

POSITIONING AND EVALUATION OF THE ACTIVITY OF LOCAL GOVERNMENT FROM THE COMPETITION BY USING SYNTHETIC INDICATOR

UMÍSTĚNÍ A HODNOCENÍ ČINNOSTI MÍSTNÍ SPRÁVY OD KONKURENCE POUŽITÍM SYNTETICKÉHO UKAZATELE

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Abstrakt:

Zhodnocení činnosti místní samosprávy vyžaduje zvážení mnoha různých proměnných, k tomuto účelu by mohla být využita metoda syntetického ukazatele. Umožňuje zhodnocení situace s ohledem na ostatní parametry, za předpokladu, že je dodržována metodologie studie. O výsledku rozhoduje soubor statistických proměnných vybraných pro analýzu. Hlavním cílem práce je prezentovat možnosti využití syntetického ukazatele k rozlišení rozdělení funkcí regionu na základě zvolené diagnostické metody, na příkladu polských vojvodství v letech 2003, 2005, 2010 a 2013. Pořadí obcí v žebříčcích se zásadně neměnilo v následujících letech (2003, 2005, 2010 a 2013), vedoucí pozici si držely Skarżysko-Kamienna a Suchedniów, na konci žebříčku se umístily Skarżysko-Kościelna, Tarłów, Ćmielów. Úroveň syntetického ukazatele aktivity kolísala mezi 0.15 (Skarżysko-Kościelna, charakterizovaná zemědělstvím) – 0.5 (Skarżysko-Kamienna, charakterizován průmyslem a službami) v roce 2003, 0.2 (Tarłów, charakterizován zemědělstvím) – 0.59 (Skarżysko-Kamienna) v roce 2005, 0.19 (Tarłów) – 0.59 (Suchedniów, charakterizován průmyslem, službami a turismem) v roce 2010 a 0.17 (Ćmieów charakterizován zemědělstvím a průmyslovou monokulturou), 0.52 (Suchedniów) v roce 2013.

Abstract.

The activity of local-government assessment requires consideration of many various variables and the synthetic index may be its tool. It enables the situation assessment with comparison to other units, on condition that the presented methodology of study is kept. A set of statistical variables selected to the analysis also decides on the results. The aim of this study is to present the possibilities of using the synthetic index to distinguish the differentiation of region's functions based on selected diagnostic features on the example of voivodeships in Poland. The analysis is statistical and dynamic, embracing the comparison of voivodeships situations in the years 2003, 2005, 2010 and 2013. The order of the municipalities in the ranking did not fundamentally change in the following years (2003, 2005, 2010 and 2013); the leading positions were held by Skarżysko-Kamienna and Suchedniów; at the end of the ranking were Skarżysko-Kościelna, Tarłów, Ćmielów. The level of the synthetic index of activity fluctuated between 0.15 (Skarżysko-Kościelna; characterized by agricultural)-0.50 (Skarżysko-Kamienna; characterized by industrial, services) in 2003, 0.20 (Tarłów; characterized by agricultural)-0.59

(Skarżysko-Kamienna) in 2005, 0.19 (Tarlów)-0.59 (Suchedniów; characterized by industrial, services, tourism) in 2010 and 0.17 (Ćmieów; characterized by agricultural and industrial monoculture)-0.52 (Suchedniów) in 2013.

Introduction

Region is a separate area which differs from other area in natural or acquired over the centuries features. The degree of development of individual regions affect the level of their competitiveness. Currently basic factors which affect this process include: modernity, diversity and innovation of the economy, level of development of infrastructure and human capital, natural environment, structure of settlement network, state of infrastructure, financial situation, structure of economy [Sokołowicz, 2008, p. 10 and next; Dorčák, Pollák, Szabo, 2014].

The definition of local development has a multidimensional character. It is defined as harmonised and systematic activities of local community, self-government and other subjects functioning in the municipality which lead to the creation of new and the improvement of existing conditions for the local economy and to providing spatial and ecological order [Kožuch 2006, page 177-178].

In order for the territorial self-government units to fulfil their role in shaping the living and managing conditions of the local communities in an active way, they must be equipped in the proper resources. The proper and effective realization of public tasks by the territorial self-government units is determined by the existence of rational financial system of these units and most importantly the system of their income and budgetary expenses. [Filipiak, Flejterski 2008].

The aim and methodology of the study

The aim of this study is to present the possibilities of using the synthetic index to distinguish the differentiation of region's functions based on selected diagnostic features on the example of voivodeships in Poland. The analysis is statistical and dynamic, embracing the comparison of voivodeships situations in the years 2003, 2005, 2010 and 2013. In order to compare the transformations happening during the studied years, the procedure of creating synthetic index was used. Table 1 describes the variables selected to build the synthetic indicator.

Table 1: Selected variables describing activity of region's

X1	total own revenues	stimulant
X2	investment capital expenditure	stimulant
X3	current expenditure	destimulant
X4	population per public pharmacy	stimulant
X5	population per library facility	stimulant
X6	population per place in theatre and musical institutions	stimulant
X7	tourist accommodation	stimulant
X8	catering services	stimulant
X9	population using waste water treatment	stimulant
X10	population using gas installation	stimulant
X11	population using water supply	stimulant
X12	population using sewerage system	stimulant
X13	social welfare institutions	stimulant
X14	medical centres in total	stimulant
X15	Housing	stimulant

Source: own authoring

Variables characterized by high spatial changeability (coefficient of variation above 0.15) and high correlation under the extracted groups (coefficient above 0.75) were removed from the set [Zeliaś 2000; Wysocki 1996].

Directly measurable variables, available to all studied units, comparable, referring directly or indirectly to the studied phenomenon were submitted to the unitarization method which enabled the comparison of variables. To this end the following formulas were used: for the stimulant

$$x = \frac{x_{ij} - \min_i x_i}{\max_i x_i - \min_i x_i}, \quad \text{for the destimulant} \quad x = \frac{\max_i x_i - x_{ij}}{\max_i x_i - \min_i x_i},$$

where: x – refers to the unitarized value of feature for a studied unit, x_{ij} – refers to value of j -feature for a studied unit, \max – maximum value of j -feature, \min – minimum value of j -feature. Next the synthetic measurement was determined, which takes values from the range [0; 1];

$$s_i = \frac{1}{p} \sum_{j=1}^p x_{ij} \quad (i = 1, 2, \dots, p)$$

, where: S_i – synthetic measurement in the studied period, x_{ij} – features of the synthetic index structure, p – number of partial indexes used in the construction of aggregate measure. Its higher values means a better situation of an object [Dziekański 2015, Wysocki 1996, Wysocki, Lira 2005, Zeliaś 2000].

Synthetic indicator allows you to divide into groups of individuals analyzed, comprising units statistically similar. The analysis made it possible to divide the municipality into 5 groups (distributed 0.25), i.e.:

$$0.80 \leq S < 1.00; \text{ very good (A)}$$

$$0.60 \leq S < 0.80; \text{ good (B)}$$

$0.40 \leq S < 0.60$; medium (C)

$0.20 \leq S < 0.40$; poor (D)

$0.00 < S < 0.20$; very poor (E) (Bury, Dziekański, 2012, p. 7-29; Zeliaś, 2000).

The action of of local government units

Territorial self-government is a very important element – not only social, but also economic – both in the terms of region and the whole country. The social expectations and needs are increasing while the resources of territorial self-government units are limited, which, as a result, enhances the need of rational and effective management of public funds. [Olak 2013, Olak, Labuzik 2013, Olak, Pawlik 2013, Sowa 2014].

Local and regional development is a complex and many-sided process which happens in economic, social, spatial, ecologic and cultural sphere [Ziółkowski 2007]. Among the conditions of a region's long-term ability of development one should mention, above all: differentiation and flexibility of the regional economic structure, which is affected by, inter alia: sector specialization, participation in the international exchange, labour efficiency, level of employment, age structure of the population, ability to raise capital and ability to generate and diffuse technical progress [Leśniewski 2010, Leśniewski 2015].

The elements of infrastructure such as roads, connection, electromagnetic network, water supply or sewage disposal improve the standard of living of the inhabitants and contribute to the increase of investment attractiveness etc. The infrastructure prevents the processes of uneven regional development which in many countries is an important element of regional policy which aims at supporting so called under-developed [Salomon, Krakowiak 2013, page 337-351, Salamon 2010].

The synthetic indicator of activity of local government

On the basis of selected variables one can notice the municipalities were improving or worsening their position. As presented in table 2 the activity of municipalities is difficult. Positive changes may be observed in the studied area in individual units.

Table 2. Assessment of municipalities' actions according to finance, environment and infrastructure.

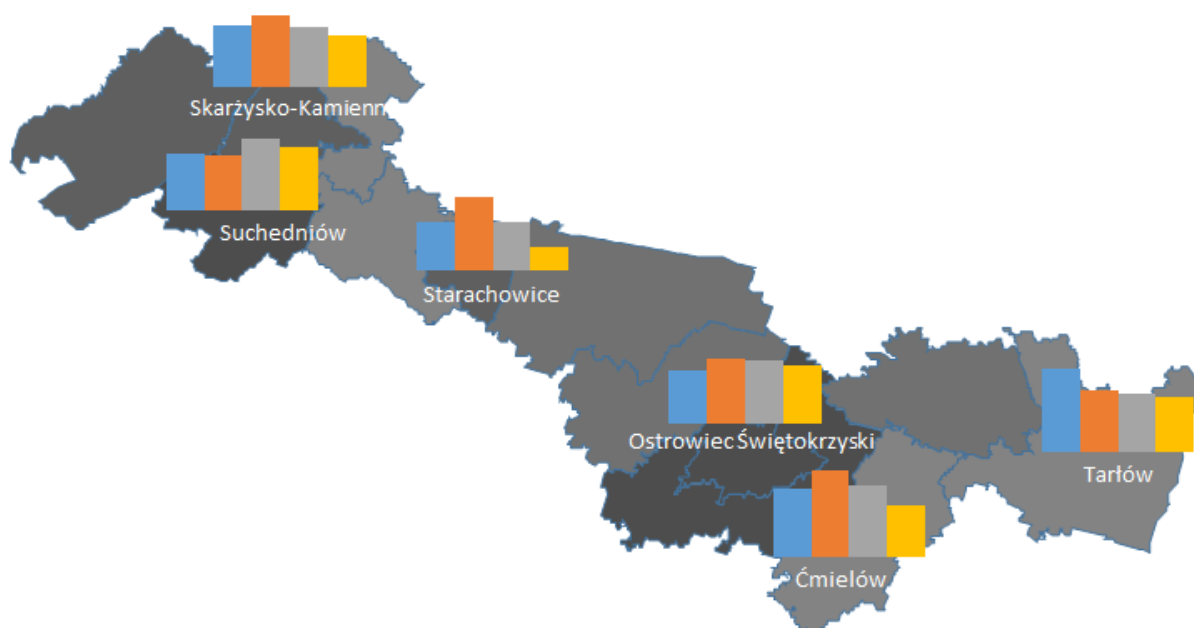
	2003	2005	2010	2014
$0.80 \leq S < 1.00$; verygood (A)	-	-	-	-
$0.60 \leq S < 0.80$; good (B)	-	-	-	-
$0.40 \leq S < 0.60$; medium (C)	Skarżysko-Kamienna (1) 0,50 Suchedniów (3) 0,47 Ostrowiec Św. (1) 0,44 Starachowice (1) 0,44	Skarżysko-Kamienna (1) 0,59 Ostrowiec Św. (1) 0,54 Suchedniów (3) 0,46 Starachowice (1) 0,46 Bodzechów (2) 0,43	Suchedniów (3) 0,59 Ostrowiec Św. (1) 0,52 Skarżysko-Kamienna (1) 0,49 Starachowice (1) 0,44 Bliżyn (2) 0,42	Suchedniów (3) 0,52 Ostrowiec Św. (1) 0,48 Bodzechów (2) 0,46 Skarżysko-Kamienna (1) 0,43 Starachowice (1) 0,42 Bliżyn (2) 0,41
$0.20 \leq S < 0.40$; poor (D)	Bliżyn (2) 0,38 Brody (2) 0,35 Bodzechów (2) 0,31 Kunów (3) 0,31 Wąchock (3) 0,31 Tarlów (2) 0,27 Ćmielów (3) 0,22 Bałtów (2) 0,20	Bliżyn (2) 0,38 Brody (2) 0,36 Bałtów (2) 0,33 Kunów (3) 0,30 Ćmielów (3) 0,28 Wąchock (3) 0,24 Skarżysko Kościelne (2) 0,21 Tarlów (2) 0,20	Kunów (3) 0,38 Bodzechów (2) 0,36 Bałtów (2) 0,36 Skarżysko Kościelne (2) 0,31 Brody (2) 0,29 Ćmielów (3) 0,23 Wąchock (3) 0,20	Kunów (3) 0,30 Brody (2) 0,27 Bałtów (2) 0,26 Skarżysko Kościelne (2) 0,24 Wąchock (3) 0,24
$0.00 < S < 0.20$; verypoor (E)	Skarżysko Kościelne (2) 0,15	-	Tarlów (2) 0,19	Tarlów (2) 0,18 Ćmielów (3) 0,17

(1) urban municipality; (2) rural municipality; (3) urban and rural commune

Source: own authoring based on the data from Local Data Bank of Central Statistical Office.

The area Kamienna basin is attractive to tourists and this region is an important point on the map of świętokrzyskievoivodeship. The use of owned resources for activity needs also depends from the existing base of local resources, the accessibility and technical infrastructure, as well as from funds which the self-governments dispose of. The quality of natural environment, which may be increased thanks to investments realized in various area of human activity, has an important meaning.

Illustration 1: Assessment of municipalities actions according to finance, environment and infrastructure (in 2003, 2005, 2010, 2013).



Source: own authoring based on the data from Local Data Bank of Central Statistical Office.

The analysis enabled the division of voivodeships into 5 groups. The vast majority of voivodeships belongs to group C and D, E. There are no municipality in group A and B. A shift in time can be observed between the groups (table 2, fig. 1).

Table 3: Transformations of infrastructure synthetic index.

	2005/2003	2008/2005	2010/2008	2011/2010	2012/2011	2013/2012
Suchedniów (3)	▼	▼	▲	▼	▼	▲
OstrowiecŚw. (1)	▲	▼	▲	—	▲	▼
Bodzechów (2)	▲	▼	▼	▼	▲	▼
Skarżysko-Kamienna (1)	▲	▼	▲	▼	▲	▼
Starachowice (1)	▲	▲	▼	▼	▲	▲
Bliżyn (2)	—	▲	▲	▼	▲	▲
Kunów (3)	▼	▼	▲	▼	▼	▲
Brody (2)	▲	▼	▼	▼	▼	▲
Bałtów (2)	▲	—	▲	▲	▼	▲
SkarżyskoKościelne (2)	▲	▼	▲	▼	▲	▼
Wąchock (3)	▼	▲	▼	▼	▲	▲
Tarłów (2)	▼	▲	▼	▼	▲	▼
Ćmielów (3)	▲	▼	—	▼	▼	▲

Synthetic index of a unit (year/year) ▲ progress ▼ regress — no changes

Source: own authoring

In the studied years one can observe both positive relations year on year and negative. The Positive transformations took place in all the local-government (which may be interpreted as progress), as well as the negative transformations (which may be interpreted as regress). In case of Suchedniów 4 positive transformations happened and 5 negative, in Skarżysko-Kamienna 3 and 3, in Tarłów 2 and 4 and in Ćmielów 2 and 3 (table 3).

Positive transformations in the studied period took place in Suchedniów (urban-rural municipality), which is characterized by agriculture and building industry, tourism. The following places in 2013 are taken by Ostrowiec Świętokrzyski (urban municipality with living function) and Bodzechów (rural municipality with industrial, agricultural, tourist and living function). The weakest municipalities are: Tarłów (rural) and Ćmielów (urban-rural), which seem to be characterized by agricultural and industrial (Porcelain Factories in Ćmielów) monoculture (Dziekański 2015).

Conclusions

Public sector performs public usability tasks, which are usually unprofitable. They are funded from public resources. The method indicated in the study enables the comparison of multi-characteristic objects according to defined criteria. It enables creation of hierarchy of the objects and their sets taken into multidimensional spaces from the point of view of selected variables. The selected set decides of the assessment result and of the informative value of the final measure.

The description of complex phenomena (activity of local-government) is impossible to measure them directly. In order to characterize complex phenomena synthetic variables are used. The replacement of the set of many variables which explain the synthetic variable may facilitate the model estimation through elimination of collinearity. It is not always possible to give them substantive interpretation, which limits the possibility of interpretation of model structure's parameters [Cieślak 2002].

The activity of local-government assessment requires consideration of many various variables and the synthetic index may be its tool. It enables the situation assessment with comparison to other units, on condition that the presented methodology of study is kept. A set of statistical variables selected to the analysis also decides on the results.

The situation in the aspect of activity local-government in Poland is differential. The differentiation of the synthetic index is surprisingly big which may indicate considerable possibilities of improvement of this sphere. The order of the świętokrzyskievoivodeships in the ranking did not fundamentally change in the following years (2003, 2005, 2010 and 2013); the leading positions were held by Skarżysko-Kamienna and Suchedniów; at the end of the ranking were Skarżysko-Kamienna, Tarłów, Ćmielów. The level of the synthetic index of activity fluctuated between 0.15 (Skarżysko-Kościelna; characterized by agricultural) - 0.50 (Skarżysko-Kamienna; characterized by industrial, services) in 2003, 0.20 (Tarłów; characterized by agricultural)-0.59 (Skarżysko-Kamienna) in 2005, 0.19 (Tarłów)-0.59 (Suchedniów; characterized by industrial, services, tourism) in 2010 and 0.17 (Ćmieów; characterized by agricultural and industrial monoculture) - 0.52 (Suchedniów) in 2013.

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