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## SPATIAL DIVERSITY OF ENTREPRENEURSHIP IN THE COUNTIES OF ŚWIĘTOKRZYSKIE PROVINCE IN THE CONTEXT OF CREATING COMPETITIVE REGIONS

*The region is perceived as a complex system created by man, including society, economy and environment. Regional economic development is a complex phenomenon, dependent not only on the combination between resources and factors of production, but also on the grounds of social, political or ecological, and cultural nature. The aim of the article is to present a positive impact on the business development of the region in terms of, among others, the number of business entities, individuals engaged in economic activity, employment and unemployment rates. For analysis, the synthetic measure the level of economic districts, and those areas of diagnostic variables were used. The analysis was carried out in a counties of the świętokrzyskie voivodeship. As source material, data from the Local Data Base of the Central Statistical Office for the 2008, 2012 and 2016 were used. The condition for economic development is the continuous growth of entrepreneurship and competitiveness in local or regional scale. Entrepreneurship is an important factor in development of regions. Enterprises are an important component of the economic structure. They are an important source of jobs, create entrepreneurial spirit and promote innovation, determine the development of competitiveness and prevent unemployment. Entrepreneurship development aligns regional disparities. It contributes to the living conditions of local communities. Regardless of the method of aggregation of synthetic measure in 2016 in the studied period high on the list were kielecki, skarżyski, starachowicki, ostrowiecki counties (industrial units in the region). At the other extreme were kazimierski, opatowski, pińczowski counties (agricultural units).*

**Key words:** entrepreneurship, the region, the region's competitiveness, synthetic measure.

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## ТЕРИТОРІАЛЬНА РІЗНОМАНІТНІСТЬ ПІДПРИЄМНИЦТВА У ПОВІТАХ СВЕНТОКШИШЬКОГО ВОЄВОДСТВА У КОНТЕКСТІ СТВОРЕННЯ КОНКУРЕНТНИХ РЕГІОНІВ

*Регион, як складна система, охоплює суспільство, економіку та природне середовище. Мета статті – представити вплив підприємництва на розвиток регіону. Аналізи були проведені на основі спостережень Свентокшишського воєводства у 2008, 2012 та 2016 роках. Підприємства є джерелом робочих місць, вирішують питання розвитку конкурентоспроможності та боротьби з безробіттям. Упродовж аналізованого періоду височили кельцеві повіти, Скаржиски, Стараховице та Островецьові повіти.*

**Ключові слова:** підприємництво, регіон, конкурентоспроможність регіону, синтетичний захід.

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## ТЕРИТОРИАЛЬНОЕ РАЗНООБРАЗИЕ ПРЕДПРИНИМАТЕЛЬСТВА В ОКРУГАХ СВЕНТОКШИШКОГО ВОЕВОДСТВА В КОНТЕКСТЕ СОЗДАНИЯ КОНКУРЕНТНЫХ РЕГИОНОВ

*Регион, как сложная система, охватывает общество, экономику и природную среду. Цель статьи – представить влияние предпринимательства на развитие региона. Анализ проводился на основе Свентокшишского воевод-*



ства в 2008, 2012 и 2016 годах. Предприятия являются источником рабочих мест, принимают решение о развитии конкурентоспособности и противодействуют безработице. В анализируемом периоде были высокие повяты Кельце, Скаржиско, Стараховице и Островецкие повяты.

**Ключевые слова:** предпринимательство, регион, конкурентоспособность региона, синтетическая мера..

**Introduction.** The region is perceived as a complex system created by man, including society, economy and environment (Naruszewicz 2004). He participates in market processes. It cooperates with other units and at the same time competing for inter alia investments, human capital. The most important characteristics of the regions include inter alia: 1) internal and external relationships; 2) determined economic specialization; 3) the ability to formulate the objectives and their implementation; 4) the operation of an urban center that acts as an integrating factor. The new meaning to the regions is given by the term „regionalization”, being associated with the increasing importance of regions in the realities of globalization (Korenik (red.) 2011). As Heller writes, the region is an area of such characteristic features that they allow to separate it from the larger territory, so that it can be a whole (Heller 2000). Closer surroundings are the local community and entities operating in the region, the further surroundings are other regions of the country, international organizations and institutions. These operators come into a variety of relationships and interactions between them in the region and outside the region (Światowy, Lisewska 2004).

Regional economic development is a complex phenomenon, dependent not only on the combination between resources and factors of production, but also on the grounds of social, political or ecological, and cultural nature. You could say that it is a social process that requires acceptance by social groups of the region and their active attitude (Huczek 2012).

**Aim, material and research method.** The aim of the article is to present a positive impact on the business development of the region in terms of, among others, the number of business entities, individuals engaged in economic activity, employment and unemployment rates. For analysis, the synthetic measure the level of economic districts, and indicated areas of diagnostic variables were used. The analysis was carried out in a counties of the świętokrzyskie voivodeship. As source material, data from the Local Data Base of the Central Statistical Office for the 2008, 2012 and 2016 were used.

The first phase of research is the choice of variables (describing the aspect of entrepreneurship in the region) and their preliminary analysis. Removed from the set were variables with low spatial variability (coefficient of variation less than 0.10) and a high correlation of variables. According to the method of reverse matrix of of the correlation coefficients the diagonal elements (variable unduly correlated) with values greater than 10 are eliminated from the set of variables (Zeliaś 2000, Wysocki 1996). Malina notes that a large value of the correlation coefficient results in duplication of information of analyzed phenomenon and may lead to incorrect conclusions resulting from the revaluation of one area at the expense of other areas of life, or business (Malina 2004 s. 96-97).

In the next stage the standardization of values of simple features was made using the procedure of zeroed unitarization using the following formulas:

$$z_{ij} = \frac{x_{ij} - \min_i x_{ij}}{\max_i x_{ij} - \min_i x_{ij}}, \text{ gdy } x_i \in S \quad (1),$$

$$z_{ij} = \frac{\max_i x_{ij} - x_{ij}}{\max_i x_{ij} - \min_i x_{ij}}, \text{ gdy } x_i \in D \quad (2),$$

where: S-stimulant, D-destimulant;  $i=1, 2, \dots, n$ ;  $j=1, 2, \dots, n$ ,  $x_{ij}$  – value of j-feature for studied unit, max – maximum value of j-feature, min – minimum value of j-feature (Wysocki 1996; Mioduchowska-Jaroszewicz 2013; Dziekański 2016; Dziekański 2017; Dziekański 2015).

The standardization process was used to calculate the synthetic measure of development districts. The first method TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) allows to determine the value of synthetic measure for each object on the basis of the formula:

$$q_i = \frac{d_i^-}{d_i^- + d_i^+}, \text{ gdzie } 0 \leq q_i \leq 1, i = 1, 2, \dots, n; \quad (3)$$

where:  $d_i^+$  means the distance from the sample, the best individual in the population surveyed,  $d_i^-$  means the distance from anti-sample,  $q_i \in [0; 1]$ ;  $\max_i \{q_i\}$  – the best object;  $\min_i \{q_i\}$  – the worst object (Standar 2017, Kurzawa, Łuczak 2018). The idea of TOPSIS method is to determine the distance of considered object from ideal and non-ideal solution. The final result of the analysis is the synthetic index creating the rank of the studied objects (Hwang, Yoon 1981).



Then a synthetic measure based on the distance in real space was counted with Euclidean metric according to the formula:

$$OE_{it} = \sqrt{\frac{1}{p} \sum_{j=1}^p (1 - z_{ijt})^2} \quad (4),$$

where:  $i=1, 2, \dots, N$ ;  $j=1, 2, \dots, p$  ( $N$  is the number of objects (provinces), and  $p$  – number of features);  $z_{ij}$  – value of  $j$  feature for studied unit,  $\max$  – maximum value of  $j$  feature,  $\min$  – minimum value of  $j$  feature (Wysocki 1996). Synthetic measure enables the measurement of studied group in terms of selected features bringing the values to the compartment  $[0;1]$ . Metric value of 0 means the maximum positive value of each of the studied units (Trojak, Tokarski 2013).

Finally there was the presentation of individual variables describing the phenomenon studied (Dziekański 2015, Dziekański 2016).

### Entrepreneurship and the process of development of the region

The condition for economic development is the continuous growth of entrepreneurship and competitiveness on the local or regional scale. Entrepreneurship is an important factor in development of regions. This involves the creation of new jobs and improvement of living conditions of the local community. Klasik and Kuźnik define regional development as sustained growth of economic potential of regions, their competitive strength and the level and quality of life. The essence of regional development is to ensure consistency in its three dimensions: economic, social and territorial (Klasik, Kuźnik 2001).

Owned structural features of the regions and the situational factors existing on their territory mean that the regions differ in the scale of entrepreneurial activity. Currently to the basic factors of production – labor, land, capital – one must also add an entrepreneurial attitude. They contribute to the creation and implementation of products, at the same time stimulating the regional economy (Jędrzejewski 2015). Among other factors, from the point of view of regional policy and economic activity, essential for the development of the region are, inter alia: the development and restructuring programs; tax breaks for investors; action in terms of human resources; strengthening of endogenous territorial capital (Latocha 2003). Other factors supporting entrepreneurship and development of the region, include: demographic characteristics of the region, the situation on the regional labor market, the viability of the economic structure of the region, the quality of human capital, the prestige of entrepreneurs in the region, housing and standard equipment infrastructure (Huczek 2016).

### Level of entrepreneurship in świętokrzyskie voivodeship – evaluation of spatial diversity

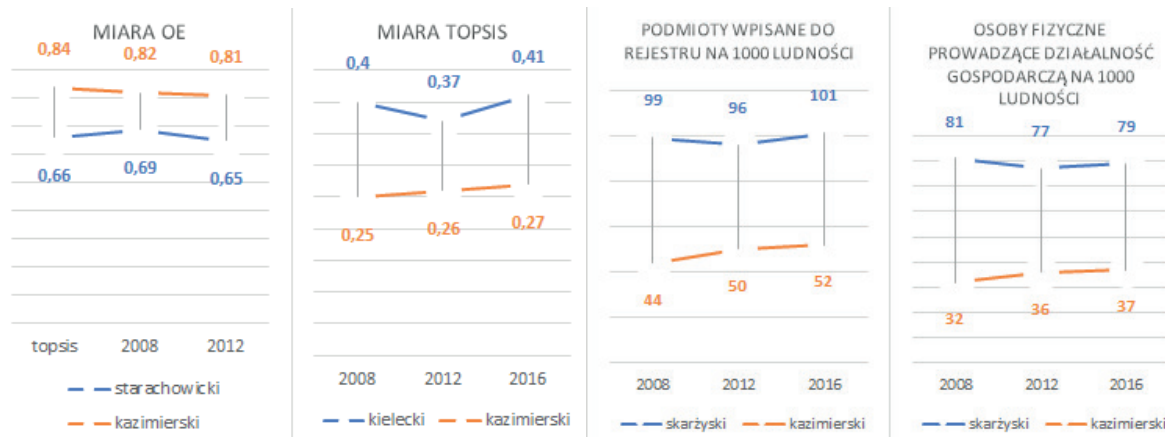
In 2008 synthetic measure of development based on the distance in real space with Euclidean metric ranged 0,66 (starachowicki province, the best unit) – 0,84 (kazimierski, the weakest), in 2012 from 0,68 (starachowicki, skarżyski) – 0,82 (kazimierski) and in 2016 from 0,65 (starachowicki) – 0,81 (Chełm). Synthetic measure based on the TOPSIS method in 2008 valued from 0,25 (kazimierski; the weakest unit) to 0,41 (kielecki, the best unit), in 2012 from 0,26 (kazimierski) to 0,38 (skarżyski) and in 2016 from 0,27 (kazimierski) to 0,41 (kielecki). Regardless of the method of aggregation of synthetic measure high in the rank were kielecki, skarżyski, starachowicki, ostrowiecki provinces (industrial units in the region). At the other extreme were kazimierski, opatowski, pińczowski provinces (agricultural units; table 1 and illustration 1).

Table 1

Synthetic measure of the development of the provinces in Świętokrzyskie voivodeship

OE measure	2008	2012	2016	TOPSIS measure	2008	2012	2016
starachowicki	0,66	0,69	0,65	kielecki	0,40	0,37	0,41
skarżyski	0,67	0,68	0,66	skarżyski	0,39	0,38	0,4
kielecki	0,69	0,70	0,67	starachowicki	0,39	0,36	0,4
ostrowiecki	0,67	0,70	0,68	ostrowiecki	0,37	0,35	0,37
konecki	0,76	0,74	0,70	konecki	0,32	0,33	0,36
buski	0,71	0,73	0,71	staszowski	0,36	0,37	0,35
staszowski	0,7	0,68	0,71	włoszczowski	0,32	0,32	0,35
sandomierski	0,71	0,73	0,72	buski	0,34	0,32	0,34
włoszczowski	0,76	0,75	0,72	sandomierski	0,34	0,31	0,33
jędrzejowski	0,76	0,77	0,75	jędrzejowski	0,31	0,29	0,32
opatowski	0,73	0,78	0,77	pińczowski	0,31	0,3	0,31
pińczowski	0,77	0,77	0,77	opatowski	0,33	0,28	0,29
kazimierski	0,84	0,82	0,81	kazimierski	0,25	0,26	0,27

Source: own authoring (sorter according to 2016).



**Illustration 1. Measures of development and entrepreneurship of selected provinces of świętokrzyskie voivodeship**

Source: own authoring/

Assessment of the level of development of entrepreneurship was made by analyzing the number of persons registered per 1000 of population. In 2016 the most entities were in the districts: skarżyskie, ostrowieckie, sandomierskie. The fewer entities were in pińczowskie, kazimierskie and opatowskie province. The level of self-employment has been measured as the number of physical persons conducting economic activity per 1000 inhabitants of the county. In 2016 most people carried on businesses in the counties: skarżyski, ostrowiecki, kielecki. The least active in this respect were the inhabitants of the district: pińczowski, opatowski and kazimierski.

Table 2

**Number of economic entities and individuals engaged in business activities in the districts of świętokrzyskie voivodeship (sorted according to 2016)**

entities registered per 1000 population	2008	2012	2016	natural persons conducting economic activity per 1000 population	2008	2012	2016
skarżyski	99	96	101	skarżyski	81	77	79
ostrowiecki	99	91	90	ostrowiecki	84	75	71
sandomierski	80	78	81	kielecki	55	59	63
konecki	78	76	80	konecki	64	61	63
starachowicki	76	75	79	buski	64	60	62
buski	77	74	78	włoszczowski	54	57	62
włoszczowski	66	72	78	starachowicki	61	58	60
kielecki	65	70	77	sandomierski	64	59	59
jędrzejowski	69	66	71	jędrzejowski	56	52	55
staszowski	70	69	71	staszowski	57	55	55
pińczowski	58	60	66	pińczowski	43	44	48
opatowski	61	59	62	opatowski	48	45	46
kazimierski	44	50	52	kazimierski	32	36	37

Source: own authoring.

In 2016 most new entities per inhabitants were registered in the counties: kieleckie, skarżyskie, koneckie (industrial units). In 2016 the fewer entities were created in: sandomierskie, opatowskie and kazimierskie. In the same year, most entities were crossed out in districts skarżyskie, włoszczowskie and kieleckie, the fewer in pińczowskie, opatowskie and kazimierskie.

The low level of unemployment in the period occurred in the districts: buskie, pińczowskie, włoszczowskie. In the analyzed period a large spatial variation of this phenomenon occurred (from 5,6 to 19,6 in 2016). The highest level of unemployment was noted in districts: ostrowieckie, opatowskie and skarżyskie. In 2016 the most employed per 1000 of population were noted in districts: starachowickie, staszowskie and włoszczowskie, the fewer in: opatowskie, kieleckie and kazimierskie.



Table 3

**Entities newly registered and crossed out in the REGON register per 10 thousand of the population  
in the districts of świętokrzyskie voivodeship (sorter according to 2016)**

newly registered units	2008	2012	2016	units crossed out from the register	2008	2012	2016
kielecki	65	87	87	skarżyski	68	78	100
skarżyski	74	94	86	włoszczowski	38	39	71
konecki	67	75	72	kielecki	42	52	69
starachowicki	68	70	67	ostrowiecki	39	68	68
włoszczowski	47	70	67	starachowicki	57	63	65
ostrowiecki	71	72	65	konecki	52	55	57
buski	46	46	62	jędrzejowski	43	43	48
staszowski	52	51	56	staszowski	38	47	47
jędrzejowski	55	55	55	buski	36	43	45
pińczowski	39	48	55	sandomierski	24	33	45
sandomierski	42	54	53	pińczowski	37	34	45
opatowski	40	49	47	opatowski	25	39	37
kazimierski	41	53	34	kazimierski	25	26	36

Source: own authoring.

Table 4

**Number of employed and the level of unemployment in the districts of świętokrzyskie voivodeship  
(sorter according to 2016)**

Employed per 1000 of population in total (person)	2008	2012	2016	Level of registered unemployment in total (%)	2008	2012	2016
starachowicki	208	194	229	buski	8,8	9,1	5,6
staszowski	186	182	186	pińczowski	8,1	9,8	7,6
włoszczowski	164	168	185	włoszczowski	13,6	14,3	8,5
konecki	162	161	167	sandomierski	10,1	12,8	8,6
skarżyski	190	167	166	staszowski	10,2	12,9	9,2
ostrowiecki	184	164	164	kazimierski	10	12,6	9,6
sandomierski	143	160	164	jędrzejowski	11,4	13,9	10,0
buski	138	143	154	starachowicki	14	18,8	10,6
pińczowski	138	153	150	kielecki	19,4	19,7	13,6
jędrzejowski	133	129	132	konecki	22	22,6	14,0
opatowski	125	111	119	ostrowiecki	16,1	22,2	14,6
kielecki	96	99	107	opatowski	16,3	22,6	16,5
kazimierski	92	80	87	skarżyski	22,2	27,4	19,6

Source: own authoring.

**Summary.** Enterprises are an important component of the economic structure. They are an important source of jobs, create entrepreneurial spirit and promote innovation, determine the development of competitiveness and prevent unemployment.

Entrepreneurship development aligns regional disparities. It contributes to the living conditions of local communities. It also creates new jobs, thus generally contributes to improving the economy of the region. We are dealing with a classic feedback of studied phenomena. It is a necessary element for the economic development of the region. It becomes necessary, therefore, to take appropriate measures to create favorable conditions for the taking up and pursuit of economic activity. Responsibility for the implementation of these measures falls largely on local authorities.

Regardless of the method of aggregation of synthetic measure in 2016 in the studied period high on the list were kielecki, skarżyski, starachowicki, ostrowiecki districts (industrial units in the region). At the other extreme were kazimierski, opatowski, pińczowski districts (agricultural units).

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