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SPATIAL DIVERSIFICATION OF THE LEVEL OF DEVELOPMENT AND THE FINANCIAL SITUATION OF RURAL COMMUNES IN THE ŚWIĘTOKRZYSKIE VOIVODSHIP

Key words: development, financial situation, rural commune, Świętokrzyskie voivodship

ABSTRACT. The aim of the article is to evaluate the spatial disproportions in the development of rural municipalities in relation to their financial situation with the use of a non-standard synthetic measure. The analysis in the area of finance and development of communes concerned the years 2011, 2014 and 2017. The study covered 70 rural communes in the Świętokrzyskie Voivodship. Data exploration was possible due to the use of data from the Local Data Bank of the Central Statistical Office and the Regional Audit Chamber. The method used in the work is a synthetic measure of development and the financial situation. Local self-government can fulfil its tasks when it is equipped with stable and efficient sources of income and an appropriate level of endogenous resources. The economic potential, infrastructure, financial resources are an important development factor. The group of communes with the best situation in terms of development was created, among others, by Sitkówka-Nowiny, Morawica and Strawczyn Communes, which are located in the Kielce district and are characterized by a good financial situation and economic potential. The research showed disproportions between rural communes characterized by an industrial function and units with a traditional agricultural function.

INTRODUCTION

Municipal self-government, as an independent entity, has a certain scope of freedom in deciding upon the way the subordinate area is developed, on common property and the implementation of public tasks. The competence of municipal authorities includes acting for the public good and satisfying the collective needs of residents, including the social, economic, ecological or residential sphere [Parysek 2001, p. 213-228]. The quality of municipality management is the effectiveness and efficiency of meeting needs in the conditions of having limited public financial resources and endogenous resources. They form the basis for the implementation of public tasks and determine the conditions for local economic development [Wojciechowski 2012, p. 234]. Socio-economic development is a process of positive social and economic changes, associated with an increase in both qualitative and quantitative well-being of inhabitants. It results from the rational use of internal and external factors of the development of a given territory [Adamowicz

2003, p. 17]. The development possibilities of particular regions are determined by their endogenous potential and exogenous environment. Territorial capital reveals the specificity of the place and its elements as well as its strategic value in market competition. As Tadeusz Markowski writes, it constitutes external benefits, available as a result of user interactions within the region [Markowski 2011, p. 25-44].

MATERIAL AND METHODOLOGY OF RESEARCH

The aim of the article is to evaluate the spatial disproportions of commune development in relation to their financial situation with the use of a non-standard synthetic measure. The analyses were carried out in the system of 70 rural communes in the Świętokrzyskie Voivodship. The source material was data from the Regional Audit Office (Kielce branch) and the Local Database of the Central Statistical Office for 2011, 2014 and 2017. When assessing the development of rural communes in the Świętokrzyskie Voivodship, social, economic, infrastructural and financial variables were adopted as partial measures.

In order to determine the measure of synthetic development, the following procedure was used:

1. The variables describing the development, infrastructure, economy, demography and financial situation of rural communes were defined and selected. From the set of variables, those characterized by low spatial variability and a high correlation of variables (according to the inverted matrix method) were removed [Malina 2004, p. 96-97].
2. The variables selected were subjected to the zero-uniformization procedure using the following formulas:

$$\text{for the stimulant } z_{ij} = \frac{x_{ij} - \min_i x_{ij}}{\max_i x_{ij} - \min_i x_{ij}} \text{ when } x_i \in S \quad (1)$$

$$\text{for the destimulant } z_{ij} = \frac{\max_i x_{ij} - x_{ij}}{\max_i x_{ij} - \min_i x_{ij}} \text{ when } x_i \in D \quad (2)$$

where: S – stimulant, D – destimulant; $i = 1, 2 \dots n$; $j = 1, 2 \dots n$, x_{ij} – means the value of the j -th characteristic for the studied unit, \max – the maximum value of the j -th feature, \min – the minimal value of the j -th feature [Dziekański 2017, Wysocki 1996, Kukuła 2000, Młodak 2006].

3. A synthetic measure of development was determined using the non-standard method based on averaging the normalized values of simple features, according to the formula:

$$S_i = \frac{1}{p} \sum_{j=1}^p z_{ij}; \quad i = 1, 2, \dots, p \quad (3)$$

where: S_i – a synthetic measure in the period under consideration, $i = 1, 2 \dots N$; $j = 1, 2 \dots, p$ (N is the number of objects (districts), and p – the number of features); z_{ij} – means the value of the neutralizing j -th characteristic for the given unit, \max – the maximum value of the j -th feature, \min – the minimum value of the j -th feature.

The indicator assumes a value between $[0,1]$. A value closer to unity means that the object is characterized by a high level of the analyzed phenomenon [Dziekański 2016, Mioduchowska-Jaroszewicz 2013, p. 127-140].

The studied area of rural communes in the Świętokrzyskie Voivodship was divided into four quartile groups. The size of the indicator in the first group means a better unit, the last one being the weakest. The cross-compliance of the results obtained was also verified based on the correlation coefficient. A scatter plot with a fit line for synthetic measures was also presented [Dziekański 2013, p. 148-163, Dziekański, Wyszowski 2018, p. 219-238].

RESEARCH RESULTS

Socio-economic development is a complex phenomenon and difficult to unequivocally and objectively evaluate. It depends both on endogenous and exogenous factors of economic growth [Kiczek 2015, p. 87-100]. It is worth emphasizing that the analyses carried out by Paweł Churski and co-authors [2013] and Monika Stanny [2013] show that the most important development factor, besides location in socio-economic space, is local finances. As Rebecca Hendrick points out, the financial situation cannot be described with one indicator since it is a complex phenomenon. It means the ability of municipalities to meet their financial obligations in a timely manner and ensure continuity in the provision of services [Hendrick 2004].

In the Świętokrzyskie Voivodship, we can observe the division whereby the North of the region is industrial while the South and East is agricultural, with a gardening and fruit-growing element. The Voivodship's industry was shaped in close connection with existing rock, chemical and energy resources. The metallurgical, machine and food industries also play an important role.

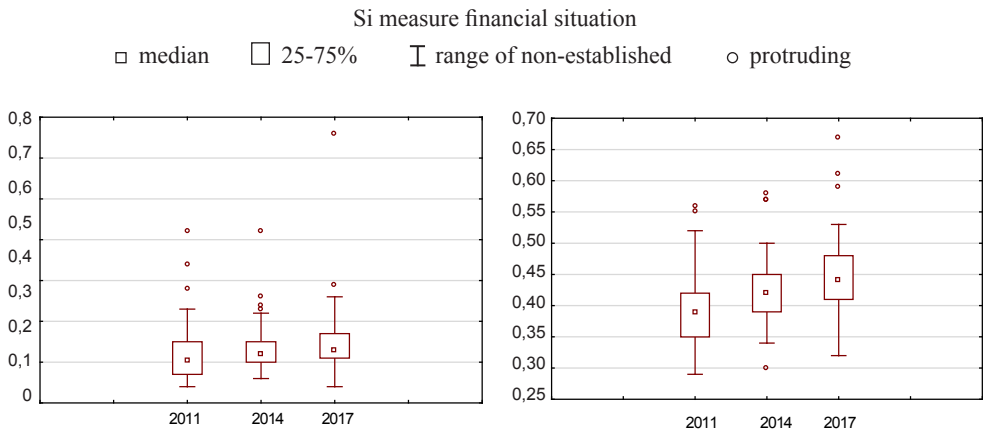


Figure 1. Diagram of the dispersion of rural communes in the Świętokrzyskie Voivodship in 2011, 2014 and 2017

Source: own study based on RIO data (Kielce) and BDL GUS

Table 1. Spatial differentiation of rural communes in the Świętokrzyskie Voivodship according to the measure of synthetic development in 2011, 2014 and 2017

2011		2014		2017				
<i>Si(r)</i>	<i>Gr</i>	<i>Si(r)</i>	<i>Gr</i>		<i>Si(r)</i>	<i>Gr</i>	<i>Si(f)</i>	<i>Gr</i>
0.56	A	0.57	A	Sitkówka-Nowiny	0.67	A	0.76	A
0.55	A	0.57	A	Morawica	0.61		0.39	A
0.52	A	0.58	A	Strawczyn	0.59		0.34	A
0.44	A	0.43	B	Piekoszów	0.48		0.27	A
0.45	A	0.47	A	Wiślica	0.48		0.14	D
0.38	C	0.48	A	Fałków	0.47	B	0.29	A
0.40	B	0.48	A	Kije	0.47		0.19	D
0.40	B	0.41	C	Łoniów	0.47		0.23	B
0.4	B	0.43	B	Łopuszno	0.47		0.26	B
0.37	C	0.40	C	Wodzisław	0.44		0.23	B
0.39	B	0.41	C	Złota	0.44		0.25	B
0.32	D	0.39	C	Bałtów	0.43	C	0.21	C
0.42	A	0.44	B	Łączna	0.43		0.21	C
0.36	C	0.40	C	Mirzec	0.43		0.26	B
0.36	C	0.41	C	Nowa Słupia	0.43		0.23	B
0.36	C	0.41	C	Obrazów	0.41		0.25	B
0.31	D	0.40	C	Waśniów	0.41		0.22	C
0.34	D	0.39	C	Mniów	0.40	D	0.21	C
0.32	D	0.41	C	Słupia (Jędrzejowska)	0.40		0.17	D
0.31	D	0.37	D	Dwikozy	0.39		0.20	D
0.35	C	0.37	D	Czarnocin	0.38		0.22	C
0.30	D	0.30	D	Nagłowice	0.33		0.16	D
0.32	D	0.35	D	Moskorzew	0.32		0.23	B

Si(r) measure synthetic development; *Si(f)* measure synthetic financial situation; sorting was made according to the value of the synthetic measure, 2017 development; the table shows the best and weakest unit in the surveyed population of rural communes by groups

Source: own study based on RIO data (Kielce) and BDL GUS

A synthetic measure of the development of rural communes in the Świętokrzyskie Voivodship indicates their spatial diversity. It is shaped by the economic character of the unit (industrial, agricultural, touristic), financial situation or infrastructure level. The value of the development measure fluctuated in 2017 ranging from 0.32 (Moskorzew, the weakest unit) to 0.67 (Sitkówka-Nowiny, the best unit). In 2014, the municipality of Strawczyn turned out to have the best measure of development (0.58), the weakest was found to be in Nagłowice (0.30), and in 2011 Sitkówka-Nowiny (0.56) and Klimontów (0.29), respectively. In 2011, 2014, 2017, Morawica and Strawczyn were also high. Nagłowice is also among the group of weakest communes. Interpretations over time can be captured between groups (table 1). The position of the units was also influenced by location in relation to the capital of the region – Kielce.

The box plot (figure 1) indicates a higher degree of dispersion of units in 2017 (in relation to 2014 and 2011), where the data is more diffused and assume more different values (see also the measure of the range, table 2). Dispersal is also evidenced by long whiskers and extreme observations (very different from the box), Morawica and Sitkówka-Nowiny Commune (Kielce district) were included in the group of shrouds, regardless of the surveyed year.

Analysis of the diversity of the synthetic measure of rural commune development in the Świętokrzyskie Voivodship indicates that in 2017, compared to 2014, the degree of

Table 2. Diversity of the measure of synthetic development and the financial situation of rural communes in the Świętokrzyskie Voivodship in 2011, 2014 and 2017

Data	Measure S_i development			Measure S_i financial situation		
	2011	2014	2017	2011	2014	2017
Standard deviation	0.07	0.06	0.08	0.06	0.05	0.06
Quartile deviation	0.04	0.03	0.03	0.04	0.03	0.03
max	0.52	0.52	0.76	0.56	0.58	0.67
min	0.14	0.16	0.14	0.29	0.30	0.32
Average	0.22	0.23	0.25	0.39	0.43	0.45
Quartile 1	0.17	0.20	0.21	0.35	0.39	0.41
Quartile 2 (median)	0.21	0.22	0.23	0.39	0.42	0.44
Quartile 3	0.25	0.25	0.27	-0.42	0.45	0.48
Gap	0.38	0.36	0.62	0.27	0.28	0.35
Quartile range	0.08	0.05	0.06	0.07	0.06	0.07
Classical variation	0.31	0.24	0.33	0.14	0.12	0.13
Positional volatility	0.20	0.11	0.13	0.09	0.07	0.08
Asymmetry	1.96	2.30	3.98	0.72	0.70	0.96

Source: own study based on RIO data (Kielce) and BDL GUS

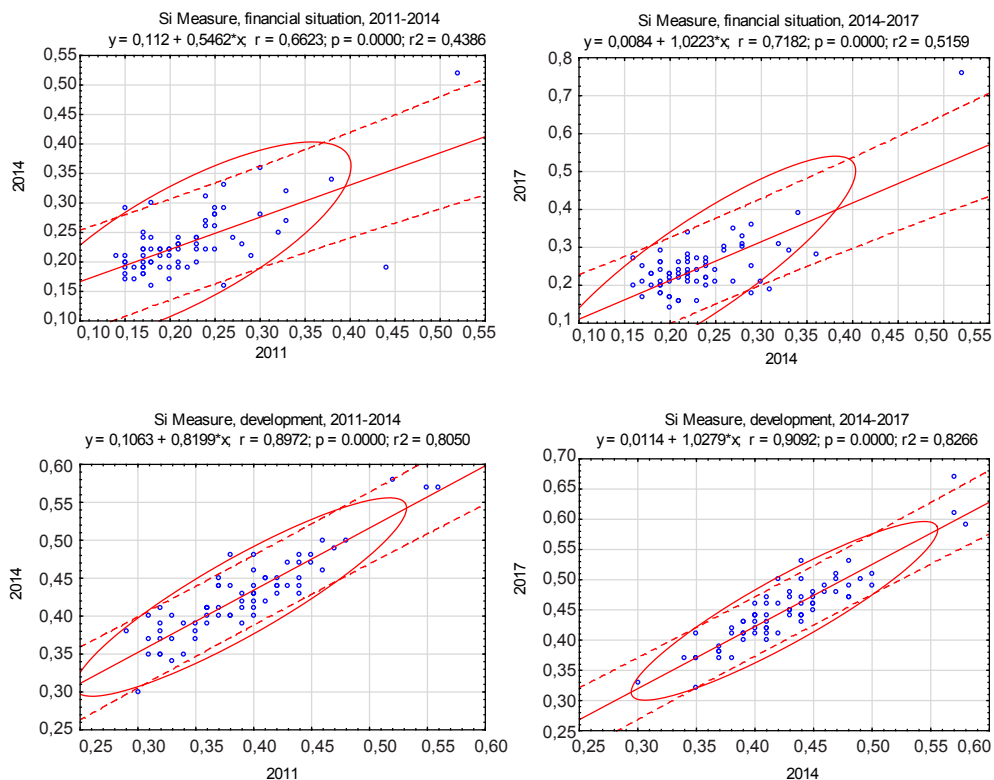


Figure 2. The relation of synthetic measures of development and the financial situation year by year with the adjustment of the regression line of rural communes in the Świętokrzyskie Voivodship
Source: own study based on RIO data (Kielce) and BDL GUS

diversification was stable (standard deviation 0.08-0.06, quartile deviation 0.03-0.03), with a simultaneous increase in dividends from 0.38 in 2011 to 0.62 in 2017. The relative stability of development level is indicated by the classic variation coefficient (0.31 in 2011 to 0.33 in 2017). In the analyzed years, the distribution of the value of the synthetic development measure was characterized by right-sided asymmetry (table 2).

The analysis of the differentiation of the measure of the synthetic financial situation in relation to the measure of development indicates changes in a similar direction, they reacted similarly to changes in the market situation. The standard deviation (0.04-0.03) and the level of the classical variation index (0.14-0.13) indicate the relative stability of the measure of the financial situation of rural communes in the Świętokrzyskie Voivodship in the analyzed years.

Figure 2 presents correlograms describing the year-to-year relations of synthetic development and financial situation. The analysis of the scatter graph indicates that the increasing value of the coefficients is accompanied by a change in the position of the points that are getting closer and closer to the straight line.

The Pearson correlation coefficient in 2017 in relation to 2014 amounted to 0.718 (at 0.662 for the 2014-2011 relation) for the financial situation measure and 0.909 for the measure of development (at 0.897 for the 2014-2011 relationship). The increase in measures indicates a small convergence process. Measures indicate a similar level of development or financial situation of rural communes in the Świętokrzyskie Voivodship. Units standing in relation to the surveyed group are in a measure of synthetic finances – Nowy Korczyn and Sitkówka-Nowiny, for the development measure – Morawica, Sitkówka-Nowiny, Strawczyn.

SUMMARY

The rural communes of the Świętokrzyskie Voivodship are characterized by internal diversity in terms of development and the financial situation. The group of communes with the best situation in terms of development was created, among others, by Sitkówka-Nowiny, Morawica and Strawczyn Communes, which are located in the Kielce district and are characterized by a good financial situation. The study identified a disproportion between rural communes characterized by an industrial function and units with a traditional agricultural function.

Local development depends, to a large extent, on processes taking place in local development centers. A comparison of spatial distribution of the best-developed rural communes in 2011, 2014 and 2017 indicates a better situation of units located in the Kielce district, in the vicinity of the capital of the region (Kielce).

The situation of the surveyed units varied. The order of rural communes in the ranking has not changed substantially in subsequent years. Financial resources form the basis of individual operations and a condition for the implementation of tasks imposed on them, they determine development, they are an expression of economic development potential.

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ZRÓŻNICOWANIE PRZESTRZENNE POZIOMU ROZWOJU A SYTUACJA
FINANSOWA GMIN WIEJSKICH WOJEWÓDZTWA ŚWIĘTOKRZYSKIEGO

Słowa kluczowe: rozwój, sytuacja finansowa, gmina wiejska, województwo świętokrzyskie

ABSTRAKT

Celem artykułu jest analiza przestrzennych dysproporcji rozwoju gmin wiejskich względem ich sytuacji finansowej z zastosowaniem bezwzorcowej miary syntetycznej. Analiza w obszarze finansów i rozwoju gmin dotyczyła lat 2011, 2014 i 2017. Badaniu podlegało 70 gmin wiejskich położonych w województwie świętokrzyskim. Eksploracja danych możliwa była dzięki wykorzystaniu danych pochodzących z Banku Danych Lokalnych GUS oraz danych z Regionalnej Izby Obrachunkowej. Metodą zastosowaną w pracy jest syntetyczny miernik rozwoju i sytuacji finansowej. Samorząd lokalny może realizować swoje zadania wówczas, gdy zostanie wyposażony w stabilne i wydajne źródła dochodów oraz odpowiedni poziom zasobów endogenicznych. Potencjał gospodarczy, infrastruktura oraz zasoby finansowe są istotnym czynnikiem rozwoju. Grupę gmin o najlepszej sytuacji w aspekcie rozwoju tworzyły m.in. gminy Sitkówka-Nowiny, Morawica i Strawczyn, które znajdują się w powiecie kieleckim. Charakteryzowały się one dobrym poziomem sytuacji finansowej i dużym potencjałem gospodarczym. Badania wykazały dysproporcje między gminami wiejskimi charakteryzującymi się funkcją przemysłową a jednostkami o tradycyjnej funkcji rolniczej.

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