Measuring Regional Disparities on Competitiveness Basis

Miklós Lukovics

Several economic theories and empirical analyses have been put forth about the nature and principles of regional disparities. Analysts often apply GDP per capita, as a quasi absolute indicator to explore regional disparities, albeit spatial processes have become more and more complicated and complex in the globalized economy. Parallel to the catching-up process of the countries at the national level, there is another spectacular process at the regional and local level: regional disparities are widening because the growth of the most developed sub-regions is increasing while the less favoured sub-regions are lagging behind. Consequently, regional analyses must devote increasing attention to studying sub-regions.

The present paper is aiming to develop a complex method on analyzing regional disparities, based on the notion of regional competitiveness and its closed logical system, correctly chosen theoretical model (the pyramidal model of regional competitiveness) and statistical data. To carry out the analysis, I use K-means cluster analysis, and its output. This is the first time ever that this has been used for this purpose.

Keywords: regional disparities, Williamson-hypothesis, regional competitiveness

1. Introduction

Economic, social and territorial cohesion are increasingly important segments of the European Union's regional policy, deriving from the history of the European integration: "*The Community shall have as its task […] to promote throughout the Community a harmonious, balanced and sustainable development of economic activities*" (EC 1997, Article 2). According to the Treaty of Lisbon, the Union shall promote economic, social *and territorial* cohesion, instead of the former terminology: economic and social cohesion (EC 2007).

At the time of the signing of the Treaty of Rome (1957), there had not been a declared common regional policy, the treatment of regional inequalities started at the national level in the 1960s (Rechnitzer 1998). The multi-step enlargement process of the European Union, and particularly the joining of the Mediterranean countries resulted in deepening spatial inequalities in the European Economic Area.

This, together with the effect of globalization, which increased the importance of locations, made the community-level regulation of the problem inevitable. The article 130 of the 1987 Single European Act declares the main objectives of the common regional policy, out of which the aim of "*reducing disparities between the*

various regions and the backwardness of the least-favoured regions" excels (EC 1987). After forming the central fund system of Structural Funds[1] to treat regional disparities on the basis of uniform principles at the end of 1980s, the Treaty of Maastricht unfolded the concept of cohesion: economic convergence and social cohesion (EC 1992).

The Treaty of Amsterdam devotes a distinct title (XVII.) to economic and social cohesion: "*in particular, the Community shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions or islands, including rural areas*" (EC 1997, Article 158). The European Spatial Development Perspective approved in 1999 mentions economic and social cohesion as one of its three main objectives (EC 1999).

The forth cohesion report is already talking about "*economic, social and territorial cohesion*" (EC 2006), and by doing so it highlights an important problem. Namely after the 2004 enlargement serious territorial disparities characterize the whole European Union regarding both output, productivity and employment.

It is also an essential mega-trend that nowadays the local level is sensibly gaining importance as a territorial level that houses core-competences, where the long-term competitive advantages of firms are concentrated, and where local actors are able to give effect to their economic development conceptions. The primary analytical unit of economic advantages is therefore the local unit where one can change their workplace without changing their domicile (Lengyel 2003).

In the present paper, by responding to the above mentioned challenges, we attempt to introduce such an analytical method that is able to detect territorial disparities *of the local level in their complexity, using a multi indicator based approach*. Before this we gain insight into the background of the conventional *single indicator-based* analyses. But first of all we review the *relevant economic theories* that are needed to understand the nature and change of territorial disparities.

2.   The nature of territorial disparities' evolution

Despite the fact that the multi-step enlargement of the European Union has drawn attention to regional policy's need for concentrating significant resources to reduce territorial disparities, we must consider the economic regularity well-known as Williamson-hypothesis, which says that *territorial disparities will grow until a certain state of development* (Figure 1). According to Williamson's concept that was put forth in 1965 economic growth first induces regional divergence and in the later phases convergence (Kiss–Németh 2006, Davies–Hallett 2002, Szörfi 2006, Nemes Nagy 2005).

---

[1] The common denomination of the European Social Fund, the European Agricultural Guidance and Guarantee Fund, Guidance Section, the European Regional Development Fund and the Financial Instrument for Fisheries Guidance.

Figure 1. Williamson curve
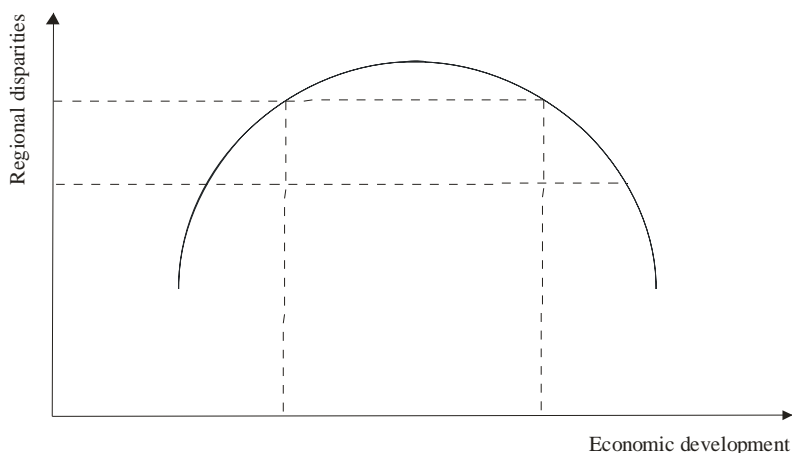
Source: Davies–Hallett 2002, Nemes Nagy 2005

In connection with the Williamson-hypothesis we must note that its consequences are inconsistent with the conceptions of certain theoretical schools, moreover the convergent phase of the Williamson curve can be *interpreted in different ways* within the conceptual background of the distinct bodies of theorizing. Zsolt Fenyővári and Miklós Lukovics (2008) reviewed eight theoretical schools in order to examine – among others – the occurrence of territorial convergence within the given theoretical interpretations[2] (Fenyővári–Lukovics 2008):

1. In the *classical economic theory* the efficiency advantages of the regions deriving from the comparative specialization will eventually contribute to the reduction of territorial disparities in a way that is advantageous for all the participating regions.
2. In the *neoclassical economic theory,* due to the presumption of the absolute mobility of the factors of production (including technology), all the inequalities in the model – embracing any kind of developmental disparities between regions – decease in the long run.
3. In the *Keynesian economics* the reduction of regional disparities can not be interpreted as the result of spontaneous market processes. The desirable processes are much more linked to the result of certain intended institutional interventions.
4. *Endogenous growth theory* interprets the productivity growth as an outcome of the spatial diffusion of knowledge and technology, which does not infer any automatism for the reduction of territorial inequalities. However the regional (economic) policy aiming at the deliberate development of the

---

[2] Similarly, the research of Málovics and Ván (2008) examined the connection between the concept of competitiveness and sustainability from the viewpoint of some highlighted economic theories.

endogenous factors (technology, knowledge and the internal resources of the region) can become efficient means of reducing regional disparities.

5. *New trade theory* states that the spatial variation of productivity derives from the varying levels of regional specialization, agglomeration and cluster formation. The spatial equilibrium shaped by centripetal and centrifugal forces is Pareto-efficient, therefore there exist no market automatisms that would induce spatial disparities.

6. In the *new institutional economics*, due to the constant change deriving from the dynamic interaction of the narrowly meant economic processes and institutional conditions, the deepening or the reduction of territorial disparities can be well interpreted within the frame of the model.

7. The Porterian *corporate strategy economics* originates the regional disparities from the basic industries and clusters of the regions. Since it focuses on the "microeconomic foundations" (the resource munificence of the region gains highlight as well), the reduction of territorial disparities characteristically does not occur through market automatisms.

8. In an *evolutionary economic* view the change in the intensity and extent of a region's innovative activities can significantly shape the regional disparities (Bajmócy 2008). Such changes may occur as a result of spontaneous market processes. Therefore in the evolutionary thinking the reduction of territorial inequalities through the market automatisms can be interpreted.

Numerous successful attempts have been carried out for the empirical verification of the Williamson-hypothesis (Kiss–Németh 2006, Davies–Hallett 2002, Szörfi 2006, Nemes Nagy 2005). Several authors managed to confirm on large samples and long-run time series that from the initial state of relative-underdevelopment regional disparities increase for a while, and when reaching a certain state of development the divergent process turns into a convergent one.

At this point we necessarily come to the question that is to say what is that certain "*state of development*" where the divergence turns into convergence? It is equally important to establish whether in the relatively underdeveloped regions *this point exists at all*, or in the divergent phase the development potential of these regions decreases to such an extent which makes their later close-up impossible.

This threat is much realistic, because the more developed areas have increased ability to become an integral part of the global economy, foreign direct investments also flow first into these regions (Enyedi 2000, EC 2004). This results in the real danger of the widening of the regional inequality gap. "*In Hungary territorial disparities significantly deepened in the early 1990s after the changing of the political system*" (Rechnitzer 2000, p. 13.). This process has not deceased by the early 2000s.

3. Single-variable analysis of the evolution of territorial disparities

One of the most widely used (one might say conventional) method for examining the evolution of territorial disparities is the analysis of the *temporal and spatial change of per capita GDP* (Sala-i-Martin 1996). According to the method we gain a picture about the evolution of territorial disparities by analyzing the dynamics of standard deviation values computed from the natural logarithm of per capita GDP data measured in PPS[3], compared to the Hungarian counties' and regions' averages. If the computed standard deviation values rise year by year, it indicates that the values deviate from their average in a growing extent, therefore the disparities of the observation units' per capita GDP data (measured in PPS) rise year by year.

Considering the Hungarian NUTS-2 level regions, NUTS-3 level counties and LAU-1 subregions as observation units, the growth of territorial disparities can be detected according to the results of a standard deviation analysis of the per capita GDP, measured in PPS on time series from 1996 to 2006. During the analysed time period the curves of both counties' and regions' standard deviation values are positive gradient, thus the observation units' state of development measured in GDP are shifting away from each other, in other words they *show divergence* (Figure 2).

The execution of the standard deviation analysis for LAU-1 sub-regions brings us to similar consequences. We must add however one extremely important notice: instead of the indicator used in case of counties and regions (GDP), we have to apply a similar-in-content indicator, the gross value added[4] (GVA), because GDP data are not available for aggregation-levels lower than counties (NUTS-3). Similarly to the standard deviation of counties' and regions' GDP, the standard deviation of sub-regions' GVA data can be characterized by a positive gradient curve in the 1996-2005 interval. This underlies the *growth of territorial disparities in the sub-region level as well*.

This statement is true both when the population includes all the 168 sub-regions[5], and when the analysis is carried out without the Budapest sub-region. We certainly receive significantly higher standard deviation values for the population that includes Budapest compared to the case when we carry out the analysis without the sub-region of the capital. This also underpins the well-known fact that Budapest and its agglomeration, which excel in the Hungarian spatial system and grow faster than the country average, *significantly contribute to the widening of Hungarian territorial disparities*.

---

[3] The guiding methodology of GDP computations is ESA 1995. The per capita GDP expressed in PPS (Purchasing Power Standard) is the value computed on the basis of purchasing power parities, expressed in Euro (Eurostat 2004).

[4] The gross value added produced by the economic units adding taxes on products and subsidies, subtracting the charge of financial intermediation results the value of gross value added computed on market prices, the indicator of gross domestic product (GDP).

[5] At the time of this paper's submission the data are not yet available for the 174 new sub-regions defined by Act CVII of 2007.

Figure 2. Change in the regional disparities of the Hungarian regions, counties, sub-regions
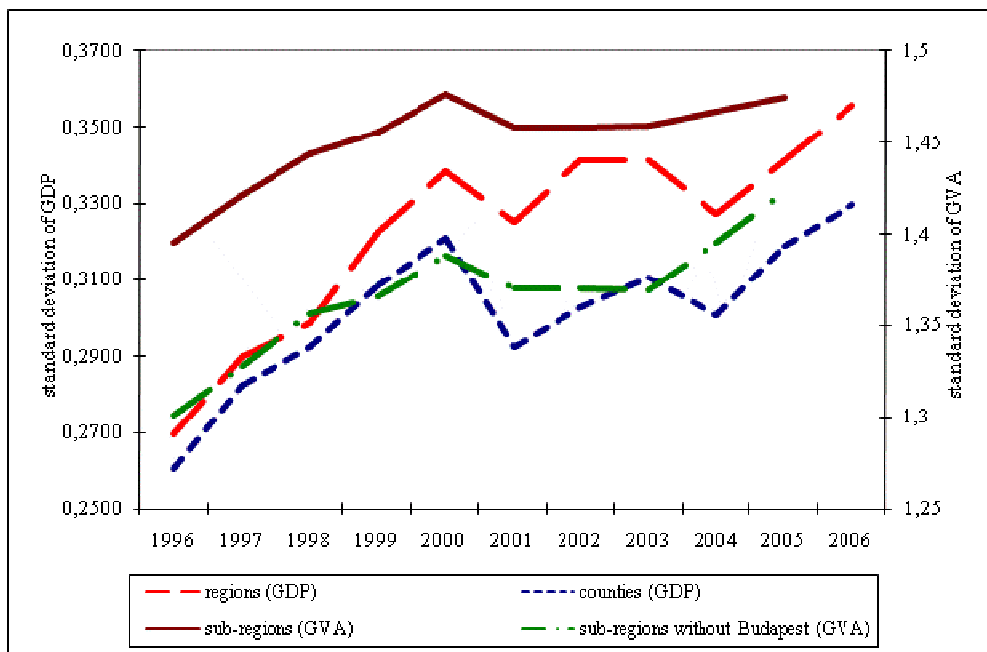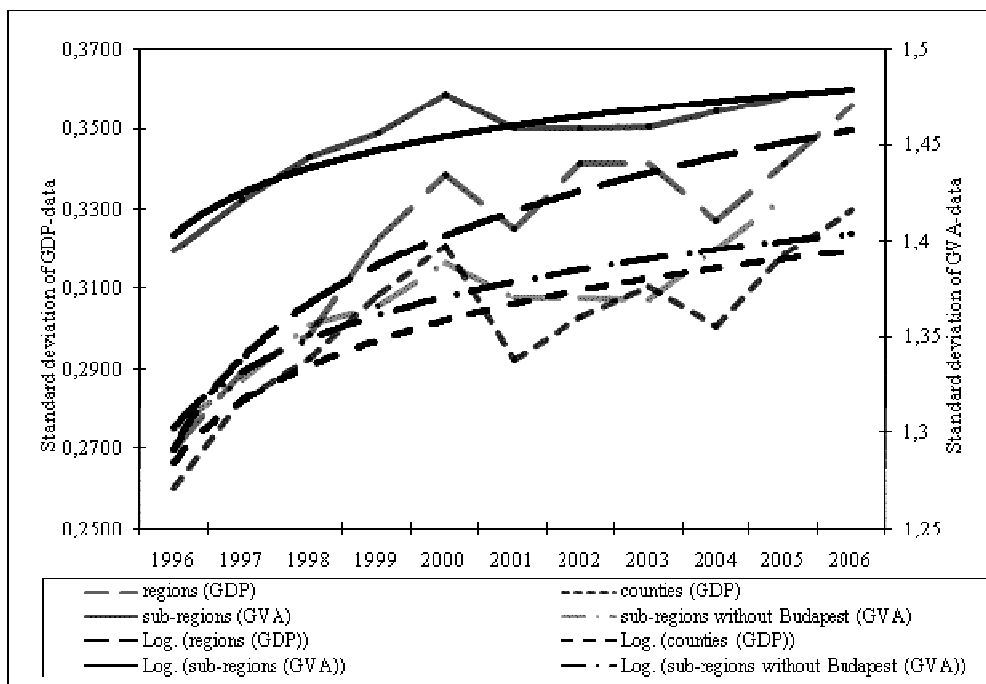

Note: calculated with natural logarithm
Source: own calculations on the basis of HCSO (2009)

The standard deviation values computed both from regional and county GDP, and sub-regional GVA provide the possibility of calculating trend-curves, in other word to demonstrate regularities in the evolution of data points. On the basis of R square as a control indicator it can be declared that the *logarithmic trend* fits well in all the four cases on the empirical data. It delineates in all the four cases the *left side of an U-shape curve* (Figure 3). By comparing these results and the Williamson-curve on the basis of the per capita GDP data we can state, that Hungarian territorial processes are in the divergent phase yet, in all the examined levels of aggregation[6].

---

[6] A convenient situation would be resulted if the statistical toolbar, by using trend-extrapolation, was able to define the point where the Hungarian territorial processes turn from the divergent to the convergent phase in the certain levels of aggregation. However trend forecast would be misleading in this case, since the logarithmic trend curve fitted on the past empirical data approximates to a zero-gradient linear curve when fitted on future points (where $t \rightarrow \infty$).

Figure 3. Logarithmic trend of the change of the Hungarian regional disparities

Note: calculated with natural logarithm
Source: own calculations on the basis of HCSO (2009)

In the foregoing the *examinations of territorial disparities were restricted to the analysis of a single indicator, the GDP per capita (or in sub-regional level the GVA).* We are convinced that spatial processes are *much more complex* than they could be described by one highlighted indicator. The trend in the literature of spatial analyses apparently shows that *it is insufficient to use single-variable approaches to measure the territorial process.* Instead, the application of complex indicator-systems is required to reach sophisticated conclusions (Lengyel–Lukovics 2006, Lukovics 2007, Lukovics 2008).

4. Methodological background of territorial disparities' multivariable analysis

In the following we demonstrate an approach for analysing territorial disparities that is much more complex than the pure examination of per capita GDP data. The method applies a complex indicator-system which is based on the concept of competitiveness. In order to assure the greatest possible accuracy of the analysis, the criterion of choosing an indicator into the basic indicator-system of the analysis can

not be based on the subjective considerations of the analyst. It is required to endeavour to minimize the analysts' subjectivity.

Miklós Lukovics and Péter Kovács (2008) developed a methodology for implementing regional competitiveness analyses, which is based on a closed logical system and where the mathematical-statistical background ensures the minimizing of analyst's subjectivity. The closed logical system of the applied method is assured by the fact that indicator selection is coordinated by a model unfolding the standard definition of competitiveness, the pyramid-model.

The data set serving as the foundation of the analysis is designed on the basis of the standard definition of competitiveness, and the pyramid model unfolding it. It is important, that the final database – that serves as the basis of multivariable data analysis methods – *emerges as a result of a multiple-stage* process (Kovács–Lukovics 2006). The first step defines the *basic data* that can be considered in the case of surveying competitiveness on the sub-regional level. These data can be defined on the basis of a deeper consideration of competitiveness as a concept and economic considerations, taking into account the most important experience of the reviewed international and national analyses. The fact that certain data are absolutely unavailable on the sub-regional level limits the inclusion of a great number of data as actual basic data; therefore, *actual basic data* are made up of the basic data available on the sub-regional level. These basic data may be considered as raw data, from which *potential indicators* can be produced with the help of simple mathematical operations. Selecting potential indicators with the help of principal component analysis leads to the *actual, relevant indicators* that finally serve as the basis of the analysis. The database reaches its final form after the *standardizing* and *weighting* of the relevant indicators (Figure 4).

Similarly to the variable-selection method we used *principal component analysis* to make an *objective weighting system*. The determination of the weights is based on the following train of thought. If we substitute the standardized variables with principal components, the principal components represent the model in reduced dimensions. As an output of the principal component analysis we receive the values of the communalities. Since the communalities are practically coefficients of multiple determinations in a linear regression model, where the dependent variable is the given variable, and the independents are the principal components, the square roots of those are coefficients of multiple correlations. In general the coefficient of multiple correlation quantify the correlation between the effective (empirical) and the estimated values of the dependent variable. Thus it also quantifies the correlation between the dependent variable and the set of independent variables. *Especially the coefficient of the multiple correlation means the correlation between the given standardized variable and the set of principal components, which represent the pyramid model. Thus, the coefficients represent the correlation between the variables and the model, namely the weight of the variables.*

Figure 4. Creating the database of the analysis
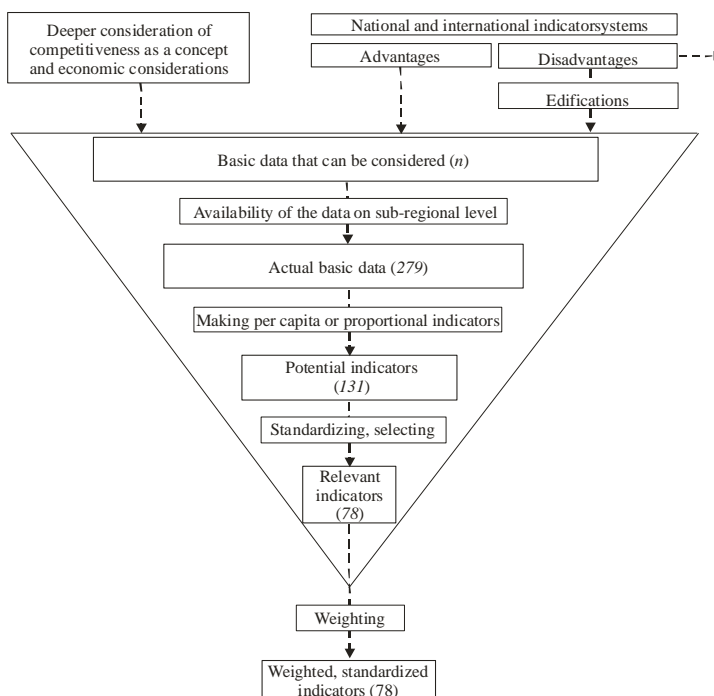
Source: Lukovics (2008, p. 116.)

After successfully accomplishing selection and weighting we receive a database in a structure that is in line with the pyramid model unfolding the standard definition of competitiveness, and that consists of 78 selected (therefore relevant regarding competitiveness), standardized, and weighted variables. As an empirical application of the developed method, we carried out the complex grouping of the 168 Hungarian sub-region on the basis of their competitiveness. This also provided an opportunity for the multi-variable analysis of territorial disparities.

5. Multi-variable analysis of territorial disparities

The model is expected to ensure *comparability in time*, which means that *beyond the relative competitiveness of the different sub-regions, its changes and through this the change of the regional disparities can also be examined* by introducing the latest statistical data to the database consisting of the selected system of indicators.

I intend to draw conclusions about the evolution of territorial disparities by examining the changes within the complex competitiveness classification of Hungarian sub-regions between two dates: 1998 and 2004. I use the well-known method of cluster-analysis, which, to the best of my knowledge, has not been used

for this purpose before. The closed logical method describable by the objective selection and weighting process of indicators based on the pyramid model of competitiveness also offers a chance *to complete an annual assessment of the changes in the relative competitive position of Hungarian local administrative units* and the changes of the regional disparities.

In our analysis, we compared the types of competitiveness of the different sub-regions in 1998 and in 2004. We studied which are the sub-regions whose competitiveness changed so much in the examined two years that their position assumed in clustering was also modified. Looking at the period between 1998 and 2004, only *ten sub-regions were found* whose ranking in clusters based on complex competitiveness changed by 2004 compared to its state in 1998.

Certain peculiarities must be emphasized though, which significantly influenced my endeavour:

1. Similarly to territorial GDP data, sub-regional GVA data are available also with a two-year delay. At the time of implementing the analysis – in the middle of 2007 – the most up to date territorial GVA data were from 2004. Therefore all the other data included to the database refer to 2004 as well.
2. The Government decree 244/2003 defined 168 sub-regions in Hungary[7] contrary to the earlier 150, which existed in 1998. This hindered the comparison of data in the level of sub-regions, but by aggregating the municipality-level data we managed to create data also for the previous years that are suitable for the new structure.
3. Since the database contains numerous specific indicators, it is very important that population data has significantly changed from 1998 to 1999. The reason for this is the recount of the previous estimated (forward counted) data.
4. The Hungarian Central Statistical Office's (HCSO) registration of enterprises by staff categories significantly changed between 1998 and 2000.
5. The calculation of unemployment rate has been in harmony with the ILO recommendation only since 1998. The HCSO previously provided the data of the Employment Offices (referring to registered unemployed).
6. Certain indicators (the number of ISDN main lines, simplified corporate taxes) are not available for 1998. In these cases I included data from the closest possible year to 1998.
7. Data of the 2004 model deriving from the 2001 population census are displaced by data from the 1990 population census in the 1998 model.

In order to draw conclusions with reference to the evolution of territorial disparities on the basis of change in the complex competitiveness classification of Hungarian sub-regions between 1998 and 2004, first we must carry out the

---

[7] The Act CVII of 2007, which defined 174 sub-regions, has not been passes at the time of the examination.

classification separately for the two years. I sorted the 168 Hungarian sub-regions for both 1998 and 2004 into three clusters by applying K-means cluster methodology based on 78 selected and weighted indicators in line with the Pyramid-model. For both 1998 and 2004 data less than 10 iterations were sufficient to develop a steady structure, hence the cluster affiliation of the territorial units based on their competitiveness is considered to be unambiguous.

Although the number of objects belonging to each clusters are the same for the two examined year, the distance of clusters from each-other and the membership of the cluster show difference to a certain extent.

If we analyse the evolution of the Euclidean distance of the cluster centres for the given years, we receive a new approach of the examination of territorial disparities (Table 1). Whether the distance of cluster centres rise from one point in time to the other, the relative competitiveness of the region-types move away from each-other. This is equivalent with the statement that territorial disparities increased between the examined points of time, and vice versa.

Table 1. Euclidean distance among the final cluster centers in 1998 and 2004

| Cluster	Relatively weak competitiveness	Medium competitiveness	Relatively strong competitiveness
Relatively weak competitiveness		8,672 (8,511)	34,968 (40,772)
Medium competitiveness	8,672 (8,511)		28,997 (35,110)
Relatively high competitiveness	34,968 (40,772)	28,997 (35,110)	

Note: Data of 2004 are in brackets
Source: own calculations

Based on the Euclidean distance of the final cluster centres, it must be underlined that *in 1998 the three clusters were situated closer to one another than in 2004*. Between 1998 and 2004, the distance of the cluster with relatively weak competitiveness and the one with medium competitiveness did not change significantly, however, the Euclidean distance between the clusters of the sub-regions with medium competitiveness and the one with relatively strong competitiveness grew significantly, and the same happened in the case of the clusters of sub-regions with relatively weak competitiveness and those of relatively strong competitiveness. *This observation, in a way, proves the increase of spatial disparities*. This recognition not only shows the growth of spatial inequalities, but also confirms the fact that the cluster of *Budapest* with relatively strong competitiveness *underwent much more dynamical development* in the examined period *than the sub-regions constituting the other two clusters*.

It can be stated about the spatial concentration of competitiveness and urbanization that there is no significant difference between the results based on the data compiled in 1998 and in 2004: the only sub-region with relatively strong competitiveness (the capital) is surrounded by the ring of sub-regions with medium

competitiveness, 90% of which are urban in both years. Furthermore, the urban sub-regions with medium competitiveness are on the one hand the sub-regions of the chief towns of counties and the sub-regions of large towns. Sub-regions with medium competitiveness (urban and rural alike) are concentrated in both years in the vicinity of developed Western centres and highways. Beyond this, it can also be stated that in 1998 and in 2004 a concentration of sub-regions with medium competitiveness can be found in the North-Western and Central regions of the country, while sub-regions with weak competitiveness are situated in the zones along the Northern and Eastern country borders. According to the data compiled in 1998 the dominance of the lake Balaton can be stated: significantly more sub-regions with medium competitiveness concentrated along the lake in 1998, than in 2004.

Figure 5. Change of the competitiveness cluster memberships of the sub-regions (1998-2004)
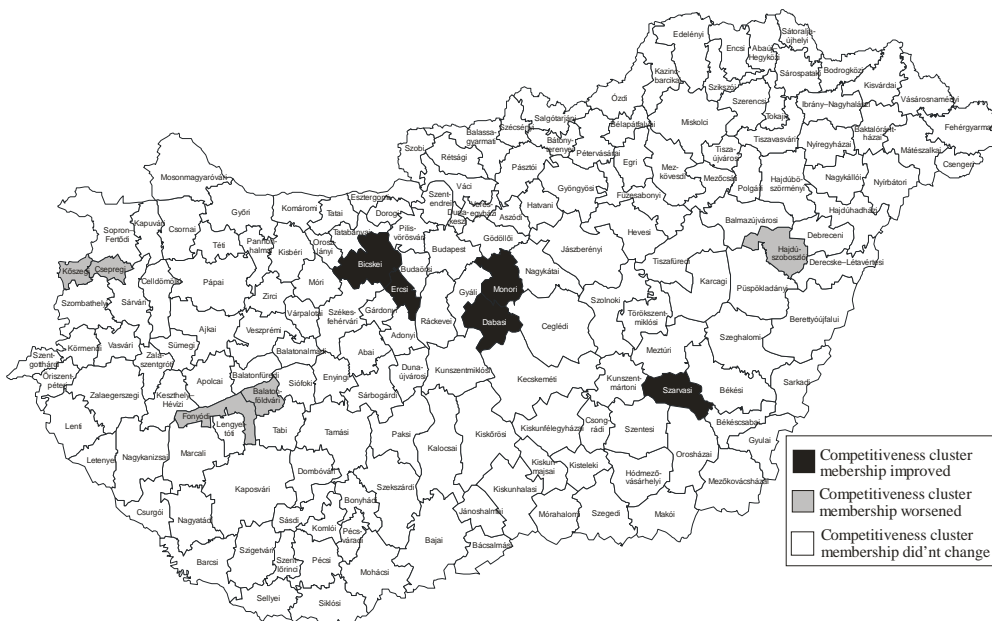
Source: own calculations

We also studied which are the sub-regions whose competitiveness changed so much in the examined two years that their position assumed in clustering was also modified. Looking at the period between 1998 and 2004, only *ten sub-regions were found* whose membership in clusters based on complex competitiveness changed by 2004 compared to its state in 1998. It should be underlined, that presumably the competitiveness of more than ten sub-regions changed in the examined period, but

the degree of change only resulted in cluster membership changing in case of 10 sub-regions (Figure 5).

From the ten sub-regions mentioned above, five (Bicskei, Dabasi, Ercsi, Monori, Szarvasi) improved its competitiveness cluster membership, five (Balatonföldvári, Csepregi, Fonyódi, Hajdúszoboszlói, Kőszegi) worsened it. The realignment of the competitiveness types is also remarkable: the competitiveness position of the wider Budapest-agglomeration improved.

6.   Summary

In the present paper we attempted to introduce a method for analysing territorial disparities based on the concept of regional competitiveness, which analyses the spatial processes by using (within the model)an objectively selected and weighted system of indicators. The essence of the method – beyond the multi-step creation process of the database – is that it analyses the evolution of territorial disparities on the basis of the final output of a multi-variable data analysis (namely the Euclidean distance of cluster centres), contrary to the most commonly used standard deviation values of per capita GDP.

According to both single-variable standard deviation analysis and multivariable examination, regional divergence can be reported in Hungary on a sub-regional level. Sub-regions with relatively high competitiveness increase their competitiveness, while sub-regions with relatively weak competitiveness fall behind. Furthermore it can be stated that the competitiveness of sub-regions in "convergence" regions is much heterogeneous: the competitiveness "engines" of these areas are the sub-regions of county centres and towns with county authorities, while the competitiveness of other, mainly rural sub-regions is weak and degrading in tendency.

These results necessarily call for the continuation of recent research: does the competitiveness potential sub-regions with relatively weak competitiveness degrade to such an extent as a result of the growth in territorial disparities that is may hinder the future catching-up.

It is necessary to survey in these sub-regions the factors that may contribute to the development of their competitiveness. For this purpose those elements of recent selected and weighted set of indicators that map the "development factors" and "success determinants" of the Pyramid-model provide a possibility. As a result of a competitiveness analysis based on the above indicators (that represent the possible directions of development strategies), it can be found out, whether sub-regions with relatively weak competitiveness possess merely a weak ex-post competitiveness, or also a faint catching-up potential.

If the results showed that also the opportunities for improving competitiveness are scarce in the sub-regions of relatively weak competitiveness, there would be a

real danger of the economic degradation of these areas. In this case the realistic aim for these sub-regions is not the catching-up, but the ceasing of further falling-behind.

References

Bajmócy, Z. 2008: A regionális innovációs képesség értelmezése és számbavétele a tanulás-alapú gazdaságban. In Lengyel I.–Lukovics M. (eds) *Kérdőjelek a régiók gazdasági fejlődésében*. SZTE Gazdaságtudományi Kar Közleményei, JATEPress, Szeged. pp. 26-46.

Davies, S. – Hallett, M. 2002: *Interactions between National and Regional Development*. Hamburg Institute of Regional Economics, Hamburg.

EC 1987: Single European Act. *Official Journal*, L 169, Luxembourg.

EC 1992: Treaty on European Union. *Official Journal,* C 191, Luxembourg.

EC 1997: Treaty of Amsterdam Amending the Treaty on European Union, the Treaties Establishing the European Communities and Related Acts. *Official Journal*, C 340, Luxembourg.

EC 1999: *European Spatial Development Perspective. Towards Balanced and Sustainable Development of the Territory of the European Union*. European Commission, Brussels.

EC 2004: *A new partnership for cohesion - Third Report on Economic and Social Cohesion*. European Commission, Brussels.

EC 2006: *The Growth and Jobs Strategy and the Reform of European cohesion policy. Fourth progress report on cohesion*. European Commission, Brussels.

EC 2007: Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community. *Official Journal,* C306, Luxembourg.

Enyedi, Gy. 2000: Globalizáció és magyar területi fejlődés. *Tér és Társadalom*, 1, pp. 1-10.

Eurostat 2004: *Eurostat Structural Indicators*. Statistical Office of the European Communities, Luxembourg.

Fenyővári, Zs. – Lukovics, M. 2008: A regionális versenyképesség és a területi különbségek kölcsönhatásai. *Tér és Társadalom,* 2, pp. 1-20.

HCSO 2009: *National Accounts Hungary 2005-2006*. Hungarian Central Statistical Office, Budapest.

Kiss, J. P. – Németh, N. 2006: *Fejlettség és egyenlőtlenségek: Magyarország megyéinek és kistérségeinek esete*. MTA Közgazdaságtudományi Intézete, Budapest.

Kovács, P. – Lukovics, M. 2006: Classifying Hungarian Sub-regions by their Competitiveness. "*Globalization Impact on Regional and Urban Statistics*" SCORUS 25th Conference on Urban and Regional Statistics and Research, Wroclaw, Poland.

Lengyel, I. 2003: *Verseny és területi fejlődés: térségek versenyképessége Magyarországon*. JATEPress, Szeged.

Lengyel, I. – Lukovics, M. 2006: An Attempt for the Measurement of Regional Competitiveness in Hungary. Paper presented at the "*Enlargement, Southern Europe and the Mediterranean*" 46th Congress of the European Regional Science Association, Volos, Greece.

Lukovics, M. 2006: Az építőipar helyzete és az építési piac térbelisége. In Lengyel, I.–Rechnitzer, J. (eds) *Kihívások és válaszok: a magyar építőipari vállalkozások lehetőségei az Európai Uniós csatlakozás utáni időszakban*. Novadat, Győr, pp. 15-47.

Lukovics, M. 2007: Measuring Territorial Competitiveness: Evidence from Hungarian Local Administrative Units (LAU1). Paper presented at the "*Local Governance and Sustainable Development*" 47th Congress of the European Regional Science Association, Paris, France.

Lukovics, M. 2008: Térségek versenyképességének mérése. JATEPress, Szeged.

Lukovics, M. – Kovács, P. 2008: Eljárás a területi versenyképesség mérésére. *Területi Statisztika,* 11, 3, pp. 246-263.

Málovics, Gy. – Ván, H. 2008: Az ökológiai fenntarthatóság és a regionális versenyképesség összefüggései. *Tér és Társadalom*, 2, pp. 21-40.

Nemes Nagy, J. 2005: Fordulatra várva – a regionális egyenlőtlenségek hullámai. In Dövényi, Z.–Schweizer, F. (eds) *A földrajz dimenziói*. MTA FKI, Budapest, pp. 141-158.

Rechnitzer, J. 1998: A helyi önkormányzatok felkészülése az Európai Unió regionális politikájának fogadására. In Csefkó, F. (ed.) *EU-integráció – önkormányzatok I*. ÖSZT-ICMA-USAID, Budapest, pp. 180-196.

Rechnitzer, J. 2000: Területi politika az EU csatlakozás előtt. In Farkas, B.–Lengyel, I. (eds) *Versenyképesség – regionális versenyképesség*. JATEPress, Szeged, pp. 13-24.

Sala-i-Martin, X. X. 1996: Regional Cohesion: Evidence and Theories of Regional Growth and Convergence. *European Economic Review*, 40, 6, pp. 1325-1352.

Szörfi, B. 2006: *Regional inequalities in the European Union: Testing the Williamson-curve hypothesis with different methods in presence of serial correlation*. Central European University, Economic Development, Budapest.

"Analyse this" – Cluster-mapping in Szeged and Csongrád County

Réka Patik

As cluster-mapping – identifying potential and existing clusters in a region's economy – has found its place in foreign literature, several attempts have been made in Hungary to reveal the economic structure of the country, a specific region or county, and to find their high-points. Despite the fact that an effective regional or local development process with the rational use of the resources at hand ideally needs the outputs of a thorough study revealing the true drivers of the economy, in practice the toolkit of cluster-mapping is often ignored. The reason is the difficult and problematic adaptation of the tools introduced in the foreign literature: statistical databases have their shortcomings, primer data collection is rather costly.

An inquiry into Szeged and its subregion and Csongrád County has been done on the basis of this toolkit, however. Besides the awareness of deficiencies and difficulties, this study gives results based on exact data. These results may also form the starting point of further studies. The economic structure of the region is analysed from different aspects, which together lead to certain consequences and also to the identification of the potential "Human resource", Construction and various processing industry clusters of the region. The study shows some possible ways for the university to enter the regional development scene.[*]

Keywords: cluster-mapping, cluster policy, peripheral regions, regional concentration

1. Introduction

Several countries' and regions' economies answer global challenges with the spatial concentration of economic activity. It has been proved that spatial proximity provides such advantages (positive local externalities) to the regional economic actors, which enhance their competitiveness and chance for success in international competition (Lengyel–Deák 2002).

In recent years, the Hungarian economic literature has turned towards clusters and cluster-based economic development (Buzás 2000, Deák 2002, Gecse–Nikodémus 2003, Lengyel 2001, Lengyel–Deák 2002, Lengyel–Rechnitzer 2002). This study deals with only one segment of building and implementing a cluster-policy aiming at developing clusters and therefore competitiveness. This segment is cluster-mapping. The focus of the study introduces the methodology from a practical

---

point of view: adaptability of the mapping toolkit[1] in Hungary, experience drawn from the statistical data based empirical study of Szeged and Csongrád County.

2. Focus and methodology

Demonstrating the commitment of international organizations towards clusters, a series of cluster-studies has targeted the region. The 2002 studies of the LEED program, however, stated that Hungary had no real clusters (Ionescu–Möhring 2002). In 2005 a more sophisticated view was formed (OECD 2005): between 2002 and 2005 clusters emerged in several industries (automotive, logistics, construction and tourism).

2.1. The region in focus

Csongrád County is part of the South-Great-Plain Region at the South-Eastern border of the EU. This region has the third biggest population amongst the Hungarian regions (after the Central Region and the North-Great-Plain Region), according to its territory it is ranked fourth[2]. The county fits well the row of the neofordist, peripheral counties in the South-Eastern crescent of Hungary (Lengyel 2003). Despite or besides the opinion cited in the previous paragraph, in 2000 several cluster(-like) initiatives existed in the region (Buzás 2000):

1. „DÉL-THERM" Union including three heat- and thermic technology firms;
2. a textile-industry reintegration program with the participation of science institutions, led by HUNGARN Fonó Ltd.;
3. the textile industry subcontractors' coordination centre at Eurotex Ltd.;
4. co-operations in IT, the agrarian sector („onion-association", organic farming) and biotechnology.

The 2-digit SIC-code (division-level) analysis of employment data of the Hungarian regions and counties (Gecse–Nikodémus 2003) shows an over-represented presence of food-processing and textile industries here. The food-processing concentration is probably due to the canning factory of Szeged, the grain

---

[1] For a general review of the toolkit please see Patik (2005), for the detailed methodological description of the present study please see Patik–Deák (2005).

[2] Based on www.nepszamlalas.hu/hun/egyeb/hnk2005/tablak/load1_2.html. Download: 27th February 2006 (Population data refer to 1st January 2004, territorial data to 1st January 2005.)
The South-Great-Plain Region itself (18.338 km^2) is a bit bigger than the Walloon Region of Belgium, and a bit smaller, than Niederösterreich in Austria. As for the population (appr. 1.3 million inhabitants), it almost equals the Champagne-Ardenne region in France, or Estonia as a whole. Csongrád county with its territory of 4.262 km^2 could be compared to Luxembourg or the Danish Viborg county, its population of approximately 425 thousand people suggests the Belgian Leuven or the Italian Parma regions. The county has around 73 thousand employees and registers 34 thousand enterprises.

mill industry, meat processing (in Szeged, Csongrád and Szentes) and winemaking (in Csongrád, Mórahalom). Textile-industry is present in almost every bigger town (Hódmezővásárhely, Szeged).

Significant employment concentrations of Csongrád County have been revealed in the chemical industry (plastics, pesticides, paints, varnishes and rubber products) and china-production (Hódmezővásárhely).

Spatial concentrations do exist in Hungary; clusters are being formed with the adaptation of foreign best practice. The private sector has built several clusters, which are promoted and supported by the government. The South-Great-Plain clusters with governmental subsidy (these might be present in the region in focus) (Gecse–Nikodémus 2003):

1. Textile Cluster;
2. Public Works and Road Construction Cluster;
3. Tourism Cluster;
4. Handicraft Cluster.

The present study is unique in a way, as it uses 4-digit SIC-code (class-level) analysis on subregional and county level, working with a complex system of indices and criteria. More detailed and accurate results are awaited accordingly.

2.2. Methodology

All empirical studies should start with an operative definition of the phenomena to be measured. The literature documents dozens of cluster-definitions, based on different theoretical background etc. (Gordon–McCann 2000, Martin–Sunley 2003). Two basic approaches are agreed to set the theoretical background: economics and business studies (Phelps 2004).

Taking these two cornerstones into consideration, this study is guided by the second one. But choosing cluster-definition does not solely define the theoretical background and the terminology to be used: it is the definition which selects the applicable tools from the cluster-mapping methodology. A definition, which serves well the aims of the mapping process, is decisive for the measures describing the concentration of economic activity (i.e. employment, turnover, number of enterprises) and also for the spatial approach, whether geographical, social, economic, cultural etc. These are the critical milestones of the mapping procedure (DeBresson–Hu 1999). Accordingly, the alternative way of cluster-development is chosen in this study (Bergman–Feser 1999).

3.   Defining the methodological framework

Before getting deeper into the facilities provided by the toolkit of cluster-mapping, several decisions have to be made, as seen above (Bergman–Feser 1999). Taking the

cited train of thought into consideration, the following pages deal with the aim of the research, the cluster-definition used, the indices and methods used, and finally the consequences drawn.

3.1. Aims and cluster-definitions

As a first step, we have to investigate the region to be developed, we have to set an aim for development, which is delivered by the programs and strategies of the region finalised in the late 90s (MTA RKK ATI 1998, DARFT 1999). These documents unitedly stress that there is a need to adjust higher education to the economic structure. As a combination of the objectives of the region and the university the baseline of the current research is the following: *to launch the knowledge-based economy of Szeged and Csongrád County, to enhance the innovativeness of the region, with the active participation of the University of Szeged.*

Quite agreeably, the university can have an influence on the economy of Szeged and its region with the knowledge produced and used inside its walls, with its research capacity and infrastructure, with the new technologies created by or with the help of the university. Enright's definition (1998) describes these initiatives the best, however, the definition of Lengyel and Deák (2002) is also remarkable for the stress on the role of the drivers of local economy. Let our cluster-definition be the following according to these: *a local/regional driver of the economy, where the enterprises operate with shared infrastructure, labour pool and knowledge-base, using division of labour.*

This definition ensures geographical proximity along with features, which implicitly assume the existence of co-operating and supporting institutions (university, technology-transfer organisations etc.). As a consequence we can expect that it will guide the mapping activity and will help in choosing the adequate tools from the methodology.

3.2. Methodology options

Before going deeper into the introduction of the toolkit, it is important to emphasize that we are going to deal with the mapping of potential clusters – no matter which index or method we use. A real cluster can be identified as a result of a multi-step analytical process. Using the chosen method on the data at hand potential clusters are identified which need to undergo further analysis. Using one single method will not result in a reliable output. Based on this we are going to see how the keywords of the definition can be investigated with the different methods.

Finding the drivers of the economy leads us to the problem of measuring the concentration of economic activity. An economic activity presumeably drives the regional economy, if it has a dominant role in the economy and shows considerable growth. It should also be a traded industry. The first two aspects can be derived from

added value, the share of employment and the number of enterprises. The share of export can feature the traded characteristics[3].

As mentioned before, the definition implicitly contains spatial proximity, geographic concentration. During the research this feature is assisted by the source of the data-set: all data refer to Szeged, the Szeged subregion and Csongrád County. In the following pages the keywords of the cluster-definition are "translated" into indices and analytical methods (a-g), thus forming the methodological frame of the mapping.

a) Share of added value, growth of added value. Added value is hard to investigate along 4-digit SIC-codes or on subregional level. The data-collection of the Hungarian Central Statistical Office (HCSO) represents the county level and the 2-digit SIC-code depth. No more detailed data are available, that is why the drive of the economy cannot be analysed well enough through added value[4].

b) Employment data. Employment data are expected to reveal the economic structure of the county and subregion through the employment share of the different economic activities, showing the size of the common labour-pool. The most often used index in this case is the location quotient, the LQ-index, exhibiting economic specialization. The LQ-index based on employment data is referred to as "employment-LQ" in the future, to distinguish it from other LQ-indices.

Despite the constraints of the usage of the employment-LQ (see Brenner 2004 for more details), this index was the central tool of the British cluster-mapping project (Miller et al. 2001). In Hungary a similar methodology assisted Gecse and Nikodémus (2003). These two projects had quite different value limits when setting the evaluation criteria, when deciding an economic activity's being a high-point or part of a cluster. Differences exist moreover in the depth of the dataset, the territorial level in focus – both studies serve as a guideline for this mapping, though.

Beside employment-LQ another important index is the change of employment. This latter has its own problems, too: it is easily influenced by the number of enterprises, productivity, capital adequacy, technological level of the economic activity investigated. However, the growing number of employees might mean the growth of the critical mass.

c) Number of enterprises, change in the number of enterprises. An attractive option for the comparison of the number of enterprises in different regions might be the use of the general LQ-index filled with enterprise data – the "enterprise-LQ". An enterprise-LQ above 1 shows relatively more enterprises in an industry than the national average. However, the number of enterprises in different regions may vary according to the regions' economic structure. The enterprise-LQ – the relative

---

[3] Certain economic activities are able to attract income into the region, although their output is not tradeable, so it won't add to the export data: tourism, higher education, R&D. These activities ought to be investigated more thoroughly.
[4] Based on consultations with the experts of the Hungarian Central Statistical Office, Summer and Autumn 2004.

number of enterprises as a mapping tool – could be misleading: caution is required. It is important to conclude that the enterprise-LQ will definitely not show the specialization of the region, but it gives a good hint on the size-structure of the economic organisations (more precisely: of the average relative size of the economic organisations). That is why it is going to be used as a secondary index, to elaborate the view of the economy given by other, "more reliable" tools.

More information on an economic activity is given by the number of enterprises, and the change in the number of enterprises. Here also it is not so much the size of the industry, but the structure, which counts. In Hungary these indices can be perfectly used, data are fully available from the HCSO.

d) Export. The RCA-index (revealed comparative advantages; used mainly in world economy) can be considered as an LQ-index, too. It has the same structure, filled with the appropriate export-data, and it shows the specialization of a region illustrated by the export activity. The "export-LQ" is not often used on a regional level, but as the output-side reflection of the employment-LQ it was worth introducing it.

Its usage in Hungary is difficult; a rather limited series of data is available on the 4-digit SIC-code level. As a consequence, the export-LQ is only used as a complementary tool.

e) Qualitative case-studies. Qualitative case-studies might reveal several of the keywords in our cluster-definition: shared infrastructure, knowledge-base, division of labour (appearing as transactions among regional actors, input-output relationships). They make hardly measurable characteristics less elusive.

As several foreign case-studies are available today, there is an opportunity for benchmarking, one might collect the distinguishing features of an industry's clusters. It is also possible to recognize those infrastructural and institutional ingredients which make the clusters function and flourish, or the presence of which might indicate the existence of a similar cluster in Hungary. Porter's diamond is often used when this method is chosen (Roelandt–den Hertog 1999, Lengyel 2000).

f) Number of patents. The birth of shared technology could be traced via the number of patents. Together with the patent citations in the USA this indicator is appropriate for following the spreading of technologies and for finding the shared technology base (Jaffe et al 1993). Hungarian adaptation is influenced and hindered by the discrepancy of the Hungarian patenting system as compared to the American. The patents of the Csongrád County organisations might reveal the innovative activities of the region, though.

g) Transactions and relationships among the regional actors. Analysing division of labour and the value chains equals the mapping of both spatial and economic proximity, provided that the data investigated refer to the appropriate territorial level. This comfortably leads us to meeting the expectations recorded in the cluster-definition. Two elements of the mapping tool-kit are widely used here: input-output analysis and graph-analysis, but qualitative case-studies have the

potential of revealing transactions and relationships, too. All three are part of the OECD-recommended methodological range (Roelandt–den Hertog 1999).

The input-output analysis is well known in Hungary (Lengyel–Rechnitzer 2004). Unfortunately, for the region in our focus no input-output matrix is available, and creating our own matrix would require additional resources.

Graph analysis (usually based on input-output matrices) would give a nice illustration of the region's economy (see i.e. Luukkainen 2001, p. 284.). The difficulties of its usage lie in the matrix itself, as explained earlier. That is why these methods are not easy to use in Hungary.

4.   Adapting the methods in Hungary – data and methodological setbacks

The previous paragraphs have proved that the potential clusters of Szeged and Csongrád County can be analysed mainly from two sides: employment and the number of enterprises. These are completed by the export data to sophisticate the results. The identified potential clusters could be tested by qualitative case-studies in the future.

After the overview of the Hungarian statistical databases with regard to the territorial level and "depth" (number of SIC-code digits) of the data, the following indices can be used to map Szeged and Csongrád County on merits:

1. employment-LQ,
2. share of regional employment,
3. enterprise-LQ,
4. number of enterprises and its change,
5. export-LQ.

4.1.   Data imperfection

The different employment patterns of certain industries and economic activities (i.e. outsourcing) might distort the value of the employment-LQ. Thus the real size of an industry is certainly bigger than shown by the data. A similar problem is – as pointed out by Gecse and Nikodémus (2003) – that the HCSO does not collect employment data from the organisations with less than 4 people. The number of employees in organisations with 4-49 people is estimated, as a result there is a possibility of imperfection.

The use of the export-LQ is made more difficult by the fact that the HCSO collects export data exclusively from the processing industry firms with more than

50 people. Moreover the act on data protection prohibits the declaration of data in economic activities with 3 or less actors. It narrows our data set[5].

When interpreting the export-LQ it should be noted that the HCSO takes export as transporting goods outside the border of Hungary. As a result, export data are incapable of showing trade among the regions or counties, and traded industries.

Further data imperfection derives from the deficiency of the industrial classification system: not every economic activity is replaceable with one or more SIC-codes, mainly the activities of the "new economy", creative industries etc[6].

Some data are collected according to the location, others according to the premise of an enterprise; some refer to Szeged, others to the Szeged subregion.

4.2. *Methodological shortcomings*

Methodological shortcomings derive mainly from aggregation, the decision on the value limits and the choice of the benchmark or the point of reference.

Aggregation influences mostly the LQ-indices and the share of the economic activities. The minimum size of the different activities on different territorial levels must be defined carefully. This is also true for the different levels of industrial classification aggregations.

Choosing the value limit means giving the value of an LQ-index, from which the given economic activity is considered relevant or concentrated. Theoretically, this limit is 1[7], but in practise caution is required (Brenner 2004). The limit for the employment-LQ should be above 1.

The differences in the employment patterns are not to be ignored in the empirical analysis, though, mainly when analysing parts of Hungary. The employment ratio of the Hungarian regions varies greatly, which distorts the employment-LQ, when having the whole of the economy as a benchmark. In a more developed region non-traded community-services are over-estimated, traded activities are under-estimated. In the peripheral regions the effect is quite the opposite. This effect can be eliminated if the traded industries serve as a benchmark.

---

[5] Although the mere existence of publishable data in itself shows the significance of an economic activity – it means that there are at least three regional actors with traded products and export activity and with more than 50 people each.

[6] The literature often doubts the ability of the NACE (SIC-code based analysis) to answer the questions about a regions economic structure. A basic problem is that the classification systems seemingly do not follow the evolution of the economy: the activities of the new economy, creative industries and biotechnology are not classified. It is true for the NACE Rev.1.1. of the EU, ISIC REV.1.1 of the UN and the harmonised Hungarian TEÁOR'03, too (KSH 2002).

North-America (Mexico, the USA and Canada) has remedied these problems recently. NAICS (North American Industrial Classification System) has been created, renewing the traditional classification and enhancing the depth of the data (6-digit codes) (Tűű 2003).

[7] At Gecse–Nikodémus (2003) the regional and county-level value limit for the employment-LQ is 1, at Miller at al (2001) the regional limit is 1,25, the local is 5.

To sum up, in the analysis of the data it is worth having LQ-index limits above 1, and having traded industries as benchmark. But selecting traded industries is not an easy task. The literature documents several methods to do that (Stimson–Stough–Roberts 2002, Porter 2003), these cannot be used in Csongrád County or Szeged.

5. Mapping Szeged and Csongrád County

Cluster-mapping in practise puts several problems and setbacks into the limelight. The analysis of Szeged and Csongrád County illustrates most of them impressively – that's why this mapping project might serve as a guideline for other Hungarian mapping approaches.

To return to the train of thought cited and used earlier, the tools and indices are defined now, this should be followed by setting the system of criteria, value limits, the sequence of the tools and indices.
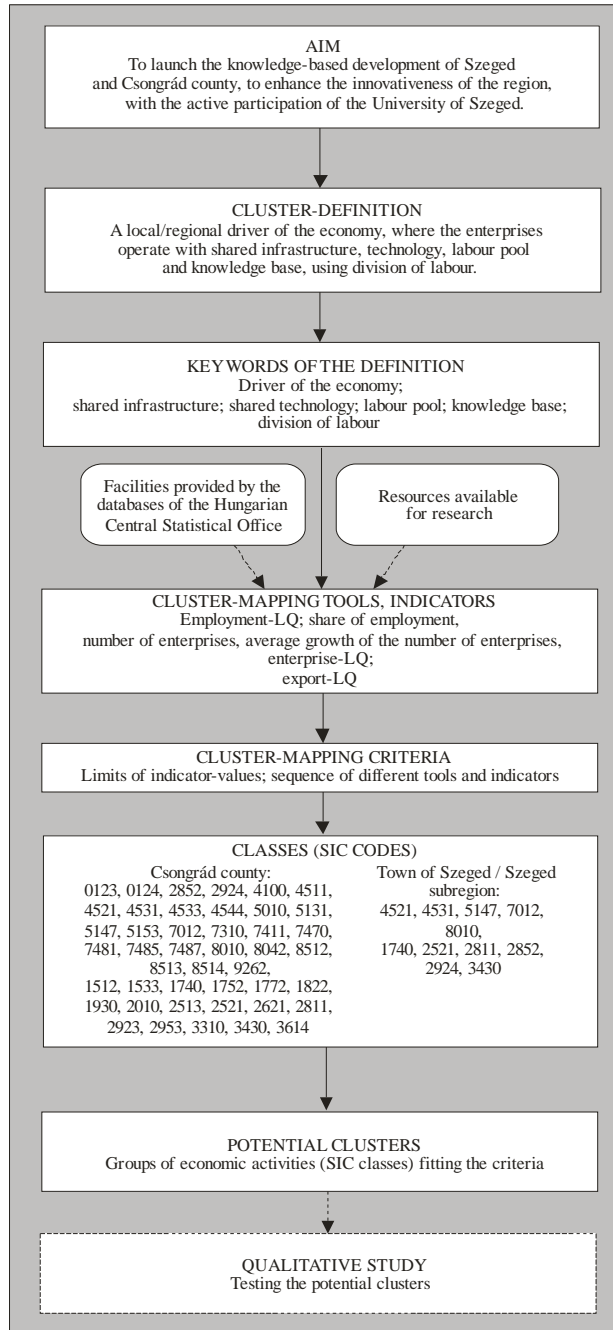
After these decisions are made, the investigation runs this way: the first step is the employment-LQ and the share of regional employment, using the economy as a whole as a benchmark (owing to the problems of dividing traded and non-traded industries). The deficiencies deriving from this benchmark are expected to be set off by the combination of several indices and tools. The mapping runs parallel for Szeged and Csongrád County.

Both employment-LQ and the share of employment are calculated with 4-digit SIC-code data for the year 2003 for Szeged and Csongrád County. In case both meet the expected value limits, the second step is analysing the number of enterprises. The data regarding the number of enterprises are for the year 2004, and these are also 4-digit SIC-code "deep". Those classes/activities which do not match the employment criteria, are removed from the research. Those having deficiency with respect to only one employment indicator are to be analysed further if they show enough enterprises. In this case two of three data prove the critical mass.

Classes with few enterprises but with good employment indicators might "suffer" from the unique features of the economic activity itself. In this case the enterprise-LQ can answer the question, whether the low number of enterprises is a general national phenomena or a regional characteristic.

Another specification for clusters was expected growth. A potential driver of the regional economy should show growing number of actors – indicated by the annual average growth of the number of enterprises regarding the 1999-2004 period.

Figure 1. The process of the cluster-mapping

AIM
To launch the knowledge-based development of Szeged
and Csongrád county, to enhance the innovativeness of the region,
with the active participation of the University of Szeged.

CLUSTER-DEFINITION
A local/regional driver of the economy, where the enterprises
operate with shared infrastructure, technology, labour pool
and knowledge base, using division of labour.

KEY WORDS OF THE DEFINITION
Driver of the economy;
shared infrastructure; shared technology; labour pool; knowledge base;
division of labour

Facilities provided by the
databases of the Hungarian
Central Statistical Office

Resources available
for research

CLUSTER-MAPPING TOOLS, INDICATORS
Employment-LQ; share of employment,
number of enterprises, average growth of the number of enterprises,
enterprise-LQ;
export-LQ

CLUSTER-MAPPING CRITERIA
Limits of indicator-values; sequence of different tools and indicators

CLASSES (SIC CODES)

Csongrád county:
0123, 0124, 2852, 2924, 4100, 4511,
4521, 4531, 4533, 4544, 5010, 5131,
5147, 5153, 7012, 7310, 7411, 7470,
7481, 7485, 7487, 8010, 8042, 8512,
8513, 8514, 9262,
1512, 1533, 1740, 1752, 1772, 1822,
1930, 2010, 2513, 2521, 2621, 2811,
2923, 2953, 3310, 3430, 3614

Town of Szeged / Szeged
subregion:
4521, 4531, 5147, 7012,
8010,
1740, 2521, 2811, 2852,
2924, 3430

POTENTIAL CLUSTERS
Groups of economic activities (SIC classes) fitting the criteria

QUALITATIVE STUDY
Testing the potential clusters

Source: own construction

The limits of the indicator-values as a set of criteria have been defined according to the foreign and Hungarian mapping practise. More combinations of value limits were tested to result in an acceptable number of activities, regional "high-points". It was also expected that the set of economic activities resulted from this research should include industries with export-capacity.

The set of industries left at the end of the process should be further analysed by qualitative case-studies, so as to group them into potential clusters, to reveal connections, co-operations among them etc.

After testing different sets of limits of indicator-value, Csongrád County showed 27, Szeged (and its subregion) showed 5 SIC classes which correspond to the criteria. (More than in the case the British or the Hungarian Gecse–Nikodémus values were used.) These classes are to be supplemented by the activities with export data as a second row. Grouping into clusters has been done with the analysis of the content of the SIC-codes, lacking a qualitative case-study (Figure 1).

6. Results

Results and experiences appear in two fields: the usage of the methodology and the development of Szeged and Csongrád County.

Methodologically the most conspicious difficulty was the quality of the data, which slowed down the whole mapping process. The Hungarian system of SIC codes was altered in 2002, and the modification was not consequently applied to the data (comparing those from 1999 with the more recent ones for example). Another disadvantageous factor was the lack of data. In some cases no employment data were published in spite of the fact that the number of enterprises was much higher than the limit for data-protection (it is three as mentioned earlier). Altogether 192 activities were analysable on the county level, 55 on the town or subregional level – all of the different data were available only in these cases from among the 518 4-digit SIC-code activities. Of course using the indices separately was possible for more than 55 or 192 activities.

We have now come to the point where the activities fitting the system of criteria are to be investigated further (Table 1 and 2). *On the whole in Szeged and the Szeged subregion five potential clusters are identified: the Construction Cluster, The Human Resource Cluster* (including activities contributing to the development and "maintenance" of the human resource of the region), *the Metal and Machinery Cluster, the Textile and Footwear Cluster, and the Plastic Cluster.*

Table 1. Potential clusters of Szeged

Name of potential cluster	Economic activities chosen through the mapping process	Percentage of employment in Szeged	Percentage of enterprises in Szeged
Construction	4521 General construction of buildings and civil engineering works 4531 Installation of electrical wiring and fittings 7012 Buying and selling of own real estate	3,99	4,68
Human resource	8010 Primary education	3,82	0,30
Metal and machinery	2811 Manufacture of metal structures and parts of structures 2852 General mechanical engineering 2924 Manufacture of other general purpose machinery n.e.c. 3430 Manufacture of parts and accessories for motor vehicles and their engines	1,31	1,24
Textile and footwear	1740 Manufacture of made-up textile articles, except apparel	0,00	0,02
Plastic	2521 Manufacture of plastic plates, sheets, tubes and profiles	0,00	0,03
	5147 Wholesale of other household goods	0,40	0,32

Source: own construction

Meanwhile the county has a more wide-ranging processing industry character. The activities named at Szeged are present with much more 4-digit SIC-code classes. On the county level the clusters of Szeged are to be completed with the Meat Cluster, the Business Services Cluster, and the Fruits and Vegetables Cluster[8]. (There are some SIC classes, which couldn't have been grouped into any of the clusters, although they met all the criteria.) These clusters are obviously only hypothetical, regarding the cluster-definition at the beginning of this study. As long as an appropriate qualitative case-study confirms their existence, the living co-operations, division of labour and transactions inside a cluster, it is a mere assumption.

Critical mass (in employment and number of enterprises) is performed on county level by the Construction and the Human Resource Cluster. A critical mass in employment is perceived in Metal and Machinery, Meat, Textile and Footwear (Table 2).

---

[8] The region has unique features, too. For example the employment-LQ of the manufacture of cordage, rope, twine and netting is extremely high, but the number of enterprises is very low, just like the number of employees. The foreign cases take this activity as part of the textile cluster – following this practise it becomes a strong point of the region's economy, making it special among the others.

Table 2. Potential clusters of Csongrád County

Name of potential cluster	Economic activities chosen through the mapping process	Percentage of employment in the county	Percentage of enterprises in the county
Human resource	7310 Research and experimental development on natural sciences and engineering 8010 Primary education 8042 Adult and other education n.e.c. 8512 Medical practice activities 8513 Dental practice activities 8514 Other human health activities 9262 Other sporting activities	12,69	6,48
Construction	2010 Sawmilling and planing of wood; impregnation of wood 3614 Manufacture of other furniture 4511 Demolition and wrecking of buildings; earth moving 4521 General construction of buildings and civil engineering works 4531 Installation of electrical wiring and fittings 4533 Plumbing 4544 Painting and glazing 5153 Wholesale of wood, construction materials and sanitary equipment 7012 Buying and selling of own real estate	7,71	7,73
Textile and footwear	1740 Manufacture of made-up textile articles, except apparel 1752 Manufacture of cordage, rope, twine and netting 1772 Manufacture of knitted and crocheted pullovers, cardigans and similar articles 1822 Manufacture of other outwear 1930 Manufacture of footwear	5,27	0,62
Meat	0123 Farming of swine 0124 Farming of poultry 1512 Production and preserving of poultrymeat	4,36	0,54
Metal and machinery	2811 Manufacture of metal structures and parts of structures 2852 General mechanical engineering 2923 Manufacture of non-domestic cooling and ventilation equipment 2924 Manufacture of other general purpose machinery n.e.c. 2953 Manufacture of machinery for food, beverage and tobacco processing 3430 Manufacture of parts and accessories for motor vehicles and their engines 5010 Sale of motor vehicles	4,27	2,19

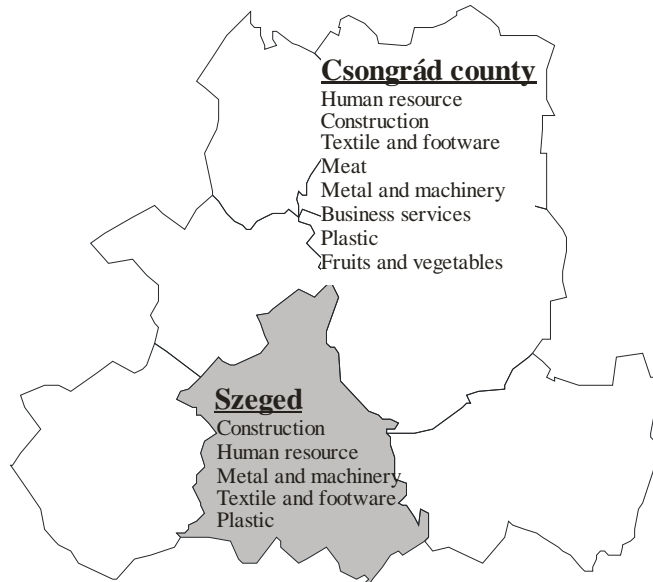|			
Business services	7411 Legal activities 7470 Industrial cleaning 7485 Secretarial and translation activities 7487 Other business activities n.e.c.	2,41	6,34
Plastic	2513 Manufacture of other rubbed products 2521 Manufacture of plastic plates, sheets, tubes and profiles	1,30	0,06
Fruits and vegetables	1533 Processing and preserving of fruit and vegetables n.e.c. 5131 Wholesale of fruit and vegetables	0,73	0,61
	4100 Collection, purification and distribution of water	1,11	0,06
	2621 Manufacture of ceramic household and ornamental articles	0,92	0,05
	5147 Wholesale of other household goods	0,44	0,26
	3310 Manufacture of medical and surgical equipment and orthopaedic appliances	0,31	0,30
	7481 Photographic activities	0,04	0,21

Source: own construction

Szeged has much less of a critical mass in any of its potential clusters. Most considerable concentrations are the Construction and the Human Resource Clusters (Table 1). Assumably, on a subregional or municipal level it is not really worth searching for clusters, it is at least the county level, where clusters with a critical mass are identifiable.

An interesting feature appears in connection with Szeged: the centre of the county shows concentration only in those activities, in which the county does so, too. Szeged might be outstanding in activities hardly measureable with the traditional SIC-code based data.

Although the aim of the mapping included the promotion of innovation, too, real innovative clusters have not been recognised. It is true however, that the methodology itself was not favourable enough for innovative clusters. Traditional industries were identified, dominantly in the processing industry (Figure 2). On one hand, it gives the university a clear view about the structure and nature of the region's economy and educational needs, on the other hand the university might find innovative partners and demand in the innovative segments of the clusters identified.

With knowledge of the economic structure and development of the South-Great-Plain Region and Csongrád County, it is supposed to be a region with (potential or latent) traditional, processing industry clusters and drivers of the economy. The university cannot ignore the innovative factor, but realistically one should not expect to find extensive innovative relationships embedded in the region. Although Szeged considers biotechnology and different high-tech activities as a breakout, these are not statistically measureable and are not dominant segments of the economy at present.

Figure 2. Potential clusters of Szeged and Csongrád County

Csongrád county
Human resource
Construction
Textile and footware
Meat
Metal and machinery
Business services
Plastic
Fruits and vegetables

Szeged
Construction
Human resource
Metal and machinery
Textile and footware
Plastic

Source: own construction

Education and research are important parts of the regional employment. Consequently, the university promotes the county and the town with its input-effects, as a passive regional role-player. With a future active university strategy the institute will be able to promote the other potential clusters, too.

7. Summary

All regions desire clusters. These economic structures are ideally created spontaneously, however, their development is sought to be supported in direct and indirect ways from various levels. This is a sort of pressure on the regions, any form of clusters or high-tech activities is a value-added feature in the competition for relocating big companies and development resources[9]. Cluster-mapping is a methodology, a tool-kit and process to support presenting a realistic image on the regions. Via the adaptable part of this tool-kit, a detailed but not too surprising picture has been received of the region. It is worth mentioning that the processing industries are dominant as usually in the neofordist or (half-)peripheral regions (Enyedi 1999, Lengyel 2003), but we have to list the activities supporting the

---

[9] Referring to the motion picture "Analyse this" mentioned in the title of this study, one might as well think that "the Robert de Niro of regions" gets a nervous breakdown because of the pressure and necessity of becoming a high-tech region, regardless of its talents and desires.

development and maintenance of the human resource alongside with the construction industry.

To summarize, the selected industries show a certain concentration / specialization (LQ-indices and the number of enterprises were used to show it), and also growth (through the number of enterprises). It means that the features ascribed to the drivers of the economy, moreover the critical mass behind the shared labour pool and infrastructure is proven in case of the potential clusters. Export contributes to the driver image, and is an atribute when identifying the traded activities, therefore to the range of activities derived from the other indices has been completed by the exporting industries.

This method did not indicate on the 4-digit SIC-code level the following activities appearing in earlier researches and initiatives: heating and thermo-technical activities, the plant breeding part of the agricultural sector (except processing and distribution), a large number of segments of the food processing industry, some areas of the chemical industry, and handicraft (the latter cannot be measured statistically anyway).

Regarding the clusters of the region it is worth considering that the local involvement and embeddedness of the enterprises located in the South-Great-Plain is extremely low (Buzás 2000). Based on this we have to be aware that the dominance in the economic structure of the region does not necessarily mean that a given activity will be the core of a cluster built on spontaneous co-operation and deeply embedded in the local and regional economy. Nevertheless, this should be the way of progress, even through the economy developing activity of the university.

References

Bergman, E. M. – Feser, E. J. 1999: Industry Clusters: A Methodology and Framework for Regional Development Policy in the United States. In OECD (ed.) *Boosting Innovation. The Cluster Approach.* OECD, Paris, pp. 243-268.

BMVA 2002: *Klaszterek kialakulása Békés megyében.* (Összefoglaló) Békés Megyéért Vállalkozásfejlesztési Közalapítvány, Békéscsaba. www.bmva.hu/klaszter/klaszter 2002.htm Downloaded: 2003.03.26.

Brenner, T. 2004: *Local Industrial Clusters. Existence, emergence and evolution.* Routledge, London.

Buzás, N. 2000: Klaszterek a régiók versengésében. In Farkas B.–Lengyel I. (eds) *Versenyképesség – regionális versenyképesség.* SZTE Gazdaságtudományi Kar Közleményei. JATEPress, Szeged, pp. 58-66.

DARFT 1999: *A Dél-Alföldi Régió stratégiai programja.* DARFT, Szeged. www.del-alfold.hu/strategia/strategia_kifejtve.htm Downloaded: 2000.10.10.

Deák, Sz. 2002: A klaszter-alapú gazdaságfejlesztés. In Hetesi E. (ed.) *A közszolgáltatások marketingje és menedzsmentje.* SZTE Gazdaságtudományi Kar Közleményei. JATEPress, Szeged, pp. 102-121.

DeBresson, C. – Hu, X. 1999: Identifying Clusters of Innovative Activity: A New Approach and a Toolbox. In OECD (ed.) *Boosting Innovation. The Cluster Approach.* OECD, Paris, pp. 27-59.

Enright, M. J. 1998: Regional Clusters and Firm Strategy. In Chandler, A.D.–Hagström, P.–Sölvell, Ö. (eds) *The Dynamic Firm: The Role of Technology, Strategy, Organisation, and Regions.* Oxford University Press, New York, pp. 315-342.

Enyedi, Gy. 1999: Egy lehetséges fejlődési pálya a félperiférián. In Baukó, T. (ed.) *Az Alföld a XXI. század küszöbén.* Nagyalföld Alapítvány, Békéscsaba, pp. 11-16.

Gecse, G. – Nikodémus, A. 2003: A hazai klaszterek lehatárolásának problémái – lokációs hányados. *Területi Statisztika*, 6, pp. 507-522.

Gordon, I. R. – McCann, P. 2000: Industrial Clusters: complexes, agglomeration and/or social networks? *Urban Studies*, 37, 3, pp. 513-532.

Ionescu, D. – Möhring, J. 2002: *Clusters in transition economies.* Progress report. DT/LEED/DC(2002)8. OECD, Paris.

Jaffe, A. – Trajtenberg, M. – Henderson, R. 1993: Geographic localization of knowledge spillovers as evidenced by patent citations. *Quarterly Journal of Economics*, August, pp. 577-598.

KSH 2002: *Statisztikai Évkönyv.* KSH, Budapest.

Lengyel, I. 2000: Porter-rombusz: a regionális gazdaságfejlesztési stratégiák alapmodellje. *Tér és Társadalom*, 4, pp. 39-86.

Lengyel, I. 2001: Iparági és regionális klaszterek. Tipizálásuk, térbeliségük és fejlesztésük főbb kérdései. *Vezetéstudomány*, 32, 10, pp. 19-43.

Lengyel, I. 2003: *Verseny és területi fejlődés: térségek versenyképessége Magyarországon.* JATEPress, Szeged.

Lengyel, I. – Deák, Sz. 2002: Regionális/lokális klaszter: sikeres válasz a globális kihívásra. *Marketing & Menedzsment*, 36, 4, pp. 17-26.

Lengyel, I. – Rechnitzer, J. (eds) 2002: *A hazai építőipar versenyképességének javítása: klaszterek szerepe a gazdaságfejlesztésben.* Régió Art Kiadó, Győr.

Lengyel, I. – Rechnitzer, J. 2004: *Regionális gazdaságtan.* Dialóg Campus Kiadó, Budapest–Pécs.

Luukkainen, S. 2001: Industrial Clusters in the Finnish Economy. In OECD (ed.) *Innovative Clusters: Drivers of National Innovation.* OECD, Paris, pp. 273-288.

Martin, R. – Sunley, P. 2003: Deconstructing clusters: chaotic concept or policy panacea? *Journal of Economic Geography*, 3, 1, pp. 5-35.

Miller, P. – Botham R. – Gibson, H. – Martin, R. – Moore, B. 2001: *Business Clusters in the UK – A First Assessment.* DTI, London. www.dti.gov.uk/clusters/map Downloaded: 2002.02.25.

MTA RKK ATI 1998: *Csongrád megye területfejlesztési koncepciója.* Csongrád megyei Területfejlesztési Tanács, Békéscsaba–Szeged.

OECD 2005: *Business Clusters: Promoting Enterprise in Central and Eastern Europe.* Executive Summary. OECD, Paris.

Patik, R. 2005: A regionális klaszterek feltérképezéséről. *Területi Statisztika*, 8, 6, pp. 519-541.

Patik, R. – Deák, Sz. 2005: Regionális klaszterek feltérképezése a gyakorlatban. *Tér és Társadalom*, 19, 3-4, pp. 139-158.

Phelps, N. A. 2004: Clusters, dispersion and the spaces in between: for an economic geography of the banal. *Urban Studies*, 41, 5-6, pp. 971-989.

Porter, M. E. 2003: The economic performance of regions. *Regional Studies*, 37, 6-7, pp. 549-578.

Roelandt, T. J. A. – den Hertog, P. 1999: Cluster Analysis and Cluster-based Policy Making in OECD Countries: An Introduction to the Theme. In OECD (ed.) *Boosting Innovation: The Cluster Approach*. OECD, Paris, pp. 9-26.

Stimson, R. J. – Stough, R. R. – Roberts, B. H. 2002: *Regional Economic Development. Analysis and Planning Strategy.* Springer Verlag, Berlin–Heidelberg –New York.

Tűű, L. 2003: Az új észak-amerikai ágazati osztályozás alkalmazása. *Statisztikai Szemle*, 7, pp. 603-605.

Quo Vadis Hungarian Spatial and Settlement Policy?

Miklós Lukovics – Tamás Besze

The sum of the possible financial resources at Hungary's disposal supported by the European Union between 2007 and 2013, indicates a historical chance in connection with the fulfillment of the development objectives, especially the spatial objectives in Hungary. The optimal utilization of the financial resources requires a continued decentralization process – started in 1996 but refracted in 1999 – and a strengthening of the regional institutional system. The efficient utilization of the financial resources also requires such a planning mechanism, which considers both the national specialities as well as the international spatial development experiences, and is based on a wide professional and political consensus.

The present paper aims to survey the most important milestones of the Hungarian spatial policy formation, especially the ones of the spatial- and settlement development. Also the evolution process of the Hungarian self government system is going to be explored, principally in regards of the relationship between the municipality development and EU grants. Finally the most important projects of the Municipality of Szeged will be demonstrated.

Keywords: regional policy, spatial development, municipality development

1.   Introduction

Since Hungary's accession to the European Union, spatial planning has come more and more into the limelight, because financial aide of the European Union is based on accomplished spatial documents (Rechnitzer–Lados 2004). Ten years ago, the Hungarian Parliament accepted the Act XXI. of 1996. on regional development and physical planning. This was a supreme and complex regulation of spatial development in Hungary (Horváth 1998). Its further importance is, that Hungary was the first among the candidate countries to adopt the legal conditions of the regional institutions relating to the principles and requirements of the European regional policy. According to the act, spatial development in Hungary is based on national and regional planning documents, concepts, programs, and physical plans (Rechnitzer 1998a).

2. Some issues of the Hungarian spatial policy until 1996

Concerning the analysis of the Trianon Treaty, Pál Teleki was the first Hungarian who examined the economic effects of spatial processes (Hajdú 2001). According to him, breaking-up the solid, poly-centric city network of the Hungarian Kingdom would trigger severe issues for the rest of the Hungarian territory. The truth of his statement is confirmed by the fact that nobody could resolve the problem of a Budapest centered, mono-centric Hungary so far..

The first legislative provision in connection with the spatial- and settlement development was the Act VI. of 1937. on physical planning of cities, housing and construction. The law obliged cities to complete city development plans (Sipos 1993), furthermore compelled cities with high level of exactitude to prepare land usage plans and general settlement plans. After World War II, the Institute of Physical Planning (the so called TERINT) was been established in 1949. The general aim of the TERINT was to coordinate socialistic industrialization and town-planning. Additionally, its task was to register all spatial and settlement changes, and to prepare several plans. Its significance might be the completion of the first regional planning works, like the one of Zagyva-valley, Borsodi area, Baranyai area.

As for local legislation, in 1949 and in 1950 the Constitution, and later the first council law introduced a council system that was completely alien to the Hungarian conditions, by copying the soviet model (MKOGY 1950). From the beginning, the major function of this system was to accomplish the central decisions of the white trash dictatorship that aimed to change society and economy mainly with means of polity, leaving little local independence. Similarly to the first one, the Second Council Law in 1954 also rejected the idea of local municipality (MKOGY 1954). There was a decrease in the councils' duties in administration and authority but the councils' spatial and settlement development tasks slightly increased. The councils were regarded as the lengthened arm of the central state organization delegated by the monolithic party-centre. In the so-called dual subservience the centre managed the county by primacy means, the county managed the townships and most of the towns and the township councils managed the villages. This local dependence attached serious lack of local democratism, nominal votings and elections preceding the real free elections. Council boards were politically insignificant, as council leaders, closed council meetings and closed executive board meetings decided on important issues beforehand, and council meetings mostly just accepted these decisions. From the aspect of city development, we cannot disregard that the panel program that started in the second half of the 1960s wasn't based on local decisions, either.

The decree with legal force of 1955. XXXVI. on the regulation of town- and village settlement determined the system of town- and village settlement, and dealt with the notion of regionalism more thoughtfully than ever before. Due to this

legislative provision, the number of regional plans increased significantly from the end of the fifties. In 1965, the National Settlement Development Plan was completed, which surveyed Hungarian settlements and development trends. In 1970, the National Settlement Development Concept was worked out, which was adopted by the Hungarian government after a wide dialog with the local and departmental authorities in 1971. According to the concept, all the settlements were classified into development categories. The financial resources provided for each settlement were dependent on the category of the concrete settlement.

This dual subservience remained in force during the later "reforms" of the council system, the laws did not provide much more local independence. The council system was only the executor of central programmes. But these programmes did not involve local needs that could have given a special image to settlement development and that could have implemented developments in a way that would have fulfilled local needs the most. As local regulation did not have any latitude in other developments either, settlements got poorer and poorer, regardless of their size.

On the whole, the Hungarian spatial policy before 1985 can be characterized with a settlement view instead of a spatial view. This policy was city-centric, which underplayed the role and importance of territorial units. In this period, the spatial policy was strongly centralized in Hungary.

From 1985 until 1996, Hungarian spatial policy can be characterized as a transitional one. The resolution of the Parliament Nr. 12/1980-85. aimed to develop the lagging behind territorial units, so this legislative provision was the first, which declared the spatial view instead of settlement view. In the middle of the eighties, it has been realized, that the development of separated settlements is not efficient, complex territorial units has to be taken into consideration and developed. In the decentralization process of the Hungarian regional policy, the Act LXV. of 1990. on the local governments counts as a substantial milestone, which pronounced the local demand on decentralization.

From 1991 until 1995, spatial development efforts were supported by a separated money fund in Hungary. The Spatial Development Fund had a broadly varied function: to support employment level expansion and economic restructuring in lagging behind regions, to support the creation of crisis management programs on the level of regions and sub-regions etc. It was also emphasized, that during this transitional period the regional policy of the European Union was introduced to Hungary, which started to receive its core principles (Lados 2001), but its effects became perceptible only in the next period.

3. Milestone in Hungarian spatial policy

The adoption of the Act XXI of 1996 on regional development and physical planning meant a turning point in regional planning, institutions, financial and economic regulation and EU-integration. 1996, the year, when the act came into force is the beginning of the third stage of the Hungarian spatial policy. This legislative provision set its regional developments goals, overall objectives – therefore the partition of competences between the Parliament and the government – in compliance with the regional policy of the European Union. This act forms the basis of the Hungarian spatial policy (Rechnitzer 1998a).

The Country Report of the European Union in 1998 gave a very positive evaluation on the Hungarian regional policy, because the adopted act was unique amongst the candidate countries. One of the most important significances of the act was to define and to clear the most important notions of the theme, like region, sub-region, spatial unit, regional development etc. Furthermore the act defined the tools, financial resources and the institutions of regional development. The notion of regional planning was given a high priority also in the preparation for drawing Structural Funds and the evaluation of the country alike.

The act set up the possibility of applying the regional policy of the European Union by containing the most important core principles of the EU's regional policy, like concentration, partnership, additionality, regional applications etc. Furthermore the act fulfills the requirements of justice, equity and solidarity, and the general cohesion objectives of the European Union (Horváth 1998). Dissociation of the institutions into national, regional, and sub-regional level also can be evaluated as a big step in the efforts of decentralization. The act ordered to complete spatial development documents first of all on the level of regions and counties[1]. This is a very important issue from economical view, because foreign direct investment and enterprise development need a well documented background, since spatial documents contain significant information to support investment decisions (for example about externalities).

The progress of the Hungarian spatial policy came to a sudden standstill in 1999. The act XCII. of 1999. on the modification of the act XXI. of 1996. on regional development and physical planning can be evaluated as a withdrawal in the decentralization efforts in spatial policy. Significant changes in the membership

---

[1] In connection with this point of the act, the following legislative provisions should be mentioned:
- 184/1996. (XII. 11.) Statutory order on the adoption process of spatial development concepts, programs and physical plans.
- 112/1997. (VI. 27.) Statutory order on the information system about spatial development and physical planning.
- 18/1998. (VI. 25.) Departmental order on the contents of spatial development concepts, programs and physical plans.
- 23/2001. (II. 14.) Statutory order on the modification of the 184/1996. (XII. 11.) Statutory order on the adoption process of spatial development concepts, programs and physical plans.

pattern of the Regional Development Councils are on the way back to centralization: the preponderance of ministries, its right of veto, the exclusion of the local economic actors (chambers, Council of Labour), the membership of deconcentrated organizations (Office of Agriculture) are steps towards centralization. The European Union passed strictures on this issue, just as on the inadequate utilization of the financial resources: spatial resources have been used as resource replenishment by municipalities and their institutions so they did not catch their originally intended target group, the enterprises.

The European Union also crabbed Hungary in connection with the NUTS-2 level regions: the defined seven regions did not satisfy the criteria of normative regions defined by the EU: there are not elected, only delegated representatives on regional level, and the Regional Development Councils do not have own financial resources at their disposal.

In 1998, the first National Spatial Development Concept (OTK) was approved by the Hungarian Parliament (Decree 35/1998 III.20. of the Hungarian Parliament). This Concept was the first complex and strategic development document in Hungary, which was the principal document of Hungarian spatial development policy, regional development. It gave orientation for different instruments of regional policy, and formulated guidelines in order to reduce regional disparities. As a framework document it contains the development perspectives of the country and its regions, outlines the long-term regional development objectives and declares the guidelines for the elaboration of various development programs. In addition, the document provided regional planners and stakeholders with the necessary information (OTK 1998).

4.   New trends in Hungarian spatial policy

According to the act XXI of 1996.[2], the National Spatial Development Concept should be analyzed every six year. As a result of three comprehensive evaluations on the emergence of the Hungarian spatial development policy and the regional processes of the country, a new concept was elaborated and approved by the Hungarian Parliament at the end of 2005 (Decree 97/2005 XII. 25 of the Hungarian Parliament). The new concept sets up the principles of a more complex spatial development policy, which must be integrated into all other policies. At the same time these policies also should be integrated through the development of regions by the process of decentralization.

---

[2] The act LXXV. of 2004. on the modification of the act XXI. of 1996. on regional development and physical planning and other related acts went back to the way of decentralization, because it abandoned the preponderance of ministries in the membership pattern of Regional Development Councils. Furthermore this act also established development councils on the level of sub-regions.

The new OTK lays down the spatial perspectives of the country, and the long term objectives in harmony with them. Furthermore it draws up medium-term objectives and spatial priorities, tools, institutional conditions, and contains the targets of the regions.

The new National Spatial Development Concept contains the following innovations in comparison with the National Development Concept of 1998 (Salamin et al 2005, OTK 2005):

- it is strong committed to accelerate and strengthen decentralization and regionalism in Hungary,
- it defines a more complex spatial policy, than ever before: a spatial policy with widespread functions, integrated into the general development policy,
- nearby the objective of decreasing regional disparities also the objective of spatial efficiency (competitiveness) and sustainability comes into the limelight,
- it is founded on cross-border thinking.

In harmony with one of the most important core principle of the EU regional policy, the idea of subsidiarity, the National Spatial Development Concept of 2005 puts down only such spatial objectives and tasks, which are valid for the country in general. These objectives of the OTK are results of a widespread consultancy process with regional development agencies. The concept provides wide elbow-room in spatial planning for the regions on several aggregation levels, especially for NUTS-2 regions. These territorial units are defined as the primary aggregation level in the decentralized development policy. During the spatial planning process of the NUTS-2 regions the general objectives written in the OTK should be considered compulsory (Salamin et al 2005, OTK 2005).

5. Development poles in the new spatial policy

The National Development Concept (OFK), as an overarching development concept fulfills the role of a country strategy was elaborated in 2005, parallel to the National Spatial Development Concept. Because of this fact, their main findings are the same: both of them define development poles in Hungary. "… *in order to ensure that development is not limited to the area of the capital, the monocentric spatial structure should be resolved. […] The whole country requires development poles to catalyze competitiveness, and which are organic elements of a harmonious, polycentric, cooperative town network system. […] Hungary's development poles are: Debrecen, Miskolc, Szeged, Pécs, Győr, and Budapest*." (OTK 2005). According to the concept, the most important task of the development poles are to facilitate innovation activity and help spreading innovation in the region. They also should contribute to the decrease of regional disparities in Hungary.

The Decree 96/2005 (XII. 25) of the Hungarian Parliament on the National Development Concept and the Decree 97/2005 (XII. 25) of the Hungarian Parliament on the National Spatial Development Concept defined Szeged as a development pole also on the level of legislative provisions with other 4 cities listed in the decrees (Figure 1).

Figure 1. Regional development poles and axes in Hungary
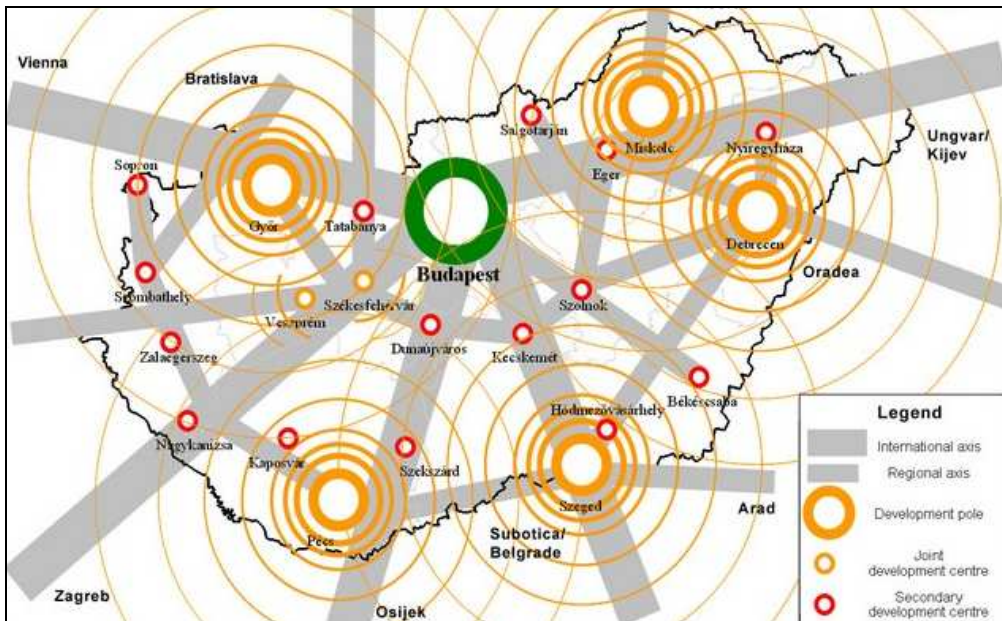
Source: own construction on the basis of OTK (2005, p. 39.)

Consequently, Szeged, as a defined development pole, with some other preferential cities together plays an accentuated role in the new spatial policy of Hungary. From the point of view of our research it also has to be emphasized, that both OTK and OFK highlight the increase of capacity for specialized research and development of the departments that are competent to instigate defined and significant development (OTK 2005). The core competence of the development pole program in Szeged is the biotechnology.

Based on this, in the following part of this paper we are going to concentrate on the city of Szeged. In the next few chapters we will enhance the most important milestones from the history of the Municipality of Szeged, then some of its relationships with the most important institution of the development pole competence, the University of Szeged will be surveyed.

6. Regime change and the evolution of settlement development's local self-governmental legal background

The regime change challenged people not only on a national but also on a local level: in Szeged, just like in all other communities of the country, the first general municipal elections were held in autumn 1990 as a significant step towards developing democracy. It put an end to the council system and new type of local self-governments replaced them, which, contrary to common councils, could be founded in each settlement.

The political necessity of founding local self-governments, which have their own rights, wealth and income sources, met the national and international economic and professional efforts started on this issue several years before. The new legislation overthrew the whole council system, building on municipal traditions and historical values instead. Dr. Balázs Horváth, Secretary of the Homeland of the Antall-government initiated that the Act LXV. of 1990 should include those basic requirements that are contained in the 1985 municipal Charta of the Council of Europe, and that József Eötvös, the Cult and Educational Minister of the revolutionary government of 1848-49 drew up as follows (ETS 1985): „ *We demand the personal independence to be maintained; we demand the decisions that are of interest only for certain segments of citizens, for example a town or the inhabitants of a county, to be made only by those whom these issues concern*!" (MKOGY 1990a)

The major basic requirement and the quintessence of the new local self-government system is municipal independence, changing the local self-governments into owners and economic organizations, which could proceed to settlement development based on local interests.

7. The economic grounds of local self-governments' development sources in the 1990s

The economic background of local self-governments that became legitimate by the democratic elections radically changed in comparison to the council system. At the change of the regime, the Act LXV of 1990 significantly changed the conditions of settlement management and placed it on a new basis.

From this point, local self-governments had their own properties, and could manage their own budgetary incomes and expenses independently. In addition, they could alienate items that had been taken away from the state property and had been given to the municipalities (such as roads, institutions, buildings, barracks etc). It was a milestone for settlement development because settlements suffering from lack of financial sources could use their properties as a collateral when asking for development aids or applying for tenders, or they could even sell, privatize these properties. Possessing own financial resources, local self-governments were able to

decide on their own settlement's actuation and the direction of their development quite independently.

But this kind of independence did not always mean complete independence in terms of development tasks in the first half of the 1990s. The reason for this is that the municipalities' financial operations and their use of sources is strongly controlled: firstly because the budget of local self-governments is part of the public finance, they get most of their financial funds from the state[3]; secondly because in case of other supports financed by the public, the state determines the conditions how these supports can be used, for example earmarked subsidies and allocations[4] based only on national sources, that were significant in this period and that realized several important investments in Szeged in the last few years.

8.   The new financial sources of the regime change: privatization incomes, earmarked subsidies, real estate barters

In the years following the regime change, Szeged couldn't see bigger developments due to a lack of equity. Similarly to other local self-governments, the Municipality of Szeged, the county capital of Csongrád County, could experience not only the bright side of wealth growth, but also took on a lot of charges after its own ownership developed. Firstly the establishment costs of municipal institutions was almost an impossible burden for the local authorities. Secondly, the only significant source of income, privatization, which started due to the possibility to alienate the local self-government's properties, meant not only income but also expenses. These properties were often rather devastated buildings and building sites without public utilities, which had to be upgraded before sale. In most cases it meant restoring building and providing building sites with public utilities.

But in terms of town development and town rehabilitation, the undoubted merit of privatization is that the incomes of selling those properties that had been given by the state meant almost the only sources that could finance more significant projects in the beginning of the 1990s. Due to such incomes several building reconstructions were started in the city (e.g. the restoration of Dóm square).

In the following years the local self-governments' independence in decision-making was damaged by the lack of other development sources independent of the budget. According to the Act LXV of 1990. on local self-governments could

---

[3] The bigger part of the incomes of the local self governments consist of state assigned taxes, normative contributions of the state budget, local taxes, incomings of its own economic activities and fees (MKOGY 1990b).

[4] According to the Act 1992. évi LXXXIX. the Hungarian Parliament supports some of law defined local investments in order to stabilize the actions of the local self-governments. If a local self-governments fits to the state specialized criteria system it gets the earmarked subsidies automatically. Beyond this adequate the ermarked allocations were available just in competition: in order to get state subsidies local governments have to create competitive project ideas for a ranking list.

manage local developments in their own jurisdiction, but without proper financial background they could only implement developments which enjoyed central state support. This statement is confirmed by how the incomes of the privatization of municipal properties (building sites, buildings, etc.) were used, as according to central legislation these incomes could be used only to restore buildings (mainly residential properties), which were almost the only reliable financial background for building restorations besides earmarked subsidies and allocations in the beginning of the 1990s (MKOGY 1990b). It includes the restoration of Szeged's historical centre, which, after the small renovations of the 1980s, appeared only point wise in the beginning of the 1990s, and was limited to certain institutional and residential buildings. From the end of the decade bigger and bigger projects were started with conscious town rehabilitation planning, such as the one billion-forint restoration of Kárász street – Klauzál square, the restoration of so-called 2nd block within Kárász, Somogyi, Kelemen and Kölcsey streets, and the 800 million-forint rebuilding of the dual roundabout at Dugonics square and the transformation of Tisza Lajos boulevard, which were remarkable improvements of the city centre's traffic conditions.

For the sake of using the available sources independently, the local self-government has often tried to find other ways of utilizing its properties to gain alternative economic benefits. After the regime change, the acquired buildings were taken into account not only as properties that could be sold, but they also gave the possibility for different organizations to join economically. The "Universitas property barter programme" that was started in the middle if the 1990s by the local self-government and the university as their first development programme in the middle of the 1990s serves as a good example for that. It meant that the university, which covers the whole of the city's area, and the municipality swaps properties on the grounds of mutual benefits with the approbation of Szeged's General Assembly. József Attila University and Juhász Gyula Teacher Training College, the legal predecessors of Szeged University possessed a notable number of properties SZMJVÖ (2000).

9. Sources appearing with the pre-accession to the European Union (Phare, ISPA)

The city of Szeged started to work out investment concepts based on new sources in the second half of the 1990s. The reason for this was that the basis of Pre-accession to the European Union became available such as PHARE, ISPA and SAPARD. From these, mainly the pre-accession programmes of PHARE and ISPA were significant from the point of settlement development. Since these programmes – mainly ISPA – supported mostly cohesive investments, the main direction of developments was also limited to remedial projects.

Due to the shift in the direction of the targets of PHARE programmes in 1997, the programme's funds could also be used directly for institutional developments and supporting investment (Flamm Benedek 2003). In autumn 2003, approaching the deadline of using the pre-accession's funds, an application was handed in to restore a square that belonged to the historical part of the city centre of Szeged. Competitive factors started to arise as part of the project as the application included not only rehabilitation, but also creation of workplaces. The reason for this was the establishment of a biomonitoring system at the square, that monitors the pollution level of the air, and to operate this system, experts had to be trained and employed, and other new employees were also hired through cooperation with civil services and the employment centre, who had to look after the renovated park. Thus the idea of partnership, that is a keystone of the grants of the European Union, concretely appears in this 1.1 billion-forint project.

Another important investment of Szeged, which aimed to establish the city's entire sewerage system, was also launched in this period. Hungary's biggest investment of this kind was implemented from a total gross budget of more than 23 billion forints, using sources from Brussels, ISPA funds, and it meant that 253 kilometres of drainage was built altogether in the city and in the neighbouring villages that joined to the programme.

The main aim of ISPA was to prepare the counties awaiting the accession to welcome the Cohesive Fund's supports, and to solve the concrete problems of traffic and environmental infrastructure, that were hindering the accession. So the supporting programme had remedial aims firstly, and not to improve economic competitiveness. We mustn't forget though, that as an indirect effect of this investment, the number of people employed in local construction increased significantly – even if temporarily -, because 80% of the contractors working on this project were local entrepreneurs, this way local employers and employees could also benefit from the rehabilitation, and it also enlarged the budget of the municipality because of the entrepreneurs' local taxes (mainly trade and communal taxes). Besides the restored roads and completed drainage system, a further benefit of the project was the strengthened local entrepreneurs, who could use this work as a reference and who, this way could apply for similar projects in other parts of the country with great chances.

10. Increase in development funds between 2004 and 2006

With Hungary's accession to the European Union on the 1st of May 2004, unprecedented financial sources became available for national and local developments. Between 2004 and 2006 675 billion forints were available for certain development priorities in the frame of the National Development Concept (NFT).

According to the basic aims[5] drawn up in the NFT, there were calls for tenders in five operational programmes (OP): Economic Competitiveness OP, Environment and Infrastructure OP, Agricultural and Rural Development OP, Human Resource Development OP, and Regional OP. From these Operational Programmes mostly GVOP, KIOP, and ROP provided possibility to implement bigger investments. The support rates were around 50-80%, but in many cases raising the 10-15% own funding was also a difficulty. Despite the extended funds, this problem could have discouraged a lot of local self-governments from potential development possibilities, but the Hungarian government established a tender possibility based only on national sources to help the local self-governments. The ministry of Home Affairs has called a tender every year since 2004 "to support local self-governments' own sources for the development tenders of the European Union" and it has supported a lot of local self-governments' development ideas, that gave fund for the own source of a successful application for an operative programme[6].

In 2005 the Association of National Municipalities' Union's standpoint on the T/17700. bill of the 2006 Budget of the Hungarian government also drew attention to the problems of local self –governments' development sources. According to this bill, the extensive reform of local self-governments, that could make the operation of each settlement economical (OÖÉSZ 2005), does not come true again in 2006. According to the starting point and the accepted bill, which was mainly unchanged compared to the original one, there wasn't a change in the duties and jurisdiction, the conditions of management regulations remained basically unchanged, the financial conditions were damaged[7], so for the next budgetary period of the European Union between 2007 and 2013, the ability to finance bigger municipal investments remained a key question of development policy.

11. New dimension: the development period of 2007 -2013

Certain chapters of the presently effective national development document, "The New Hungary Development Plan" (hereafter UMFT) enhanced the development possibilities of local self-governments. The 675 billion-forint fund available in the

---

[5] The National development Plan (2004-2006) drafts three general goals (competitive ecomomy, more effective human resource and well-balanced spatial development) in order to improve the living standard sin Hungary (NFT 2004).

[6] In the year 2005 a municipality managed project with the name of „Integrated Development of the E-government in Szeged" was granted by the EU. The total project budget was 670 million HUF (appr. 2,3 million EUR). Beyond the 540 million HUF EU grant the municipality got other 78 million HUF as an own source subsidy from the Hungarian Government (SZMJVÖ 2005).

[7] According to the Act of the annual Hungarian Budget in 2005 the local self-governments got 1349,8 billion HUF (approximately 4,49 billon EUR) as state financial source which was half billion HUF less than in the previous year (MKOGY 2005).

frame of NTF got ten times larger in the period of 2007-2013 and it provides a possibility for more specific aims (Table 1).

According to the Decree 96/2005 (XII. 25) of the Hungarian Parliament on the National Development Concept and the Decree 97/2005 (XII. 25) of the Hungarian Parliament on the National Spatial Development Concept defined Szeged as a development pole also on the level of legislative provisions with other 4 cities listed in the decrees. The long term aims of UMTF is broadening employment and ensuring permanent growth. As for the latter one, according to the UMFT Integrated Settlement Development Strategy, the support for the economic growth of the settlements that are development centres predominates mostly in polycentric, cooperative settlement network system (UMFT 2007). To ensure a long term, balanced spatial development, there is a need to compensate the capital's economic dominance and to change the monocentric structure of the country, which they want to establish with functionally assigned settlements and emphasized developments based on technological innovation. This idea was rather weakened later, in the phase of planning and social discussions, but because of the central role of 5 "pole cities" the possibility of some key investments (based mainly on equity) didn't disappear. As a matter of fact, cities that are assigned as competitive poles do play a key role in determining their area's competitiveness with their innovation potential.

Table 1. Operational Programmes of The New Hungary Development Plan (UMFT)

Priorities	Operational Programmes	Financial Sources (billion HUF)
1. Economic development	Economic Development OP (GOP)	690,0
2. Transport development	Transport OP (KÖZOP)	1703,2
3. Social renewal	Social Renewal OP (TÁMOP)	966,0
	Social Infrastructure OP (TIOP	538,9
4. Environment and energy developments	Environment and Energy (KEOP)	1140,0
5. Regional Development	OPs of the 7 regions of Hungary: West Pannon OP Central Transdanubia OP South Transdanubia OP South Great Plain OP North Great Plain OP North Hungary OP Central Hungary OP	1609,4
6. State reform	State reform OP	140,7
	Electronic Public Administration OP (ÁROP)	
Co-ordination and communication of the New Hungary Development Plan	Implementation OP (VOP)	87,2
TOTAL (billion HUF)		**6875,4**

Source: own construction on the basis of UMFT (2007, p. 132.)

Although UMFT also underlines the importance of settlements and the settlement system from the point of competitiveness in this case, it is probable that these settlements have also come to the front in case of other kinds of project concepts' central and EU funds – usually developing basic settlement functions.

12. Summary

The reform of the institutional system in the Hungarian spatial development takes place very slowly. The institutional system set up for the access was not consequently built on institutions of regional development, which disappointed the regions (Szaló 2006). The effective establishment of the seven NUTS-2 regions has not been achieved yet, though some encouraging efforts happened. §6 of the act XCII of 1999. on the modification of the act XXI of 1996. ordered to set up regional development councils, hereby the regional framework has been defined by legal means. Some competences and tasks have been delegated to regional level, but the regions possess neither elected representatives nor own financial resources, although those later two are very important from the point of view the European Unions definition on regions.

The correct usage of some core principles (decentralization, subsidiarity, partnership) requires the reconsideration of decision-making competencies, to decentralize the power, to strengthen the autonomy of the local communities (Rechnitzer 1998b). The institutional framework of the spatial policy in Hungary is strongly attached to public administration, especially to the counties. Economic development is unfortunately only second priority in the distribution of financial resources, entrepreneurs are not able to enforce their interests. The counties hesitate to be partners of each other, although an efficient spatial policy requires a successful concentration of forces on each territorial level.

References

ETS 1985: *European Charter of Local Self-Government (15.X.1985).* European treaty series No. 122, Strasbourg.

Flamm Benedek, L. 2003: *Kulcs a sikeres Eu-s pályázatokhoz. A tagállamok tapasztalatai és gyakorlata.* Európai Unió Munkacsoport Közhasznú Diákegyesület, Budapest.

Hajdú, Z. 2001: Teleki Pál tájelméleti munkássága. *Földrajzi Közlemények*, 1-2, pp. 51-64.

Horváth, Gy. 1998: *Az Európai Unió strukturális és kohéziós politikájának hatása a magyar terület- és településpolitikára.* ÖSZT-ICMA-USAID, Budapest.

Lados, M. 2001: A területi tervezés kihívásai a kilencvenes években Magyarországon: a területfejlesztési stratégiák kialakításától a programozásig és az értékelésig. *Tér és Társadalom*, 2, pp. 25-69.

MKOGY 1950: *1950. I. tv. (I. Tanácstörvény).* Magyar Népköztársaság. Budapest.

MKOGY 1954: *1954. X. tv. (II. Tanácstörvény).* Magyar Népköztársaság. Budapest.

MKOGY 1990b: *Az 1990. LXV. Tv. a helyi önkormányzatokról. 80§ (2)*. Magyar Köztársaság, Budapest.

MKOGY 1990a: *Dr. Horváth Balázs 68. számú parlamenti felszólalása* (1990.07.02.). Országgyűlési napló, Budapest. Letölthető: http://www.parlament.hu/naplo34/ 018/018tart.html

MKOGY 2005: *Magyarország 2006. évi költségvetési törvénye (2005. CLIII. (XII.19.).* Magyar Köztársaság, Budapest.

NFT 2004: *Nemzeti Fejlesztési Terv (NFT)*. Magyar Köztársaság Kormánya, Budapest.

OFK 2005: Országos Fejlesztéspolitikai Koncepció. 96/2005 (XII.25.) Ogy. Határozat. Magyar Országgyűlés, Budapest.

OOÉSZ 2005: *Országos Önkormányzati Érdekképviseleti Szövetségek Állásfoglalása a Magyar Köztársaság 2006. évi költségvetéséről szóló T/17700. számú törvényjavaslatnak a helyi önkormányzatokra vonatkozó szabályairól (Tárgyalási szám: a T/17700) szóló anyaga,* Budapest.

OTK 1998: Országos Területfejlesztési Koncepció. 35/1998 (III.20.) Ogy. Határozat. Magyar Országgyűlés, Budapest.

OTK 2005: Országos Területfejlesztési Koncepció. 97/2005 (XII.25.) Ogy. Határozat. Magyar Országgyűlés, Budapest.

Rechnitzer, J. 1998a: A helyi önkormányzatok felkészülése az Európai Unió regionális politikájának fogadására. In Csefkó, F. (ed.) *EU-integráció – önkormányzatok I.* ÖSZT–ICMA–USAID, Budapest.

Rechnitzer, J. 1998b: *Területi Stratégiák*. Dialóg Campus, Budapest–Pécs.

Rechnitzer, J. – Lados, M. 2004: *A területi stratégiáktól a monitoringig*. Dialóg Campus, Budapest–Pécs.

Salamin, G. – Péti, M. – Czira, T. 2005: Paradigmaváltás küszöbén. Az új területfejlesztési koncepció és a területi tervezés. *Területi Statisztika*, 5, pp. 423-439.

Sipos, A. 1993: *Reformok és reformtörekvések a fővárosban*. Budapesti Negyed, Budapest.

Szaló, P. 2006: Az alap mellé épült ház. *Falu, város, régió*, 1, pp. 7-11.

SZMJVÖ 2000: A 42/2000 (I.14.) *Kgy. határozat a szegedi egyetem és az önkormányzat között létrejött Universitas ingatlancsere-program megállapodásról*. Szeged Megyei Jogú Város Közgyűlése, Szeged.

SZMJVÖ 2005: *„Szeged integrált e-kormányzat rendszerének fejlesztése" elnevezésű projekt támogatási szerződése* (Azonosító: GVOP-4.3.1.-2004-06-0007/4.0), GKM–SZMJVÖ, Szeged.

UMFT 2007: *Új Magyarország Fejlesztési Terv (UMFT)*. Magyar Köztársaság Kormánya, Budapest.

Public Goods, Private Interest and Altruism

Ferenc Mozsár

This study shows through an example of a public good-like commodity, that the market might possibly provide the commodity even when there is no rivalry in its consumption and the exclusion of non-payers is costly. The actions of the market actors motivated by private interest both on the demand and supply side may render public (eg. government) decision unnecessary, and thus the necessary welfare losses associated therewith (like taxation, public choice, allocation of resources, particular interests) can be avoided. I will also show, that altruistic behaviour – which is, in a way quite distant from the logic of the market – does not necessarily enhance efficiency.

1.   Introduction

Economic theory and practical evidences show, that private demand for public goods, which is, the individuals' willingness to pay, and the supply of these goods frequently results in socially suboptimal quantity of these goods. Economic theory, however, clearly suggests possible solution most of the time as well. This solution is typically not a kind of centralised decision mechanism, that appears a plausible solution, but there are generally methods that can be activated, devised by the entrepreneur on the supply side. It is always advisable to consider these methods, as in this case we do not have to calculate with the transaction costs and other efficiency losses linked to the public provision of these goods (costs of taxation, allocative losses in connection with realisation of partial interests). In this short paper I would like to illustrate my above view through an example of an arbitrarily chosen public good-like commodity. As a by-product of this simple model it can also be shown how, under certain circumstances, it does not matter whether self-interested market behaviour is accompanied by altruistic behaviour.

Well-known definitions for a public good mention *non-rivalrous consumption* (Samuelson 1955, Mansfield 1975), *non-excludability* (Fisher 2000, Pearce 1993), *extern effects* (Buchanan – Stubblebine 1962, Cornes–Sandler 1996), *indivisibility* (Stiglitz 2000) of the good and possibly *governmental provision* (Rodda 2001) as differentiating characteristic.[1] I will now take non-rivalry as a sole important characteristic of a public good, which also means that congestion will not happen in

---

[1] On the notion of public goods in detail see Mozsár (2003).

spite of a growth in the number of consumers. Non-excludability as a frequently mentioned attribute of a pure public good will be handled as a *second condition*, which might go together with the first, but it results in different kinds of problems. It can also characterise private goods, and should be handled differently. A third dimension of the public good problem is whether the good in question is discrete or continuously divisible. In the first case, we only have to make a „yes-no" decision, or more of this kind consecutively, in the other case decision have to be made about the quantity too. In this paper I will investigate a perfectly discrete good, the consumption of which is non-rivalrous, there is no congestion and non-payers can only be excluded at prohibitively high cost.

In this sentence most of the papers that I am aware of would have said that non-payers are *non-excludable*, but the main problem is the *high cost of exclusion*, not the technical impossibility of exclusion. Thus „non-excludability" in reality means, that taking on the cost of exclusion leads to a socially not efficient outcome, since the costs associated with exclusion would mean a greater burden on society than the potential loss associated with solutions allowing free riding (where loss results form suboptimal allocation of resources or form supply provided by the government) or with the altogether failure of supply. „Too costly" exclusion techniques may hinder the market altogether from producing the good. In this case the entrepreneur has to discover or invent less costly excluding techniques. But if exclusion is currently indeed „too costly", the possibility of free riding has to be considered and one should investigate, whether private solutions could possibly lead to efficient outcome under the circumstances.

2. The case of a single potential buyer

In the most simple case there exist *one and only one* consumer whose reservation price exceeds the production cost of the good in question. In such cases it is possible, that this person alone provides the public good by herself. The only condition for this to happen is, that her disutility (envy) resulting from others' free riding should not decrease her *net* welfare from consuming the public good below the production cost of it, and that she should be sure that without her contribution the public good would not be produced at all. In other words, she has to have *perfect information* over the others' willingness to pay. The only rational thing to do for her is to produce the public good, access to which is now the same as it would be with a private good. The positive value others attach to this good now does not play any role, since the good is assumed to be discrete and congestion effects are ruled out.

This kind of solution is does in fact happen frequently in the reality, especially in the case of public goods of smaller value.[2] The probability of this kind of solution is higher as the intensity of preferences in the group become more

---

[2] Someone or other from the block will eventually salt the frozen sidewalk.

differentiated. Intensity of preferences is often determined by the status, for example by the wealth of the individual, and the more it is differentiated, the more probable it is, that there exist someone in the relevant group whose valuation exceeds the public good's cost of production. It is clear, that the more real estates one has, the higher she values a prospective decrease in real estate tax (as a public good), and the more she is willing to sacrifice to win the decision makers (legislators) to this case. „Small" actors are thus fairly able to exploit the „big" actor or actors, as we shall see later (Olson 1971).

3. More than one potential buyers

The situation is more difficult if there are *more than one* actors in the relevant group, whose valuation exceeds acquisition costs of the public good, because this opens up for them a way to free ride. In this case, it is not totally certain, that the good will be acquired at all (Hindriks–Pancs 2001). Let b indicate the utility of the public good to any consumer, and C the cost of acquisition. Let us assume, that $b > C$ for *every* member of the group! If a member of the group is sure, that *no other* member will provide the public good, it is rational to her to acquire it herself. Her net utility than is $b - C$. If she succeeds in free riding, however, her net utility will be b. The course of action she will take is dependent on the relation between the *certain* $b - C$ and the *expected* b when free riding. Precondition for a successful free ride is the existence of at least one actor in the group, let us call her *altruist* – as opposed to the *egoist* free rider – who is willing to finance the public good unconditionally whenever $b > C$ holds. Let us suppose, that the relevant group is a random subset of a population where the ratio of egoists is $e [e \in (0,1)]$[3]. The likelihood that in a group of $n \geq 2$ there is no altruist is than e^n and thus obviously the likelihood of there being *at least one* altruist is $1 - e^n$. If we look at the situation from the point of view of an egoist, than the likelihood of there being at least one altruist among the others is $1 - e^{n-1}$. It is rational for her to abstain from acquiring the public good if

$$b - C \leq (1 - e^{n-1})b \tag{1}$$

For $n = 2$ this is true if[4]

$$\frac{C}{b} \geq e \tag{2}$$

In this case, the likelihood $[\pi(n, e)]$, that the public good will be produced equals to the likelihood of there being at least one altruist in the group.

$$\pi(n, e) = 1 - e^n. \tag{3}$$

---

[3] See (Goeree et al 2002) on the relationship between alturism and group size.
[4] And if it holds for $n = 2$, than it also holds for any group larger than that.

According to this, the likelihood of actually producing the public good proportional to the size of the group and inversely proportional to the ratio of egoists in the population. The former relationship seems to contradict the results of Olson whose opinion is, that small groups are more successful in providing public goods than bigger ones (Olson 1997), but notice, that in this model the utilities *b* derived from using the good by the members of the group is independent of the size of the group (as I assumed there be no congestion), whereas in Olson's model the *sum of the member's utilities* $\Sigma b_i(n)$ is constant.

What happens, if the original population is more egoistic, or the cost-benefit ratio *more favourable*? With suitably chosen parameter values the ratio of egoists in the population will exceed *C/b*, that is

$$\frac{C}{b} < e. \tag{4}$$

In this case $b - C > (1 - e^{n-1})$, and since $e < 1$ and $C > 0$, there exist a critical group size n^* so, that

$$b - C > (1 - e^{n-1})b \qquad \text{for every } n < n^* \text{ and}$$

$$b - C \leq (1 - e^{n-1})b \qquad \text{for every } n \geq n^*.$$

Solving the inequation $b - C \leq (1 - e^{n-1})b$ for *n* one gets

$$n^* = 1 + \frac{\ln(C/b)}{\ln e} > 2 \tag{5}$$

Critical group size is thus bigger *the less favourable* the cost-utility ratio is, and the smaller the ratio of egoists in the basis-population. There are two possibilities:

1. if $n \geq n^*$, then the existence of at least one altruist in the group is very likely, so the dominant strategy for the egoists is not to pay, that is, to free ride. The probability of the production of the public good is the same $(1 - e^n)$ as in the previous case.

2. if $n < n^*$, then one egoist is going to pay, the others are not. Symmetric behaviour is not a possible equilibrium, since we assumed $b > C$, so payment of one single person is enough for the public good to be produced. It is also not a possible equilibrium that no one pays, since $b - C > (1 - e^{n-1})b$. Let us denote with p the probability that a given (egoistic) person will not pay! Who does pay will earn a net utility of $b - C$. Who does not pay will earn net b utility if someone else does pay, and 0 otherwise. The likelihood that one member of the $n - 1$ size group („the others") will pay is $1 - (ep)^{n-1}$, which is

the sum of the likelihood of „there is at least one altruist" $(1 - e^{n-1})$ and „although there are no altruists, at least one of the egoists will eventually pay" $[e^{n-1}(1 - p^{n-1})]$.

If $b - C > [1 - (ep)^{n-1}]b$ than the probability of one egoist paying will increase, otherwise it will decrease. In equilibrium

$$b - C = [1 - (ep)^{n-1}]b,$$

and in that case:

$$ep = \left(\frac{C}{b}\right)^{\frac{1}{n-1}} \text{ for every } n < n^*. \tag{6}$$

The decrease (increase) of altruists is, in this case (when $n < n^*$ and $e > C/b$) offset by the increase (decrease) in the egoists' willingness to pay, thus the right hand side of the equation is constant.[5] The likelihood of the public good actually being produced will be then independent of the level of altruism:

$$\pi(e, n) = 1 - (ep)^n, \tag{7}$$

that is:

$$\pi(e, n) = 1 - \left(\frac{C}{b}\right)^{\frac{n}{n-1}}. \tag{8}$$

The probability of the public good actually being produced is inversely proportional to the size of the group.[6]

In the former 1) case the smaller the ratio of egoists in the population and the larger the size of the group, the more likely it is, that the public good will be produced. The precondition of a certain production of the public good is the *total absence* of egoists or an infinitely large group. These results signify what *an entrepreneur* should do: she should lower the ratio of egoists within the group or raise the size of the group concerned. In my opinion, the "magnitude" of egoism is directly proportional to C/b whereas the "feeling" of belonging to the concerned group is inversely proportional to it. Lowering the costs of providing the public good, which is a typical task for an entrepreneur, will lower the probability of egoistic behaviour, and higher private advantages associated with the existence of the public good (b) can raise the size of the group. The private advantages associated

---

[5] As a reminder, e is the ratio of egoists within the population, p is the egoists' likelihood of not paying. A rise in the ratio of egoists means an increase in e and their higher propensity to pay means a decrease in p.

[6] Assuming $C/b = 0,5$ the probability of the public good actually being produced is $\pi(e, n) = 0,75$ when $n = 2$ and $\pi(e, n) \to 0,5$ when $n \to \infty$.

with the existence of the public good can be supplemented with various "selective incentives" Olson mentions (Olson 1997). These selective incentives are non collective goods, the individual usage of which is conditional on taking part in financing a public good, and thus can be an effective tool in organising latent groups. In my opinion such private goods that can be used by members of a group can, in addition to their functions mentioned by Olson, induce people to be part of the group, which in turn make them interested in providing the public good that enhances welfare of the group. I do not therefore take the relevant group as given, this is why we can speak here of the "feeling of belonging to a group". It is one of the tasks of the entrepreneur to generate and strengthen this kind of feeling in prospective consumers through informing them, providing complementary goods or in other ways.

In case 2) the more probable the actual production of the public good the smaller the C/b ratio, and the smaller the concerned group. In this case the perquisite for the certain production is $C = 0$.[7]

In the above model we cannot reach the reassuring conclusion that under realistic circumstances voluntary contributions can assure the provision of the public good whenever the sum of private valuations is higher than the cost of providing the good. This (ex post) efficiency condition is maybe a too strict one too according to Menezes et al. (Menezes et al 2001). It is in fact not very appropriate to evaluate the "goodness" of an allocation mechanism on a binary (either good or bad) scale. An alternative evaluative method can be, as the aforementioned authors also suggest is to measure the probability of actually providing the public good, once provision is otherwise effective[8].

4.   No potential consumer

The situation gets even more difficult, if no member of the group has a high enough willingness to pay as to finance the public good, even though its existence would be Pareto-efficient, that is

$$b_i < C, \qquad\qquad \text{for every } i, \text{ and:} \qquad n{\cdot}b > C.$$

The contribution of any single player is insufficient in this situation to guarantee for her the availability of the public good. Her contribution is than useless if not enough other players other than her contribute and meaningless if the public good is financed without her contribution anyway. The real question here is the

---

[7] Lower costs will modify the reaction of the players under some circumstances. It can happen, that it lowers willingness to pay, and thus it will not change the likelihood of the public good's production (Menezes et al 2001).
[8] It would be good to use this kind of evaluation in general, whenever the efficiency of allocative systems, market structures are considered.

probability of hers being the pivotal contribution. How probable is it, that the public good will not be produced without her contribution, but it will with it? Let us investigate first the case when $n = 2$, $b_i = 1$ (i = 1,2) and $1 < C < 2$. Denoting c_i the contribution of the *i*-th person to the costs, the public good can be financed if $\Sigma c_i \geq C$.

If the players have *perfect information* regarding the valuation of the others, than any contribution so that $C–1 < c_i < b_1 = 1$ can lead to the efficient outcome, to the procurement of the public good. The symmetric outcome is naturally the $c_1 = c_2 = C/2$.

Considering now the case of less than perfect information, let us assume, that any player values the public good at $b_i = 1$ with a probability of 0,5 and $b_i = 0$ with the same probability. While everyone is perfectly aware of her own valuation, as to the others everyone knows only this probability distribution. Depending on what happens with the contributions paid if the public good is not produced due to the behaviour of the other, two cases can be distinguished (Menezes et al 2001).

a) In the first „game" if $\Sigma c_i \geq C$ the public good will be purchased, but the potentially positive sum $\Sigma c_i – C$ will not be refunded (but will remain the profit of the producer). In the case of $\Sigma c_i < C$, however, the contributions are paid back. This variation is called subscription game. The symmetric Nash-equilibrium in this game is, that everyone contributes $c_i = 0$ if the good is invaluable, and $c_i = C/2$ whenever the good is valued at 1.[9] The outcome will always be Pareto-optimal.

b) In the other game, $\Sigma c_i < C$ is a sufficient condition to prevent the purchase of the good, but the money paid in already will not be refunded. This kind is called contribution game[10]. The contribution of player 1. is obviously zero if $b_1 = 0$. How much is she willing to pay, if she values the good at 1? In case of a contribution of $C/2$ the public good will be purchased with a probability of 50%, which means an expected value of ½, thus the expected net utility is $½ – C/2 < 0$. Maximal contribution from each player is ½, which is not sufficient to finance the public good, as we assumed $C > 1$. The resulting outcome will not be efficient[11].

This simple, two-player model with binary valuations can be generalised to N > 2 players or to cases in which the valuation of the players is characterised by continuous probabilistic variables of known distribution (Menezes et al 2001). More complicated models bring up many new issues and make lots of new insights, but in our case they all mark pretty much the same path as our above compact

---

[9] Nash (or Nash-Cournot) equilibrium means, that everyone's choice is optimal, given everyone else's choice. This means, that no one wants to alter her strategy ex post.

[10] Typical examples of this are when the contribution is an unconditional donation or physical work.

[11] Further models that assume non constant contributions in (Menezes et al 2001).

model. More general analysis also supports the superiority of the subscription game over the contribution game just as it is confirmed in laboratory experiments. Perhaps our opinion is not fictitious, that in contribution game situations secondary („selective", if you like) incentives like self-esteem or prestige play a greater role than potential benefits from the public good itself. This is suggested by the significant national differences in donation habits. In subscription games, however, the contrary can be assumed.

Let us now assume, that from a group of n at least $1 \leq w \leq n$ members have to contribute to the production of the public good. For the sake of simplicity let us again fix the amount of contribution at c per person. Denoting with m_n the number of contributors in the group of n, the probability that there is exactly $m_{n-1} = w - 1$ contributors in any group of $n - 1$ (the „others"), that is, the player in question is a pivotal contributor is:

$$prob(m_{n-1} = w - 1) = \binom{n-1}{w-1}(ep)^{n-w}(1-ep)^{w-1}, \qquad (9)$$

where e denotes again the ratio of egoists within the population, and p the probability that an egoist will not pay. The indifference condition for a given group-member, assuming contribution game is:

$$prob(m_{n-1} \geq w - 1)b - c = prob(m_{n-1} \geq w)b. \qquad (10)$$

Subtracting the right hand probability from both sides and rearranging we get:

$$prob(m_{n-1} = w - 1)b = c. \qquad (11)$$

In the equilibrium:

$$\binom{n-1}{w-1}(ep)^{n-w}(1-ep)^{w-1} = \frac{c}{b}. \qquad (12)$$

The probability also, that in a group of n only $m < w$ members contribute, and therefore the public good will not be produced is the sum of probabilities $m = s$, $s < w$
($s = 1, \ldots, w - 1$), that is:

$$\pi_w^{nem}(e,n) = \sum_{s=0}^{w-1}\binom{n}{s}(ep)^{n-s}(1-ep)^{s}. \qquad (13)$$

The probability of the public good being produced is than obviously:

$$\pi_w^{igen}(e,n) = 1 - \pi_w^{nem}(e,n) = 1 - \sum_{s=0}^{w-1}\binom{n}{s}(ep)^{n-s}(1-ep)^{s}. \qquad (14)$$

Because of (6), *ep* is constant, the altruist/egoist ratio again does not affect the probability of producing the public good. This probability will decrease as the group size increases until n^* (Hindriks–Pancs 2001), above that this probability increases. Increase in the number of necessary contributors also decreases the probability of the production of the public good.

5. Conclusion

The task of the par excellence entrepreneur is to discover opportunities by which she is able to enhance net social welfare, and collect reward for her doing so from those who enjoy this enhanced welfare. Every situation commonly discussed under the topic of „market failure" is thus an opportunity to market players. An environment should be created, where the entrepreneur can reach her goal, and at the same time also fullfills her social function („invisible hand").

In this paper we investigated a public good, which is an eclatant example of market failure, and three possible relevant groups. We assumed a public good in the consumption of which – in our terminology: naturally – there is no rivalry, no congestion effect, and excluding non-payers would be socially inefficient due to exclusion costs. We analised a (relevant) group, in which at least one member's willingness to pay exceeds the production cost of the public good, then one in which this holds for more members and lastly one in which the provision of the public good is conditional on common financing.

In the more complicated cases (2. and 3.) we pointed out those factors – cost/benefit ratio, group size, selective incentives – which an entrepreneur could modulate, thus making the opportunity to enhance welfare also an opportunity to earn money. We also pointed out, that in the analised situations the not so market-conform altruistic behaviour do not necessarily enhance the efficiency of the allocation.

Of course most of the public goods that are generally viewed as such can have many other specific characteristics (congestion, excludability of non-payers) that bring up newer problems and call for new solutions. The objective of this paper was solely to show, that these (*private*) opportunities can in fact exist.

References

Buchanan, J. M. – Stubblebine, W. C. 1962: Externality. *Economica*, 29, 11, pp. 371-384.
Cornes, R. – Sandler, T. 1996: *The Theory of Externalities, Public Goods and Club Goods.* Cambridge University Press, Cambridge.
Fisher, E. 2000: Public Good and Common Resources. http://economics.sbsohiotate.edu/ efisher/econ200/Chapter11_files/frame.htm

Goeree, J. – Holt, C. – Laury, S. 2002: Private costs and public benefits: unraveling the effects of altruism and noisy behavior. *Journal of Public Economics*, 83, 2, pp. 255-276.

Hindriks, J. – Pancs, R. 2001: *Free Riding and Altruism and Group Size.* Working Papers No. 436, Queen Mary University of London, London.

Mansfield, E 1975: *Microeconomics. Theory and Applications*. W. W. Norton & Co, New York.

Menezes, F. – Monteiro, P. – Temini, A. 2001: Discrete Public Goods with Inclompete Information. *Journal of Mathematical Economics*, 35, 4, pp. 493-514.

Mozsár, F. 2003: On the Notion of Public Goods. In: Lengyel, I. (ed.) *Knowledge Transfer, Small and Medium-Sized Enterprises, and Regional Development in Hungary*. JATEPress, Szeged, pp. 60-78.

Olson, M. 1971: *The Logic of Collective Action: Public Goods and the Theory of Groups*. Harvard University Press, Cambridge, MA.

Pearce, D. W. 1993: *A modern közgazdaságtan ismerettára*. Közgazdasági és Jogi Könyvkiadó, Budapest.

Samuelson, P. A. 1955: Diagrammatic Exposition of a Theory of Public Expenditure. *The Review of Economics and Statistics*, 37, 4, pp. 350-356.

Stiglitz, J. 2000: *A kormányzati szektor gazdaságtana*. KJK-Kerszöv, Budapest.