have better competitiveness potentials than the others out of the zones. Therefore, I suggest that most of the funds and investments need to be channeled to the pole-cities, which will have a positive impact on the micro-regions of the zones as well (due to the center-periphery model).
4. In addition, I suggest the application of **demand-oriented regional strategy on the basis of the special internal** conditions in the least-developed micro-regions as well. Thus, the comparative advantages of the restricted factors of the rural land-use (natural endowments, landscape protection areas etc.), could be utilized.
5. In order to optimize the rural land-use, I suggest the preference of **alternative energy sources, sustainable technologies and food industry**, which could result the increase of rural added value in the least-developed micro-regions.

Overall, it can be stated that all four hypotheses were justified, since the areas near the borders constitute a homogenous peripheral zone and the negative tendencies are due to accumulated social and economic conditions.

## **PUBLICATIONS RELATED TO TOPIC OF THE DISSERTATION**

### **SCIENTIFIC PUBLICATIONS (BOOKS, PARTS OF BOOKS)**

**Kollár K.** - Goda P. (2009): The assessments of economic subsystems for improving the potential of the Hungary's economic competitiveness. In.: Káposzta, J. (2009): New elements and research in spatial economy. Scientific Book. Research Institute of J. Selye University, Komarno, 2009. ISBN 978-80-89234-72-1 pp.138-148.

### **ARTICLES IN SCIENTIFIC JOURNALS**

*In English:*

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