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Exploring creative clusters using micro-geographic data

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Exploring creative clusters using micro-geographic data.

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Introduction

Currently is in economic science a discussion of importance of creativity. The works, that inspired many authors, are mainly publication of J. Howkins *The Creative Economy: How People Make Money from Ideas* published in 2001 and bestseller of American Professor R. Florida *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community And Everyday Life* published in 2002. Creativity is an inevitable condition for creating new knowledge. The concept of creative economy discusses a lot of themes - urban growth, creative individuals, creative cities and creative industries or creative ecology. Based on these ideas are already in many countries developing the strategies to support the creative economy. In connection with the creative industries, many authors argue that the creative industries are concentrated in the area.

However, some authors have dealt with creativity a long ago. A. Smith emphasized the importance of knowledge - which is a prerequisite of creativity. J. Schumpeter saw the sources of growth in the so-called creative destruction, which lies in the competition and creating new business ideas. The continuous production process is subject to the mechanism of innovation that leads to permanent replacement of one product with another. R. Florida recognizes, that already in the works of A. Marshall and J. Jacobs, cities are seen as "melting pot" of diversity and diversity is seen as the basis for creativity and innovation [FLORIDA, 2003]. Creativity is the basis of the theoretical concept of creative economy. Howkins characterizes the creative economy as the economy, which is based on new ways of thinking and working. The primary inputs are individual ability and talent. These inputs may be known or new, but more importantly, creativity transforms them in new ways [HOWKINS, 2001]. Much attention has been devoted to the creative industries. There are several definitions of creative industries. In 1998 created DCMS - UK Department for Culture, Media and Sport, classification, consisting of 13 industries, which led to the statistical information eg. about employment. The document authorized the local authorities and regional development agencies to implement new types of economic strategy. The creative industries characterized as those, that have their origin in individual creativity, skill and talent and which have the potential for wealth and job creation through generation and exploitation of intellectual property. In identifying the creative industries, the input into the production process is creativity and the output is seen as intellectual property [DCMS, 1998]. One of the most known classification systems for exploring the creative industries established J. Howkins,

who examines 15 industries [HOWKINS, 2001]. The WIPO (World Intellectual Property Organisation) classification of creative industries is based on copyright protection. The important aspect is, that there is a distinction between industries, that produce intellectual property and industries, that are necessary to transfer the product to the consumer [CURRAN, VAN EGERAAT, 2010]. In line with the creative industries, is one of the research areas is exploring of their location. The aim of the paper is to verify the concentration of creative industries in the Slovak Republic and to find out, in which areas are located the clusters of creative industries.

Spatial concentration of creative industries

Creative industries are concentrated in the area, and their increased concentration can be observed mainly in the cities [LANGE, KALANDIDES, STOBER, MIEG, 2008; BOIX, LAZZARETTI, HERVÁS, DE MIGUEL, 2011; STAM, DE JONG, MARLET, 2008]. Large cities, or administrative centers of regions, are also the centers of creative industries - though of course some cities stand out above the rest¹ [EUROPEAN CLUSTER OBSERVATORY, 2009]. Even in the cities could be found the parts, in which is an increased incidence of firms of creative industries [BRINKHOFF, 2006]. Markusen argues, that the spatial concentration can be observed mainly in urban centers [MARKUSEN in SLACH, 2008]. Creative industries are creating the clusters. Spatial concentration was confirmed not only for all creative industries together, but also for individual groups of creative industries, eg. in Scotland, the film and television is concentrated in Glasgow [TUROK, 2003], or the London goldsmith in London City Fringe [BAGWELL, 2008].

In relation to the concentration of creative industries, authors often speak of the creative cluster. Porter defines a cluster itself as a geographical concentration of interconnected companies, specialized suppliers, service providers, firms in related industries and associated institutions (eg. universities, trade associations) in a field that compete but also cooperate [PORTER, 2000]. However, the creative cluster differs from the classical concept of cluster. Evans² points out, that the creative cluster includes the science parks, media center and also the non-profit organizations - cultural institutions, art centers and artists. It is a place to live and work, where is concentrated production and consumption of cultural works and

¹ such super creative cities in Europe are London and Paris, followed by Milan and Amsterdam

² Simon Evans is director of the English company Creative Clusters

services. It is also inspired and based on the diversity and constant change, and thus contributes in a busy, multi-cultural environment of the city, which is distinctive and well connected with the world [EVANS in IVANIČKOVÁ, 2011]. Creative Clusters bring together resources into networks and partnerships, to stimulate activity, creativity and economies of scale [UNESCO, 2006].

However, some authors look at creative clusters not only from the perspective of the industry. De Propriis characterized the creative cluster as [DE PROPRIS in DE PROPRIS, CHAPAIN, COOKE, MACNEILL, MATEOS – GARCIA, 2009]:

- place, connecting the community of creative people [FLORIDA, 2002], who share an interest in news, but not necessarily in the same area,
- place where people, relationships, ideas and talent can complement each other,
- an environment offering diversity, initiative, or freedom of expression,
- strong, open and constantly changing networks, that support individual uniqueness and identity.

The authors are using different methodological approaches. Brinkhoff in his research of concentration of creative industries in Los Angeles used the aggregated data for each of the city [BRINKHOFF, 2006]. The concentration of creative industries in the area and creating clusters has been documented also in Europe [BOIX, LAZZARETTI, HERVÁS, DE MIGUEL, 2011]. The authors used localization quotient method and spatial statistics K-Order Nearest Neighbour Index. Based on the localization quotient, they mapped the geographic distribution of creative industries. Using the K-Order Nearest Neighbour Index, they identified a number of clusters in various creative industries, the number of firms in clusters and the cluster of companies in the total number of creative businesses. Similarly, based on the localization quotient was verified the tendency of concentration of creative industries in the area [UNESCO 2008, NESTA, 2010].

One of the other ways of analyzing the location of creative industries is to examine the employment of their groups. It was confirmed, that the Netherlands is dominated by the strong tendency towards the concentration of the employees working in sectors: arts, media and publishing, and creative services (including architects and designers) [STAM, DE JONG, MARLET, 2008]. The surveys are also using the qualitative methods. Turok made his study

of the cluster film and television industry in Glasgow, Scotland, interview [TUROK, 2003]. In Slovakia, it was realized in several recent analyzes of creative industries. It was analyzed the spatial concentration of groups of creative industries by comparing the location of creative industries with a population density at district level [CHOVANEC, REHÁK, 2011], creative centers of employment in the cultural and creative industries [BLAHOVEC, HUDEC, 2012] and the concentration of creative industries, using the methods of spatial statistics [CHOVANEC, REHÁK, 2012].

Aim and methodology

The aim of the paper is to verify the concentration of creative industries in the Slovak Republic and to find out, in which areas are located the clusters of creative industries. When analyzing the location of creative industries in Slovakia, we use the definition of DCMS: creative industries are industries, that have their origin in individual creativity, skill and talent and which have the potential to create wealth and jobs through the creation and use of intellectual property [DCMS, 1998]. To the creative industries were included businesses, whose main economic activity falls within the classification system established by DCMS (Annex 1). The exceptions are businesses, whose main economic activity is indicated by code 78.10 - Activities of employment placement agencies, after the detailed analysis it is evident, that these businesses do not meet the definition of the nature of the creative industries. It was defined the 39 industries, which are divided into 11 groups of creative industries: Architecture; Digital Media and Entertainment; Music, Visual and Performing Arts; Marketing communication; Fashion design, Radio and television; Publishing software; Art and antiques; Video, film and photography; Publishing, Manufacture of clothes. Data on economic activities of businesses were drawn from a database Register of economic subjects of Slovak republic issued by Infostat in 2012. The analysis included all active businesses, whose main economic activity falls within the definition of creative industries in the code classification of economic activities NACE rev. 2.

A total of 12 936 business were analyzed from these groups of creative industries. We used analysis of aggregated data and localization of individual businesses based on their GPS coordinates. To meet the aim were used the methods Nearest Neighbor Analysis, Ripley K analysis, location quotient, Nearest Neighbour Hierarchical Spatial Clustering and Risk-adjusted Nearest Neighbor Hierarchical Clustering.

The concentration of creative industries

In the Slovak Republic are 12 936 active businesses. Most of them belong to groups of Marketing communication, Art and antiques and a Digital Media and Entertainment. Conversely, at least businesses are active in groups of Publishing software and Radio and television.

Table 1: Count of firms in each group of creative industries to 30.4.2012

Creative industry	Count	Share	Creative industry	Count	Share
Architecture	1019	7,88 %	Publishing software	48	0,37 %
Digital Media and Entertainment	1313	10,15 %	Art and antiques	2962	22,90 %
Music, Visual and Performing Arts	279	2,16 %	Video, film and photography	873	6,75 %
Marketing communication	4025	31,11 %	Publishing	1163	8,99 %
Fashion design	285	2,20 %	Manufacture of clothes	909	7,03 %
Radio and television	60	0,46 %	Creative industries total	12936	100,00 %

Source: authors, based on data of Register of economic subjects

Nearest Neighbour Index, which took into account the distance of each point to its nearest neighbor, indicates, that the creative industries are concentrated in the area. Naturally, the degree of concentration is different in each group of creative industries. For all creative industries recorded Nearest Neighbour Index value 0,16351 indicating a high degree of concentration of businesses in the area.

Table 2: Nearest Neighbour Index of creative industries to 30.4.2012

Creative industry	Nearest Neighbour Index	p-value	Creative industry	Nearest Neighbour Index	p-value
Architecture	0,20662	0,0001	Publishing software	0,63079	0,0001
Digital Media and Entertainment	0,20993	0,0001	Art and antiques	0,24145	0,0001
Music, Visual and Performing Arts	0,34430	0,0001	Video, film and photography	0,22326	0,0001
Marketing communication	0,18160	0,0001	Publishing	0,22200	0,0001
Fashion design	0,23346	0,0001	Manufacture of clothes	0,30881	0,0001
Radio and television	0,63372	0,0001	Creative industries total	0,16351	0,0001

Source: authors, based on data of Register of economic subjects

Concentration, respectively dispersion of points in space can be analyzed by the method of Ripley K. It identifies the radius, which describes the area of greatest concentration of points (businesses). The dispersion of the creative industries can be observed only in group Radio and Television - in terms of the radius of 81,51 km. For other values of the radius, we can therefore speak about concentration of businesses in the area. Table 3 summarizes the values of radius of clusters, in which is recorded the highest density of points (spatial concentration of businesses)

Table 3: Ripley K analysis to 30.4.2012

Creative industry	Radius (km)	Creative industry	Radius (km)
Architecture	10,66	Publishing software	8,64
Digital Media and Entertainment	12,71	Art and antiques	10,21
Music, Visual and Performing Arts	12,34	Video, film and photography	13,13
Marketing communication	11,29	Publishing	10,00
Fashion design	10,33	Manufacture of clothes	8,55
Radio and television	13,40	Creative industries total	10,53

Source: authors, based on data of Register of economic subjects

There was found relatively low values of $L(t_s)$ - 8.55 to 13.40 km. This implies, that clusters are formed in small areas, suggesting, that there are in the Slovak republic the areas (probably cities, respectively their parts), which is a very high density of the location of creative businesses. With increasing distance from the center of the area, however, the number of operators rapidly decreases. These areas thus constitute a separate cluster, which may be located close to each other and to their concentration in an area that leads to the formation of clusters at higher levels.

Identification of clusters of creative industries

The higher number of businesses of the creative industries are located in urban areas, respectively districts with higher populations. Therefore, we used location quotient, that compares the number of business of creative industries on 1000 inhabitants on level of city, which was compared to the number of business of from creative industries on 1000 inhabitants in Slovak republic. In calculating the index at the location of towns and villages in the ranking are placed high and cities that have low population - as they are sensitive to the number of operators. Therefore, we applied the criteria of minimum population of the towns and cities included in the final ranking. The highest value of the index recorded Bratislava. It is interesting, that the third and sixth rank is placed by the Ivanka pri Dunaji and Svätý Jur, which are located in close proximity to Bratislava (Annex 2).

To identify areas of clusters of creative industries ignoring border of towns and villages, was used the method Nearest Neighbor Hierarchical Spatial Clustering. The analysis concludes, that the clusters are formed in all groups of creative industries. The six clusters are merged into the second cluster level. Clusters on higher levels can not be created. Except the group Radio and television, were at least half of businesses in a cluster. The analysis was realised for all the creative industries together, as its results could not be obtained by summing or averaging the results for each of the creative industries. The cluster of creative industries includes 10 771 businesses, representing a 83,26% share. They form a 182 clusters on the first level, which are combined into 12 clusters on the second level. The results are shown in Annex 3. Visualization of creative clusters is shown in Annex 4.

According to the fact, that the method of Nearest Neighbor Hierarchical Clustering does not compare the results to distribution of population, we used the method Risk-adjusted

Nearest Neighbor Hierarchical Clustering. The number of clusters and businesses in cluster on the first level was with the exception of the Radio and Television reduced (Annex 5). This indicates, that the concentration of population in the area has an impact on the formation of clusters. When comparing the results generated clusters on the second level, there is interesting fact, that in the Marketing communications we can see the emergence of two clusters and in group of Manufacture of clothes, which by the method of Nearest Neighbour Hierarchical Spatial Clustering does not create a cluster, by method Risk - Adjusted Nearest Neighbour Hierarchical clustering creates one cluster on the contrary. It means creating more clusters in areas, where there is a statistically significant concentration of businesses due to the relatively weaker concentration of population.

Conclusion

Creativity and creative economy are in general in centre of attention of many authors. Their empirical studies show, that concentration of creative industries occurs mainly in the cities, respectively regional centers. In the Slovak Republic still lacks sufficient research papers that would verify this fact. Therefore, the aim of the paper is to verify the concentration of creative industries in the Slovak Republic and to find out, in which areas are located the clusters of creative industries.

In the Slovak Republic are 12 936 active businesses. Most of them belong to groups of Marketing communication, Art and antiques and a Digital Media and Entertainment. Conversely, at least businesses are active in groups of Publishing software and Radio and television. Based on the analyzes can be stated, that in Slovakia there is a concentration of creative industries in the area. Nearest neighbor analysis confirms, that the concentration tendencies are in different groups of different creative industries. For all creative industries is recorded Nearest Neighbour Index value 0,16351 indicating a high degree of concentration of businesses in the area. Ripley K analysis similarly confirms, that the result of localization companies is their concentration in space and defines the radius of the area, in which is the concentration strongest and therefore this area can be considered for the cluster. To identify clusters was first research based on the location quotient. The highest values was reached in Bratislava. High values but also reached the Ivanka pri Dunaji and Svätý Jur, which are located close the Slovak capital. Next, we used the method Nearest Neighbor Hierarchical Spatial Clustering. We found out the tendencies of clustering in groups of creative industries.

The number of clusters is reduced, if a statistically significant concentration of creative industries in area is compared to the population, by the method Risk - Adjusted Nearest Neighbour Hierarchical clustering.

This paper analyzes the localization of creative industries in Slovak republic, and provides arguments for a more detailed examination of the creative industries in the Slovak Republic. If we accept the idea, that creativity is the main source of economic growth in cities, then it is necessary to obtain knowledge of the business, that use creativity to create their products. The policy supporting creative industries in particular areas, respectively cities, it may significantly help to restructure the economy, which would therefore not have to be dependent on the industry (and routinely performed activities), but on knowledge of which condition is creativity.

References

- [1] BAGWELL, S. (2008): Creative Cluster and City Growth. Creative Industries Journal, Volume 1, Number 1, Intellect Ltd Article. English language. doi: 10.1386/cij.1.1.31/1
- [2] BLAHOVEC, R., HUDEC, O. (2012): Kreativna ekonomika na Slovensku: Priestorový a časový vývoj v rokoch 2001 – 2008. 2. zimný seminár regionálnej vedy: zborník príspevkov: Nový Smokovec, Vysoké Tatry 21.-24.3.2012 Bratislava: Vydavateľstvo EKONÓM, 2012. ISBN 978-80-225-3422-2
- [3] BOIX, R., LAZZARETTI, L., HERVÁS, J. L., DE MIGUEL, B. (2011): Creative clusters in Europe: a microdata approach. 51st European Congress of the Regional Science Association International. August 2011.
- [4] BRINKHOFF, S. (2006): Spatial Concentration of Creative Industries in Los Angeles. Humboldt-Universität zu Berlin Geographisches Institut
- [5] CURRAN, D., VAN EGERAAT, CH. (2010): Defining and Valuing Dublin's Creative Industries. National Institute For Regional and Spatial Analysis.
- [6] DCMS - Department of Culture, Media and Sport (1998): Creative Industries Mapping Document
- [7] DCMS - Department of Culture, Media and Sport (2011): Creative Industries Economic Estimates
- [8] DE PROPRIS L., CHAPAIN, C., COOKE, P., MACNEILL S., MATEOS – GARCIA, J., (2009): The geography and creativity, Report 27, NESTA, UK
- [9] EUROPEAN CLUSTER OBSERVATORY (2009). Priority Sector Report: Creative and Cultural Industries.
- [10] FLORIDA, R. (2002): The Rise of the Creative Class. Basic Books. ISBN 978-0-465-02477-3
- [11] FLORIDA, R. (2003): Cities and the Creative Class. City & Community, 2: 3–19. doi: 10.1111/1540-6040.00034
- [12] HOWKINS, J. (2002): The Creative Economy: How People Make Money From Ideas. Penguin Global, 288 s., ISBN 978-0140287943
- [13] CHOVANEC, M., REHÁK, Š. (2011): Priestorový vývoj kreatívnych odvetví na Slovensku v období rokov 1996 - 2010. Zimný seminár regionálnej vedy : zborník príspevkov z vedeckého seminára 23. - 25. marec 2011, Nový Smokovec, Vysoké Tatry. Bratislava: Katedra verejnej správy a regionálneho rozvoja NHF EU, 2011. ISBN 978-80-225-3196-2, s. 1-20.
- [14] CHOVANEC, M., REHÁK, Š. (2012): Priestorová koncentrácia firiem v kreatívnych odvetviach v SR - využitie firemných mikrodajov. 2. zimný seminár regionálnej vedy: zborník príspevkov: Nový Smokovec, Vysoké Tatry 21.-24.3.2012 (elektronický zdroj). - Bratislava : Vydavateľstvo EKONÓM, 2012. ISBN 978-80-225-3422-2

- [15] IVANIČKOVÁ, A. (2011): Malé mestá – priestor a možnosti kreatívnych činností. Konkurenceschopnosť a udržateľný rozvoj malých miest a venkovských regiónov v Českej republike. Ježek, J., Kaňka, L (ed.), s. 34 – 54, Plzeň.
- [16] LANGE B., KALANDIDES, A., STOBBER, B., MIEG, H.A. (2008): Berlin's creative industries: governing creativity?', *Industry and Innovation*, vol 15, pp. 531-548.
- [17] LEVINE, N. (2010): CrimeStat: A Spatial Statistics Program for the Analysis of Crime Incident Locations (v 3.3). Ned Levine & Associates, Houston, TX, and the National Institute of Justice, Washington, DC. July.
- [18] NESTA – De Propriis, L., Chapain, C., Cooke, P., MacNeill, S., Mateos – Garcia, J. (2010): *The Geography of Creativity*.
- [19] PORTER, M. E. (2000): Location, Competition, and Economic Development: Local Clusters in a Global Economy. *Economic Development Quarterly* 2000; 14; 15 DOI: 10.1177/089124240001400105
- [20] SLACH, O. (2008): Kreativní odvětví a jejich prostorová organizace. Zborník příspěvků z mezinárodní vědecké konference konané 16. - 17. října 2008 na Vysoké škole v Sládkovičově. Sládkovičovo: Vysoká škola v Sládkovičově, 2008. s.85-93. ISBN 978-80-89267-14-9
- [21] STAM, E., DE JONG, J.,P.,J., MARLET, G. (2008): Creative industries in The Netherlands: structure, development, innovativeness and effects on urban growth. *Geografiska Annaler: Series B, Human Geography*, 90 (2), pp. 119-132
- [22] TUROK, I. (2003): Cities, Clusters and Creative Industries: the Case of Film and Television in Scotland, *European Planning Studies*, 11:5, 549-565.
- [23] UNESCO (2006): *Understanding Creative Industries, Cultural Statistics for Public Policy Making*.
- [24] UNESCO (2008): *Creative Industries Clusters Study. Stage One Report*. Department of Communications, Information Technologies and the Arts.

Annex 1: Classification of creative industries

Creative industry	NACE rev. 2	description of NACE rev. 2 code
Architecture	71.11	Architectural activities
Digital Media and Entertainment	58.21	Publishing of computer games
Digital Media and Entertainment	62.01	Computer programming activities
Music, Visual and Performing Arts	59.20	Sound recording and music publishing activities
Music, Visual and Performing Arts	90.01	Performing arts
Music, Visual and Performing Arts	90.02	Support activities to performing arts
Music, Visual and Performing Arts	90.03	Artistic creation
Music, Visual and Performing Arts	90.04	Operation of arts facilities
Marketing communication	73.11	Advertising agencies
Marketing communication	73.12	Media representation
Fashion design	74.10	Specialised design activities
Radio and television	60.10	Radio broadcasting
Radio and television	60.20	Television programming and broadcasting activities
Publishing software	18.20	Reproduction of recorded media
Publishing software	58.29	Other software publishing
Art and antiques	47.78	Other retail sale of new goods in specialised stores
Art and antiques	47.79	Retail sale of second-hand goods in stores
Video, film and photography	74.20	Photographic activities
Video, film and photography	59.11	Motion picture, video and television programme production activities
Video, film and photography	59.12	Motion picture, video and television programme postproduction activities
Video, film and photography	59.13	Motion picture, video and television programme distribution activities
Video, film and photography	59.14	Motion picture projection activities
Publishing	18.11	Printing of newspapers
Publishing	18.13	Pre-press and pre-media services

Publishing	58.11	Book publishing
Publishing	58.13	Publishing of newspapers
Publishing	58.14	Publishing of journals and periodicals
Publishing	58.19	Other publishing activities
Publishing	63.91	News agency activities
Manufacture of clothes	14.11	Manufacture of leather clothes
Manufacture of clothes	14.12	Manufacture of workwear
Manufacture of clothes	14.13	Manufacture of other outerwear
Manufacture of clothes	14.14	Manufacture of underwear
Manufacture of clothes	14.19	Manufacture of other wearing apparel and accessories
Manufacture of clothes	14.20	Manufacture of articles of fur
Manufacture of clothes	14.31	Manufacture of knitted and crocheted hosiery
Manufacture of clothes	14.39	Manufacture of other knitted and crocheted apparel
Manufacture of clothes	15.12	Manufacture of luggage, handbags and the like, saddlery and harness
Manufacture of clothes	15.20	Manufacture of footwear

Annex 2: Location quotient to 30.4.2012

Ranking	City/town	Location quotient	Ranking	City/town	Location quotient
1.	Bratislava	23,66	26.	Košice	5,24
2.	Žilina	11,55	27.	Kysucké Nové Mesto	5,06
3.	Ivanka pri Dunaji	9,71	28.	Vrútky	4,99
4.	Komárno	9,66	29.	Malacky	4,64
5.	Dunajská Streda	9,61	30.	Partizánske	4,50
6.	Svätý Jur	8,95	31.	Senica	4,34
7.	Liptovský Mikuláš	8,68	32.	Liptovský Hrádok	4,29
8.	Banská Bystrica	8,21	33.	Poprad	4,19
9.	Dolný Kubín	7,83	34.	Svit	4,02
10.	Čadca	7,80	35.	Holíč	4,01
11.	Piešťany	7,07	36.	Šaľa	3,92
12.	Pezinok	7,03	37.	Bardejov	3,91
13.	Námestovo	7,02	38.	Šamorín	3,80
14.	Senec	6,77	39.	Zvolen	3,78
15.	Ružomberok	6,47	40.	Turčianske Teplice	3,77
16.	Modra	6,34	41.	Veľký Meder	3,65
17.	Skalica	6,22	42.	Nové Zámky	3,59
18.	Galanta	6,06	43.	Stará Ľubovňa	3,53
19.	Nitra	5,89	44.	Stará Turá	3,28
20.	Martin	5,81	45.	Turzovka	3,24
21.	Prešov	5,78	46.	Topoľčany	3,19
22.	Trnava	5,60	47.	Nové Mesto nad Váhom	3,18
23.	Štupava	5,59	48.	Sliač	3,18
24.	Štúrovo	5,47	49.	Považská Bystrica	3,15
25.	Trenčín	5,45	50.	Prievidza	3,13

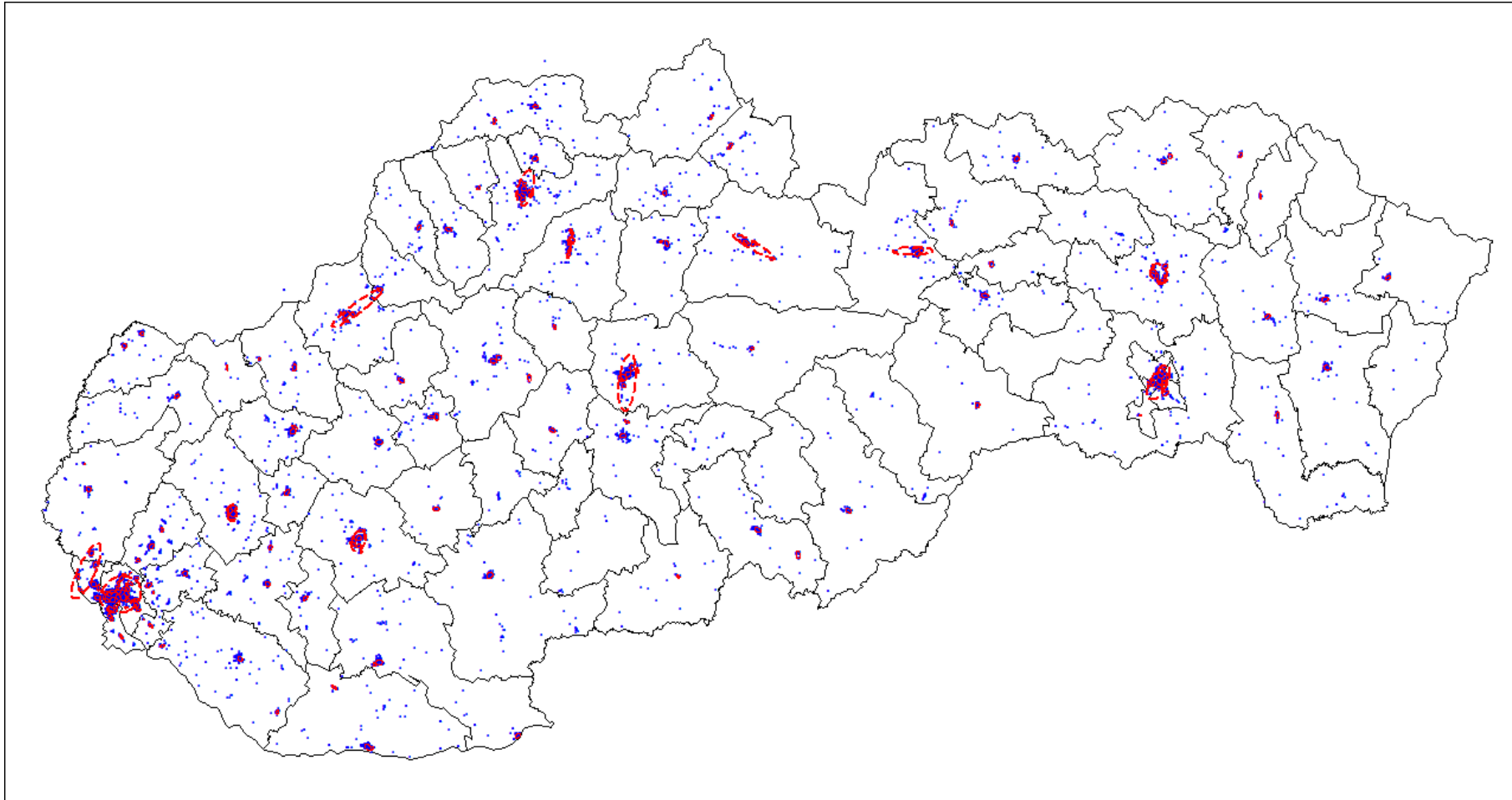
Source: authors, based on data of Register of economic subjects

Annex 3: Clusters of creative industries identified by the method Nearest Neighbour Hierarchical Spatial Clustering k 30.4.2012

Creative industry	Count of businesses	Count of clusters on first level	Count of businesses in cluster	Share of business in cluster	Count of clusters on first level creating clusters on second level	Count of clusters on second level
Architecture	1019	18	723	70,95 %	6	1
Digital Media and Entertainment	1313	8	972	74,03 %	10	1
Music, Visual and Performing Arts	279	3	155	55,56 %	-	-
Marketing communication	4025	55	3365	83,60 %	20	1
Fashion design	285	2	183	64,21 %	-	-
Radio and television	60	2	25	41,67 %	-	-
Publishing software	48	2	28	58,33 %	-	-
Art and antiques	2962	55	2118	71,51 %	17	2
Video, film and photography	873	9	606	69,42 %	7	1
Publishing	1163	16	825	70,94 %	5	1
Manufacture of clothes	909	21	499	54,90 %	-	-
Creative industries total	12936	182	10771	83,26 %	113	12

Source: authors, based on data of Register of economic subjects

Annex 4: Clusters of creative industries to 30.4.2012



Source: authors, based on data of Register of economic subjects

Annex 5: Clusters of creative industries identified by the method Risk – adjusted Nearest Neighbour Hierarchical Spatial Clustering k 30.4.2012

Creative industry	Count of businesses	Count of clusters on first level	Count of businesses in cluster	Share of business in cluster	Count of clusters on first level creating clusters on second level	Count of clusters on second level
Architecture	1019	7	500	49,07%	7	1
Digital Media and Entertainment	1313	7	755	57,50%	7	1
Music, Visual and Performing Arts	279	2	152	54,48%	-	-
Marketing communication	4025	24	2664	66,19%	19	2
Fashion design	285	1	181	63,51%	-	-
Radio and television	60	2	26	43,33%	-	-
Publishing software	48	1	22	45,83%	-	-
Art and antiques	2962	20	917	30,96%	13	2
Video, film and photography	873	4	591	67,70%	-	-
Publishing	1163	7	638	54,86%	7	1
Manufacture of clothes	909	6	201	22,11%	6	1
Creative industries total	12936	58	7115	55,00%	36	2

Source: authors, based on data of Register of economic subjects