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MEASURING CENTRE-PERIPHERY RELATIONSHIP IN NORTH-EAST HUNGARY BY COMPLEX INDEX OF LIVING AND LOCAL RETAINING CAPACITY

Summary

The latest transformation of industrial and agricultural areas leads to inequity implying economic and social consequences. The complex index of living is the key factor in establishment of the index of local retaining capacity. These indexes are a very useful tool in determination of the goals of revitalization.

Key words: globalization, regional economy, regional differences, survey, rural areas

1. Introduction

Liveability and revitalization of rural areas are in close relation. The ultimate aim of the revitalization is to improve liveability of revitalized areas, which covers development of material and natural environment (hard factors) as well as social and service (soft) factors.

The key question of this paper is the liveability of the North-Eastern Hungary, which concerns the population retaining ability, the capital attraction capacity and – through this – the competitiveness. Speaking about liveability, we should necessarily include living standard and quality of life, as closely connected concept categories.

The concepts of living standard and quality of life are often mentioned together in different analyses, but the two concepts are not totally overlapping. Living standard means the welfare level of the population, the satisfaction degree of its needs. It is difficult to measure because it also includes – besides personal income – the in-kind and public utilities provided by the state, the quality differences of which cannot be quantified. The quality of life is a much broader concept category. Besides the components of living standard, it also includes

environmental factors that is the cultural and tidy environment, environmental protection issues, recreation facilities, possibilities of pursuing the desirable way of life and the quality of public services [ÖTM, 2008].

The quality of life, the individual contentment, welfare and living standard cannot be regarded simply an objective state because its external factors are judged through individual evaluations. It is also proved by the fact that there are different measuring systems concerning the individual satisfaction in the different societies [Inglehart – Klingemann, 2000]. It can be applied to local societies, too, it is enough to consider the attitudes emerging in connection with the regional differences.

Diener and Suh [1997a] reached the same conclusion, but in connection with their examination it should be noted that they found a relation between the GDP per head and the content with life. The same result was revealed by Veenhoven [1997] when he measured the level of happiness. When analysing life quality, welfare and happiness [Veenhoven, 2000] gave a special interpretation based on a certain duality: duality of life opportunities and life achievements, as well as internal and external qualities. This includes four life qualities: liveability of environment, viability of the individual, „external utility" of life and „internal value" of life.

The material and non-material classification of life quality factors requires the application of objective and subjective living standard categories. The two categories also represent two important life quality research models. One of the models is the Scandinavian, which starts from the „availability and disposal of resources" that is it concentrates on objective factors, while the other is the American model, which focuses on subjective perception and evaluation.

The approach of life quality by Erik Allardt [1993] is a certain blending of the two models. He created the hierarchy of needs, determining three different levels, namely: material-environmental (having), social (loving) and the personal development (being) needs. Disregarding which level is in question, he differentiated the objective factors and the related subjective attitude (Table 1).

Table 1

Life quality model of Allardt

Need	Objective factors	Subjective factors
Having (Material needs)	Living standard and environmental factors	Satisfaction with life conditions
Loving (Social needs)	Relationship with other people	Satisfaction with relations
Being (Personal development needs)	Relation to society and nature	Subjective feeling of personal fulfillment

Source: (Allardt, 1993).

Out of the indicators concerning the objective life quality and living standard, we primarily mean the labour market possibilities and status, income conditions, supply with consumer goods, etc., while in international comparison we mean the GDP per head. The subjective life quality can be measured with questionnaires including most often some attitude questions which mostly concern personal life areas, the satisfaction with them and the opinion about them [Márfai, 2007].

Besides the above, the examinations were also extended to the relations between subjective life quality and age. Diener and Suh says that the degree of satisfaction with life quality is increasing by the aging, because the personal expectations get closer to possibilities, that is the people tend to think more rationally [Diener, Suh, 1997b]. On the other hand, the factors influencing happiness are different by age groups. On the basis of the results of some examinations, the satisfaction with relationships and health becomes more important in older age and parallel with aging, the factors explaining welfare and life quality are decreasing [Lomranz et al., 1990].

Analysing the differences of life conditions in some Polish regions, Marczyńska-Witczak [1998] explained life quality and living standard as the degree of efficiency of economic management. According to this, the factors he picked are as follows: state of environment, unemployment and welfare, public security, local public expenditures, personal income, social benefits, personal consumption, housing supply, technical infrastructure, education and culture, health services and age structure.

According to Spanier, the quality of everyday life depends more and more on education (higher education) and the innovative activities, mainly in those economies where labour force needs higher level of technical expertise and communication skill, and the personal income strongly depends on school qualification [Spanier, 1999].

It is obvious that income and available possessions have important role in the improvement or maintenance of current living standards. Moreover, the growth state of a given national economy can also support this, but the state of human development – including long and healthy life, good information supply and access to material possessions – is equally important. HDI (Human Development Index) [Gaertner, Xu, 2008] is an excellent tool to measure this. In the determination of final value of HDI, the life expectancy at birth (long and healthy life), the adult literacy, the combined elementary, secondary and higher education schooling (information supply, qualifications) and last, but not least, the Gross Domestic Product (GDP) calculated at purchasing power parity are considered [Csite, Németh, 2007].

In our opinion, on the basis of sources dealing with the above described life quality and living standards, it is not by accident that the GDP per head and the income are among the qualities measuring living standards and quality of life all over the world, for example in the work of Ditlevsen and Früs-Hansen [2008], in the comparison of Quality of Life Index (QLI) calculated for countries by International Living [IL, 2009], or in the short study of The Economist [2005]. The above sources, of course, calculate not only with these two factors, but a much wider range of indices are considered.

On the basis of the above introduced international and national surveys, studies and some indices, it is obvious that different organisations and individuals create indices from different approaches to measure living standards or the quality of life in different countries, but the group of key factors comes from the same fields of economic and social life. The personal income conditions, the public services (education, health services, transport), the infrastructure and the impact of natural and built environment are considered with different weight but always highlighted in the evaluation of life quality of the individuals. We can also find a lot of references concerning the considerable impact of local and regional economic performance of the given location (settlement, region) on both the objective and the subjective life quality and living standards.

Perfection of soft factors contributes to the improvement of the feeling of life quality to a great extent. Based on American case studies Kotval [1999] pointed out that for example development of the telecommunications, as a soft factor could be a part of an efficient revitalization strategy.

From the beginning of the 1990s in the Hungarian socio-economic structure significant changes happened. The urban and rural areas had push and pull factors, which induced inner migration in Hungary [Brown, Schafft, 2002]. From the downsized socialist industrial cities (e.g. Miskolc) the population flowed out to the new developing centrums and the city agglomerations (rural areas). At the same time the new centrums, developed along the new technological and service functions, powerfully pulled the immigration. Migration from the rural to the urbanized areas increased, at the same time a reflow could be observed, which was characterized by a small part of the urban intellectuals, who started the revitalization of earlier uninhabited settlements (e.g. Gyűrűfű) and adapted and/or developed new sustainable socio-economic living models (i.e. starting ecological farming, formed eco-settlements).

After the transition the former socialist industrial cities of the Central-Eastern European countries (e.g.. Miskolc in Hungary or Gdansk as an emblematic urban of Polish economy in Poland) faced new significant challenges as a result of their role having been changed, and in terms of liveability, their revitalization is claimed, which decreases migration of inhabitants, too [Polańska, 2008].

At the same time it has to be seen clearly, that maintenance of liveability of rural areas requires that revitalization process is not stopped at the level of finishing separate revitalization projects, but complex long term planning and continuous activity is also needed. [Wawrzyniak, Sobczyk, 2008].

Therefore the objective of the study is – by comparing the outcomes of secondary research based on the regional data of KSH (Central Statistical Office of Hungary) and the outcomes of the almost 1000-strong questionnaire survey – to reveal that the regional evaluations and analyses based on the indices of regional economic statistics are very meaningful, but cannot be the exclusive supports in regional development decisions. The features that are less or not at all measurable by regional statistics, make the problems more subtle, moreover they are also life quality factors. This way the role of individual, the local community, the image of the region in the individual, his attitude to the region, and the identity: alto-

gether the complexity of attitudes of the local citizens, the local culture becomes important. It is justified to use wider-based sociological approach in local and micro-regional economic development.

2. Material and methods

Questionnaire survey in North-Eastern Hungary

A standardized written questionnaire survey was made in order to perform a more complex analysis of economic, social and regional processes.

The above mentioned questionnaire survey was made in the area of North-East Hungary, in April, May and June of 2008. The survey covered altogether two statistical regions (North Hungarian and Northern Great Plain), which consist of 6 counties (Heves, Borsod-Abaúj-Zemplén, Nógrád, Jász-Nagykun-Szolnok, Hajdú-Bihar and Szabolcs-Szatmár-Bereg) and 55 statistical micro-regions. According to this, the population consisted of the inhabitants in this region of Hungary, the *number of elements of random sample* (N) was 989 heads. The survey was not considered regarding either North-East Hungary, or the regional units consisting of it. Although the number of elements of random sample was close to the 1000-strong sample size which is approved and applied by the social sciences to make national representative surveys with 95.5% reliability level, but the layers are too clear and it cannot be regarded representative due to the type of the questions and the regional dividedness (Table 2).

Complex liveability and retaining capacity indices

Complex liveability index

Three questions of the questionnaire survey were related to the evaluation of life quality. The liveability of the county, the micro region and the settlement had to be classified on a 5-level Likert scale.

The qualification aspects concerning the county: easily accessible, successful and rich, capable of development, full of opportunities, attracts investments, popular tourist destination, appropriate for successful business activities, clean and tidy. (1=not typical at all 5=very typical).

Table 2

The representativeness of the sample at county level in reflection of the regional distribution of population

Regional unit	Population		Questionnaire		Representativeness*
	head	%	pcs	%	

Heves county	319 460	11.5%	397	40.1%	Significantly above
Borsod-Abaúj-Zemplén county	719 001	25.9%	214	21.6%	Slightly below
Nógrád county	213 030	7.7%	95	9.6%	Slightly above
Hajdú-Bihar county	545 641	19.6%	61	6.2%	Significantly below
Jász-Nagykun-Szolnok county	404 072	14.5%	159	16.1%	Slightly above
Szabolcs-Szatmár-Bereg county	576 054	20.7%	63	6.4%	Significantly below
North-Eastern Hungary	2 777 258	100.0%	989	100.0%	–

Source: based on data of KSH, 2008; own research.

The qualification aspects concerning the microregions: job opportunities, average income level, level of public education, level of health services, level of official administration, sports facilities, cultural possibilities, other leisure time possibilities, public security, local transport, intercity transport, state of public roads, public infrastructure (water, gas, electricity, sewage), image of locality, public sanitation, state of natural environment. (1 = very bad, 5 = very good).

The qualification aspects concerning the evaluation of the liveability of the settlement compared to other microregions or settlements: economic situation, unemployment rate, infrastructural conditions (roads, water, gas, electricity, telecommunication, etc.), state of population (degree of migration, proportion of the youth), qualifications, prospects of entrepreneurial activities, healthy, liveable environment, complex state of development (together with the above) (1 = very bad 5 = very good).

Out of the three life quality aspect groups one complex life quality index was made on the basis of mean averages of values given by each factors.

Complex liveability index

$$K = \frac{\frac{\sum_{j=1}^{k}\sum_{i=1}^{n} x_{ij}}{k} + \frac{\sum_{j=1}^{l}\sum_{i=1}^{n} y_{ij}}{l} + \frac{\sum_{j=1}^{m}\sum_{i=1}^{n} z_{ij}}{m}}{3 \cdot n}$$

where: n = number of elements of regional sample; k = number of liveability evaluation aspects of the county; l = number of liveability evaluation aspects of the microregion; m = number of liveability evaluation aspects of the settlement; x_i = points received on the basis of feature i of the given area unit; y_i = points received on the basis of feature i of the given area unit; z_i = points received on the basis of feature i of the given area unit; 1 K 5.

Complex liveability index modified with development category point

$$K_f = \frac{K + f}{2}$$

where: f is the development point of the given area unit; $1 \leq f \leq 5$; $1 \leq K_f \leq 5$.

Local retaining capacity index

The local retaining capacity of the settlements and the microregions can be analysed in relation to the liveability of a given area. The factors involved are: the service function points calculated in connection with the settlement functions, the freeway accessibility, the type of the settlement and the rank of the settlement. The local retaining capacity index was corrected with the representativity level (Table 3).

On the basis of the above the formula of local retaining capacity for a microregion is as follows:

$$I_{HK} = \frac{\sum_{j=1}^{m}\left(\alpha_j \times \beta_j \times \sum_{i=1}^{n} x_i\right)}{m} \times r_k$$

where: x_i = the points of feature i of settlement j; = is the settlement rank weight of settlement j; = is the settlement type weight of settlement j; m = sample element number of microregion k sample (settlement number of microregion sample); r_k = representativity weighted point of microregion k and 1 k p.

3. Results

The centre-periphery relations can be clearly drawn up by analysing the complex liveability index of microregions (Figure 1). There are no significant differences between K and K_f index values created on the basis of the replies (Table 4), but the consideration of settlement ranks strenghten the differences.

On the basis of the cartogram it becomes obvious that clear centre-periphery relations can be pointed out in the examined regions. In the next phase of the research we assumed that the significant difference between the microregions in the centreplace and those in the periphery can be proved with statistical means.

The categorisation of microregions was made according to the following:

– administrative, cultural, industrial centre microregions (county town) (C_A)
– higher education, cultural centre microregions (C_C)
– industrial centre microregions (C_I)
– outer periphery (microregions on the country border (P_O)
– inner periphery (peripheric microregions not adjacent to a country border) (P_I)

– administrative and higher education, cultural centre microregion together (C_AC = C_A and C_C)
– all the centre microregions together (C_ACI=C_A, C_C and C_I)

Table 3

Factors and their values used for the calculation of retaining capacity index

Factor	Category within the factor	Category centroid
Service function point	Kindergarten	0.20
	Elementary school	0.30
	Secondary school	0.40
	Family doctor surgery	0.20
	Specialist clinic	0.30
	Certificate issuing office	0.40
	Police station	0.40
	Fire station	0.40
	Post office	0.20
	ATM	0.30
	Bank	0.40
Freeway access	0–15 minutes	1.00
	16–30 minutes	0.90
	31–60 minutes	0.70
	60 – minutes	0.50
Rank of settlement	County town, town with county rights	2.00
	Town	1.50
	Large village	1.00
	Village	1.00
Type of settlement	Large city	2.00
	Medium city	1.50
	Small town	1.25
	Giant village	1.10
	Large village	1.00
	Small village	1.00

	Mini village	0.90
	Micro village	0.80
Level of representativeness	Over represented	0.50
	Represented	0.40
	Below represented, significant within the sample	0.30
	Below represented, can be leading	0.20
	Below represented, not suitable for conclusions	0.10

Source: own construction.

The basic hypothesis is that there is no significant difference between the microregion categories. The examination of the hypothesis was made with two-sample t-test assuming unequal variances (Tables 5, 6 and 7).

It has been proved that there is no significant difference between centre categories in the corrected complex liveability index, and there is no difference between periphery categories, either. There is, however, significant difference between the judgement of liveability of administrative centres and peripheries.

There is a significant difference between the average of liveability judgement of centre microregions and the average index value of peripherical microregions (Table 7).

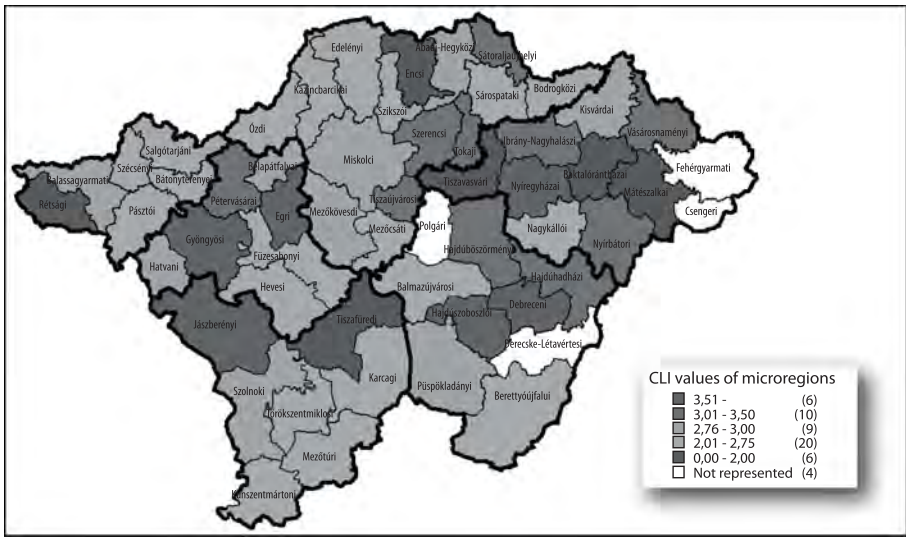

Figure 1. Complex liveability index (CLI) of microregions

Source: own construction.

Besides the judgement of liveability of microregions we also analysed their local retaining capacity. The results are summarized in Figure 2.

It can be stated that the inner areas of the region are more able to retain their inhabitants than the borderside (those on the outer periphery) or near-the-border regions. Those microregions have better local retaining capacity which have better transport infrastructure (motorway or railway network ensuring direct access to a national centre).

Comparing the local retaining capacity index to the modified complex liveability index by regions, it is obvious that the former has more homogenous values thus there is no closer relations between the points received by area units. The value of correlation between the values of the two indices is only 0,3599.

In my opinion, the reasons for this are the differences between the methods of forming the two indices: the liveability index was more based on the personal attitudes, the image about the given area unit, while the local retaining capacity was based on more objective elements. It is true, however, that the weighing is subjective.

Table 4

Liveability judgement of microregions on the basis of indices created from the results of the questionnaire

Micro region	Ranking	K	Order	K_f	Order
Debreceni	C_A	3.5581	2	3.7791	1
Egri	C_A	3.4182	4	3.7091	2
Miskolci	C_A	2.9661	22	2.9830	17
Nyíregyházai	C_A	3.1298	16	3.5649	6
Salgótarjáni	C_A	2.8340	31	2.4170	33
Szolnoki	C_A	2.9071	26	2.9535	21
Gyöngyösi	C_C	3.3707	5	3.6854	3
Jászberényi	C_C	3.1769	13	3.5885	5
Mezőtúri	C_C	3.2746	7	2.6373	26
Hatvani	C_I	2.9565	23	2.9783	18
Tiszaújvárosi	C_I	3.3187	6	3.1593	9
Tiszavasvári	C_I	1.7870	51	1.3935	51
Törökszentmiklósi	C_I	2.7185	37	2.3593	36
Baktalórántházai	P_I	2.8006	33	1.9003	47
Balmazújvárosi	P_I	3.1219	17	2.5609	27

Bátonyterenyei	P_I	2.2681	47	2.1340	44
Bélapátfalvai	P_I	2.7842	35	2.8921	24
Füzesabonyi	P_I	2.8550	29	2.4275	32
Hajdúböszörményi	P_I	3.2236	8	3.1118	10
Hajdúszoboszlói	P_I	3.2176	9	3.6088	4
Hevesi	P_I	2.7972	34	2.3986	34
Ibrány-Nagyhalászi	P_I	3.2028	10	3.1014	11
Karcagi	P_I	2.6081	40	2.3041	39
Kunszentmártoni	P_I	2.1389	49	2.0694	45
Mezőcsáti	P_I	2.4772	44	2.2386	42
Mezőkövesdi	P_I	2.9228	25	2.9614	20
Nagykállói	P_I	3.0014	21	2.5007	30
Pásztói	P_I	2.6076	41	2.3038	40
Pétervásárai	P_I	3.1646	14	3.0823	14
Püspökladányi	P_I	2.9413	24	2.9706	19
Sárospataki	P_I	3.1073	18	2.5537	28
Szerencsi	P_I	3.1797	12	3.0899	13
Tiszafüredi	P_I	2.8694	28	1.9347	46
Tokaji	P_I	3.0955	19	3.0477	16
Abaúj-Hegyközi	P_O	2.5111	42	2.7556	25
Balassagyarmati	P_O	2.8106	32	2.9053	23
Berettyóújfalui	P_O	2.7204	36	2.3602	35
Bodrogközi	P_O	3.0417	20	2.5208	29
Edelényi	P_O	2.4152	46	2.2076	43
Encsi	P_O	2.4600	45	1.7300	48
Hajdúhadházi	P_O	3.1302	15	3.0651	15
Kazincbarcikai	P_O	2.6141	39	2.3071	38
Kisvárdai	P_O	2.8444	30	2.9222	22
Mátészalkai	P_O	2.2079	48	1.6040	49
Nyírbátori	P_O	3.2014	11	3.1007	12

Ózdi	P_O	2.6669	38	2.3334	37
Rétsági	P_O	1.8417	50	1.4208	50
Sátoraljaújhelyi	P_O	3.6519	1	3.3259	7
Szécsényi	P_O	2.4828	43	2.2414	41
Szikszói	P_O	2.8822	27	2.4411	31
Vásárosnaményi	P_O	3.4639	3	3.2319	8

Explanation: C_A = administrative, cultural, industrial centre (county town); C_C = higher education, cultural centre; C_I = industrial centre, P_I = internal periphery; P_O = external periphery.

Source: own calculation.

Table 5

The expected value and variance of liveability index according to the classing of microregions into centre or periphery relation

Title	C_A	C_C	C_I	P_I	P_O	C_AC	C_ACI
Mean	3.234	3.304	2.473	2.628	2.498	3.258	3.016
Variance	0.288	0.335	0.635	0.218	0.319	0.265	0.478
Observations	6	3	4	21	17	9	13

Key to signs: C_A = administrative, cultural, industrial centre (county town); C_C = higher education, cultural centre; C_I = industrial centre; P_I = inner periphery; P_O = outer periphery; C_AC = C_A and C_C centres together; C_ACI = C_A, C_C and C_I centres together.

Source: own calculation.

Table 6

The significance analysis of liveability index of microregion categories with two-sample t-test assuming unequal variances (by differentiating the centre features)

Title	C_A-C_C	C_A-C_I	C_A-P_I	C_A-P_O	C_C-C_I	C_C-P_I	C_C-P_O	C_I-P_I	C_I-P_O	P_I-P_O
Hypothesized Mean Difference	0	0	0	0	0	0	0	0	0	0
df	4	5	7	9	5	2	3	3	4	31
t Stat	–0.173	1.675	2.508	2.847	1.598	1.932	2.228	–0.378	–0.061	0.760
P(T<=t) one-tail	0.435	0.077	0.020	0.010	0.085	0.097	0.056	0.365	0.477	0.226
t Critical one-tail	2.132	2.015	1.895	1.833	2.015	2.920	2.353	2.353	2.132	1.696
P(T<=t) two-tail	0.871	0.155	0.041	0.019	0.171	0.193	0.112	0.730	0.954	0.453

t Critical two-tail	2.776	2.571	2.365	2.262	2.571	4.303	3.182	3.182	2.776	2.040
Significant difference (K_f)	no	no	yes	yes	no	no	no	no	no	no
Significant difference (K)	no	no	weak	yes	no	yes	yes	no	no	no

Source: own calculation.

Table 7

The significance analysis of liveability index of microregion categories with two-sample t-test assuming unequal variances (without differentiating the centre features)

Title	C_AC-C_I	C_AC-P_I	C_AC-P_O	C_ACI-P_I	C_ACI-P_O
Hypothesized mean difference	0	0	0	0	0
df	4	14	18	19	23
t Stat	1.809	3.152	3.456	1.786	2.197
P(T<=t) one-tail	0.072	0.004	0.001	0.045	0.019
t Critical one-tail	2.132	1.761	1.734	1.729	1.714
P(T<=t) two-tail	0.145	0.007	0.003	0.090	0.038
t Critital two-tail	2.776	2.145	2.101	2.093	2.069
Significant difference (K_f)	no	no	yes	weak	yes
Significant difference (K)	no	yes	yes	no	weak

Source: own calculation.

4. Conclusions

The aims of revitalization of areas are determined by the living factors of the lifeless areas. In North-East Hungary after the socio-economic transition lots of areas lost their former economic functions and the living circumstances have not improved, in some cases they have even degraded.

In the national centre-periphery relation system the East-Hungarian regions – due to historical reasons and their location – are significantly behind the central region which includes the capital, too.

At the same time the research has proved that centre-periphery relation system can be traced within the periphery, too.

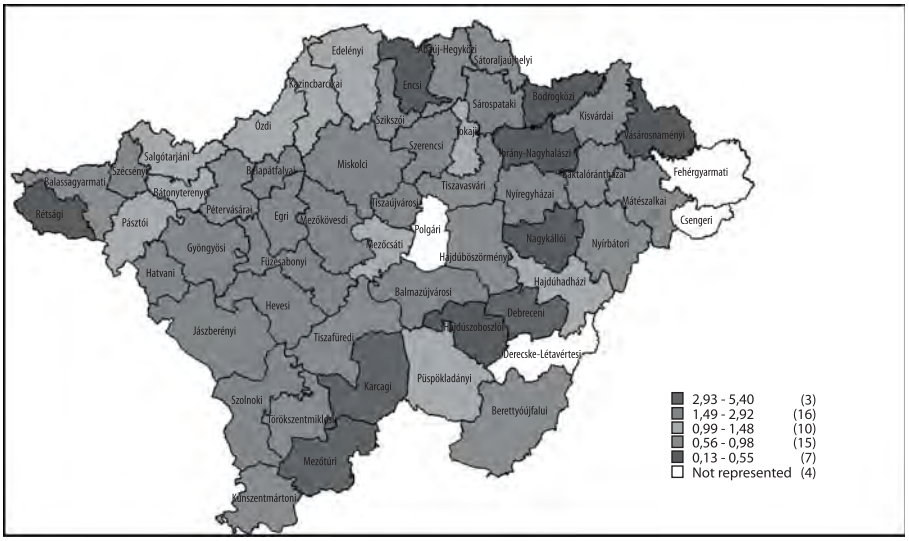

Figure 2. Local retaining capacity index by microregions

Source: own construction.

According to the results of the examination, it can be proved that the inhabitants of the administrative, cultural and industrial centres of the regions consider their microregion more liveable than those living in the peripherical microregions consider their own living place. Although on the basis of the average of classification the inhabitants of the inner periphery microregions regard their microregion more liveable than those in the outer periphery, there is not significant difference between the two values. It is surprising that the inhabitants of the industrial centre microregions judge the liveability of their microegions similarly adversely than those living in the periphery. The results indicate that the revitalization of these areas could improve their living factors, and this way they influence the judge of liveability.

Analysing the local retaining capacity of microregions, it is obvious that those microregions are at the top of the evaluation which have higher level of infrastructural supply, especially the access to motorway network is related closely to this.

On the other hand, there is no close relation between the judgement of liveability and the local retaining capacity of microregions.

It can be stated that the image of Hungary – including all its parts, regions and settlements – depends significantly on cultural and other soft factors besides, of course, the hard or traditional factors. All these generate the investment and entreprising activities, productivity (income, capital, etc.), efficiency, in other words, the factors of competitiveness and improve these abilities.

The revitalization of the peripheries and of the industrial urban areas is one of the most important tools realizing these goals, improving their liveability.

In connection with the above, a lot of questions can be raised. Among them, for example, whether the cultural parameters of a nation or a region can be changed deliberately, „from above" with the help of educational, pedagogical or economic policy means. The answer is definitely yes, if we just think of the sample of Japan which broke with its feudal regime one and a half century ago. The economic policy and social responsibility are determinant factors in this, because the less popular or less „convenient" actions are also necessary for the long-term success, competitiveness and for creating „good image" (good will). It is still in question, however, whether the required intellectual surplus can be found in the present Hungarian or North-East Hungarian society…

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