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**Uneven Distribution Possibilities
of Creative Capital Development
in Rural Areas (Case Study of the Podkarpackie
Communes, Poland)**

Abstract

This paper presents the results of the research, which is an attempt to modify the assumptions of R. Florida's theory regarding the creative class. The measurement is based on indices that are the basis for the measurement of three categories: talent, technology, tolerance is not always possible due to the lack of data.

The purpose of the study was to identify factors determining activation of creative capital in the areas of communes (local level). The objective results from the need to determine whether or not such conditions are present at the local level.

Using the available literature, a questionnaire was prepared. Its results obtained from a survey among the Podkarpackie residents, were presented in the paper. It was found, as in the case of the results of the work of other authors, that in municipal communes there were better conditions for the development of creative capital.

Keywords: Creative class; creative capital; community; factors, rural areas

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Introduction

An economic growth is a difficult process. The complexity of an assessment changes relatively to the level, i.e. macro-, meso- or micro-economics. Some differences can be observed by reference to the global, regional and local scale. It is possible to look for disparities between rural and urban areas, yet it is difficult to find a clear-cut explanation of such disproportions.

In the literature, it has been established that there are numerous differentiating factors, e.g. natural resources, infrastructure and human capital. It should also be emphasised that intangible assets gain importance over material resources.

In accordance with hierarchical NUTS classification, each member state of the European Union is divided into the first-level territorial units (NUTS 1), which in turn are divided into the second-level territorial units (NUTS 2), and these are further divided into the third-level territorial units (NUTS 3), where one territorial unit may represent a few NUTS levels.

The regulation of the Council of Ministers of 13 July 2000 (Rozporządzenie, 2000), in force since 8 August 2000, changed an administrative division of Poland and introduced a statistical division. The whole country was divided into five territorial levels, NTS 1 – an area of the whole country, NTS 2 – voivodeships /regions/, NTS 3 – subregions, and the two lower levels referred to as the local level NTS 4 – *poviats*, NTS 5 – *gminas* /communes/ ([http:// stat. gov.pl/statystyka](http://stat.gov.pl/statystyka)).

The studies verifying the concepts of creative class in Poland previously focused on NTS 1, NTS 2 and NTS 4. No study was carried out for NTS 5 level, i.e. in communes.

The knowledge of differences between communes in a given administrative area is important in the context of the region development. The research enables an assessment of the position of a given commune in the region. The present study was preceded with a review of theories related to regional and local development.

The development of a spatial unit such as a commune is a multidimensional process. Therefore, it was necessary to adopt simplifying assumptions for the study. The starting point in methods of multidimensional comparative analyses involves the definition of variables describing the object of the study (the so-called potential variables). Disproportions in the development of communes were evaluated taking into account features considered to be

characteristic for the spatial variability. Thus, measurement of conditions promoting the development of creative capital was based on the variables divided by reference to Florida's methodology.

The basic research problem investigated in the study is reflected by the following question: do conditions existing in local areas, i.e. in communes (NTS 5) foster development of creative capital?

The exploration of this research problem is justified by the fact that the theory of spatial development attributes preferences to central regions or large cities, and regression resulting from a territorial position to local areas.

The purpose of the study was to identify factors determining activation of creative capital in the areas of communes (local level). The objective results from the need to determine whether or not such conditions are present at the local level.

Assumptions of R. Florida's theory**

The concept of creative capital results from the theory by R. Florida presenting assumptions related to the creative class. Since economy is the basis for the creative class, the author claims that the class draws its identity from the role of creativity providers. If we assume that creativity is the driving force of economic growth, this class has gained a dominant place in the society (Florida 2004; Florida 2010).

Importantly, representatives of the creative class settle down in places governed by tolerance, talent and technology. Interactions between the "3Ts", as Florida called these in short, are designed to create foundations for economic growth. Involvement of people recognised as part of the creative class is linked with their preferences for specific life-styles and expectations, frequently differing from standard needs. Such life-styles reflect these individuals' identity. This is also linked with a number of activities resulting from their interests and social roles, which, however, are connected with creativity.

In the literature, one can encounter various approaches to creative capital. It is not always directly defined by authors. It may be treated

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as a derivative of human capital (Florida 2004: 8; Florida 2010: 83–84), a constituent of milieu (Landry 2008), a potential of cities (Klasik 2008), an element of creative sector (ESSnet 2012) or the totality of conditions necessary for attracting human capital.

Therefore, it is assumed that “creative capital is a resource characteristic for people who collaborate and function in all circumstances including new conditions, while using their creativity”. This definition also comprises the creative class and all individuals who in any way use their creativity in their life and work.

A review comparing definitions of creative capital shows significant freedom of interpretation which may be considered an advantage or a drawback. The latter will be reported by critics in connection with repetitions, multiplications or brand new definitions which in fact match the definition of human capital adopted in economics, or intellectual capital considered in the area of management.

Various interpretations result from conditions in which we examine human activity inspired by a need for a change based on creativity. This is also an important element arising from the need to promote and stimulate creativity. All definitions convey positioning of this capital and its significance in terms of effects and assets.

Measurement of this capital, as proposed by R. Florida, is based on indicators comparing the strength of creative class across countries or regions, such as provinces, districts and cities/towns (Klasa 2012: 76).

They include: an index of high technologies, an index of innovativeness, an index of gays, an index of boheme, an index of talent (defined as the coefficient of human capital) which presents the percentage of persons with a bachelor’s degree and higher within the entire population of a given region, an index of the melting point, an index of diversity is the aggregation of the gays, boheme and the melting pot, an index of creativity which is the aggregated coefficient of innovation, high technology, number of gays and measurements of the creative class (number of persons performing creative professions to the overall number of the employed) (see Szara 2014: 86–87; Florida 2010: 83, 343–344; Klincewicz 2012: 86–87).

The indices were modified for specific needs, such as enabling calculation of European Creativity Index (Florida and Tingali 2004), Hong Kong Creativity Index (Hui, Chung-Hung and Mok 2004). The measurement

using these indices is most often used for countries. The following are sample results of the global creativity index for selected countries (Table 1).

Table 1. The Global Creativity Index (selected countries)

Rank	Country	GCI
1	Australia	0.970
2	The United States	0.950
3	New Zealand	0.949
4	Canada	0.920
5	Denmark	0.917
5	Finland	0.917
7	Sweden	0.915
...		
11	Norway	0.883
14	Germany	0.837
16	Switzerland	0.822
16	Slovenia	0,822
35	The Czech Republic	0.609
38	The Russian Federation	0.579
45	Ukraine	0.518
46	Poland	0.516
51	Lithuania	0.490
54	The Slovak Republic	0.484
...		
139	Iraq	0.032

Source: Florida, R.& Mellander, CH. & King, K. The Global Creativity Index 2015, (Toronto: Martin Prosperity Institute)

Studies focusing on creative class frequently cannot apply the originally proposed variables (Florida Mellender and Stolarick 2016). Hence, these are replaced with other variables of significance for the economy and

society, such as with indices proposed for the measurements in the Czech Republic and Slovakia (Kloudova and Chwaszcz 2013), in Polish districts (Podegrodzka 2013), and Ukrainian oblasts (Szara 2014).

The research conducted by Florida in the USA shows that creative class accounts for 30% of the labour force (Florida 2010: 84).

In the European Union, the studies focused on cultural activity of the states (New 2003). Likewise, valuable publications contributed by UNESCO also contain concepts associated with a creative activity (Our 1996).

In Poland, the creative class comprises the total of 3,064,500 employees, including 537,500 individuals constituting the “creative core”, 2,527,000 “creative professionals”, and 33,200 artists employed full-time (Klasa 2010: 21). A study carried out in Poland by a team supervised by K. Klincewicz (Klasa 2010) also compares creative class with other socio-demographic groups and suggests a better position related to the dimension of the quality of life. The findings of other authors suggest that it is not easy to transfer the indices applied in the methodology of counting the creative class into the Polish realities due to the lack of comparable data. In Poland, the recommendations for studies based on other variables, as proposed by, for example, M. Podegrodzka (2013), are linked with the specificity of a place (region). Furthermore, it is not a good idea, and for this the theory is sometimes criticised, to unconditionally transfer standards of an assessment applied in the USA to the European area.

Besides the positive reception of Florida’s concepts in the literature, we can also find the aforementioned critical opinions. The assumptions of the concept have drawbacks which were presented in studies by A. Markusen; (Markusen 2006: 1923), by J. Peck (2005).

Other opinions note that Florida’s findings are not always verified by research of other authors who adopt the same assumptions, e.g. relations between the diversity of the city and tolerance (Rese 2012), or migrations (Hansen and Neidomysl 2009; Martin-Berlot et al. 2010).

The review of critical literature also shows negative opinions related to the preference for cities (Andersenm, Bugge, Hansen, Isaksen and Raunio 2010), and a lack of assessments focusing on rural areas (Thulemark and Hauge 2014) as a place of growth for creative class (Hatcher, Oyer and Gallardo 2011; Krätke 2010; Schnook 2013).

The criticisms voiced by various researchers are important, and this author also agrees with the limitations of the concept of creative class

presented. On the other hand, in spite of the justified critical remarks, this controversial theory has been verified in practice, in particular in the context of urban development. According to this author, in spite of the limitations of the theory, it is a good idea to investigate creativity and creative capital not only at the level of countries or cities. It is necessary to look for solutions for the criticised aspects to enable improvements and ultimately produce a tool which can be used in empirical studies to verify or refute disputable assumptions.

Domination in research on this subject of urban areas and the indicated critical voices referring to the lack of research in rural areas are justified. Territorial space cannot be limited for the development of creative capital. Conditions for its development may be better or worse in these rural areas.

In the world literature, there is research addressing this issue, but not comprehensively and selectively in relation to selected criteria, i.e. talent, technology or tolerance (e.g. Kentucky (Hatcher, Oyer and Gallardo 2011), Sälen in Sweden (Bjorn and Hogni 2009)).

Method and data

In Poland, the size of creative class and the creative core strongly correlates with the other variables of the model reflecting talent, technology, tolerance and economic growth. Classification of the regions taking into account the strength of 3Ts, i.e. talent, technology and tolerance, as well as public support for 3Ts shows the leading position of the Mazowieckie and Dolnośląskie Regions. An uneven growth is observed in the Łódzkie and Wielkopolskie Regions, and the growth despite obstacles occurs in the Małopolskie, Pomorskie and Śląskie Regions. The regions aspiring for the growth of creative class include: the Podkarpackie, the Podlaskie, the Świętokrzyskie, the Warmińsko-Mazurskie, and the Zachodniopomorskie. The remaining regions are found in an unfavourable situation when it comes to these variables (Klasa 2012: 192).

The choice of the Podkarpackie for these analyses resulted from the fact that it was classified in the group of regions aspiring for the growth of creative class. Additionally, because of its geographical location and historical background, the Podkarpackie is an interesting case from the perspective of creative capital phenomenon (Ustawa 1998).

The Podkarpackie is the most south-eastern region of Poland – map 1. It borders with Ukraine and Slovakia as well as regions of the Małopolskie, the Świętokrzyskie and the Lubelskie ([http: ...podkarpackie](http://...podkarpackie)). The Podkarpackie has approximately 2,129,000 inhabitants, which accounts for 5.5% of the total population of Poland. Residents of towns and cities in the Podkarpackie constitute 41.1% of the population, and a comparison with the whole country (the mean rate is 61.8%) shows it is the least urbanised area of the country. In 2014, rural areas in the Podkarpackie occupied 93.29% of the region. Projections show that in the period from 2015 to 2050 the rate of the rural population in the Podkarpackie will increase from 58.78% to 63.04% (<http://www.portal>).

Map 1. Voivodeships of Poland



Source: <http://www.zwiazek-strzelecki.pl/wp-content/uploads/2017/05/mapa.pn>

Therefore, the choice of the Podkarpackie was inspired by the region's extremely high rate of rural population (Oszary 2015) in relation to the

total number of residents, and by the fact that disproportions in the growth across the entire region are particularly big. This choice makes it possible to verify research assumptions in diverse conditions, in line with the trend in research into economics of diversity (Natan 2015). Moreover, this choice is a response to comments related to Florida's theory and its preference for urban areas and insufficient attention to rural areas (Bjom and Hogni 2009; Hatcher, Oyer and Gallardo 2011; Thulemark and Hauge 2014).

In the regional system of Poland, the Podkarpackie holds a low strategic position. For administrative purposes, it is divided into 21 districts (Polish: *powiat*) and 4 cities with district rights, i.e. Krosno, Przemyśl, Rzeszów and Tarnobrzeg. All the districts consist of the total of 160 communes (Polish: *gmina*), including 16 urban, 109 rural and 35 mixed urban-rural communes. Their area comprises 50 towns, including 34 located within mixed urban-rural communes. The administrative units within the region are greatly varied in terms of both size and socio-economic development. Economy of the region is mainly based on industrial operations related to aviation, chemical, glass and electromechanical sectors.

At the level of commune, it was impossible to identify the required number of professions classified as creative, and due to this an assessment was carried out for qualities indirectly representing this type of capital.

The surveys, sharing some of the questions, were undertaken in two groups of purposefully selected respondents. Given the role of self-government in local development it was assumed that the survey should be addressed to all the 160 commune offices in the Podkarpackie. The survey, carried as a computer-assisted web interview (CAWI), was preceded with a phone call informing about the study and asking the respondent to complete the questionnaire. The questionnaire was completed in July and August 2015. In the offices, the surveys were completed by three randomly selected employees holding various positions in the organisational hierarchy. Six communes (urban commune of Dynów, Gawłuszkowice, Nowa Szarżyna, Sokołów Małopolski, Strzyżów, and Żołyńia) refused to participate, despite renewed invitations. Five communes did not provide the three requested responses. Hence, out of the originally stipulated population of 480 respondents, the completed questionnaires were received from 453 subjects.³

³ General research results are presented in the monograph by Szara, K. 2017 'Uwa-

The questionnaire contained questions developed on the basis of the literature on the subject of creativity, barriers to its development and conditions characterizing the category of: talent, technology, tolerance and cooperation.

It should be noted that the following catalog of variables describing the “3 T” category is of a relative nature. Municipalities are open systems, therefore there is an exchange with the environment. What is happening in the commune has its sources in the surrounding. It confirms the influence of global factors. However, for the deliberations it seems advisable to identify determinants that affect the possibility of building creative capital, which at the same time means that the commune has the conditions for the development of this capital and, by analogy, this variable can be taken into account in local development.

The technology in the author’s opinion can be characterized by assessments made by the respondents. They have a subjective character, but it should be noted that they were granted by people who work and live in the space of given municipalities. They, as stakeholders, have the most knowledge about the state of technological advancement and its use. Variables describing talent indicate the possibilities of its development in the education process and investment awareness. However, the respondents’ opinions seem to be valuable as to how educational values are important in the community. Also, representatives of local stakeholders have the greatest knowledge of small local communities, including local artists, creators of creative capital representatives.

Tolerance was assessed in the area of openness to change, acceptance of other views, multiculturalism, and cultivation of tradition. The description of talent, technology, tolerance responsible for creating the conditions for the development of creative capital was created using the weighted average

runkowania i możliwości aktywizacji kapitału kreatywnego jako determinanty rozwoju lokalnego na przykładzie gmin województwa podkarpackiego’ *Prace naukowe Wydziału Ekonomii Uniwersytetu Rzeszowskiego, Seria Monografie i Opracowania no. 23, Rzeszów: Wyd. UR, 1- 335.* The results of the research concerning a group of employees of commune offices were presented in the study: Szara, K. 2016 *Możliwości wykorzystania kreatywności w organizacji, BPM vs. HRM* in: M. Kunasz (ed.) *Seria Zarządzanie procesami w teorii i praktyce no.4 Szczecin: Wyd. Uniwersytet Szczeciński, pp. 109- 119* therefore, they were omitted in this article.

called the impact ratio for the category of assessments made by employees and residents.

The ranking of features describing the variables characterizing the development of the commune, with particular emphasis on the activation of creative capital, was expanded on the basis of literature into a category called “cooperation”, referring to participation in the life of the commune’s culture. This word appears in the definition of own creative capital. Cooperation is also an element of social capital and a feature of human capital. Through this feature, it is possible to more thoroughly verify the role of social capital, which Florida proposed to replace with creative capital.

Inclusion of the definition of cooperation results from the ability to obtain and process information, skills in working within social or economic links.

Both access to information and activities for the benefit of the commune community are associated with the organization of events, involvement in joint work in the commune, activities in the area of the commune’s goal. At the same time, they point to the relations between the community in the commune and its “relation” to creative capital. The selection of this criterion is subjective based on the respondents’ opinions, while different categories can be included in the research. The evaluation and description for the variables were carried out separately, which means that they do not distort the remaining results. Due to the degree of detail of the analysis, weighted average scores were presented, no detailed description of the distribution of responses was presented.

In the case of employees of the commune office, it was additionally expanded to assess the possibility of using creativity in the office.

The other group of respondents comprised residents of various communes across the Podkarpackie. The survey based on PAPI method was undertaken among randomly selected subjects. It was assumed that the Podkarpackie has a population of approximately 2,130,000³. The adopted fraction was at the level of 50%, maximum error of 5%, significance level of 5%, which resulted in a sample of 385 surveys. Given the difficulties faced by studies based on the surveys, particularly due to incomplete responses, the number of participants was increased by 50. The resulting statistical sample made it possible to obtain reliable information regarding the entire population. Ultimately, the data from 418 correctly completed

questionnaires were taken into account in the analyses. The responses were selected by the subjects in a scale from 1 to 7.

Due to the random selection, 26.1% of surveys from urban communes were obtained, 29.2% from urban and rural communes and 44.7% from rural communes. Respondents mostly lived in rural areas (64.11%), which reflects the regional structure of the voivodeship. This paper will analyse the results of the study of this group due to the fact that these are the residents of communes who can join the development process. The development of local initiatives is associated with the level of activity of residents. The latter depends on the entrepreneurial, innovative and creative values and attitudes they represent. Among the group of the surveyed inhabitants of the Podkarpackie the majority of respondents are young people, aged 18–24 (69.37% of respondents). In the 25–35 age group there were 17.7% of respondents, while the 36–45 range represented 7.17%, the remaining 5.5% were over 45 years old. The advantage of young people in the study was dictated by theoretical contact with creativity during previous education, which was verified before the start of the study. Similarly, young people are much less burdened with stereotypes that might suggest partial answers. Due to the gender population of the Podkarpackie population, women represented 69.14% and men represented 30.86%. Definitely more as 64.11% of respondents represented the rural area, the remaining 35.89% were represented by communes. People with different education levels participated in the study. The most, or 41.62%, were people with secondary education. The respondents with BA degree accounted for 21.77%, with higher education 19.62%, primary education was 14.11% and 2.88% of respondents with vocational education.

As a synthesis of the results of the research, the grouping of communes with the Ward method was presented.

In order to determine relative creative attractiveness of all the communes in the Podkarpackie, they were subjected to clustering with the use of Ward's method. It is generally believed to be most effective in creating homogenous clusters (Metody, 2006).

The sequence of operations in Ward's method is similar to the procedures applied in other agglomerative clustering methods. Significant differences occur in the parameters applied in the formula. In the procedure matrixes of taxonomic distances with $n \cdot n$ dimensions are determined; these

comprise pairwise distances for all objects. The matrix is symmetric to the main diagonal made of zero values exclusively.

Pairs of objects (and subsequently clusters) are determined based on the smallest mutual distances. The objects are assumed to have numbers “p” and “q”, where $p < q$.

Further on “p” and “q” are joined into one cluster which occupies position marked with “p” number. Concurrently, the object (cluster) marked with “q” is deleted and higher numbers of clusters are decreased by one. This way, the dimension of the matrix is decreased by 1.

The distance of the new cluster from the other clusters is determined based on the formula:

$$D_{pr} = a_1 \cdot d_{pr} + a_2 \cdot d_{qr} + b \cdot d_{pq}$$

r runs number of clusters other than “p” and “q”

D_{pr} – distance of a new cluster from the cluster marked with “r” number

d_{pr} – distance of the original “p” cluster from “r” cluster

d_{qr} – distance of the original “q” cluster from “r” cluster

d_{pq} – mutual distance of the original “p” and “q” clusters

a_1, a_2, b – parameters which in Ward’s method have the following formulas:

$$a_1 = \frac{n_p + n_r}{n_p + n_q + n_r}$$

$$a_2 = \frac{n_q + n_r}{n_p + n_q + n_r}$$

$$b = \frac{-n_r}{n_p + n_q + n_r}$$

In these formulas, “n” represents the number of single objects in the specific objects.

Tree diagram is created in course of interpretation of the identified clusters. In the present study the findings are shown on a map.

Typology of communes based on determinants of creative capital development

The variables to be assessed were selected based on the literature related to the subject, taking into account the local nature of the study. The quality of collaboration supported the definition adopted by the author. The descriptive determinants (characteristics – Table 2) included in a survey and assessed by respondents showed effects of specific factors in local development and were indirectly connected with creative capital.

The assessment made by the respondents shows that in the group characterising the technological conditions in the communes, the openness of people to new technological solutions and an implementation of innovations in the commune are the most important issues (Table 2).

Table 2. Ranking of variables describing the categories of talent, technology, tolerance and cooperation in the opinion of residents

Variables/ characteristics		Average answers	Ranking
technology	People's openness to new technologies	4,65	1
	Implementation of innovations by businesses in the commune	4,61	2
	Capacity to apply specialist knowledge by the local people, at work and in personal life	4,49	3
	Dominance of small businesses	4,38	4
	Dominance of high technology business	3,88	5
talent	Application of their own diverse abilities by people	4,86	1
	Expenditure related to self-education (additional education after the age of 18)	4,66	2
	Local people's investments in culture and art	4,62	3

Table 2. Ranking of variables describing the categories of talent, technology, tolerance and cooperation in the opinion of residents

Variables/ characteristics		Average answers	Ranking
talent	Local community awareness of its own values	4,59	4
	Artistic talents of the local people (related to music, painting, sculpture, dancing and acting)	4,49	5
	Awareness of the value of education in the local community	4,47	6
	Emotional sensitivity, ability to empathize with others	4,31	7
tolerance	Identification with the place and community	5,03	1
	Cultivation of local traditions	4,80	2
	Openness to change	4,65	3
	Acceptance for other people's views by the population of the commune	4,35	4
	Acceptance for multiculturalism	4,12	5
collaboration	Organization of common events	4,98	1
	Involvement in the life of the local community	4,80	2
	Attention of the local residents to common goals and needs	4,77	3
	Available information	4,66	4
	Initiating targeted operations with inhabitants of other communes	4,56	5

Source: elaborated by the author, based on research findings

The assessment was made by assigning the first place in the ranking of the highest weighted average. This is mainly related to the absorption of knowledge about technological novelties, which in the era of computer science, mobile telephony and video games is not difficult, especially since

young people want to have such devices, and the age of using them decreases. The second position in the ranking of entrepreneurship development testifies to the acceptance of commune progress in this direction, which is a legitimate activity in the market economy. The third position was taken by an ability to use specialist knowledge by people in the commune at work and in personal life. Technology determines development, also indicates the advancement of society, and it is important at the global level but also at the local level.

The category of talent is assessed through the prism of human capital. It is connected with the level of education; hence, the awareness of further education, also throughout life, is important. Recognition of education as a value testifies to the need to develop a human factor in the commune, including creative capital. The most important in the opinion of respondents was the use of various skills by people, which indirectly proves their creativity.

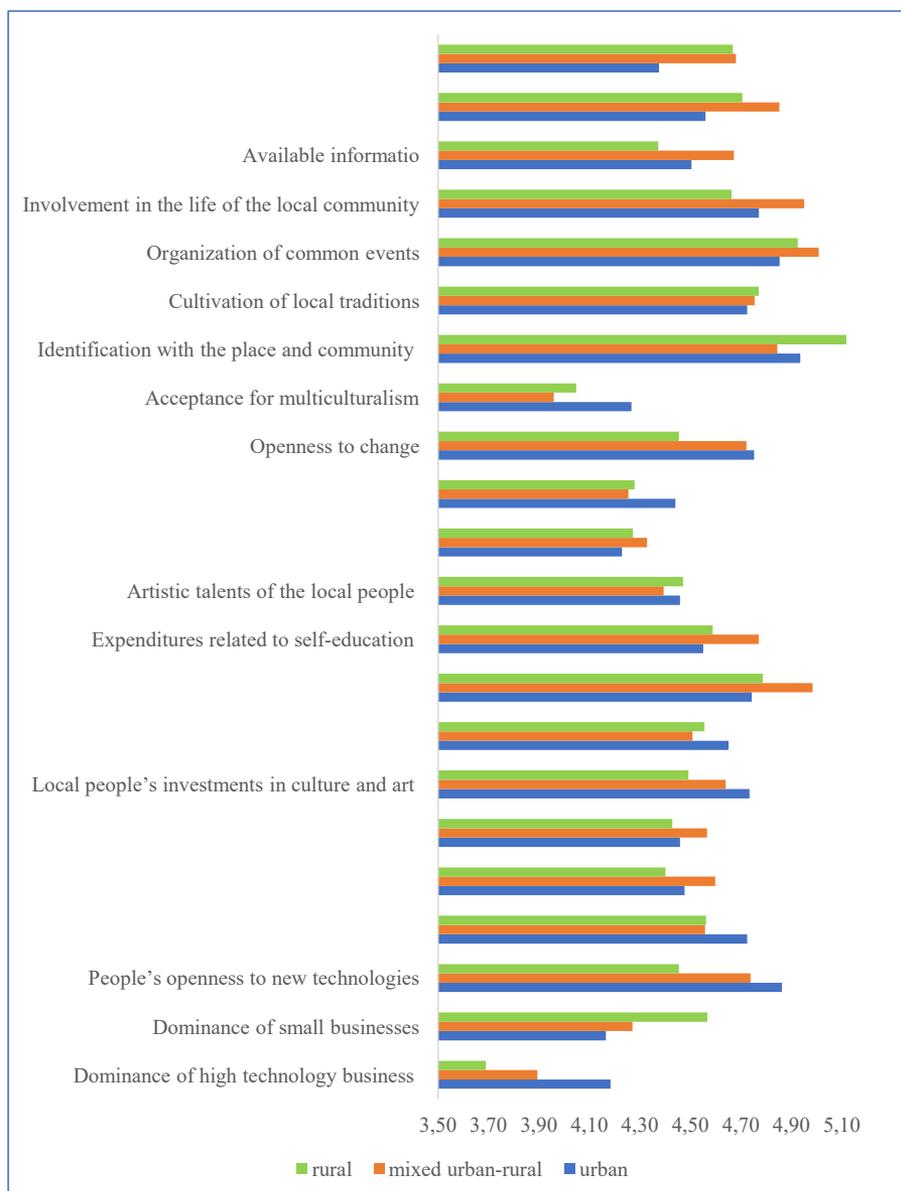
For sociologists analysing the local community, the features that were adopted as indices of tolerance in communes are important. Identity with place, community was the most important variable describing this criterion in the combined list of all characteristics. It is important to cultivate local traditions, which came second. In the opinion of the residents, the openness to changes that occur in the life of every human being was also indicated.

In the list of features describing the criterion of cooperation, the organization of joint events is of the greatest importance, which proves the participation of the community in such undertakings. This confirms successively the commitment to the community and the care of residents for common goals and needs. Respondents also appreciated the need for information, mainly in this context referring to the development and activities of culture in the commune, awarding this variable the fourth position in the ranking.

There are differences in the rankings of the features listed for the types of communes. Among the weighted averages for urban communes, one can see the preference in the description of features characterizing tolerance (Fig. 1).

Compared to other types of communes, the scores awarded to rural communes are notably lower. The constructed ranking of features for individual types of communes indicates a similar tendency in respondents' answers for rural communes, as in the case of urban-rural communes. The

Figure 1. Average answers of respondents in the layout of types of communes (for the readability of the chart a scale of 3.5 to 5.1 was started)



Source: author's own study

results obtained for urban communes are confirmed by the conclusions from the literature on better predispositions of urban areas for the development of creative capital.

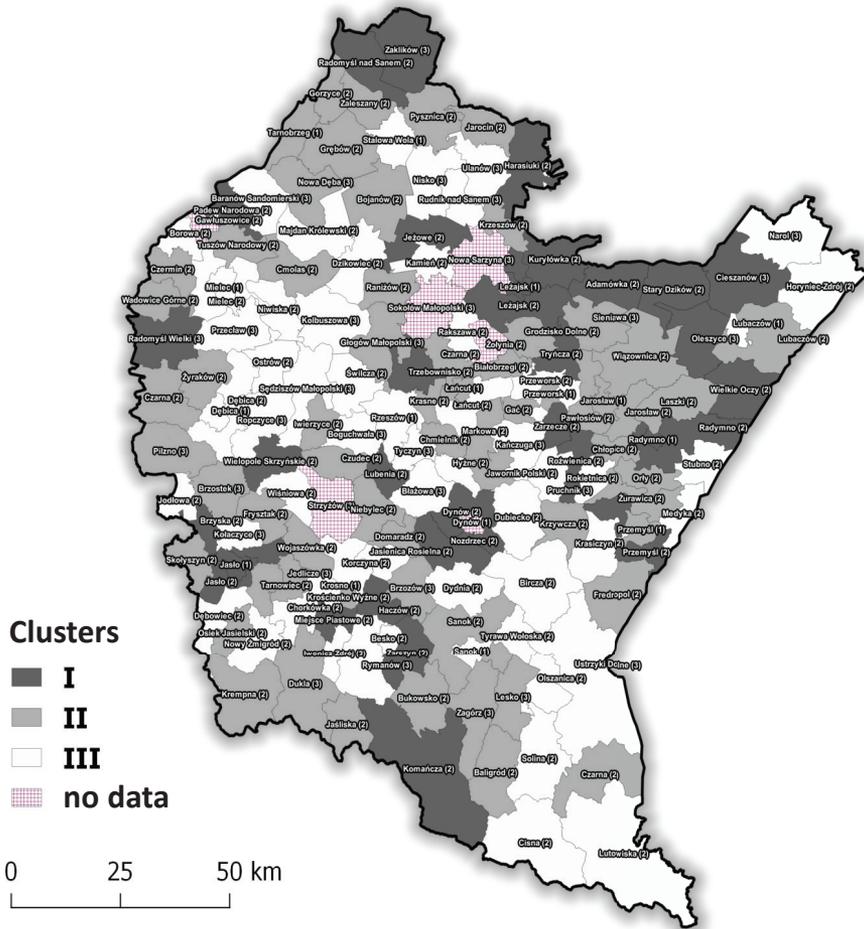
The features describing the distinguished 3T categories were verified by analysing the correlations between them. The correlations allow evaluating the relationship between features, signifying important similarity, an analogy in the behaviour of two variables. The increase of one characteristic causes the increase of the other. The strength of the compounds was evaluated because of the strength of the properties. Many very high correlations were obtained between the analysed features, which proves their statistical significance and their co-occurrence with each other⁴.

In order to determine the relative attractiveness of communes for the development of creative capital, a grouping of all the Podkarpackie communes was carried out using the Ward method, which belongs to agglomeration grouping methods based on the minimization of variance criterion. In general, it is considered to be the most effective in creating homogenous clusters (Wierzbińska and Sobolewski 2002). Using taxonomic methods allows the separation of communes with a similar level of surveyed traits. The data obtained from responses of residents as well as employees of commune offices were used. The communes were grouped into three clusters. Cluster I comprised 63 communes – Map 2.

These were communes which, based on the responses, obtained the scores similar to the mean values for the entire population. The lowest differences from the means were found in the case of the characteristics related to technology and the highest in those describing talent. In all the categories of responses, the specific descriptive characteristics were found to range from 94 to 111% of the mean values (=100). Therefore, based on the respondents' opinions, it can be concluded that these communes are characterised by good conditions related to the categories of talent, technology, tolerance and collaboration.

⁴ Detailed correlation results and a description of static analyzes are included in the monograph by Szara, K. 2017 'Uwarunkowania i możliwości aktywizacji kapitału kreatywnego jako determinanty rozwoju lokalnego na przykładzie gmin województwa podkarpackiego' *Prace naukowe Wydziału Ekonomii Uniwersytetu Rzeszowskiego, Seria Monografie i Opracowania* 23: 232–234.

Map 2. Clusters of communes of the Podkarpackie according to characteristics



Source: elaborated by the author (designations (1) – urban, (2) – rural, (3) mixed urban-rural commune)

Cluster II comprised 32 communes, including three urban communes, Leżajsk, Radymno, Jasło, 4 rural communes, Zaklików, Cieszanów, Oleszyce, Radomyśl Wielki. The remaining are mixed urban-rural communes. These areas feature poor conditions in the opinion of respondents assessing the categories defined in 3T model related to determinants of creative capital

development. The values of the assessments were lower than the average scores calculated for the entire population, ranging from 70 to 88% of the means. One disadvantage of these communes is linked with the fact that they are located at a considerable distance from large cities.

Cluster III is a group of 59 communes, including the urban communes of Dębica, Krosno, Lubaczów, Mielec, Rzeszów, Sanok, Stalowa Wola. These are areas, which in the assessment of characteristics predisposing for development of creative capital received 5–16% higher scores, in comparison to the mean values for the entire population. Based on the respondents' opinions it can be assumed that these communes have very good conditions for development of creative capital related to the categories of talent, technology, tolerance and collaboration designed to promote the growth of this capital. Geographically these communes are located along interconnected roads, which may reflect relation between geographical location and the obtained scores.

Discussion

The analysis of the present findings shows that conditions promoting the development of creative capital are associated with the location: either urban, rural or mixed urban-rural. In the Podkarpackie the most beneficial conditions for creative capital development are found in urban communes. The need for development of creative capital was also identified in rural communes of the region. The opportunities available in these communes are poorer, compared to their urban equivalents, yet this does not mean that the capital has no chances for a growth. Assumptions adopted with reference to Florida's theory regarding preferences for urban areas, are also consistent with preferences of people choosing urban areas as a place for settling down. This does not mean that in rural areas there may be no advancements in the phenomenon of creativity. People living in rural areas also have their needs and want to be involved in the affairs of their local community. It is important that these needs are acknowledged by employees of municipal offices who directly influence policies defined for the relevant area. Hence, it is necessary to consider creativity in defining directions for local development. Similar recommendations can be found in research findings related to Kentucky. These authors, however, focused

on tourism and on attractiveness of facilities from the viewpoint of creative capital development in this area.

Relatively comparable findings pertaining exclusively to conditions promoting creative capital growth can be found in a study by Bontie and Muszta who focus on advantages in urban areas. On the other hand, in a study by McGranahan, Wojan and Lambert, one can read about rural areas and conditions supporting growth of creative class. In these communities, the combined effects of entrepreneurship and creativity lead to economic success. The growth of creative capital in a rural area standing out for tourist attractions, i.e. Salem, Sweden is reported by Thulemark and Hauge (2014). People constituting creative class are recognised as the foundation of creative capital, and they are highly diverse and motivated by different preferences.

Based on the findings acquired in the communes of the Podkarpackie Region, Poland, it is possible to identify some factors describing conditions which promote development of creative capital. This is consistent with the approach used by Florida who argued that development of creative capital occurred in open and tolerant regions. These qualities definitely describe the urban communes identified based on the quantitative characteristics. Determination related to openness of local community may be confirmed by a fourth T related to terrain attractiveness, adopted by Stolarick (2008).

In practice, the results of the study correspond not only with Florida's theory of creative class, but also with Ch. Landry's theory of creative milieu (2013). The findings obtained at the local level are convergent with the assumptions of this theory related to cities.

Cities, as locations of thriving creative capital (Florida 2012; Boren and Young 2013; Urike 2016; Cunningham and Higgs 2008, Majer 2014) are areas to which it is attracted and where it accumulates.

Development-related differences between urban and rural areas are increasing (Gorzalak 2009; Smętowski 2014), which is linked with the interest in creative capital in these areas (Hatcher, Oyer and Gallardo 2011).

According to this author, due to the fact that it is not possible to assess the size of creative class and GDP at the local level, the degree of their comparability is only limited to the selected factors distinguished in the above studies.

Conclusions

The research on creative capital in the Polish realities does not have a long history. It most frequently focuses on an identification of creative class at the level of regions. Another novel research area is related to creative industries and focuses on identifying creativity in business operations.

In a territorial unit, such as a commune, there are conditions for identifying and assessing an activity of creative capital with the use of statistical instruments.

An attempt to implement 3T methodology was made with reference to conditions existing in the communes. Neither synthetic creativity index nor partial index were calculated due to the lack of corresponding data. No comparisons were made regarding the size of creative class. Technology, tolerance and talent were adopted as determinants of local development. They were examined with the use of available data. The findings show that at the local level it is possible to identify creative capital based on existing favourable conditions.

Determinants of creative capital development were found to correlate with locations of urban, rural, and mixed urban-rural type. In the Podkarpackie better conditions for development of creative capital are found in urban communes. Moreover, a need for development of creative capital was identified in the rural communes of the Podkarpackie. The conditions in these communes are less favourable than those in the urban areas, but it does not mean that there are no opportunities for development of this capital.

In the present study, the relationship between the theory of creative capital and the local level was reflected in the characteristics describing 3T criteria. In the opinion of the residents, the category of tolerance and cooperation was highly rated.

The findings presented are of a general nature and they do not describe in detail all the examined determinants assessed by the respondents. The study made it possible to look at the theory of creative class from the viewpoint of the conditions existing in communes, and it confirmed that creative capital may be identified and may develop not only in urban but also in rural areas, which in the case of the Podkarpackie comprise majority of the territory.

The research on creative capital is relatively small. It is also a new research problem in the case of rural areas.

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