ISSUES IN THE ECONOMIC DEVELOPMENT AND UTILIZATION OF EU FUNDS IN A DISADVANTAGED SUB-REGION OF THE SOUTHERN GREAT PLAIN REGION

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Abstract: The development period between 2007 and 2013 had a historical significance for Hungary as the funds that were provided by the European Union and were supplemented by the domestic and public sectors naturally offered great possibilities for the country's sub-statistical regions and regions to inspire their development and innovation. In order to use these funds efficiently it is essential to incorporate the developments into the area's capabilities, to harmonize them and to increase the role of the sub-statistical regions and regions. This study ranks the sub-regions of the Southern Great Plain Region in terms of their economic characteristics and identifies the most disadvantageous ones. Using as an example a specific sub-region it determines the local effects of EU payments with the application of different statistical methods.

Keywords: sub-statistical regions, EU sources, Southern Great Plain, cluster-analysis

Introduction

There are unarguably regional differences in the European Union. The per capita GDP is unequally divided between the eastern peripheral part of the European Union and the central and western regions. The GDP of peripheral areas is far below that of the developed regions which is why it is a strategically important task for these areas to catch up. In order to strengthen its regional competitiveness, Hungary is trying to invigorate two fields: the region and the sub-statistical regions – this is a challenging objective as neither of them are administrative units. The present situation of the most disadvantageous sub-statistical regions and their development possibilities are pressing strategic questions. The recently accepted 311/2007 (XI.17) governmental decree – concerning the classification of the beneficiary regions – presents the development conditions of Hungary's sub-statistical regions based on the collection of comprehensive data. In addition it also acts as guidance for the methods to adopt when applying for tenders while developing different subsidy systems, indicating which sub-statistical region needs the most attention and advanced care.

The study focuses on a number of questions:

- to determine the Southern Great Plain Region's economically most disadvantaged sub-regions,
- to summarize the amount of EU subsidies in the sub-region of Sarkad,
- to analyse in what way and to what extent the subsidies have improved the situation of settlements in the sub-region of Sarkad,
- to establish whether there is any correlation between the support and the change in complex development indicators,
- to establish whether there is any correlation between the support and any deviation from the average of indicators of settlements

Material and Methods

This study analyses mainly secondary data, based on the works of Hungarian and foreign experts in the subject. The sub-statistical regions of the Southern Great Plain were divided into clustering groups based on economic indicators. The cluster analysis, with the data of the 25 sub-statistical regions, was carried out with SPSS 17.0 statistical software. This software is mainly used to develop detailed computerised cluster analysis in the scientific literature (Székelyi and Barna 2002). Cluster analysis is a popular methodology among statistical approaches. It is similar to factor analysis which examines the subsets of connections. Cluster analysis does not differentiate between dependent and random variables, but rather examines the mutual connections within the set of variables.

Statistical data was made available by GEOX GIS Ltd., which includes complex indexes on the income, demography, economy and infrastructure of the sub-region of Sarkad between 2004 and 2009. The total subsidies gained by the sub-region were calculated from the website of the National

Development Agency (NDA) within the framework of the National Development Plan (NDP) and the New Hungary Development Plan (NHDP). On the website of the Agricultural and Rural Development Agency (ARDA) I calculated the total area-based subsidies obtained by the settlements of the sub-region, the payments for agrarian-environmental management, the subsidies for deprived areas, and young farmers' starting subsidies. The cluster analysis was also carried out with the statistical program SPSS 17.0, in which the various complex indexes were the variables and the monitored units were the settlements. The main goal of the cluster analysis was to rank the monitored units in relatively homogeneous groups on the basis of the chosen variables in such a way that the monitored units in the same group resemble each other, but differ from units in other groups. During the cluster analysis I used the Ward-method and the classic Euclides distance measure. I chose the Ward-method, because it aims to minimize the clusters' internal heterogeneity. I used the Pearson correlation coefficient to determine the connection between subsidies gained and complex indexes, because I was searching for relationships between the criteria measured on the measurement scale (Malhotra, 2001).

Results and discussion

In Hungary distributions of disadvantaged sub-regions (Local administrative unit 1) were introduced by Faluvégi and Tipold (2007), who developed five index groups (economic, social, infrastructural, employment and welfare) and evaluated sub-regions considering 31 indexes. Based on these indexes 33 sub-regions were placed in the most disadvantaged category, which needed help from complex programmes.

The study examines the sub-statistical regions of the Southern Great Plain. The survey was conducted in order to cluster the sub-statistical regions in terms of economic indicators. The cluster analysis was based on the details of 25

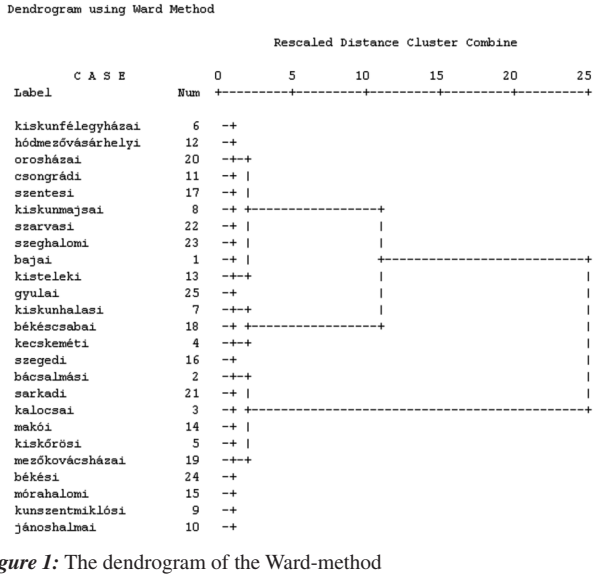

Figure 1: The dendrogram of the Ward-method
Source: Author's own calculation with Spss 17.0 software

sub-statistical Southern Great Plain regions and completed with the use of SPSS 17 software. The sub-statistical regions were grouped together based on golden scale variables. I made a hierarchic cluster analysis of the cases on the basis of these variables – I set the cluster number to 4, based on previous research.

The software, after implementing all settings, produced the dendrogram shown in Figure 1:

The dendrogram shows that 4 well-separated groups were formed on the correct level, and a new variable was introduced which includes the cluster-classification of the sub-statistical regions.

Table 1 and 2 show the results of a statistical comparison of the original classification and the classification by the Ward-method.

Table 1: Group average according to the first four variables of the cluster analysis

Ward Method	The number of operating economic organizations per 1000 people in 2004	The number of visitor nights per 1000 people in 2005	The number of retailers per 1000 people in 2005	Agricultural employment (%) in 2001
1	**0** 51.8000	**++** 1881.4000	**+** 16.7000	**-** 15.0400
2	**—** 42.7000	**—** 241.7000	**-** 13.9500	**++** 20.9500
3	**++** 74.5000	**0** 894.7500	**++** 18.0500	**—** 6.5000
4	**+** 55.3333	**+** 1063.1667	**0** 16.4000	**0** 17.9167
Sum total.	**52.6400**	**871.2800**	**15.7440**	**16.7280**

0: around average, — far below average, - a little below average, ++ far above average, + a little above average
Source: Author's own calculation with Spss 17.0 software

Table 2: Group average according to the second four variables of the cluster analysis

Ward method	The ratio of employment in the service industry (%) in 2001	The change in the number of enterprises between 1999-2004	Tax income of local authorities per person (HUF) in 2005	The number of researchers per 1000 inhabitants in 2005
1	**0** 51.7000	**-** 113.7200	**0** 16825.8000	**0** .2820
2	**-** 49.4100	**-** 113.5600	**—** 10212.0000	**—** .0640
3	**++** 63.3500	**0** 114.7500	**++** 31448.7500	**++** 1.5050
4	**—** 47.7333	**++** 117.4833	**+** 21933.6667	**-** .2267
Sum total.	**51.6960**	**114.7240**	**17745.8400**	**.3772**

0: around average, — far below average, - a little below average, ++ far above average, + a little above average
Source: Author's own calculation with Spss 17.0 software

The original output was complemented with the markings that were used by Kovács and Balogh (2007) for easier understanding. The markings are shown at the bottom of the table; the averages inside the groups were compared to the given variable's average. Relying upon these data I can state that the sub-statistical regions in the 1st group show average values according to 4 variables and the in case of 3 indicators the

deviation from the average is also very small. Only the number of customer nights stands out in this group as it exceeds the average indicators of the other sub-statistical regions. The highest number values below the average can be found in group 2, with only the ratio of the agricultural employees showing significantly above the average results. The sub-statistical regions of group 3 have the best parameters; they have the best results regarding 5 variables and in comparison with the other groups the ratio of the agricultural employees has below average values. In group 4 results are slightly above or below the average. The sub-statistical regions in this group cannot be considered average even though they do not have extreme values.

The sub-statistical regions in group 2 have the worst results from the economic point of view. Geographically these sub-regions are located mainly along the Hungarian-Romanian and Hungarian-Serbian borders. According to the cluster analysis the most disadvantageous regions are: Bácsalmás, Kalocsa, Kiskőrös, Kunszentmiklós, Jánoshalma, Makó, Mórahalom, Mezőkovácsháza, Békés and the selected sub-region of Sarkad.

Effects of subsidies after joining the European Union in the sub-region of Sarkad

Hungary joined the European Union on 1 May 2004, but had been entitled to the subsidies of the Structural Funds and Cohesion Fund before that date. Those member states that did not reach 75% of the collective average of per capita GDP had to draw up a National Development Plan, in which they had to elaborate their aims and priorities. The fulfilment of the aims elaborated in the National Development Plan were helped by five operative programmes between 2004 and 2006 (Kerek and Marselek, 2009).

In 2007 a new budgetary period was started in Hungary (2007–2013), in which a new opportunity emerged and over the subsequent seven years Hungary has been drawing on its EU sources and acquiring 15 thousand billion forints for development. The New Hungary Development Plan was completed to make use of the developmental resources, and includes the main structural direction of the investments, and the strategic frameworks for the successful and effective utilization of the resources. Synchronized state and EU developments were initiated in six particular fields to fulfil these aims. These were the areas of the economy, transport, human resources, environment and energy policy, regional development and public utility services (Panyor, 2010).

The disadvantageous situation of the sub-region of Sarkad is the result of a long process, which has been accentuated by the unfavorable outcomes produced by the change in economic system in the region. The first element of this process occured when the big cooperative farms, which provided employment on a large scale, were eliminated, and most of the employees became unemployed. Unfortunately, most of these former agricultural workers could not become agricultural entrepreneurs, because of their lack of entrepreneurial skills (Restructuring program, 2005).

Figure 2 illustrates the subsidies gained by the subregion of Sarkad. It is clear that the per capita subsidies in the central settlement is the highest in Sarkad, and subsidies in Zsadány and Újszalonta, and Kötegyán are relatively high as well.

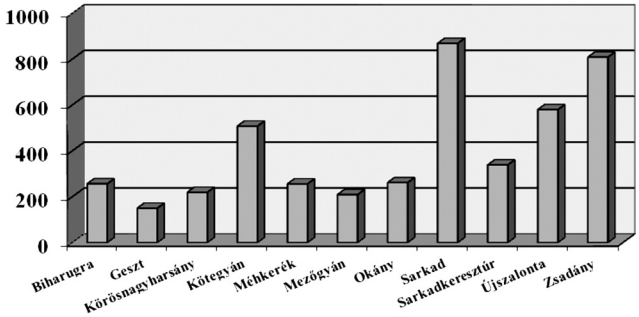

Figure 2: Subsidies per person in the settlements of the sub-region of Sarkad
Source: Personal research based on the publically available data from the NDA and ARDA, 2011

I conducted a cluster analysis based on the four complex index-groups, which resulted in four clearly different clusters. The first cluster contains those settlements whose cluster indexes showed the best results, and the fourth cluster contains those whose cluster indexes showed the worst results. We can conclude that those settlements where the per capita subsidies as compared to the average were over 100%, could improve one position on the cluster (Table 3). Four settlements managed to do so: Kötegyán, Sarkad, Újszalonta and Zsadány.

Table 3: Classification of the settlements of the sub-region of Sarkad according to the results of the national cluster analysis

Settlement	Cluster classification (2004)	Cluster classification (2009)	The degree of subsidy per person compared to the average
Biharugra	2	2	63.3%
Geszt	4	4	37.1%
Körösnagyharsány	4	4	54.2%
Kötegyán	4	3	**125.3%**
Méhkerék	2	2	63.2%
Mezőgyán	4	4	51.7%
Okány	4	4	64.6%
Sarkad	2	1	**214.4%**
Sarkadkeresztúr	4	4	83.6%
Újszalonta	4	3	**143.1%**
Zsadány	4	3	**199.5%**

Source: Personal research based on publically available data from the NDA and ARDA, 2011

Following this, I was curious to discover which region was most affected by the amount of subsidies using the complex indexes. I examined this in two different ways. First I checked the correlation between the amount of subsidies and the change in the settlement compared to all settlements between 2004 and 2009 (Table 4).

Here I experienced that the subsidies gained over the course of the NDP and the NHDP have had an economically

Table 4: The effect of certain subsidies on partial development 1.

		NDP	NHDP	Area-based, Agrarian-Environmental, Areas with Disadvantageous Conditions, Young Farmers	Subsidies sum total
Demographic	Correlation CE	**0.188**	**0.196**	**0.704**	**0.224**
	Sig.	0.581	0.563	0.016	0.507
Economic	Correlation CE	**0.743**	**0.814**	**0.566**	**0.832**
	Sig.	0.009	0.002	0.069	0.001
Infrastructural	Correlation CE	**0.590**	**0.495**	**0.510**	**0.519**
	Sig.	0.056	0.122	0.109	0.102
Revenue related	Correlation CE	**0.222**	**0.555**	**0.154**	**0.534**
	Sig.	0.512	0.077	0.651	0.091

Source: Personal research based on publically available data from the NDA and ARDA, 2011

Table 5: The effect of certain subsidies on partial development 2.

		NDP	NHDP	Area-based, Agrarian-Environmental, Areas with Disadvantageous Conditions, Young Farmers	Subsidies sum total
Demographic	Correlation CE	**0.171**	**0.191**	**0.669**	**0.218**
	Sig.	**0.614**	**0.573**	**0.024**	**0.520**
Economic	Correlation CE	**0.852**	**0.720**	**0.568**	**0.746**
	Sig.	**0.001**	**0.012**	**0.068**	**0.008**
Infrastructural	Correlation CE	**0.689**	**0.396**	**0.516**	**0.427**
	Sig.	**0.019**	**0.228**	**0.104**	**0.190**
Revenue related	Correlation CE	**0.210**	**0.574**	**0.139**	**0.553**
	Sig.	**0.536**	**0.065**	**0.683**	**0.078**

Source: Personal research based on publically available data from the NDA and ARDA, 2011

significant impact on the settlements of the sub-region of Sarkad, so the NDP and the NHDP affected only the economic index out of the four complex indexes. The highlighted part is clearly significant in the chart, since the significance of the correlation coefficient is under 1%.

I also conducted a correlation analysis on only those settlements in the sub-region of Sarkad. I took the mean of the eleven settlements' indexes separately. I determined the deviation of each settlement from the average in 2004 and 2009 and then correlated the difference between the two situations and the amount of subsidy (Table 5).

The highlighted sections show explicit significance. The NDP affected the economy and infrastructure, and the NHDP affected mainly the economy up to 2009. The area-based subsidies and the others ranked here mainly affected demographic aspects. Results marked in grey are close to the significance line, but have no real effect.

Conclusion

The result of the cluster analysis clearly shows that the most disadvantageous sub-statistical regions are mainly along the Hungarian-Romanian and Hungarian-Serbian borders in the Southern Great Plain region. Regarding the economic conditions of the sub-statistical regions our results support the statement that the region is on the periphery of the periphery. Funds from the European Union can represent new perspectives but only an improvement in the relationship among the frontier regions can reduce the isolation of the region. Those settlements that gained greater subsidies than the average improved one position in their cluster ranking. In so far as I examined the developmental change among all the settlements in Hungary, only the effects of the NDP and NHDP subsidies can be verified and only in the case of the economic index. If the developmental change is only examined in the settlements of the sub-region of Sarkad, all the three effects are significant in some of the indexes, but a strong correlation can only be observed in the economic aspect of the partial development.

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