

Quantifying the cultural performance of micro-regions

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ABSTRACT: Assessing the economic role of culture and interpreting it in connection with regional development are becoming increasingly important. Following the introduction of some of the most relevant pieces of literature in the field, Hungarian and international alike, this study aims to reflect on the assessment of and possible means of quantification for the cultural economy. While seeking to gain an insight as to how segments of the cultural economy may be examined using information available in statistics databases both foreign and domestic, it also provides an empirical analysis of micro-regions in Hungary. Given that we were compelled to restrict our analysis to the segment of community culture, attempts were made at investigating the cultural performance of Hungarian micro-regions using multivariate statistical methods (principal component analysis, hierarchical and non-hierarchical cluster analysis), as well as the numerical correlations between cultural development/distress and the complex development of micro-regions.

Introduction: certain theoretical aspects of cultural economics

The concept traditionally referred to as culture is undergoing a tremendous transformation. While retaining a human context, its social, ecological and economic (financial and marketing-specific) implications have been augmented. Parallel to this, there continue to be notable deviations in its interpretation, as far as individual countries are concerned. In German societies, the term *Kultur* has to do with man's most human characteristics, meanwhile in France, although there is indeed an anthropological approach to culture, it typically refers to high-brow culture and is separated from its German counterpart in terms of both spelling and significance. In the English-speaking world, the terminology (culture, cultural) has long ago lost its initial connotations. Despite all perceivable disparities, however, the human understanding of the Latin concept of *cultura* has remained (Huff, 2010).

According to Richard Florida, the cultural environment – or rather, its attractive force – is becoming, as part of what is known as social capital, one of the driving factors of development for cities and regions alike (Florida 2003, 2007, 2008). Understanding that his thoughts facilitate gentrification and exclusion and advocate the development of private property as opposed to economic and community development, a number of analysts have since challenged Florida's theory (Peck, 2005).

Meanwhile, among the various schools of thought in culture interpretation, none seems to address the everyday cultural life of local societies. This can be summarised as follows (Fábián, 2009):

- cultural developments and resources are becoming increasingly focussed on downtown enterprises and their immediate cultural environs in large and medium-sized urban areas, whereas values of local societies remain out of sight;
- cultural assets and infrastructures are not in line with the cultural history and internal needs of the local society;
- there is a wide gap between relevant policy decisions and the real cultural needs of local societies.

Economist David Throsby observed that cultural capital has the effect of amalgamating the criteria of economic and environmental sustainability. Sustainable economic and environmental development must cooperate in such symbiosis that neither can hinder nor cause stagnation to the other. In addition, these must be capable of propagating processes that endorse renewal for the ecosystem and our society at large as well. Reducing the number of short-term and interim solutions, exploring and bolstering key forces, and eliminating harmful

self-inducing processes prior to their becoming indicative, could all form objectives for cultural policy (Throsby, 2001).

Relevant practices suggest that culture in Europe is considered a resource with strategic importance and plays an important strategic role in today's knowledge-based economy as well. Its indirect underlying effects are gaining momentum in promotional strategies also. With the proliferation of global tourism, municipalities are placing a growing emphasis on the development of cultural tourism (Bianchini, Parkinson, 1993). It has also been discovered that, when it comes to selecting a neighbourhood in which to live, well-educated employees demand high-quality educational and cultural services (Dziembowska-Kowalska, Funck, 1999). The marked status of culture, interconnected with the image of a city, has given a boost to the growing importance of image awareness in modern economies (Kong, 2000).

Actual and potential roles can be best established by defining what culture's prospective contributions to regional development can be.

Classical civil economists regarded culture a unique (extern) factor bearing an influence on rational (intern) decision-making and therefore was to be dispensed with – similarly to ethics and other human elements (Huff, 2010):

- Modern economic theory based on classical traditions prefers to be seen as a rational (rationalising) science. As such, economic factors that it cannot accept or tolerate are thus labelled irrational and are usually ignored. If, for whatever reason, this is not an option, they are degraded as “environmental circumstances”.
- It was by realising the role of environmental factors that commerce became a modernist branch of science. Philip Kotler distinguished between two major categories of decisions: there are “inevitable factors” that can and must be reckoned with, and there are those that “cannot be monitored”. Their role is nevertheless important, so they too form part of the system, if only in its “external environment”.

Our study seeks to establish as to whether culture itself, along with its spatial development effects, can be in any way gauged. And whatever is quantifiable – that is, for which statistical data are available –, does that encompass the entire breadth of culture, as it were, or do “data miners” only concentrate on a few segments of it, thereby leaving large amounts of valuable information unrevealed? Throughout our research, we strove to analyse the cultural potential of Hungary's micro-regions and make comparisons with results gained under complex inquiries of development. As regards the above questions, allow us to postulate that cultural economy can indeed be measured, but its assessment is confined to community culture only. The next section provides an elaborate explanation to that.

Cultural economic indicators in relation to Hungarian and international databases and publications

In the following, we will provide a brief review of and evaluate available statistical databases in the EU and Hungary for possible indicators used to measure cultural performance and the cultural economy.

In the open database of Eurostat, information and statistical analyses on culture are collected and published primarily on a nationwide level. In the organisation's viewpoint, it is the level of cultural employment, the corporate background of the cultural sector, the international trade of cultural goods, the cultural expenditure of households, the participation in various cultural endeavours, as well as computer and internet usage that represent the most significant indicators. Their most recent findings were summarised in a handbook that, published in 2007 under the title *Cultural Statistics*, relies solely on publicly available data from the European Statistical System, the UNESCO Institute for Statistics and the European

Commission's Eurobarometer surveys. Eurostat is planning to have its second handbook on the cultural state of the Union published in late 2011. Prepared by a separate, multinational workgroup in the European Statistical System, the booklet is set to contain the latest data published by the UNESCO as well. As for Eurostat, it is worth noting that, while there is an adequate array of national data at hand, only a scant amount of information is available to the public as far as regional statistics are concerned.

Another publication entitled *European Cultural Values* was issued by Eurobarometer in 2007, also dealing with the state of culture in the EU. Summarising the results of questionnaire surveys conducted across member countries, this document essentially aims to find out what culture means to the citizens of Europe, while also drawing comparisons between the cultural activities, employment and various forms of participation relevant to individual member states. Moreover, the study touches upon the possibilities for the flow of cultural goods and values, and discourses on the roles of culture in the future of Europe's society.

Although less frequently than Eurostat, the Compendium information system also provides various data and tables on the cultural performance and economy of EU member states. Such comparison tables rely on open national and EU databases and contain nationwide data, most of which are updated only up to 2008. Within the system, one can distinguish between four key areas:

- participation of the population in cultural life (number of cinema tickets sold, internet usage, participation in various cultural activities),
- market and trade of cultural goods and values (cultural price index of goods and services (CUPIX¹), household spending on culture, exports and imports of cultural goods, indicators related to movie production),
- indicators of cultural employment (number of people working in the culture industry, in particular the proportion of women in various fields of culture)
- indicators on cultural expenditures (relevant government spending figures, expenses by various sectors of the national economy).

Last but not least, when it comes to providing reliable statistical information in the EU, we must also mention the Urban Audit, a joint effort by the Directorate General for Regional Policy (DG Regio) and Eurostat, in which a total of 30 pertaining indicators are maintained under the categories of culture and recreation. Thirteen of these indices are directly related to culture and the community-specific aspects thereof (e.g. library, museum, cinema and theatre visitorship, or employment statistics in culture and entertainment). Indicators used to gauge community culture are available for the 258 most notable European cities, 10 of which are located in Hungary. The latest data represent 2004 figures.

Hungary's Central Statistical Office (KSH) has been collecting and releasing information by which to better describe the cultural performance of micro-regions and townships – more specifically the community culture aspect of the cultural economy – since 2006-2007. The regional database of KSH comprises nearly 30 indicators, in an arrangement largely identical to that of the Eurostat database. A huge advantage of such provision of data is the availability of indicators at both settlement and micro-region levels. On a general note, however, it can be asserted that researchers venturing to study the cultural economy from a

¹ An acronym for Cultural Price index on Goods and Services, CUPIX is an assemblage of PPP data for select products and services. This indicator operates on two dimensions: one is the segment represented by the consumer prices of cultural industries (CICP), which is based on the simple arithmetic mean of the prices of the most sought-after electronic media, bestseller books and the latest releases in cinema. The other dimension is called the Public Arts Services Prices (PASP) index, which is the simple arithmetic mean of the prices of museum tickets, opera tickets, as well as of the fees for music lessons.

statistical standpoint will face a number of challenges, given the limited accessibility of public information (this usually holds true for EU documents and databases as well). Attention must be paid at least at two drawbacks of information available with the KSH:

- One is that, despite the range of publicly available information having been significantly expanded since 2007, the indicators fall short of portraying the country's cultural economy as a whole. Whilst various indices quantifying community culture are indeed at hand, they reflect but a segment in the system of cultural economics. Conversely, these figures are not necessarily suitable for estimating the level of development/distress in micro-regions and townships either;
- The other such pitfall has to do with the inconsistency between systems of indicators pertaining to different years, thus yielding information that cannot be weighed against one another. In the 90s, but even during the first years of the new millennium, the number of indicators being used had been significantly less than over the past few years. Although new markers were indeed being created, a considerable number of earlier indicators were discontinued. As a result, we cannot find a single “benchmark year” in relation to which changes having taken place in Hungary regarding cultural facilities and values in recent years could be demonstrated, nor can we pinpoint which of the country's micro-regions and townships have been able to improve on their cultural standing.

It was chiefly due to the latter that we chose not to embark on a time-scale study but opted for a specific point (year) in time for which an adequate number of indicators were available. In the meantime, we also tried to maintain the relevance of this study; therefore, our analysis was focussed on the year 2009.

The cultural economy of Hungary's micro-regions: questions of methodology²

In light of this document's introduction, it is beyond doubt that any inquiry and methodology aimed at comprehending the cultural economy must be handled as a complex issue. If we were to attain a clear-cut portrait of the cultural economy of Hungary's micro-regions, we will need a review encompassing multiple features and determinants on a local scale. What this means is that we must elaborate a system of indicators comprising, at a minimum, the following:

- material, institutional and infrastructural background relating to cultural economy (e.g. number of public institutions, landmark monuments, museums, libraries and personal computers, internet penetration etc.),
- different options of and actual trends in participation as regards community culture (e.g. cinema audience and library visitorship statistics, participation at various cultural events and in creative arts communities etc.),
- factors of the cultural economy having to do with education (e.g. number of instructors and employees working in higher education) and
- implications of cultural-educational activities and employment (having special regard to the number and percentage of registered enterprises engaged in fields of the national economy such as arts, education, leisure and science).

Data forming the basis of the analysis originate from the TeIR database, with Hungary's micro-regions representing the spatial unit utilised. Since its statistical figures showed

² Our analyses were conducted using SPSS version 16.0. When visualising our results, we relied on the publication by Csizmadia and Rechnitzer (2005).

extreme values, Budapest was excluded from any further assessment. This meant that a total of 173 micro-regions were considered for our multivariate analysis. More than 30 relevant variables were contained in the initial database of micro-regions, which were then subjected to data reduction due to subsequent cluster analyses.

The suitability of available information was studied by way of different methods of factor analysis. For purposes of this document, however, only the KMO value, obtained at 0.787, is referenced. Our variables are thus suitable for factor analysis. To establish the number of factors, the method known as Kaiser's criterion was selected, yielding a complex variance of 60 percent for four factors. Given the sample size, a factor score coefficient of 0.45 was still considered significant based on the principles of Hair et al. (as quoted by Sajtos, Mitev, 2007). As a result of the Varimax rotation, we were able to plot our original variables across four dimensions, yielding a total of such 26 variables for our subsequent processes that could play dominant roles in the shaping and recognition of the cultural economy of a given micro-region.

Table 1: The make-up of key components

Key components and variables	Weight
1. Cultural employment, education and broadcast media (TV, movies, Internet)	
Number of registered enterprises per 1000 inhabitants in professional, scientific and technological fields of the national economy (2009)	0.913
Number of registered enterprises per 1000 inhabitants in the field of education (2009)	0.856
Number of registered enterprises per 1000 inhabitants in the arts, entertainment and leisure industries of the national economy (2009)	0.827
Number of cinema visits per 1000 inhabitants (2009)	0.793
Number of employees at institutions of higher education, per 1000 inhabitants (according to location) (2009)	0.788
Number of students enrolled at institutions of higher education, per 1000 inhabitants (according to location) (2009)	0.766
Number of Internet subscriptions per 1000 inhabitants (2009)	0.712
Number of cable TV subscriptions per 1000 inhabitants (2009)	0.677
Number of movie screenings per 1000 inhabitants (2009)	0.558
2. Participation in various forms of community culture	
Number of creative arts communities per 1000 inhabitants (2009)	0.913
Number of regular cultural courses per 1000 inhabitants (2009)	0.898
Number of members in creative arts communities per 1000 inhabitants (2009)	0.873
Number of cultural events per 1000 inhabitants (2009)	0.796
Number of cultural institutions per 1000 inhabitants (2009)	0.610
Number of participants at cultural events per 1000 inhabitants (2009)	0.572
Number of participants engaged in regular cultural activities per 1000 inhabitants (2009)	0.467
3. Museums and public institutions	
Number of museums per 1000 inhabitants (2009)	0.720
Number of museum exhibits per 1000 inhabitants (2009)	0.690
Number of public institutions with own library per 1000 inhabitants (2009)	0.677
Number of monuments and sites of landmark significance per 1000 inhabitants (2009)	0.654
Number of museum visits per 1000 inhabitants (2009)	0.630
Number of public institutions with internet access per 1000 inhabitants (2009)	0.591
Number of public institutions with own computer network per 1000 inhabitants (2009)	0.554
4. Cultural background infrastructure	
Number of Internet users per 1000 inhabitants (2009)	0.819
Number of personal computers per 1000 inhabitants (2009)	0.786
Number of public libraries per 1000 inhabitants (2009)	0.630

Source: own elaboration (2011).

Consisting of nine indicators, the key component of cultural employment, education and broadcast media gives an overview on the number of officially registered enterprises that can

be related to the cultural economy, while also providing reliable figures on the number of employees and students in higher education, as well as statistics on the population's internet and cable TV use and cinema attendance. The most important role in this compact index is attributed to the indicators pertaining to registered enterprises. The key component of participation in various forms of community culture includes seven indicators. This is a dimension that relates to participation at cultural events as well as to aspects of creative arts communities and regular cultural activities. Looking at their weights, it is understood that the creative arts communities bear the most influence. Unlike the second key component, the third and fourth dimensions shift the focus from cultural events towards the various institutions of and the presence of background functions in the cultural economy. The key component of museums and public institutions comprises seven indicators – this is a dimension of exhibits and audience figures, library and PC usage and internet penetration. Finally, the key component representing the background infrastructure of culture integrates three variables, each referring to the material resources and assets of culture (personal computers, Internet, books).

In the following, it is by the use of these four key components that the cultural economy of Hungary's micro-regions will be examined. Given their additional role as the result variables in our cluster analysis, Table 2 provides an overview of the most significant features of key components.

Table 2: Descriptive data of key components

		Key component no. 1	Key component no. 2	Key component no. 3	Key component no. 4
Sample size	Valid	173	173	173	173
	Missing	0	0	0	0
Mean		0	0	0	0
Deviation		1	1	1	1
Median		-0.30	-0.13	-0.26	-0.23
Minimum		-1.57	-2.06	-1.95	-2.14
Maximum		3.51	4.87	3.76	2.94
Kurtosis		2.24	3.05	3.11	0.46
Skewness		1.60	1.14	1.54	0.75
Quartiles	25%	-0.66	-0.63	-0.67	-0.70
	50%	-0.30	-0.14	-0.26	-0.23
	75%	0.25	0.39	0.41	0.62

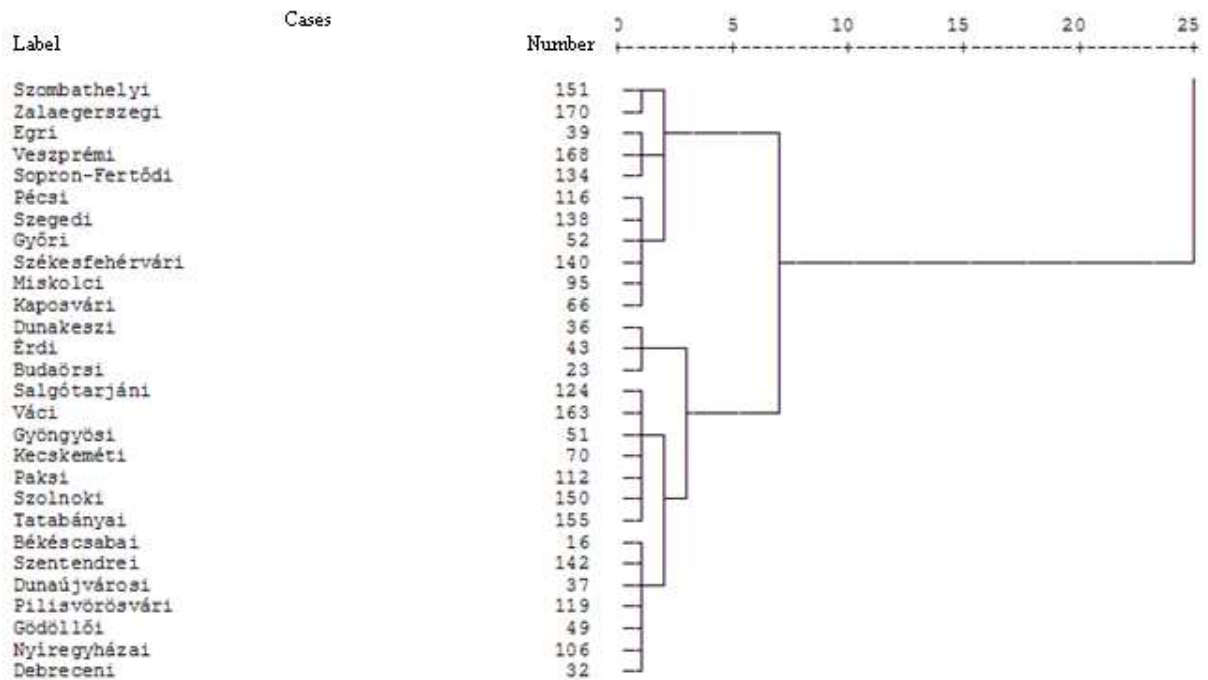
Source: own elaboration (2011).

Hungary's micro-regions: possible means of classification

Hierarchic method

Having identified our key components, we continued our inquiry with a cluster analysis. Since there were no prior guidelines as to the number of clusters to be established, we selected hierarchic clustering first (with the application of Ward's method). Using this method, a more confined set containing 28 micro-regions, as well as two larger blocks, could be isolated already in the first step. As we proceeded step-by-step, further elaborations took place primarily within these two larger blocks. Rather than presenting the entire model – mostly because of the dendrogram's overall size –, we will only discuss the group that became the most markedly distinguished during the procedure (Figure 1).

Figure 1: Possible clusters within the first “outstanding” set of 28 micro-regions



Source: own elaboration (2011).

If, within this outstanding set, we are to define possible clusters based solely on the dendrogram, the result would be six clearly distinct bundles. The set resulting from hierarchic clustering mostly comprises micro-regions that include towns with county rights or other larger urban areas (e.g. select regions within the greater Budapest metro area), such as:

- subgroup no. 1: micro-regions of Szombathely and Zalaegerszeg
- subgroup no. 2: micro-regions of Eger, Veszprém and Sopron-Fertőd,
- subgroup no. 3: micro-regions of Pécs, Szeged, Győr, Székesfehérvár, Miskolc and Kaposvár
- subgroup no. 4: micro-regions of Dunakeszi, Érd and Budaörs,
- subgroup no. 5: micro-regions of Salgótarján, Vác, Gyöngyös, Kecskemét, Paks, Szolnok and Tatabánya, and
- subgroup no. 6: micro-regions of Békéscsaba, Szentendre, Dunaújváros, Pilisvörösvár, Gödöllő, Nyíregyháza and Debrecen.

In addition to the above cluster, attempts were made at the identification and characterisation of the rest of the clusters as well. Based on the dendrogram, we have come to the conclusion that the establishment of five clusters is what seems most practical. Individual clusters were then analysed for cluster centroids (averages) and deviation, results of which are presented in Table 3.

Table 3: Cluster centroids and deviation under the five-cluster solution
(hierarchical cluster analysis)

		Key component no. 1	Key component no. 2	Key component no. 3	Key component no. 4
Cluster no. 1	Sample size	28	28	28	28
	Mean	1.71	0.85	-0.10	0.23
	Deviation	0.88	0.72	1.11	0.94
Cluster no. 2	Sample size	14	14	14	14
	Mean	0.57	1.42	0.84	-1.91
	Deviation	0.75	1.46	0.55	0.60
Cluster no. 3	Sample size	15	15	15	15
	Mean	0.15	1.62	-0.43	1.24
	Deviation	0.47	0.70	1.08	0.60
Cluster no. 4	Sample size	54	54	54	54
	Mean	-0.55	-0.13	0.69	0.42
	Deviation	0.48	0.53	0.81	0.65
Cluster no. 5	Sample size	62	62	62	62
	Mean	-0.45	-0.21	-0.64	-0.34
	Deviation	0.45	0.52	0.58	0.62
Entire model	Sample size	173	173	173	173
	Mean	0.00	0.00	0.00	0.00
	Deviation	1.00	1.00	1.00	1.00

Source: own elaboration (2011).

With the exception of three cases, the deviation of variables suggests that we have, by and large, succeeded in establishing homogeneous groups. While key component no. 1 boasts the highest degree of consistency, the following two are the poorest performers in this regard.

By comparing the mean values, we can determine that micro-regions belonging to cluster no. 1 – as shown in the dendrogram above – carry average or above-average figures as far as cultural performance is concerned. Cultural employment and education (key component no. 1) for the 28 micro-regions stand at outstanding levels – hardly a surprise, given that each accommodates significant cities and urban areas, and that is where entrepreneurial activities tend to be concentrated and centres for higher education are located. As for the other three key components, the 28 micro-regions perform at average levels, even though their mean values still surpass those of the other two clusters. This means that:

- key component no. 2 performs better than the mean values of cluster nos. 4 and 5,
- the values of key component no. 3 possess exceed the mean of cluster nos. 3 and 5,
- the value for key component no. 4 is more suitable than the mean of clusters no. 2 and 5.

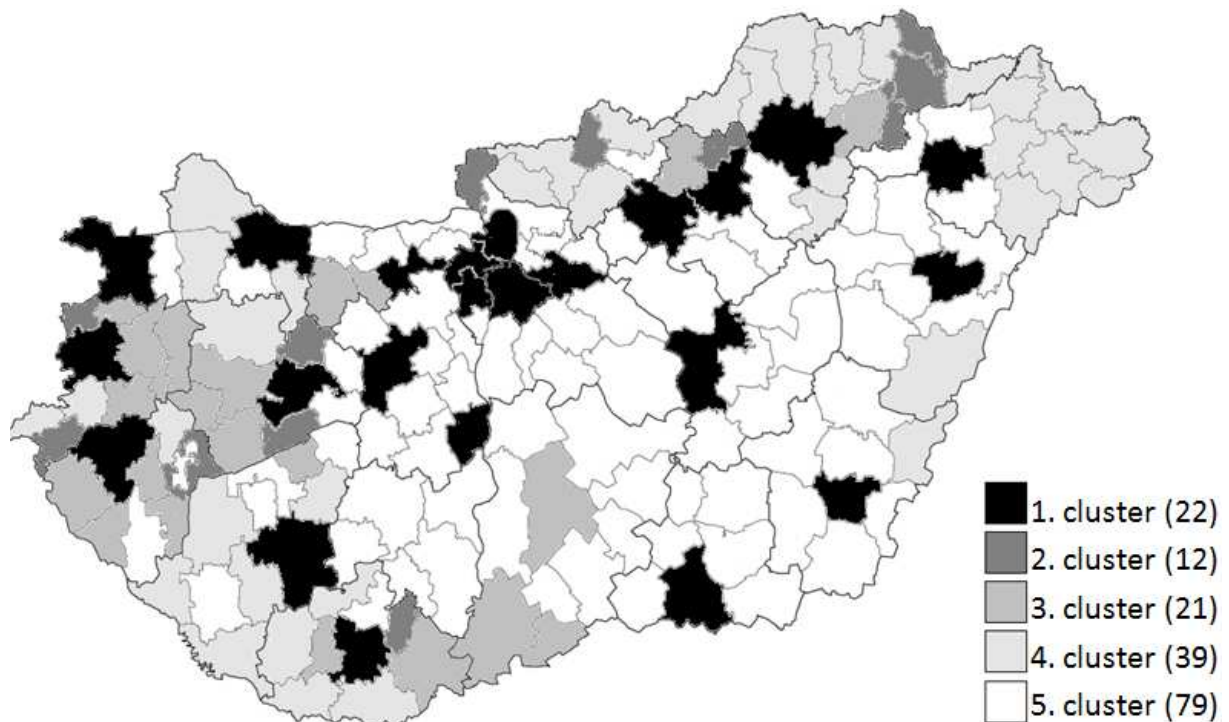
Regarding key component no. 2, it is the micro-regions of cluster nos. 2 and 3 that possess the best results. These two groups are made up of a total of 29 micro-regions, the majority of which are home to tourist attractions (e.g. micro-regions of Balatonfüred, Keszthely, Kőszeg, Óriszentpéter, Sáropatak, Sátoraljaújhely, Tokaj and so forth). However, there are notable differences between the two sets in terms of background infrastructure and museum visitorship. That is because cluster no. 2 comprises regions that, while ranking above-average for the availability of museums and public institutions, fall below average as far as background infrastructure is concerned. Cluster no. 3 seems to be an exact opposite: here, background infrastructure towers above the significance of various forms of community culture. Micro-regions in cluster no. 2 enjoy a somewhat more favourable position as regards private enterprises and broadcast media.

A large number of micro-regions that constitute cluster nos. 4 and 5 represent average or below-average levels, meaning that their cultural performances – especially in cluster no. 5 – lag behind those of the first three clusters. In the case of cluster no. 4, centroids for key component nos. 3 and 4 still indicate agreeable figures, however, the mean figures for cluster no. 5 are definitely low.

Non-hierarchical method

With the help of compressed indicators generated during factor analysis, Hungary's micro-regions may be categorised, in addition to the hierarchical method, by way of what is referred to as *k*-means clustering as well. Our main objective for this inquiry was to compare different groups of micro-regions in terms of the two cluster analyses, while also exploring as to whether it is always the same dimensions, or key components, which represent the main force of differentiation for each of the clusters. Following an evaluation of several possible numbers of clusters, we decided to have the set of micro-regions broken into five individual segments. As for the above questions, this partition yielded some advantageous distinctions. Pertaining results are shown in Figure 2.

Figure 2: Typifying the 173 micro-regions based on the *k*-means clustering method



Source: own elaboration (2011).

While working with the *k*-means algorithm, a great deal of emphasis was placed on having the main characteristics of each of the clusters identified. The average values (high, intermediate, low) of variables recorded for each cluster were distinguished based on the values for quartile nos. 1 and 3 (Table 4).

Table 4: Results of classification by means of non-hierarchical cluster analysis

Cluster	N	Cluster centroids							
		Key component no. 1		Key component no. 2		Key component no. 3		Key component no. 4	
1	22	2.03	high	0.84	high	0.70	high	0.34	intermediate
2	12	0.58	high	1.79	high	0.81	high	-2.00	low
3	21	-0.06	intermediate	1.26	high	-0.99	low	1.00	high
4	39	-0.50	low	0.16	intermediate	1.07	high	0.48	intermediate
5	79	-0.39	intermediate	-0.38	intermediate	-0.41	intermediate	-0.30	low
Total	173								

Source: own elaboration (2011).

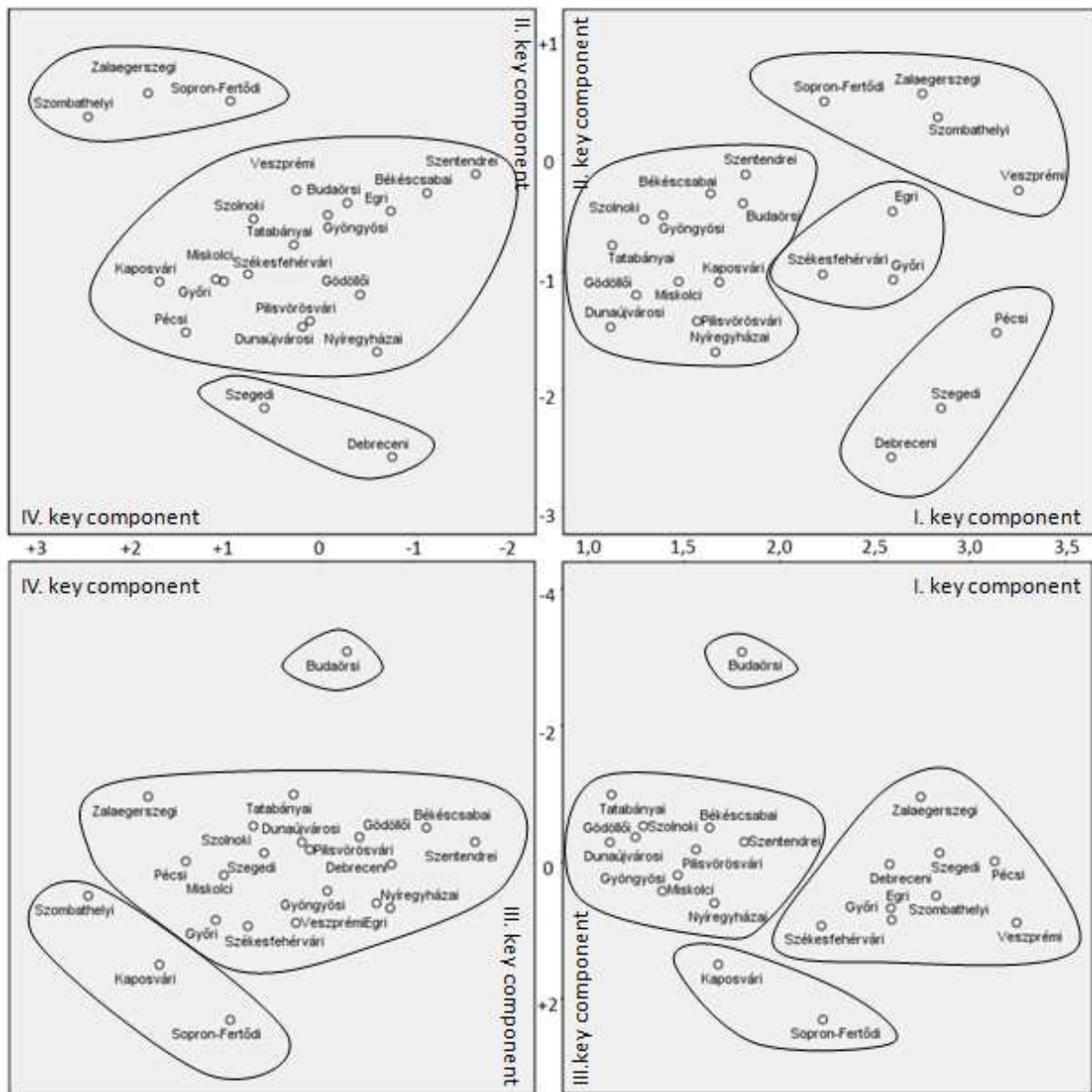
Comparing Tables 3 and 4, we can establish that minor deviations exist between the hierarchical and *k*-means methods as regards cluster sample size and mean value. When working with the *k*-means method, a total of six micro-regions (Dunakeszi, Érd, Kecskemét, Paks, Salgótarján and Vác) seem to have "fallen out" of the cluster (previously as no. 1) labelled as "outstanding" under the hierarchical method. Some notable rearrangements were also witnessed in the last two clusters as well. However, cluster centroids showed no signs of pronounced modification, even though mean values have somewhat departed and deviation within individual blocks has also grown. This means that, by way of *k*-means clustering, the contrasts unveiled using the hierarchical method have become more apparent.

Upon a comparison of mean values, it was no longer difficult to establish the five basic types of micro-regions in Hungary:

- cluster no. 1: hubs boasting significant cultural capacities;
- cluster no. 2: potentially cultural regions with considerable capacities in creative arts and museums;
- cluster no. 3: potentially cultural regions with considerable infrastructures in creative arts and culture;
- cluster no. 4: regions with average (moderate) cultural capacities;
- cluster no. 5: developing or culture deficient regions.

Using scatterplot charts as shown in Figure 3, the statuses of micro-regions – now only 22 instead of the initial 28 – of the set were visualised in relation to one another across two dimensional maps, with each dimension being a key component. As opposed to the previous six subgroups, in this case we managed to partition three or four subgroups per pairs of factor component at most. The micro-regions of Szombathely and Zalaegerszeg, both having previously belonged to subgroup no. 1 of cluster no. 1, were again close to each other and, in two of the four maps (three for the Szombathely region), were placed in the same cluster with the Sopron-Fertőd micro-region also. Subgroup no. 2 generated with the hierarchical method was dissolved; the Eger micro-region now moves along with the rest of the pack, meanwhile Veszprém shows both outstanding and average values. Subgroup nos. 3, 5 and 6 have, for the most part, merged, with a few micro-regions having been exchanged. Regions of Debrecen, Szeged and Pécs join forces in the first quadrant, with the former two also forming a separate subgroup in the fourth quadrant. Additionally, no. 4 of the set previously marked as "outstanding" has also dissolved, and its micro-regions became parts of other clusters. Although the Budaörs micro-region withstood the tests of *k*-means clustering, its values for key component no. 3 are far below average (underscoring its lack of museums, exhibits and heritage or landmark sites).

Figure 3: status of micro-regions within the most developed cluster in relation to the dimensions of key components (*k*-means clustering method)



Source: own elaboration (2011).

Fifteen of the micro-regions belonging to cluster no. 1 are home to county seats, with another two (the Sopron-Fertődi and Dunaújváros micro-regions) including towns with county rights. This leads us to assume that community culture is closely related to position within the hierarchy of settlements, although six micro-regions comprising towns with county rights – three of which are county seats: Kecskemét, Salgótarján and Szekszárd – boast similar features regarding the elements of different clusters. There are five micro-regions containing towns that, although not possessing county rights, are deemed to be full-fledged small or medium-sized towns. The majority of these are located within the greater Budapest metro area. As for distribution in Hungary’s regional breakdown, each of Western and Central Transdanubia and Central Hungary contain four micro-regions, whereas Northern Great Plain and Northern Hungary include three micro-regions each. The regions of Southern Transdanubia and Southern Great Plain are both home to two micro-regions.

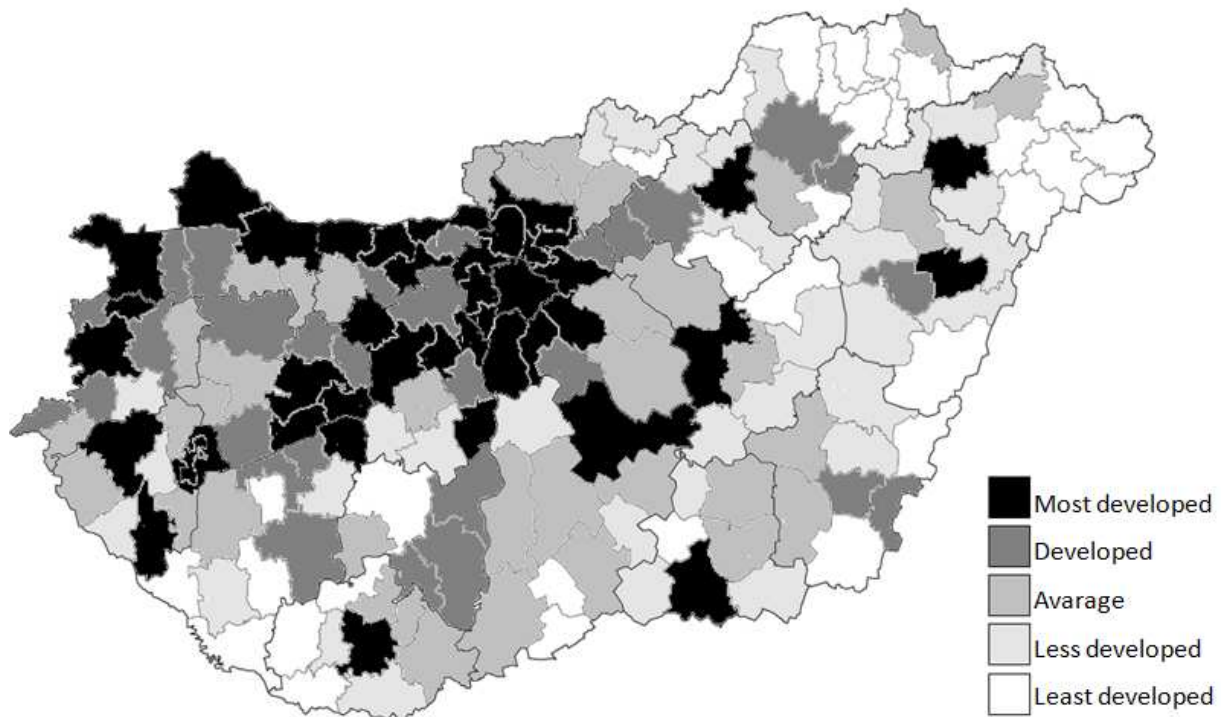
Having assessed the make-up of cluster no. 2 and the mean values of each key component, no significant shifts took place, that is, cluster characteristic remained unchanged. Cluster no. 2 therefore contains – similarly to the results gained in the hierarchical analysis – micro-regions that are significant in terms of participation in various forms of community culture, considered average for the number of enterprises, education and museum visitorship, and lag behind as far as the financial means of culture are concerned. Some of them contain full-fledged but more likely incomplete small towns. Cluster no. 3 includes micro-regions that, although scoring above average in terms of creative arts communities, cultural events and background infrastructure, trail behind with respect to the availability of museums and public institutions (with pertaining results being similar to those relating to hierarchical clustering). Finally, upon having been subjected to the *k*-means clustering method, cluster nos. 4 and 5 continue to include micro-regions that perform at average or below-average levels for each key component. In the case of cluster no. 4, the figures for key component no. 3 show a sudden peak, but component no. 1 sinks well below average. Home to a large number of micro-regions, cluster no. 5 continues to trail behind the rest of the blocks. Based on the results of *k*-means clustering, two micro-regions with county seats (Kecskemét and Szekszárd) also belonged to cluster no. 5, and so did a few others that include full-fledged medium-sized towns (e.g. the micro-regions of Esztergom, Hódmezővásárhely, Kiskunhalas, Nagykanizsa, Orosháza, Szentes, Tata and Vác).

Correlation between the development and cultural performance of micro-regions

As the last goal of our study, we sought to find out as to how groups having manifested as a result of cluster analysis are in line with the development level of Hungary's micro-regions³. The complex development level of micro-regions can be seen on Figure 4.

³ Complex indicators on micro-regional development were taken from a 2008 publication by the KSH entitled *Information on high-priority subsidized micro-regions* (KSH, 2008).

Figure 4: Development of micro-regions



Source: KSH (2008).

The relationship between the development and cultural performance of micro-regions was studied by way of correlation analysis, separately for each of the four key components:

- For key component no. 1, after having had all outstanding values excluded, we worked with a sample size of 165, resulting in a correlation value of 0.688 ($p=0.00$). This means that Hungarian micro-regions suggest a moderately strong connection between their level of development and employment, education and broadcast media.
- While the sample size for key component no. 2 was also 165, the pertaining correlation value came to -0.282 ($p=0.00$). This figure illustrates a negative relationship, weaker than average, between micro-regional development and participation in vehicles of community culture.
- Correlation analyses for key component nos. 3 and 4 were conducted, respectively, with sample sizes of 170 and 167, both yielding values that were weak and insignificant. What this illustrates is that there is no unambiguous relationship between the availability of museums and public institutions, their background infrastructures and the development of individual micro-regions.

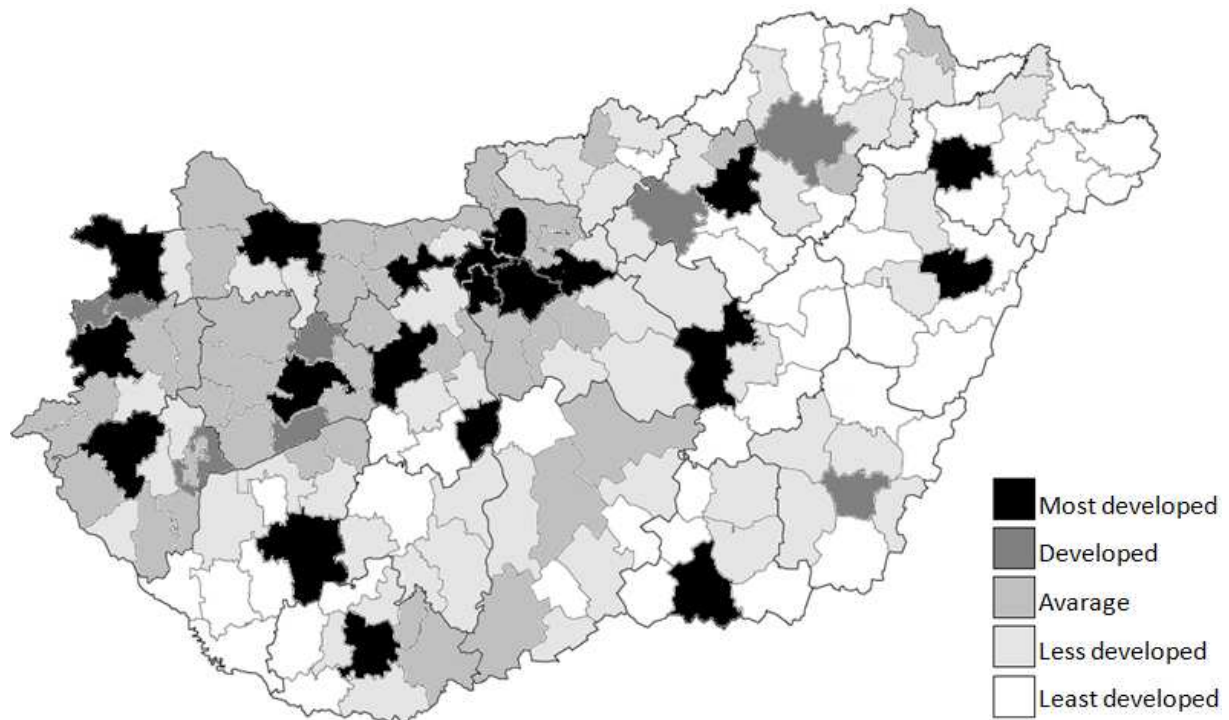
As a result of correlation analysis, it can be established that there was a moderately firm and significant relationship for the first factor, that is, with the exception of cultural employment, education, cinema visitorship and service subscriptions, there is no significant relationship between the cultural performance (dimension of community culture) and the level of development of micro-regions.

In order to confirm their validity, these results were then subjected to a chi-square test, thus expanding our investigation on the relationship between micro-regions and cultural performance. The chi-square value came out to be 78.2, and the theoretical threshold showed 203.6 at a significance level of 5 percent, thereby justifying the results of correlation analysis,

that is, there is no distinct relationship between the development and cultural performance of micro-regions.

Figure 5 shows a combined representation of groups according to both cultural and complex development, based on the cluster arrangements of Figures 3 and 4.

Figure 5: Combined typing of cultural traits and complex development



Source: own elaboration (2011).

As the result of our combined assessment, we have identified 19 micro-regions that, in addition to being among the leaders in complex development, also boast considerable cultural capacities (the micro-regions of Budaörs, Debrecen, Dunaújváros, Eger, Gödöllő, Győr, Kaposvár, Nyíregyháza, Pécs, Pilisvörösvár, Sopron-Fertőd, Székesfehérvár, Szeged, Szentendre, Szolnok, Szombathely, Tatabánya, Veszprém and Zalaegerszeg). Immediately behind the first group are a total of eight regions (those of Balatonfüred, Békéscsaba, Csepreg, Gyöngyös, Keszthely, Kőszeg, Miskolc and Zirc). As far as complex development and cultural potential are concerned, these micro-regions tended to show adequate scores for one factor only while ranking average or above-average for the other. However, the bulk of micro-regions was to be found in the average or below-average categories.

Conclusions

Aimed at exploring as to how Hungary's micro-regions could be categorised along the dimension of cultural economy, our study revealed that a number of micro-regions do not possess the means needed to establish adequate cultural environments. Indicators and key components suggested marked differences between micro-regions; these were typically in line with the prevailing settlement hierarchy and complex development as well.

As for the shortcomings of our analysis, it must be noted that, given the limitations and even inconsistencies of available statistics, our data collection cannot be compared with cultural researches where quantitative and qualitative information are both at hand. This study

could nevertheless provide an adequate basis for further inquiries on the subject of cultural economy. It is to be emphasised that, in addition to changes in economic and social variables, the fundamental aspects of culture ought to be taken into account as well, whenever it comes to the selection of headquarter sites or to the examination of corporate success. That is to say, well-defined cultural features provide an excellent basis for analysing competitiveness. The cultural environment is a factor bearing way more relevance than what is being attributed to it today. Not only does a rich cultural environment turn out products that are unique, it also attracts a highly qualified labour pool, which is undoubtedly the driving force behind any dynamic knowledge-based economy (Enyedi, 2005).

Expanding the scope of our inquiries will most importantly require a uniform database, one that takes into account a number of characteristic areas beyond the segment of community culture (such as the features of the markets and trade of cultural goods and services, the cultural expenditures in various sectors of the national economy, the cultural/creative industries and employment). Use of indicators referred to in the second part of our study would be much desired in order to fully apprehend the cultural economy. Naturally, this might also give way to the further deepening of gaps – to the extent that only units within the same cluster will be comparable with one another. As a closing note, it would be worth to study and evaluate cultural capabilities not only in a domestic but also in an international context, at a minimum by drawing cross-border comparisons.

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