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SLOVAK CREATIVITY INDEX – A PCA BASED APPROACH

Abstract. The article aims at transferring the European Creativity Index (ECI) assessment from the country to regional comparison basis, focusing on the case of Slovakia. The newly created Slovak Creativity Index (SCI) has the power to assess the creativity potential found in the Slovak regions. The Principal Component Analysis has been chosen as an advanced method for establishing a well-designed overall Index and six sub-indices to show differences and variability according to all dimensions of the creative potential. The research also explains several relations between creative performance of the regions by several factors such as urbanisation, cultural environment, human capital and tolerance.
Key words: Slovak creativity index, urbanisation, principal component analysis
JEL codes: R11, C21, A13

1. INTRODUCTION

A strategic viewpoint on the global economy resides in the question how to develop unique resources to stimulate competitiveness. Competitiveness is no longer based only on conventional production factors such as labour, capital, equipment and raw materials (Maskell *et al.*,1998) but also on creating and diffusing knowledge more rapidly than other competitors. While some authors (Lundvall and Borrás, 1997; Johnson *et al.*, 2012) consider the post-industrial economy as knowledge-driven, R. Florida stresses the factor of creativity instead (Florida, 2002). Creativity is considered as a fundamental attribute of human existence, and all human beings are creative by nature and possess an untapped creative potential. In contrast to natural resources, people working in creative jobs (creative class) are considered as a highly mobile growth factor, and the quality of place (region, city) is crucial for life and work of creative individuals. Creative industries also tend to cluster in certain places, and benefit from agglomeration and urbanisation economies (De Propris *et al.*, 2009; Tremblay and Chicoine, 2011; Rehák, 2014). Hence, the field of cultural and

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creative geography is associated with a creative spawn that exists in a place thank to its cultural tradition, economic development and existing demand.

This invokes a question why some places attract more creative people than others and what are the factors that enable some places to stimulate creativity. The pioneering work comes from Richard Florida (2002) who has proposed to embrace Technology, Talent and Tolerance factors to explain the development of the cities and regions (3T concept). He combined all the three dimensions into one composite measure named Creativity Index and ranked the creative potential of more than 40 metropolitan regions in the USA.

Florida´s creativity concept also received a high degree of critical attention. The critique is focused on the apparent fuzziness of some definitions, causal logic between gay index and high-tech index (Peck, 2005) or impossibility to clearly distinguish creative and non-creative occupations (Markussen, 2006; Clifton *et al*., 2013). Additionally, North America, where the concept of 3 T´s model was developed, shows a substantial difference in comparison to Europe in their attitudes to social outcomes, economic growth processes, priorities in political area (Clifton *et al*., 2013) and life preferences (Marlet and Woerkens, 2005). Europe is typical by more conservative and regulated market structures. Moreover, USA benefits from common institutional setting and language while European countries vary in respect of language, culture, education system, technology policies, labour market, etc. In this European context, personal networks, relationships, available jobs, tax regimes and other hard factors can play a more important role in the decision making process of creative actors to settle in a specific urban region than so-called soft conditions proposed by Florida (e.g. diversity, tolerance) (Musterd and Murie, 2010).

The original 3T model was therefore extended and modified for the European environments as the Euro-Creativity Index (Florida and Tinagli, 2004). The Euro-Creativity Index was applied on the 14 European countries, Slovakia was not included in the sample. Additionally, KEA European Affairs (KEA) argued that definition of creativity used in Euro-Creativity Index is too broad and a large number of indicators to depict the creativity are science-based, e. g. patents, R&D expenditures, number of scientists (KEA, 2009). Consequently, KEA established a novel, repuTable statistical framework for measuring the interaction of diverse factors that contribute to the growth of creativity in the European Union. Their European Creativity Index (ECI) has brought a new dimension into a discussion on ranking countries, reflecting more arts and culture, education in art schools, cultural employment, cultural participation, etc. ECI comprises together 32 indicators grouped into six pillars, namely Openness and Diversity, Human Capital, Cultural Environment, Technology, Institutional Environment and Creative Outputs.

Creative industries play a positive role in regional and local development, but a little attention has been paid to the spatial dimension of their distribution and

an assessment on a regional basis is rare, because of lack of regional data. This is the reason, why this article makes efforts to find a way how the respected framework and philosophy used in the construction of the ECI can be shifted from the country to the regional basis. It aims at direct transfer of the country evaluation to the regional assessment, respecting the European context and having same explanatory power as the ECI. Even lower territorial level is hardly possible because of availability accessibility of the data, so the analysis of urban centres requires a different approach.

2. PILLARS OF CREATIVITY ACCORDING TO THE EUROPEAN CREATIVITY INDEX

Table 1 provides the list of 59 variables and their sources categorised within six sub-indices in the same way as the European Creativity Index of KEA.

Table 1. Composition of Slovak Creativity Index

A: OPENNESS AND DIVERSITY SUB-INDEX		
Attitude in population index		Data Source
Percentage of population that express tolerant attitudes toward minorities	The share of respondents in the total number of respondents who answered NO to the question: Would you mind if foreigners become part of your family? (Q_1)	European Social Survey, 2004
	YES to the statement: Gay men and lesbians should be free to live their own life as they wish (Q_2)	European Social Survey, 2004
	YES to the statement: In Slovakia should live people from different cultures, it would enrich us. (Q_3)	European Social Survey, 2004
	Scale to statement: To what extent do you think Slovakia should allow people of races or ethnic groups other than most Slovak people to come and live here? (Q_4)	Eurobarometer, 2007
	Number of marriages with foreigners per 1000 marriages in the region (FOR_MAR)	Statistical Office SR, 2012
Share of population interested in arts and culture in other European countries	Number of exhibitions (gallery, museum) + performances (theatre) of foreign ensembles per 1000 performances and exhibitions (FOR_EXHIB)	Ministry of Culture SR, 2012

Table 1. (cont)

Market data index		
Market shares of non-national European films	Number of copies of books in languages other than Slovak language per 1000 copies (BOOKS)	Ministry of Culture SR, 2012
	Number of foreign-born residents per 1000 population (FOR_RES)	Statistical Office SR, 2012
Level of Media Pluralism	Number of radio stations (RADIO) and television broadcast stations at regional and local level (TV) per 1000 population.	Statistical Office SR, 2012
Non-national share in cultural employment	Number of foreign employees per 1000 employees (FOR_EMPL)	Central Office of Labour, Social Affairs and Family, 2012
B: HUMAN CAPITAL SUB-INDEX		
The potential of culture- and arts-based education to help foster creative talents		
Number of hours dedicated to arts and culture in primary and secondary education	Number of civic association (CO) with a specific purpose: artistic and cultural activities, foundation (FOUND) with the purpose of: cultural and non-profit organization (NPO) with the purpose of: development and protection of cultural and spiritual values cultural per 1000 population	Ministry of Culture SR, 2012
Number of art schools per million population Number of state universities + state art schools (secondary) + free time centres + elementary art schools + conservatories per 1000 population (AS_STATE)	Number of private universities + private art high schools + free time centres + elementary art schools + conservatories per 1000 population (AS_PRIV)	Ministry of Education, 2012
	Ministry of Education, 2012	
The level of creative talents coming out of tertiary education and in cultural employment		
Tertiary students by field of education related to culture	State tertiary students by field of education related to culture per 1000 population (STUD_ST)	Ministry of Education, 2012
	Private tertiary students by field of education related to culture per 1000 population (STUD_PRIV)	Ministry of Education, 2012
Cultural employment in total employment	Cultural employees per 1000 population. (C_EMPL)	Statistical Office SR, 2012

C: CULTURAL ENVIRONMENT SUB-INDEX		
Cultural participation		
Cultural expenditure per household	Average annual cultural and recreation expenditure per one member of household (EXP)	Statistical Office SR, 2012
Participation in cultural activities	Number of people participating in theatre (PART_T), dancing, (PART_D), music (PART_M) and other (PART_O) ensemble per 1000 population.	Ministry of Culture SR, 2012
Cultural offer		
Number of public theatres per capita	Number of public and private theatres per 1000 population (THEAT_PU), (THEAT_PR)	Ministry of Culture SR, 2012
Number of public museums per capita	Number of public museums per 1000 population (MUS)	Ministry of Culture SR, 2012
Number of public concert halls	Number of educational and cultural organizations per 1000 population (CO)	Ministry of Culture SR, 2012
	Number of libraries per 1000 population (LIBR)	Ministry of Culture SR, 2012
	Number of galleries per 1000 population (GAL)	Ministry of Culture SR, 2012
Number of cinema screens by country	Number of cinema screens per 1000 population (SCREEN)	Ministry of Culture SR, 2012
D: TECHNOLOGY SUB-INDEX		
Households who have personal computers and video game consoles	Percentage of households who have internet at home (INT)	Statistical Office SR, 2012
Broadband penetration rate Number of R&D employees per 1000 population (R&D_EMP)	Research and development expenditure per 1000 population (R&D_EXP)	Statistical Office SR, 2012
	Statistical Office SR, 2012	
Percentage of households who have personal computers at home (COMP)	Statistical Office SR, 2012	
E: INSTITUTIONAL ENVIRONMENT SUB-INDEX		
Financial support		
Tax break for artists or people who work in the creative sector: no regional differences		
VAT rates on books, press, sound recordings, video, film receipts, freelance authors, visual artists: no regional differences		
Tax incentives concerning donations and sponsoring	Receiving of 2% income taxes per 1000 population (TAX)	www.rozhodni.sk, 2012

Table 1. (cont)

Direct public expenditure on culture	Current and capital expenditure of region per 1000 population (CU_EXP), (C_EXP)	Ministry of Culture SR, 2012
State funding for cinema	Expenditure of audio-visual fund per 1000 population (AVF)	Audio-visual fund, 2012
State funding for public TV	Expenditure of Regional Operational Pro-gramme (ROP) „Integration of Natural and Cultural Potentials" and average year expenditure of European Capital of Culture project (2011–2013) programme per 1000 population (ROP)	Ministry of Culture SR, 2012
	Expenditure of Ministry of Culture per 1000 population (MOC)	Ministry of Culture SR, 2012
Intellectual Property		
Level of rights collected by authors in music per capita: **not available**		
F: CREATIVE OUTPUTS SUB-INDEX		
Economic contribution of creativity		
Value added of creative industries as % of GDP	Values added of creative industries as % of GDP of region (GVA)	Financial Adminis-tration, 2012
Turnover in music indus-tries per capita	Turnover in music industries per 1000 pop-ulation (TO_M)	Financial Adminis-tration, 2012
Turnover in book indus-tries per capita	Turnover in book industries per 1000 popu-lation (TO_B)	Financial Adminis-tration, 2012
Turnover in cinema indus-tries per capita	Turnover in cinema industries per 1000 population (TO_C)	Ministry of Culture SR, 2012
Other outcomes of creative activities		
Feature films produced	Number of theatre performance, gallery and museum exhibition per 1000 population (EXHIB)	Ministry of Culture SR, 2012
Recordings released per capita: **not available**		
Books published per year and capita	Number of books published per 1000 popu-lation (BOOK)	Ministry of Culture SR, 2012
Design applications	Number of design applications per 1000 population (DESIGN)	Patent Office SR, 2012

Source: Elaboration reflecting on KEA index (2009).

A. Openness and Diversity

Creativity cannot be accelerated without a creative climate characterised by diversity, tolerance and openness to different ethnic, racial and lifestyle groups (Jacobs, 1993; Clifton *et al.*, 2013; Florida 2002). Similarly, the openness to the immigration (Ottaviano and Peri, 2005) and to the gay community (Florida, 2002) have become tools in the pursuit of new elements of growth (Karppi, 2012). Places more open to diversity are likely to attract creative people as a key driver of regional economic growth (Carta, 2009; Sen, 1993). Table 1 provides an overview of five indicators for Openness and Diversity index proposed by KEA. Given the difficulty of providing the same data at the regional level in Slovakia and their meaning (e.g. market shares of non-national European films) they are replaced by meaningful indicators. As a suitable measure of tolerant attitudes, the indicator of a number of marriages with foreigners is included.

B. Human capital

Learning and education are important factors reflecting the level of human capital in any society (OECD, 2001; Barro, 2001). The human capital is conventionally measured as the share of the population with a bachelor's degree. As culture plays a central role in developing the creative side of human capital, KEA (2009) has limited the educational variable only to students of music, dance, arts, design, theatre, film, crafts, new media, culture fashion and architecture, etc. Human capital dimension originally included five indicators in total (Table 1). The number of hours dedicated to arts and culture in primary and secondary education proposed by KEA had to be replaced as the number of hours is set by Slovak government equaly.

C. Cultural environment

The cultural infrastructure (museums, galleries, theatres, libraries, etc.) provides a basis for the development of creative activities. Various studies have shown that museums are places where creativity can flourish, because they encourage people to think differently and expose their creative ideas and solutions. Similarly, an active participation in cultural activities supports personal development and creative personality traits (Jeanotte, 2003). Index of Cultural Environment consists of two areas, cultural participation and cultural offering. Each of the proposed indicator by KEA could have been measured at regional level in Slovakia.

D. Technology

Human creativity is considered as the engine of the technological progress and innovation (Florida, 2002). Conversely, the rapid development of digital technology provides for all the people an opportunity to express their individuality and gives stimuli for the emergence of new forms of creative activities in the areas such as computer animation, music composition, digital graphics etc.

E. Institutional environment

The creative economy is established and managed by a set of institutions named social structure of creativity (Florida, 2002). A proper coordination and implementation of cultural policy is important to build institutional environment stimulating creativity and covering various areas of creative industries. The creative environment can be boosted by adopting institutional parameters conducive to creativity such as appropriate infrastructure, effective intellectual property regime, tax incentives, public investment in arts and culture, etc.

F. Creative outputs

The post-industrial era reflects the transition from mass production to the production of personalized or unique products. The creative industries are shifting to mainstream economics and belong to the most innovative sectors in the economy. KEA used several indicators of creative industries performance reflecting creative potential of a country. At the regional level, the Creative Outputs sub-index employs the indicators of turnovers of the creative industries and the outputs in number of books or design applications.

3. METHODOLOGY

In this research, the Principal Component Analysis (PCA) has been chosen as a more advanced technique suitable for highly correlated variables, when the distributions of the variables are not normal and outliers are presumable. The main criterion for the number of examined variables to be lower than the number of observations for each part of the sub-index is fulfilled. Thus, the PCA approach is suitable for constructing Slovak Creativity Index (SCI). The newly proposed SCI aims at measuring the interaction of different factors contributing to creativity growth, as well as for identifying regional strengths and weakness in more details by comparing sub-indices and their variables. In comparison to ECI, SCI is

composed by using more sophisticated methodology useful in comparing regions (instead of countries) from the perspective of their creativity potential. The benefit of the SCI is also in its database consisting scarcely accessible variables.

PCA technique can reduce the original number of observed variables to a smaller number of their linear combinations (principal components), which are already independent – uncorrelated and ordered according to decreasing variance. Only the first few *(j)* of the principal components representing the most of the variation present in the whole original data set retain (Jolliffe, 2002).The data was first normalized to zero mean and unit variance (Li *et al.*, 2012) and then PCA was applied separately on each part of the sub-index to get the eigenvalues *λ*k for each component. The composite value for each sub-index *(i)* and region *(n)* can be determined as:

$$SI_{i,n} = \frac{\sum_{k=1}^{j} F_{n,k} * \sqrt{\lambda_k}}{\sum_{k=1}^{j} \sqrt{\lambda_k}}$$

i=1,2,….6, *n*=1,2,……8   (1)

$F_{n,k}$ – coordinate of the region n in the component *k*,
λ_k – eigenvalue of the component *k*,
j – number of retained components.

The values of sub-indices *SI*i,n provide the information about the regional potential strengths or weakness in six pillars of interest: Openness and Diversity, Human capital, Creative Outcomes, Institutional Environment, Technology, and Cultural Environment. In general, the higher is the sub-index value of region, the better is regional performance. The SCI index is built up according to equation (2).

$$SCI_n = \frac{\sum_{k=1}^{j} F_{n,k} * \sqrt{\lambda_k}}{\sum_{k=1}^{j} \sqrt{\lambda_k}}$$

n=1,2,……8   (2)

$F_{n,k}$ – coordinate of the region n in the component *k*,
λ_k – eigenvalue of the component *k*,
j – number of retained components.

A key step in PCA is to identify the number of retained components that account for the most of the variability in the original data set. A standard approach requires selecting components which together explain at least 60% of the total variation and at the same time each component must explain at least 5% of total variation (Jolliffe, 2002). Subsequently, the Kaiser-Meyer-Olkin (KMO) measure of the sampling adequacy was calculated for each variable and also for the overall sub-index (KMOc), to test whether data are likely to factor and which variables to drop from the model because of their high multicollinearity. The sample is adequate, if KMOc is greater than 0.5 (Jona, 2015). The choice of variables is tested by the Bartlett test of sphericity, testing whether the correlation matrix is an identity

matrix, implying that all of the components are uncorrelated. The composition of the retained components for each sub-index, as well as the values of KMOc statistic and the p-values of the Bartlett test are in the Table 2.

Table 2. Components of Slovak Creativity Index

Components of sub-index Technology		
	Comp.1	Comp.2
COMP	0.455	0.889
R&D_EXP	0.625	−0.356
R&D_EMP	0.634	−0.288
% variation	77.5	21.8
KMOc	0.5626718	
Bartlett test	χ^2=18.2729, df=3, p-value=0.0003864	
Components of sub-index Openness and Diversity		
	Comp.1	Comp.2
BOOKS	0.598	−0.522
Q_2	0.681	0.042
FOR_EXHIB	0.422	0.850
% variation	44.69	31.88
KMOc	0.5172006	
Bartlett test	χ^2=0.5377, df=3, p-value=0.09005	
Components of sub-index Cultural Environment		
	Comp.1	Comp.2
MUS	0.489	0.089
LIBR	−0.473	0.026
THEAT_PU	0.470	0.032
THEAT_PR	0.508	0.185
PART_D	−0.109	0.711
PART_O	−0.215	0.661
% variation	58.97	29.77
KMOc	0.5898246	
Bartlett test	χ^2=30.8475, df=15, p-value=0.009207	
Components of sub-index Creative Outputs		
	Comp.1	Comp.2
TO_M	0.360	−0.534
TO_C	0.453	0.023
TO_B	0.436	−0.140

EXHIB	0.426	0.208
BOOK	0.454	0.025
DESIGN	0.298	0.799
% variation	79.6	12.85
KMOc	0.7282174	
Bartlett test	χ^2=50.7252, df=15, p-value=9.161e-06	
Components of sub-index Institutional Environment		
	Comp.1	Comp.2
CU_EXP	0.362	0.903
MOC	0.499	0.396
AVF	0.556	0.132
TAX	0.558	0.100
% variation	76.8	17.99
KMOc	0.6505544	
Bartlett test	χ^2=37.0822, df=6, p-value=1.697e-06	
Components of sub-index Human Capital		
	Comp.1	
C_EMPL	0.502	
STUD_PRIV	0.488	
STUD_ST	−0.487	
AS_PRIV	0.522	
% variation	77.89	
KMOc	0.585649	
Bartlett test	χ^2=14.3006, df=6, p-value=0.02645	
Components of Slovak Creativity Index		
	Comp.1	Comp.2
TECHNOLOGY	0.392	0.233
OPENNESS AND DIVERSITY	0.065	0.956
CULTURAL ENVIRONMENT	0.462	0.082
CREATIVE OUTPUTS	0.454	−0.045
INSTITUTIONAL ENVIRONMENT	0.424	0.025
HUMAN CAPITAL	0.451	−0.139
% variation	87.08	10.67
KMOc	0.685249	
Bartlett test	χ^2=17.3286, df=6, p-value=0.0207e-03	

Source: authors' elaboration.

Each sub-index contains appropriate variables what is confirmed by KMO statistic (KMO is higher than 0.5 for each sub-index) and the components explain high percentage of variability, between 77.89 (Human capital) and 99.30 (Technology). Also in the case of total SCI, 97.75% of variability is explained by two components. The linear combination of the original variables employed together in a component can partly explain the overall component meaning. For instance, the first component Cultural Environment sub-index dimension is positively correlated with the number of theatres and museums. The second component is positively correlated with the number of people participating in dancing and other ensembles, thus it has a meaning of cultural participation.

4. RESULTS AND DISCUSSION

Table 3 presents the results of the overall score in SCI as well as regional performance in each dimension, and Table 4 provides ranking of Slovak regions. Each column has a zero mean value, and the plus sign values mean the position above the average value. The SCI shows a unique position in creativity performance in the Bratislava region (3.548) followed by Banská Bystrica (BC) and Košice (KI) regions. First two ranks fit with the size of the largest cities in Slovakia (Bratislava and Košice), although the city size is not always the main factor of higher creative performance. BC region displays the lowest level of Openness and Diversity and Technology, but still belongs to three top regions in terms of overall SCI because of its Human Capital and corresponding Creative Outcomes.

Table 3. Slovak Creativity Index – scores

Region	SCI	Openness and Diversity	Human Capital	Creative Outputs	Institutional Environment	Technology	Cultural Environment
Bratislava (BL)	**3.548**	1.653	1.378	4.016	3.148	2.249	3.073
Banská Bystrica (BC)	**1.266**	−1.094	2.376	0.393	−0.331	−1.007	−0.348
Košice (KI)	**0.731**	0.447	1.555	−0.379	0.040	−0.948	−0.265
Žilina (ZI)	**0.038**	−0.186	0.572	−0.430	−0.482	0.478	−0.254
Nitra (NI)	**−0.150**	−0.403	0.550	−0.905	−0.578	−0.420	−0.100
Prešov (PV)	**−1.601**	0.353	−1.771	−1.133	−0.368	−0.993	−0.630
Trnava (TT)	**−1.816**	−0.458	−1.921	−0.651	−0.846	0.268	−1.425
Trenčín (TC)	**−2.016**	−0.311	−2.740	−0.910	−0.583	0.372	−0.050

Source: authors' elaboration.

Table 4. Slovak Creativity Index – ranks

Rank	Openness and Diversity	Human Capital	Creative Outputs	Institutional Environment	Technology	Cultural Environment
1.	BL	BC	BL	BL	BL	BL
2.	KI	KI	BC	KI	ZI	TT
3.	PV	BL	KI	BC	TT	NI
4.	ZI	ZI	ZI	PV	TC	ZI
5.	TT	NI	TC	ZI	NI	KI
6.	NI	PV	NI	NI	KI	BC
7.	TC	TC	TT	TT	PV	PV
8.	BC	TT	PV	TC	BC	TC

Source: authors' elaboration.

Previous reasoning opens up the question of an impact of urbanisation on the creative potential. Creative industries have a tendency to cluster and to exploit agglomeration and urbanisation economies (Acs and Megyesi, 2009; De Propris *et al.*, 2009). Urbanisation rate calculated as a proportion of the regional population living in areas with a population density of more than 500 inhabitants per km² can be tested for correlation with the creative performance measured by the SCI. Higher proportion of creative workers in the total regional employment is generally positively related to a higher degree of urbanisation. Figure 1 exhibits the position of regions in the relationship between urbanisation rate and overall SCI values.
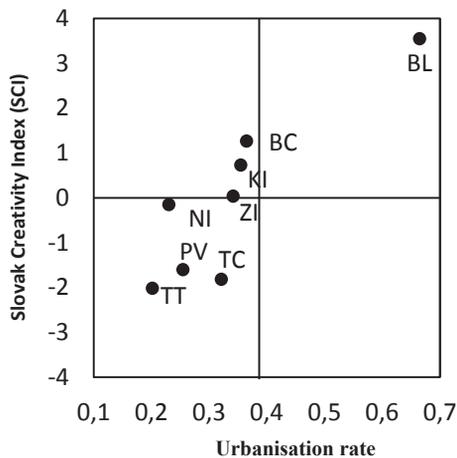

Fig. 1. Relationship between SCI and urbanisation rate

Spatial distribution of the regions according to Slovak Creativity Index and it sub-indices is depicted in Figure 2.
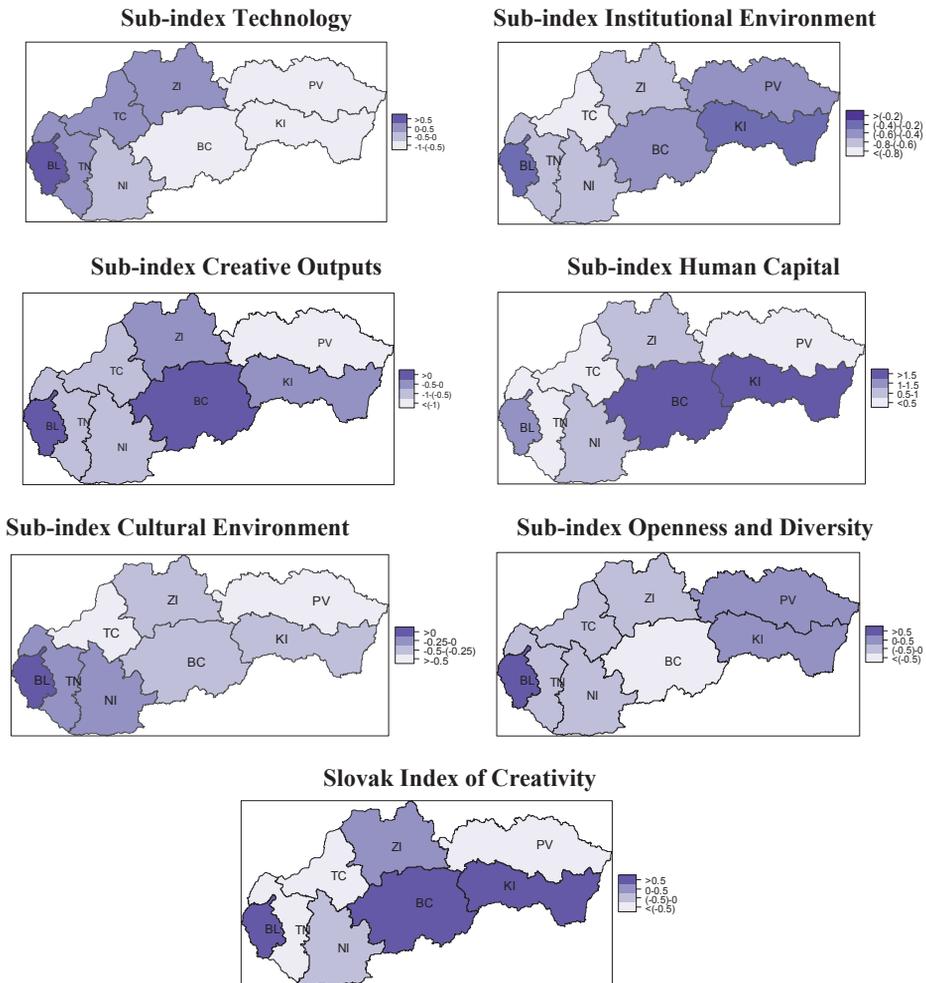

Fig. 2. Spatial distribution of the Slovak Creativity Index and its sub-indices

The Sub-index Technology is the only sub-index replicating existing economic disparities in the country. The metropolitan region of Bratislava and the Western regions are in a long time economically more advanced (Žudelová and Urbančíková, 2015), while the more eastern and rural regions are lagging behind. The ECI index transferred as SCI index to Slovak regions is more focusing on cultural aspects of creative economics, and it has discovered yet unknown creative potential of the BC region, its talent and human potential and corresponding higher creative output.

A more detailed view on the variables of the Human Capital sub-index shows the highest value of the level of creative talents in the BC region consisting of the variables on students in arts and culture and a number of cultural employees (The Figure 3). The Figure 4 confirms the closeness of the Human Capital factor and the creative performance.
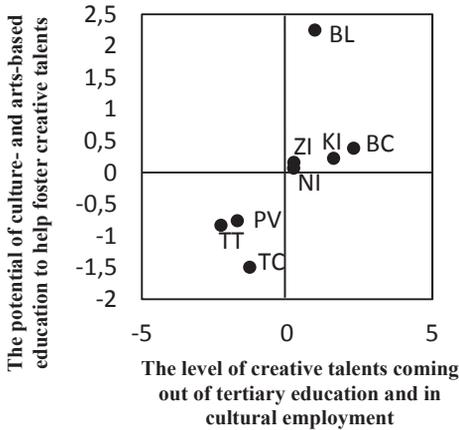

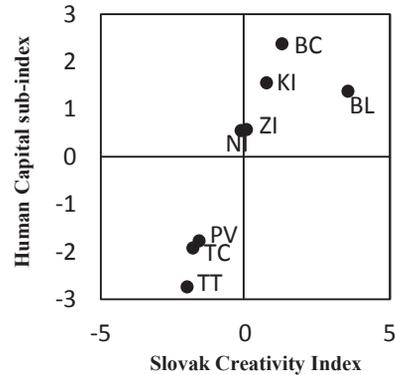Fig. 3. Decomposition of Human Capital sub-index

Fig. 4. Decomposition of Human Capital sub-index

Florida and other authors suggest considering also Tolerance (here named Openness and Diversity) as a factor of prosperity in a society, together with Technology dimension. Figure 5 therefore explores the relationship between the Technology and Openness and Diversity sub-indices. The Tolerance is represented by the key measures of tolerant attitudes in population toward minorities – foreigners, gay and lesbians, the different races or ethnic groups (see the description of the variables in the Table 1).
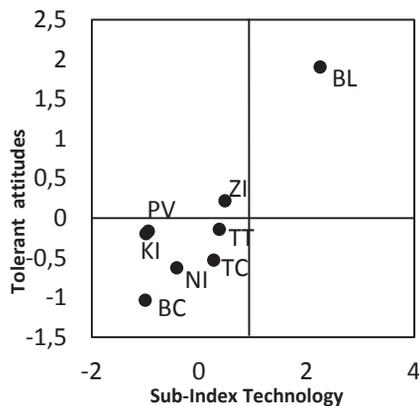

Fig. 5. Relationship between Tolerant attitudes and sub-index Technology

The position of the capital Bratislava region relates to its significantly higher tolerant attitudes than in the rest of Slovakia, what can be explained by the degree of urbanisation and more cosmopolitan character. The region of Banská Bystrica, which is comparatively well performing in human capital and creative outputs, is losing in Tolerance and Technology dimensions.

5. CONCLUSIONS

The main goal of the article was to develop a composite index applied on the Slovak regions to assess their creative potential and to ensure the philosophy and concept of the European Creativity Index. Finally, the Slovak Creativity Index comprises 59 indicators aggregated into six areas. The regional index reached the quantity as well as the quality of the indicators and the Principal Component Analysis has been used to reduce the number of variables due to the partial correlations. This made possible a coherent and solid construction of the index, using a technique that is novel in comparison to previous constructions of the simple weighted indices. The results are thus more reliable, credible and comparable to the concept of KEA.

There has been no doubt about the exclusive position of Bratislava region in the index measuring the regional creative potential. The results clearly confirmed the hypothesis about the impact of urbanisation on providing attractive conditions for the creative class, talents and creative industries. SCI in comparison to previous studies (e.g. Murgaš and Ševčíková, 2011) discovers Banská Bystrica as the region of cultural human capital, having established the network of art schools and producing relatively high creative output, however in a contradiction to 3T concept has the lowest score in Openness and Diversity sub-index. This is subject to its mixed urban/rural character, but from the other side, the lower tolerance attitudes show the way of policy interventions for the development of creative potential in the region. The first three regions in terms of SCI (Bratislava, Banská Bystrica and Košice) have a valuable creative and cultural potential that should be further developed when considering their pros and cons in terms of sub-indices.

Proximity to creative centres is not an unambiguous factor of creative performance. Economic development spread from Bratislava to neighbouring regions visible in the Technology dimension does not result in higher creative outputs or better cultural environment. Generally, the primary setting of the European ECI index and its pillars can be confirmed at the Slovak regional level, showing substantial differences and variability according to all dimensions, justifying the

important role of all of them. The SCI index and the PCA technique tested on the Slovak regions have brought a possibility to transfer the European comparisons to the regional level.

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