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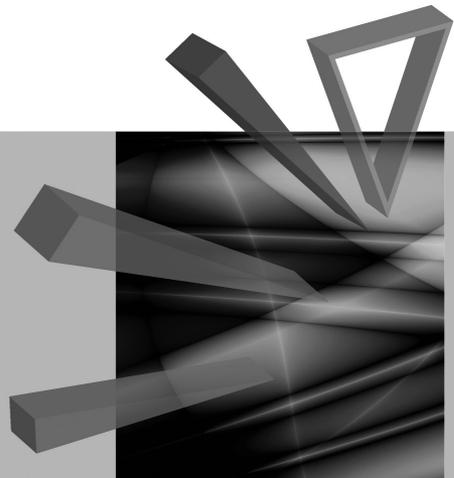
Uniwersytetu Ekonomicznego we Wrocławiu

RESEARCH PAPERS

of Wrocław University of Economics

324

Economy and Space



edited by

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Publishing House of Wrocław University of Economics
Wrocław 2013

Copy-editing: Agnieszka Flasińska

Layout: Barbara Łopusiewicz

Proof-reading: Barbara Cibis

Typesetting: Comp-rajt

Cover design: Beata Dębska

This publication is available at www.ibuk.pl, www.ebscohost.com,
and in The Central and Eastern European Online Library www.ceeol.com
as well as in the annotated bibliography of economic issues of BazEkon
http://kangur.uek.krakow.pl/bazy_ae/bazekon/nowy/index.php

Information on submitting and reviewing papers is available on
the Publishing House's website
www.wydawnictwo.ue.wroc.pl

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Wrocław 2013

ISSN 1899-3192

ISBN 978-83-7695-391-5

The original version: printed

Printing: Printing House TOTEM

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FINANCIAL SYNTHETIC INDEX AND THE ECONOMIC SECURITY OF THE REGION IN THE CONTEXT OF LOCAL GOVERNMENT EFFICIENCY

Abstract: The evaluation of local government units' activities and the economic security of the region should include the social and economic factors shaping the units' potential in the region. The financial resources are the basis for all local government units' actions and the main condition for carried activities. They determine the commune's development and are the expression of economic development potential. The methods of multivariate statistics, allowing for determining the synthetic measure, are applied in order to evaluate the effectiveness of local government, its financial economy and economic security. It requires taking into account many variables, selection of which may significantly influence the gained results and the possibilities of using the synthetic index for the inter-regional evaluations of various countries. Such an approach allows for the evaluation of a district by means of one value and for arranging the analysed data according to the phenomenon.

Keywords: synthetic index, finances, income, effectiveness of actions, local government.

1. Introduction

Local government is a very important social and economic element both in the regional and entire country scale. Recently, a significant part of the government expenditure has been spent on investments that have contributed to the development of the economy. Expectations and social needs grow, while the resources available to the local government units are limited, which in turn increases the need for rational and effective management of public resources. Therefore, to achieve maximum usability and maximum meeting of the society expectations, the local government units must constantly increase the efficiency and use the human and financial potential in the best possible way. It also affects the perception of economic security of the region.

The evaluation of local government units' activities concerning the economic security should take into account the social and economic characteristics forming the potential of the local government units. The level of characteristics, the influence of local authorities on the social and economic situation, as well as the possibilities of identifying the needs of stimulating the potential of the unit, allow for the multi-faceted analysis of the regional situation. The assessment should answer the questions about the tangible results which will be brought by the measures located in a given task.

Economic security is the state of the economy which allows it to maintain a relatively high development dynamics, which guarantees a low unemployment rate, maintains competitiveness and stable state finances. This precisely means keeping the economy in such conditions that the dynamics of the economic growth do not raise the unemployment rate, rather lead to its reduction; that the deficit does not exceed 3% of the GNP, but rather is a surplus; that the public debt is below 60% of the GNP; the inflation and the interest rate are also low. In an open economy, such as the Polish one, such goals can be accomplished by any country applying a proper policy corresponding to its level of development.

Economic security in its subject field concerns mainly the national economic system development, the use of natural resources, according to their potential, countering the interference of external stakeholders and simultaneous development of multilateral integration relations in the economic field.

Finances are a key area for the management of local government units due to a wide range of public tasks performed by the local sector. Their implementation requires adequate financial means. Financing municipalities is a complex process, each time resulting from economic and social conditions of the local government units and their implemented financial and budgetary management policy. Providing own budgetary resources supplemented by outside resources, such as the European Union funds, credits, loans and municipal bonds, capital form of public-private partnerships, grants or financial participation of the citizens is a necessary condition to ensure economic security.

The aim of the article is to show the role of the financial synthetic index in the process of government finances management evaluation, as well as to show the directions of this evaluation taking into account the need of an effective management of public resources and economic security.

2. The effectiveness of activities and the management of local government income

The local government performs many tasks. Its range of activities includes all public affairs, in case of commune self-government [Ustawa z 8 marca 1990, Art. 6, Item 1] – the matter of local interest, in case of local government – district

tasks [Ustawa z 5 czerwca 1998, poz. 578], in case of voivodship government – provincial affairs [Ustawa z 5 czerwca 1998, poz. 576]. The local government has some freedom in shaping their tasks and choosing legal forms of their implementation [Wiktorowska 2002, p. 123 ff.].

The effectiveness of government actions means the results of undertaken actions defined by the relation of gained profits and expenditure incurred. In the broad meaning, the notion of effectiveness means the best effective results compared with the aims. The quantification of results is the main problem of the expenditure and effects analysis in public goods production. It is hard to clearly define whether the achieved result will meet the expectations. Thus, it is important to find methods allowing better use of limited financial resources for the effective realization of public tasks. The evaluation of the results of government actions is a complex and multi-layered aspect [Łukasiewicz, Kłoskowska 2006, p. 361]. The effect is related to the purpose of its activities and will impose qualitative and quantitative approach to its measurement [Owsiak 2005; Sochacka-Krysiak 2009, p. 192].

The eminent economists P.A. Samuelson and W.D. Nordhaus even claim that efficiency is perhaps the main subject of economics. According to these authors, the economy functions effectively if the production of one good cannot be increased without reducing the production of another, which means reaching the edge of production capacities [Samuelson, Nordhaus 1995, p. 185].

In the article, the adopted definition of effectiveness means the quantitative ability of an organization to survive and act within changing conditions, which may be identified by recognizing and evaluating the ways of carrying out the tasks of a given institution or organization and the proper choice of these tasks (in case of public institution this will be the proper choice of aims connected with meeting social needs, aims taking into account the public interest, priorities resulting from the acceptance of all interested parties).

The management of organizations in conditions of rough market competition increases the importance of the efficiency. The question arises how to measure the effectiveness of the use of public finances while dealing with dispersion of income and expenditure sources, as shown by the analysis of structure for communes of Ostrowiec district.

The main incomes of the local self-government units are own incomes, general subvention and target subventions from the state. Income can also be formed by outside sources, grants from EU or other means defined by separate regulations. According to Constitution, the commune's own income cover all income of local government units, except for general subventions and target subventions.

Another source of own income of the communes is the tax income, property income, donations for the local government units, income from fines defined by separate regulations, interests from loans, unless there is no separate regulation, interest from overdue payments forming the income of the unit, interests from finances on accounts, unless there are no other regulations.

Defining the relationship of income and expenditure reflects the effect of decisions taken by the local government. Such an assessment involves the need to determine the relationship between various components of income and expenditure. The conclusions, together with the elements of comparisons with other local governments, can be the basis for the verification of made decisions and the evaluation of local authorities budgetary policy.

The ability of income creation is derived from the government's own capabilities and skills of using local instruments of government intervention. The success of using such instruments depends on the potential of endogenous resources, the benefits of location, the functional structure of the scale and structure deciding about the scale of relationship with the environment and the local society; general competence and creativity of the local government and authorities. The biggest group of instruments, used by a local government to affect the environment, are the tools of fiscal policy, including the local authorities' actions undertaken within the revenue budget of the local government.

3. Research methodology

The final set of diagnostic variables has been established taking into account the substantive, formal and statistical criteria. The characteristics of spatial units have been based on the arithmetic average, standard deviation, coefficient of variation, asymmetry factor, correlation coefficient. Considering the formal conditions, quantifiable, complete and available variables have been selected. However, when it comes to statistical criteria, quasi constant variables, those for which the coefficient of variation does not exceed 10% (stability of variables) have been eliminated from the set of variables. By analysing the matrix of correlation of coefficients for variables, the features which were too correlated with one other (more than 0.80) have been removed.

Taking into consideration the availability of data, the author has decided to construct a synthetic variable aggregating the indices describing the financial situation of the commune. In order to be able to make a comprehensive assessment of all communes, the author has used Local Data Bank of GUS (General Statistical Office). All gathered information presents the most important aspects of the budgetary policy. Finally, a set of indicators has been chosen, which have been selected as the most representative of the entire set, not repeating the information of other accepted indices. The following variables are *per capita*:

- X_1 – the value of revenue in general,
- X_2 – the value of own revenue in total,
- X_3 – the value of targeted grants,
- X_4 – the value of subsidies,
- X_5 – the value of EU funds,

- X_6 – the value of income,
- X_7 – the value of the expenditure in total,
- X_8 – the value of total financial expenditure,
- X_9 – the value of the investment expenditure,
- X_{10} – the value of the total current expenditure,
- X_{11} – the value of the current expenditure on salaries,
- X_{12} – the value of the public debt service expenditure.

It is important to identify the nature of the variables that describe the objects. In the diagnostic variables set there are variables that have different effects on the direction of the development of the phenomenon: stimulate or inhibit it (stimulant, destimulant).

The values of variables may differ and have different orders of magnitude. At a later stage of the calculation the method of unitarization has been used to standardise the diagnostic variables by examining the isolation of a feature. It can be used to ration different variables, whatever the type, character, or the size of the units.

For such transformed features the no-standard method of construction of synthetic measure has been used, applying the average standardized values. In case of the lack of normative values serving as the pattern of variables, the formula coordinates at the level of maximum values of max indicator $\{x_{ij}\}$ are often adopted. The variables unitarization procedure requires the use of the following formulas [Wysocki, Lira 2005]:

unitarization method

$$\text{stimulant } X = \frac{x_{ij} - \min_i x_i}{\max_i x_i - \min_i x_i}, \quad (1)$$

$$\text{destimulant } X = \frac{\max_i x_i - x_{ij}}{\max_i x_i - \min_i x_i}, \quad (2)$$

the range of the synthetic index $\langle 0,1 \rangle$,

where: X – the average value of standardized, unitarized and normalized feature of the researched unit,

x_{ij} – the value of j features of the unit,

\max – the maximum value of the j feature,

\min – the minimum value of the j feature.

In order to determine the value of the synthetic indices, the non-standard method has been used in which normalized simple values features are averaged. It assumes that the achieved variable contains all the information provided by individual gauges of the structure. The features of simple values are averaged according to the formula [Dziekański 2011; Bury, Dziekański 2012]:

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

where: S_i – a synthetic measure of the financial condition of the district during the period considered,

X_{ij} – features of the synthetic index structure,

p – the number of sub-indices used in constructing the aggregate measure of the potential aspect.

The synthetic gauge takes values from the range [0; 1], the higher the value of this index, the better the situation of an object. The values are organized linearly according to fixed values and on this basis the typological class units have been selected.

4. Communes in Ostrowiec district

Ostrowiec district is located in the north-eastern part of Świętokrzyskie voivodship. It comprises one urban commune – Ostrowiec Świętokrzyski, two urban-rural communes: Ćmielów and Kunów, and three rural communes: Bałtów, Bodzechów and Waśniów. Ostrowiec district covers the area of 61 681 ha which constitutes 5.3% of the whole voivodship. According to CSO data for the 3rd quarter of 2011, the terrain of the district was inhabited by 114 025 people. The population density according to CSO data for the 4th quarter of 2010 was 185 people per 1 km² (average population density in the voivodship is 108 people per 1 km²). In the 4th quarter of 2010 there was a negative natural growth in the district (level index of 2.9) and in the voivodship (1.2).

Ostrowiec district plays a significant role in both economic and social processes. Ostrowiec Świętokrzyski is a large industrial centre, full of possibilities and with highly developed traditions and a strong background in the area of infrastructure and human potential. The expanded road network, rapid industrial and cultural development of Ostrowiec, adequate technical facilities and prepared – in terms of infrastructure – sites, create special and favourable conditions for potential investors. The leading industries in the current economy of the city are: production of building materials (based on the raw materials of the region), underwear and clothing production, production of paper and cardboard, construction services, communication services, publishing and printing services, a wide range of consumer services, as well as wholesale and retail trade.

All economic processes taking place in this economy remain under the direct or indirect influence of money. These processes involve the economy, all sectors and all stakeholders, namely the institutions, organizations, enterprises and society as a whole. The particular position of local government units requires special care of their financial

situation, which specifies the ability to discharge of current and future obligations in specified time, scope and quality standard [Bury, Dziekański 2012; Bury 2002].

The commune is the most important level the of local self-government development due to the range of tasks, financial potential and freedom to determine development policy. By providing the possibility of creating own income, it is possible to take actions not only financed by the subsidy from the State budget, but also by the whole spectrum of its own initiatives.

The structure of revenue of Ostrowiec district is presented in Table 1. Own revenue in communes in 2009 ranged from 15.18% (Waśniów) to 62.02% (Ostrowiec Św.), grants ranged from 17.77% (Ostrowiec Św.) to 28.61% (Waśniów), and subsidies from 18.53% (Ostrowiec Św.) to 53.97% (Waśniów). In 2010 all communes (except Kunów) had the decrease of grants, subsidies and own revenues.

Table 1. Income structure of districts of powiat of Ostrowiec (total revenues = 100%)

Commune	The share of own revenue in total revenue (%)			The share of target grants in total income (%)			The share of subsidies in total revenue (%)		
	2008	2009	2010	2008	2009	2010	2008	2009	2010
Ostrowiec Świętokrzyski (1)	62.24	62.02	57.70	17.77	16.56	16.79	19.98	20.49	18.53
Bałtów (2)	27.84	29.43	28.37	21.36	22.46	12.98	50.79	47.41	33.11
Bodzechów (2)	32.95	28.76	28.41	24.00	20.83	20.83	43.04	44.21	42.02
Ćmielów (3)	30.06	25.78	21.77	21.63	21.30	20.56	48.31	52.34	44.11
Kunów (3)	27.50	27.55	31.30	28.61	25.00	20.83	43.89	46.69	36.64
Waśniów (2)	18.56	15.18	18.42	27.47	23.33	21.58	53.97	50.68	50.07

Source: own research, based on Local Data Bank Central Statistical Office (LDB CSO).

Higher levels of income (*per capita*) allow local governments to meet the material needs of society better by providing higher quality public services. The increase of income *per capita* leads to positive qualitative changes affecting the increase of social welfare. Positive changes in the quality of life lead to increased comfort of life (e.g., quality of education, quality of health care, the extension of life expectancy, etc.). In the case of communes of Ostrowiec district, the highest level of income *per capita* can be seen in Bałtów, Kunów, Waśniów (in 2010; Table 2). This is thanks to the EU grants which have been gained in recent years for the expansion and modernization of infrastructure.

The expenses of local government are the reflection of their activities. The size of different types of expenditure depends on the direction and scope of the tasks entrusted to the local authorities for implementation [Drwiłło, Gliniecka 1997, p. 142]. Expenses are characterized by high rigidity and cannot be changed when the economic situation changes. The change means changing the structure of local policy purposes.

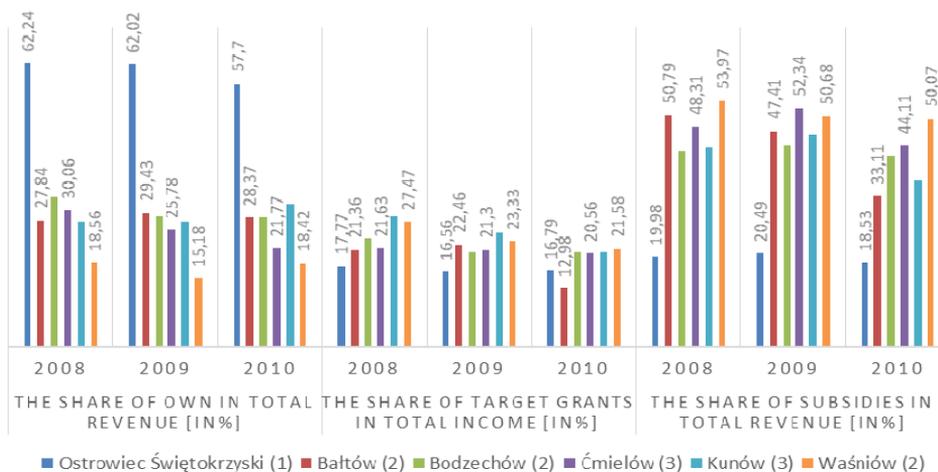


Figure 1. Income structure of communes of Ostrowiec district (total revenues = 100%)

Source: own research, based on LDB CSO.

Table 2. Total expenditure and revenue *per capita*

Commune	Total expenditure <i>per capita</i> (PLN)			Total revenues <i>per capita</i> (PLN)		
	2008	2009	2010	2008	2009	2010
Ostrowiec Świętokrzyski (1)	2099.72	2551.84	2819.46	2124.55	2294.36	2405.89
Bałtów (2)	2515.01	3263.82	4677.41	2162.61	2709.34	4034.35
Bodzzechów (2)	2124.36	2286.33	2682.52	2094.07	2320.32	2471.22
Ćmielów (3)	1988.70	2257.17	2900.00	2043.22	2228.85	2626.55
Kunów (3)	2019.26	2335.81	3538.94	2192.53	2343.90	2904.45
Waśniów (2)	2301.30	3096.11	2959.54	2399.87	2851.21	2792.96

Source: own research, based on LDB CSO.

The analysis of the structure of expenditure of the communes of Ostrowiec district are shown in Table 3, where current expenditure (in total) ranges from 66.31% (2009 – Waśniów) to 91.14% (2009 – Ćmielów). The public debt service in the surveyed communes in 2009 ranged from 0.06% (Ćmielów) to 0.58% (Kunów). In 2009, communes in Ostrowiec district spent on investments 8,86% (Ćmielów) and 33.69% (Waśniów).

The analysis of financial balance shows the level of financial independence and the ability to cover the long-term debt. The growth of individual indices of the analysis proves bigger degree of the financing budget expenditure by each income group of a district. Local government autonomy is greater when the time during which the incomes cover the total district's budget expenditure is long enough. The decreasing level of contribution is connected with a central administration control over the financial economy and the structure of local government activities, which can be understood as the increase of the financial independence of local governments.

Table 3. The structure of expenditure of the communes of Ostrowiec district, income *per capita* (expenditure from the budget in total = 100%)

Commune	Property investment in total expenditure share (%)			Share of current expenditure in total expenditure (%)			Share of current expenditure in total expenditure on remuneration (%)		
	2008	2009	2010	2008	2009	2010	2008	2009	2010
Ostrowiec Świętokrzyski (1)	19.41	28.17	28.56	80.59	70.46	70.16	29.95	26.89	27.29
Bałtów (2)	16.88	26.80	43.05	83.12	73.20	56.95	35.74	29.81	22.53
Bodzechów (2)	19.19	16.11	22.44	80.81	83.89	77.56	31.68	32.82	31.66
Ćmielów (3)	7.18	8.86	28.08	92.82	91.14	71.92	35.89	35.29	29.04
Kunów (3)	12.35	11.68	36.53	87.65	88.32	63.47	33.28	34.30	23.83
Waśniów (2)	16.22	33.69	21.15	83.78	66.31	78.85	32.78	26.78	30.47

Source: own research, based on LDB CSO.

Table 4. The relation of own income, subventions and expenditure in total

Commune	Relation of own income and expenditure in total			Ratio of contribution to total expenditure			Ratio of subventions to total expenses		
	2008	2009	2010	2008	2009	2010	2008	2009	2010
Ostrowiec Świętokrzyski (1)	62.98	55.76	49.23	17.98	14.89	14.32	20.22	18.42	15.81
Bałtów (2)	23.94	24.43	24.47	18.37	18.64	11.19	43.68	39.35	28.56
Bodzechów (2)	32.48	29.18	26.17	23.66	21.14	19.19	42.43	44.87	38.71
Ćmielów (3)	30.88	25.45	19.72	22.23	21.03	18.62	49.63	51.68	39.95
Kunów (3)	29.86	27.65	25.69	31.07	25.09	17.09	47.66	46.85	30.07
Waśniów (2)	19.35	13.98	17.38	28.65	21.48	20.37	56.28	46.67	47.25

Source: own research, on the basis of the report of the implementation of the budget of the district and LDB CSO.

The analysis of the financial economy shows a high degree of financial independence of Ostrowiec. Unfortunately, year by year the index is dropping. The financial independence in the years 2008 and 2009 was falling, which means decreasing autonomy of communes (Table 4). In 2008 and 2009, the level of contribution fell which can be positively assessed as the decrease of central administration control over the financial economy and the structure of local government tasks.

The analysis of the rotation of the budget is to identify the level at which the budget revenue of local governments is used. When the length of the rotation cycle exceeds 360 days, it means that the total expenditure of the financial year has been covered by own income and that there is a surplus.

Table 5. Rotation rates of the budget

Commune	The rotation cycle of own revenue [(own revenue × 360)/total expenditure]		
	2008	2009	2010
Ostrowiec Świętokrzyski (1)	226.72	200.74	177.24
Bałtów (2)	86.19	87.94	88.08
Bodzechów (2)	116.94	105.06	94.23
Ćmielów (3)	111.17	91.64	70.99
Kunów (3)	107.48	99.53	92.49
Waśniów (2)	69.67	50.32	62.58

Source: own research, on the basis of the report of the implementation of the budget of the district and LDB CSO.

The bigger the local government's autonomy, the longer the time the budget revenue covers the expenditure of the commune. In the case of Ostrowiec Św. – as shown in Table 5 – the own revenue was enough from 50 to 226 days of functioning in 2008–2010. The analysis of the budget rotation is to identify the degree of use of the local government revenue.

5. Synthetic index of finance as a determinant of economic security

Effective financial management of local governments leads to obtaining a competitive advantage in the market. That is why systematic comparative analysis, both in time and in space, provides managers with a lot of important information needed to make the right decision.

This research tries to evaluate selected aspects of local government activities at the local level (communes), as most of the basic public services are provided at this level. Its purpose is to identify the challenges faced by local and regional authorities, which will help to determine the direction of the currently demanded systemic changes.

The tested features are characterized by diverse mutual relations. It is proved by the correlation of coefficients ranging from 0.0 to 0.99 in 2008; from 0.03 to 0.99 in 2009 and from 0.05 to 0.99 in 2010.

The coefficient of variation is used in comparisons of diversity: several communities in terms of the same characteristics or the same population in terms of several characteristics. In this case, the selected features are characterized by large spatial differentiation, which is shown by a significant range of the coefficient of variation: 0.06 to 1.58 in 2008; 0.1 to 1.09 in 2009 and 0.11 to 0.92 in 2010.

The coefficient distribution asymmetry around its average provides information about the possible positive and negative differences between deviations from the average. It is commonly used to demonstrate whether the distribution is symmetrical (normal). The coefficients of asymmetry (skewness) are used in comparisons to determine the strength and direction of asymmetry. These are the unitless numbers, and the higher their value, the stronger the asymmetry. In case of the asymmetry, the factor ranged between 1.24 and 2.07 (2008); 1.38 and 1.81 (2009), and 1.49 and 2.02 (2010).

Tested features are characterized by various positive and negative relations. The correlation coefficients for the years 2008, 2009 and 2010 are presented in Tables 6, 7 and 8. They do not contain the variables X_1 , X_6 , X_8 , X_{10} , because if the variation does not exceed 0.1 (stability of the variables) or when there is a high level of mutual correlation (exceeding 0.8) – the synthetic index structure has been removed from the variables and is not included in the further study.

Table 6. The correlation matrix of variables of the synthetic index structure in 2008

2008	X_2	X_3	X_4	X_5	X_7	X_9	X_{11}	X_{12}
X_2	1	-0.71	-0.97	-0.08	-0.26	0.29	-0.52	0.63
X_3	-0.71	1	0.71	0.46	0.07	-0.09	0.07	0.05
X_4	-0.97	0.71	1	-0.06	0.44	-0.14	0.63	-0.62
X_5	-0.08	0.46	-0.06	1	-0.40	-0.35	-0.31	0.52
X_7	-0.26	0.07	0.44	-0.40	1	0.67	0.87	-0.50
X_9	0.29	-0.09	-0.14	-0.35	0.67	1	0.23	0.00
X_{11}	-0.52	0.07	0.63	-0.31	0.87	0.23	1	-0.73
X_{12}	0.63	0.05	-0.62	0.52	-0.50	0.00	-0.73	1
Min	445.34	377.6	424.59	5.5	1988.7	142.79	628.97	0
Max	1322.35	659.36	1295.18	94.84	2515.01	424.5	898.99	14.57
Arithmetic average	712.81	511.83	944.83	22.53	2174.73	334.19	723.52	6.53
Standard deviation	309.09	110.06	290.17	35.58	199.38	113.4	95.9	5.61
Coefficient of variation	0.43	0.22	0.31	1.58	0.09	0.34	0.13	0.86
Asymmetry factor	2.07	0.42	-1.16	2.4	1.16	-1.24	1.47	0.51

Source: own research, based on LDB CSO.

The variation index in the variables X_1 , X_7 and X_{10} does not exceed 0.1. These variables may have a permanent character.

The highest correlation index occurred in 2008 between the following characteristics: X_2 - X_4 , X_3 - X_6 , X_7 - X_{10} i X_7 - X_{11} , X_8 - X_9 , X_{10} - X_{11} . This ratio exceeds the level of 0.8.

In 2009, the level of correlation for the relationship of variables X_1 - X_3 , X_1 - X_6 , X_1 - X_7 , X_1 - X_8 , X_1 - X_9 , X_2 - X_4 , X_3 - X_4 , X_5 - X_6 , X_6 - X_8 , X_6 - X_9 , X_7 - X_8 , X_7 - X_9 , X_8 - X_9 , X_{10} - X_{11} exceed the value of 0.8.

Table 7. The correlation matrix of variables of the synthetic index structure in 2009

2009	X_2	X_3	X_4	X_5	X_7	X_9	X_{11}	X_{12}
X_2	1	-0.73	-0.91	-0.55	-0.06	0.13	-0.44	0.56
X_3	-0.73	1	0.89	0.65	0.63	0.43	0.74	0.13
X_4	-0.91	0.89	1	0.58	0.45	0.21	0.74	-0.22
X_5	-0.55	0.65	0.58	1	0.46	0.58	0.14	-0.10
X_7	-0.06	0.63	0.45	0.46	1	0.91	0.71	0.68
X_9	0.13	0.43	0.21	0.58	0.91	1	0.36	0.65
X_{11}	-0.44	0.74	0.74	0.14	0.71	0.36	1	0.37
X_{12}	0.56	0.13	-0.22	-0.10	0.68	0.65	0.37	1
Min	432.76	379.92	470.08	14.62	2257.17	200.01	686.28	1.42
Max	1422.9	665.11	1445.09	307.77	3263.82	1043.07	973.06	11.2
Arithmetic average	756.76	532.92	1081.07	101.64	2631.85	579.65	806.08	6.3
Standard deviation	347.53	105.12	333.98	110.66	440.17	347.62	95.89	3.54
Coefficient of variation	0.46	0.2	0.31	1.09	0.17	0.6	0.12	0.56
Asymmetry factor	1.81	-0.26	-1.38	1.66	0.82	0.25	0.94	0.09

Source: own research, based on LDB CSO.

Table 8. The correlation matrix of variables of the synthetic index structure in 2010

2010	X_2	X_3	X_4	X_5	X_7	X_9	X_{11}	X_{12}
X_2	1	-0.72	-0.67	0.26	0.37	0.48	-0.01	0.24
X_3	-0.72	1	0.81	0.16	0.18	0.08	0.33	0.17
X_4	-0.67	0.81	1	0.50	0.42	0.28	0.73	0.55
X_5	0.26	0.16	0.50	1	0.97	0.94	0.91	0.88
X_7	0.37	0.18	0.42	0.97	1	0.98	0.85	0.89
X_9	0.48	0.08	0.28	0.94	0.98	1	0.76	0.80
X_{11}	-0.01	0.33	0.73	0.91	0.85	0.76	1	0.95
X_{12}	0.24	0.17	0.55	0.88	0.89	0.80	0.95	1
Min	514.44	403.85	445.84	168.12	2682.52	602.04	769.44	3.91
Max	1388.14	604.86	1398.52	1138.43	4677.41	2013.82	1053.98	39.71
Arithmetic average	871.7	531.63	1073.57	443.29	3262.98	1025.69	876.67	14.51
Standard deviation	343.15	73.71	339.69	355.03	752.89	544.1	96.55	13.36
Coefficient of variation	0.39	0.14	0.32	0.8	0.23	0.53	0.11	0.92
Asymmetry factor	0.6	-1	-1.49	2.02	1.75	1.53	1.42	1.76

Source: own research, based LDB CSO.

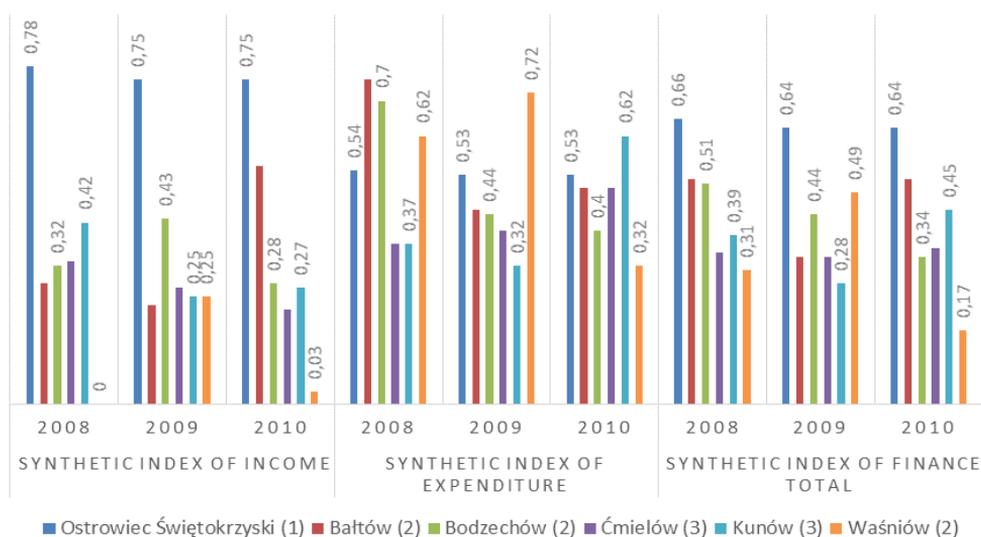
The index in case of the X_{10} , X_{11} did not exceed the level of 0.11.

In case of the relationship between variables X_1 - X_5 , X_1 - X_6 , X_1 - X_7 , X_1 - X_8 , X_1 - X_9 , X_1 - X_{10} , X_1 - X_{11} , X_1 - X_{12} , X_3 - X_4 , X_5 - X_6 , X_5 - X_7 , X_5 - X_8 , X_5 - X_9 , X_5 - X_{10} , X_5 - X_{11} , X_5 - X_{12} , X_6 - X_7 , X_6 - X_8 , X_6 - X_9 , X_6 - X_{10} , X_6 - X_{11} , X_6 - X_{12} , X_7 - X_8 , X_7 - X_9 , X_7 - X_{10} , X_7 - X_{11} , X_7 - X_{12} , X_8 - X_9 , X_9 - X_{10} , X_9 - X_{12} , X_{10} - X_{11} , X_{10} - X_{12} , X_{11} - X_{12} – the correlation rate exceeded the level of 0.8 (in 2010).

Table 9. Synthetic index of the financial sphere of communes of Ostrowiec district

Commune	Synthetic index								
	of income			of expenditure			of finance total		
	2008	2009	2010	2008	2009	2010	2008	2009	2010
Ostrowiec Świętokrzyski (1)	0.78	0.75	0.75	0.54	0.53	0.53	0.66	0.64	0.64
Bałtów (2)	0.28	0.23	0.55	0.75	0.45	0.50	0.52	0.34	0.52
Bodzechów (2)	0.32	0.43	0.28	0.70	0.44	0.40	0.51	0.44	0.34
Ćmielów (3)	0.33	0.27	0.22	0.37	0.40	0.50	0.35	0.34	0.36
Kunów (3)	0.42	0.25	0.27	0.37	0.32	0.62	0.39	0.28	0.45
Waśniów (2)	0.00	0.25	0.03	0.62	0.72	0.32	0.31	0.49	0.17

Source: own research, based on LDB CSO.

**Figure 2.** Synthetic index of the financial sphere of communes of Ostrowiec district

Source: own research, based on LDB CSO.

The surveys confirm the existence of imbalance in the financial area between the communes of Ostrowiec district. Ranking of districts for the years 2008–2010, taking into account all components, is presented in Table 9.

The comparison of general synthetic indices for three years indicates that the overall financial situation of the communes has improved, and some part has deteriorated. The leader is Ostrowiec Świętokrzyski (commune), Bałtów, Bodzechów, Ćmielów have a fairly stable position on average level. At the end of the table, the situation also appears to be stable, with Kunów and Waśniów.

The high position of Ostrowiec results from a stable level of income and business development. The positions of Bodzechów and Bałtów result from

investment activities (2008 and 2009) in the field of road infrastructure and tourism, as well as grants from the EU. The weak position of Waśniów results from the fact that it is a rural commune, with strong agricultural sphere.

The synthetic indices for the income sphere of the communes of Ostrowiec district are presented in Table 9. In this case it cannot be said that the general trend is improving or worsening the situation, however, the top of the table and its end are taken by the same communes as above.

It should be stressed that the communes belong to three different types, i.e. urban, urban-rural and rural.

6. Summary

The evaluation of the effectiveness of the government activities, its financial economy and economic security is a difficult task. It requires taking into account various variables, the selection of which may have a crucial influence on the gained results and the possibility of applying the method for evaluating the region of different countries.

Monitoring the financial situation of a local government unit is a crucial element in the process of finances management. Especially during a crisis, the reliable evaluation of the phenomena allowing the cause-result analysis, together with undertaking preventive and repair actions, may prevent the undesirable effects, as well as stimulate the local development.

The financial situation of the researched communes was diversified. Apart from Kunów (the increase of the index), the communes did not change their positions despite the changes of the level of synthetic index: Ostrowiec Świętokrzyski (index at the level of 0.66 to 0.64), Waśniów (0.31 to 0.17) and Ćmielów (0.35 to 0.36).

The analysis of the financial situation of the local government in Poland proves the decrease of the level of own resources (Ostrowiec Świętokrzyski from 62.24 to 57.70; Bodzechów 27.84 to 28.37; Ćmielów from 30.06 to 21.77) which together with the increase of investment expenditure may lead to further increase of the level of debts. It significantly limits the financial independence of the communes and causes the increase of dependence on the government administration. It may be proved by the fact of lower dynamics of granting subventions and their share in the total income.

Similarly to incomes, the financial situation of communes is influenced by the budget expenditure (current and investment) being the result of the communes' tasks. The current expenditure is devoted to keeping, sustaining and exploiting the facilities and equipment and their functioning. These are for instance remuneration, the maintenance costs (in the researched districts they range from 55.95 in Bałtów to 77.56 in Bodzechów). The investment costs decrease the current expenditure but they also serve the development aims (from 21.05 in Waśniów to 43.05 in Bałtów).

Big differences in the value of synthetic indices may prove the relatively big possibilities of improving the financial sphere of a given district. Conclusions should always be carefully drawn and the final evaluation – especially this conditioning the further functioning of the government units – should be backed up by further studies.

The financial resources as the basis of the local government units' activities and the conditions of carried out tasks also determine the communes' development and prove the economic development potential.

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SYNTETYCZNY WSKAŹNIK BEZPIECZEŃSTWA EKONOMICZNEGO REGIONU W KONTEKŚCIE DZIAŁALNOŚCI WŁADZ LOKALNYCH

Streszczenie: Ocena działań jednostek samorządu terytorialnego i bezpieczeństwa ekonomicznego regionu powinna uwzględniać cechy społeczne i ekonomiczne kształtujące potencjał jednostek samorządowych w regionie. Zasoby finansowe są podstawą działania jednostek samorządu terytorialnego oraz warunkiem realizowania nałożonych na nie zadań, determinują rozwój gminy, są wyrazem potencjału rozwoju gospodarczego. Ocenie efektywności działania samorządu, jego gospodarki finansowej i bezpieczeństwa ekonomicznego służy stosowanie metod statystyki wielowymiarowej, pozwalające na wyznaczenie miary syntetycznej. Wymaga ona uwzględnienia wielu różnych zmiennych, których dobór może mieć istotny wpływ na uzyskane wyniki i możliwość wykorzystania wskaźnika syntetycznego do ocen między regionami pochodzącymi z różnych państw. Takie podejście umożliwia ocenę obiektu (gminy) za pomocą jednej wielkości oraz pozwala na porządkowanie analizowanych obiektów pod względem rozpatrywanego zjawiska.

Słowa kluczowe: wskaźnik syntetyczny, finanse, dochody, efektywność działania, samorząd terytorialny.