Comparative analysis of micro-regions in the northern Great Plain Region

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SUMMARY FINDINGS, CONCLUSIONS, RECOMMENDATIONS

Our short paper examines the region of the Northern Great Plain, mainly due to its disadvantaged situation. Comparative analysis of the micro-regions in this particular region was implemented to identify possible causes for differentiation between the micro-regions. Finding these causes would then help us find more effective ways to address regional inequalities, currently one of the central issues not only in Hungary but throughout Eastern Europe. The methods used for such analysis included statistical indicators, such as difference in migration rates, rate of unemployment, number of incorporated enterprises per 1000 inhabitants etc., as well as the principal component analysis and the currently applicable categorisation system for micro-regions. The findings are univocal: the nationally disadvantageous situation of the region is aggravated by the heterogeneity present within the region, by the huge differences between micro-regions encompassing county seats, and peripheral micro-regions. The outstanding situation of the micro-regions of Nyíregyháza, Debrecen and Szolnok was maintained in 2006 as well; apart from these, only the micro-regions of Jászberény and Hajdúszoboszló can be regarded as being above-average. The micro-region of Csenger is still seriously underdeveloped in comparison with other areas in the region. The key to remedying these problems could lie in their proximity to the border, elimination of the infrastructural deficiencies of the micro-region and improving the population's qualification levels.

THE SITUATION OF THE NORTHERN GREAT PLAINS REGION

There are 28 micro regions in the statistical region comprising Hajdú-Bihar, Szabolcs-Szatmár-Bereg and Jász-Nagykun-Szolnok counties in compliance with Act CVII/2007. Regarding the geographical endowments, it is relatively homogeneous but as for its economic and social factors, otherwise it is heterogeneous. The socio-economic modernisation and structural change cannot be achieved from merely own resources as there is still a need for conscious central intervention with the objective of catching up (*Malakucziné – Sólyom, 2007*). The region can be regarded as one „releasing inhabitants" significantly for a long time and, as a result, its migration balance is negative (*ÉARFÜ, 2007*). The decisive part of the settlements characterised by the greatest decrease of inhabitants can be found on the periphery. It is difficult to get access to them or they are situated near the border of the country (*Malakucziné – Sólyom, 2007*). The gross national product of the Northern Great Plains region comprises about 10% of the national average, this way it is only preceded by South Transdanubia and Northern Hungary (*ÉARFÜ, 2006*).

The economic indicators show a much weaker enterprising activity than the national average in the significant part of the micro regions accompanied by rather moderate tourism activity and less extensive network of retail outlets. It is only in the micro region of Nyíregyháza and Debrecen that the number of ongoing enterprises per 1000 inhabitants exceeds the national average (Table 1). Given the weaker enterprising potential, the revenues of the local municipal governments in the form of taxes only in certain cases take up 20% of the national average (*KSH, 2008*). The activity of innovation is concentrated on the county seats as well as their regions. The biggest backwardness can be discerned in Szabolcs-Szatmár-Bereg County.

Table 1

Some typical indices per micro region

Micro region	Number of ongoing enterprises per 1000 inhabitants	Number of retail outlets per 1000 inhabitants (2005)	Number of scientific researchers, developers per 1000 inhabitants (person)
Hajdú-Bihar county			
Balmazújváros	59	82	2
Berettyóújfalu	58	98	12
Debrecen	124	116	283
Hajdúböszörmény	69	84	5
Hajdúszoboszló	90	95	-
Polgár	55	83	-
Püspökladány	54	87	11
Derecske – Létavértes	55	64	-
Hajdúhadház	49	69	4
Jász-Nagykun-Szolnok county			
Jászberény	66	88	34
Karcag	69	88	25
Kunszentmárton	53	79	-
Szolnok	98	104	17
Tiszafüred	56	99	-
Kunszentmiklós	55	77	3
Mezőtúr	68	87	31
Szabolcs-Szatmár-Bereg county			
Baktalórántháza	43	68	-
Csenger	46	123	-
Fehérgyarmat	53	109	-
Kisvárda	66	97	3
Mátészalka	57	96	4
Nagykálló	60	80	7
Nyírbátor	53	82	1
Nyíregyháza	134	146	80
Tiszavasvár	58	81	3
Vásárosnamény	54	96	8
Ibrány- Nagyhalász	48	76	-
Záhony	57	78	-

Source: Hungarian Central Statistical Office (hereinafter referred to as HCSO), 2008

With the exception of the county seats and the micro region of Jászberény unemployment in the region is well above the national average. What is more, in most of the micro regions of Szabolcs-Szatmár-Bereg county it can even be twice or three times as high (*ÉARFÜ, 2007*). The proportion of the unemployed is the highest in the micro regions of Hajdúhadház, Csenger, Vásárosnamény and Záhony.

THE MICRO REGIONS OF THE NORTHERN GREAT PLAINS AS REFLECTED IN THE STATISTICS

The micro regions were compared on the basis of seven indices, namely, migration difference, unemployment rate, the number of incorporated enterprises, retail outlets, passenger cars and houses built per 1000 inhabitants as well as the extent of income serving as the basis for levying Personal Income Tax.

Regarding the indices the differences within the region are significant, in most cases headed by the county seats. Further huge differences can be experienced between the latter ones and the areas with the greatest backwardness.

Examining the formation of *migration difference*, the average value of the period between 2002 and 2006 is only positive in the micro region of Derecske-Létavértes (5.63) and Hajdúhadház (2.68), which stand out of the other micro regions. It can be due to the agglomerating effect of Debrecen as the settlements forming the two micro regions can be found in the 40 km catchment area of the Hajdú-Bihar county seat. Presumably the same holds true for the Hajdúszoboszló micro region where the average value of the examined period is around 0. The most drastic wave of migration took place in the eastern part of Szabolcs-Szatmár-Bereg and Jász- Nagykun Szolnok counties or, to be more precise, in the micro region of Csenger, Fehérgyarmat and Vásárosnamény.

One of the reasons triggering migration can be *unemployment* so that is why it is not surprising that areas with a significant migration have an outstandingly high proportion of unemployment. Only the county seats – Nyíregyháza, Debrecen, Szolnok – and their catchment areas were able to reach or exceed the national average. Besides them, the micro region of Jászberény is the only one to challenge the three cities or produces even better proportions. The proximity of the capital, the regional, tourism endowments and industrial plants play a role in the latter one.

The relation between the *number of incorporated enterprises* and the unemployment rate is also obvious as most enterprises and work opportunities can be found in the county seats as well as their catchment areas so the unemployment rate is the lowest there. There is no discernible difference between the micro regions outside the catchment areas of the county seats only the outstanding values of the Hajdúszoboszló micro region and the catching-up of the Kisvárda micro region are worth mentioning.

Taking the *number of retail outlets* into consideration there have not been great changes lately. The number of outlets is strikingly high in Debrecen and Nyíregyháza as the county seats together with the micro regions of Csenger, Vásárosnamény and Fehérgyarmat. Regarding the number of retail outlets per 1000 inhabitants the micro regions of Szolnok – as a county seat – and Tiszafüred are above the average.

Examining the values of income serving as the basis for levying *Personal Income Tax* the micro regions of Debrecen, Szolnok and Nyíregyháza are understandably ahead due to their regional role while the micro regions of Szabolcs-Szatmár-Bereg County are significantly behind the regional average.

Considering the *number of passenger cars per 1000 inhabitants* the backward-

ness of the most disadvantageous micro regions cannot be experienced to such a great extent as in the case of the income serving as the basis for levying *Personal Income Tax*.

The number of houses built per 1000 inhabitants is likewise another useful indicator to characterise the regional income situation. The micro regions of Hajdúszoboszló, Nyíregyháza, Debrecen and relatively that of Szolnok stand out.

THE COMPARATIVE ANALYSIS OF THE MICRO REGIONS IN THE NORTHERN GREAT PLAINS

To compare the micro regions as well as to explore the differences, principal component analysis was applied together with other statistical indices as it is basically such an analytical method whose objective is to explore the most substantial interactions between the original characteristics (*Székelyi – Barna, 2002*). Its starting point is the hypothesis that the variance of the observed variables can be explained by the same number of background variables in a way according to which the primary defining background variables can be selected while the other variables can be disregarded due to their slight impact (*Szűcs, 2002*). The principal components gained this way make the plotting of the observed entities easier and based on the situation of the dots it is easier for us to notice the groups that come together as well as to separate them (*Harnos, 1993*), which is very advantageous amidst of the regional examinations as the regional differences, the spatial condensation or, on the contrary, thinning can be clearly discerned.

The principal component analysis of the micro regions was carried out in every single year of the examined period. Regarding the constraints of the present paper only the analysis for the years of 2002 and 2006 are presented now to suggest the changes. It is worth mentioning that the number of the micro regions as observed entities is different as in 2002 there were only 24 micro regions in this region so that is why data are not applicable for the micro regions of Derecske–Létavértes, Hajdúhadház, Mezőtúr and Ibrány–Nagyhalász that were formed only in the following year.

The conditions of applicability were met in the case of the „threefold rule", the Bartlett-trial and the Kaiser test, too. Significance shows a value below 0.05 every examined year so the observed variables are not independent from one another. The KMO index was above 0.5 every year except 2002 when it was low (0.577) but acceptable.

While carrying out analyses two principal components were identified. In the case of the first principal component (PC1) the relation was rather strong regarding the number of retail outlets, strong regarding the income serving as the basis for levying Personal Income Tax and the number of passenger cars, medium regarding the number of retail outlets and houses built and not significant concerning the unemployment rate. In the case of the migration difference there was no relation at all, which can be explained by the second principal component (PC 2) as strong relation only existed with regards to this indicator.

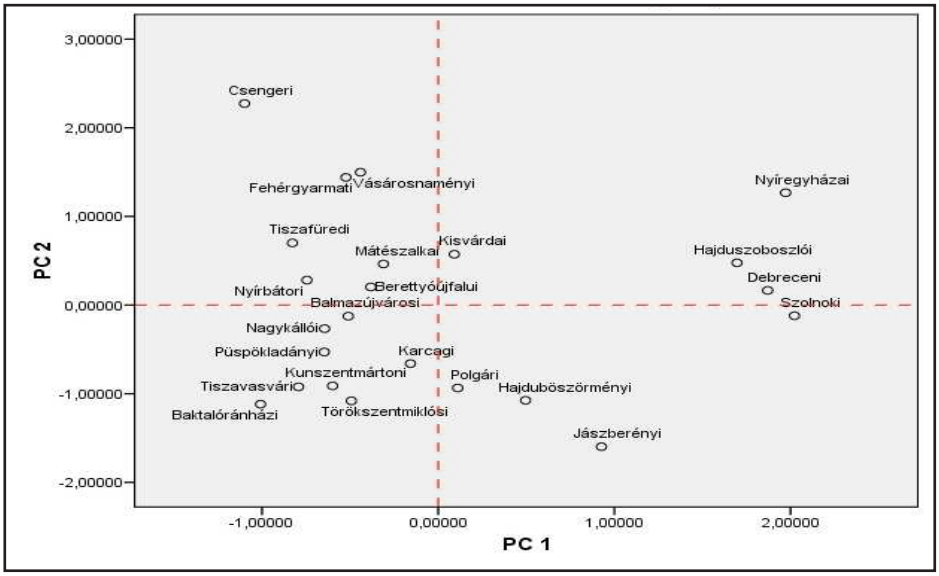
To present the results of the analysis, coordinate systems confined by the principal components for the first (2002) and the last year (2006) of the examined period are used as an illustration (Fig. 1-2).

In the year 2002 the regions are discernibly more scattered while in 2006 a spatial condensation and grouping can be seen. The group ahead of the others obviously comprises the micro regions of the county seats supplemented by the micro region of Hajdúszoboszló and Jászberény. The latter two clearly make up the second most developed group after the county seats in 2006.

From the next category the micro region of Polgár must be highlighted, which promising data in 2002 but by 2006 it had slipped back to Group IV regarding development. In the case of the areas with the greatest backwardness no advancement could be experienced. Even the situation of the micro region of Csenger, which is the worst from all aspects, slowly but surely was declining. The micro region of Hajdúhadház also stands apart that is due to the growth of the unemployment rate. All in all, we can state that certainly it is the county seats that have the most advantages while certain micro regions of Szabolcs County are the most disadvantaged and with regard to the other areas no significant differences can be measured.

Figure 1

The spread of the micro regions of the Northern Great Plains region in the coordinate system confined by the two principal components (2002)



Source: own compilation, 2008

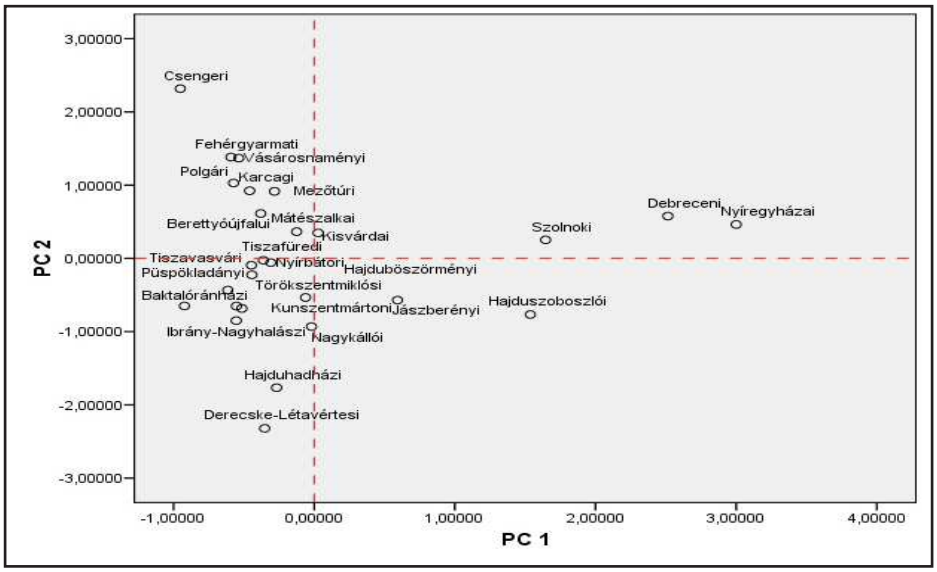
Interpreting the values of basic data indices forming a matrix is essential for the proper judgment of our conclusions drawn from the results of the principal component analysis above. That is why the presentation of our conclusions starts on the basis of the statistical data.

First of all, let us have a look at the migration difference as mentioned previously, this indicator or, more properly, its volume can say a lot about a region and its other indicators and retaining capacity. Migration of the greatest volume can be measured in the micro regions of Csenger, Fehérgyarmat and Vásárosnamény considering the average of the period between 2002 and 2006. These regions could not show good results regarding the other indicators, as well. Taking the unemployment rate into consideration, they are far above both the national and the regional average and these proportions keep growing continuously in the examined years (around 18-19% by 2006 in all the three areas). As a result, the income serving as the basis for levying Personal Income Tax cannot be

high, either, so from this respect the micro region of Csenger is in the gravest situation. However, the number of retail outlets is higher than in the other areas of the region, which may be explained by its structure of tiny settlements and proximity to the border. By examining the result we can conclude that all this is not enough to improve the living standard.

Figure 2

The spread of the micro regions of the Northern Great Plains region in the coordinate system confined by the two principal components (2006)



Source: own compilation, 2008

The results of the analysis proved that Szabolcs-Szatmár-Bereg county had the worst statistical data as the three most disadvantaged micro regions can be found here. Partly this can be due to its situation on the eastern border, which is not very attractive for the potential investors. On the other hand, the lack of motorways and other highways contribute to the fact that these areas are completely cut off the international economic mainstream.

Another possible explanation for the backwardness of certain areas can be the distance from the county seat (which does not depend on the proximity of the border) and lack of cities as well as job opportunities. The affected micro regions have several opportunities to handle project applications as projects arriving from the most disadvantaged settlements that must be supported by the complex programme in Government decree 311/2007 (17 November) and/or are carried out in the settlements stated by Government decree 240/2006 (30 November) have priority. By means of such support the areas could be able to develop some functions and secure more modern ones. All this can be made easier with the inclusion of the local communities or civil organisations so it is also practical to make use of the sources and possibilities provided by the LEADER programme.

Moreover, it can clearly be stated that the areas that are in the neighbourhood (catchment area) of the county seat have better conditions. One of them is the micro

region of Hajdúszoboszló whose situation is far the most advantageous behind the micro regions of the county seats when compared to the other areas. Its statistical indices are not so far behind those of the micro region of Szolnok or Nyíregyháza. The reason for this lies in the outstanding economic potential of the city of Hajdúszoboszló that can be due to its national and international tourism returns. It also proves that the tourism potential of the region could be made more use of by harmonising different supply elements (thermal baths, Hortobágy, Lake Tisza, Szamos, Szatmár Plains etc.)

The results of the principal component analysis appear in accord with the conclusions drawn on the basis of the values of the original indices that were presented by Fig. 1-2. The differences in development – in the form of the segregation of the single dots and groups- and the changes taking part during the examined period can also be discerned in the coordinate system confined by the two principal components (2002 and 2006).

The fact previously proved by figures that the micro regions of the county seats are significantly separated from the other areas of the region can be clearly seen.

This holds true mainly by 2006 as in 2002 even the area of Hajdúszoboszló „kept up" with them presumably due to the above mentioned tourism impacts. However, in 2006 it formed a group with the micro region of Jászberény so was transferred to Group II regarding development. The situation of the latter one in Group II was explained by the proximity of the capital and its advantageous geographical endowments.

Moreover, the micro regions of Kisvárda, Polgár and Hajdúböszörmény must also be highlighted: the first two because of their situation in Group I-II. regarding development (2002) although statistical data do not prove it. This contradiction is only apparent as they have very low values based on component PC1 (which primarily expresses economic indicators) and do not stand apart from the bigger group formed by the other areas so sharply.

As for the other micro regions a kind of „condensation" can be experienced between 2002 and 2006, i.e. the differences between these regions became slighter. Unfortunately, based on our own experiences, it was primarily due to a decline in performance and stagnation.

To sum it up, comparing the years of 2002 and 2006, the situation of the disadvantaged regions has not improved as there were not any significant changes in the categorisation of the micro regions. At present, the micro regions of Csenger, Fehérgyarmat and Vásárosnamény are a cause for concern. The present categorisation of development for the micro regions also supports our conclusions drawn on the basis of the statistical indicators and the results of the principal component analysis.

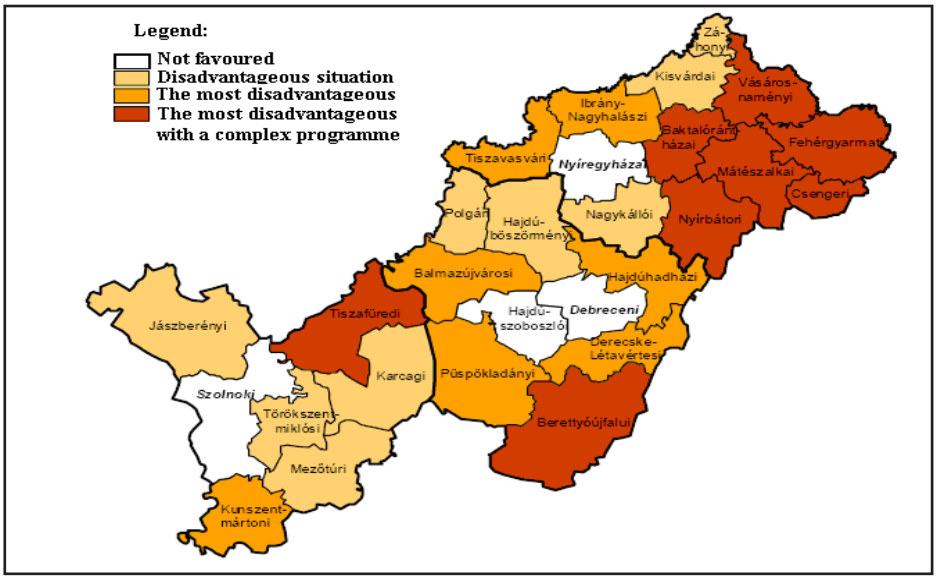
This categorisation is based on the development complex indicator recorded in Resolution 67/2007 OGY in the legal framework, which was created on the basis of 32 statistical indicators classified into 5 groups (economy, infrastructure, society, social affairs, and employment). Based on this development complex indicator we can talk about the following categories: Not favoured, Disadvantageous, The most disadvantageous (the most disadvantageous I), The most disadvantageous with a complex programme (the most disadvantageous II) (Fig. 3).

To sum it up, the situation of the Northern Great Plains region is not a promising one in national standards, either, but when overviewing the development heterogeneity of its micro regions as well as regarding its favoured regional status the picture is even made more disadvantageous. In our opinion the basics of catching up could be secured if the possibilities of project applications were fully used and by developing the network of motorways and highways the disadvantaged areas were drawn in.

At the same time, we must not forget that all this can have an earliest impact in the middle run and requires plenty of energy and expertise as well as patience, creativity and cooperation from the part of the local communities. If the above mentioned things came true, catching up for the region would be secured.

Figure 3

The favoured micro regions of the Northern Great Plains region



Source: HCSO, 2008

REFERENCES

(1) Észak-alföldi Regionális Fejlesztési Ügynökség. (2006): Az Észak-alföldi régió stratégiai programja 2007-2013. Debrecen – (2) Észak-alföldi Regionális Fejlesztési Ügynökség. (2007): Észak-alföldi Operatív Program 2007-2013. Debrecen – (3) Harnos, Zs. (szerk.) (1993): Biometriai módszerek és alkalmazásaik MINITAB programcsomaggal. Gödöllő: GATE. p. 240 – (4) Malakucziné, P. M. – Sólyom, M. (2007): Észak-alföld hátrányos helyzetű kistérségei. Debrecen: Központi Statisztikai Hivatal – (5) Sajtos, L. – Mitev, A. (2007): SPSS kutatási és adatelemzési kézikönyv. Budapest: Alinea Kiadó. p. 402 – (6) Székelyi, M. – Barna, I. (2004): Túlélő készlet az SPSS-hez. Budapest: Typotex Kiadó. p. 453 – (7) Szűcs, I. (szerk.) (2002): Alkalmazott statisztika. Budapest: Agroinform Kiadó. p. 547 – (8) 67/2007. (VI. 28.) OGY határozat A területfejlesztési támogatásokról és a decentralizáció elveiről, a kedvezményezett térségek besorolásának feltételrendszeréről – (9) 240/2006. (XI.30.) kormányrendelet A társadalmi-gazdasági és infrastrukturális szempontból elmaradott, illetve az országos átlagot jelentősen meghaladó munkanélküliséggel sújtott települések jegyzékéről – (11) 311/2007. (XI. 17.) kormányrendelet a kedvezményezett térségek besorolásáról.

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