

Abstract

A poviats is an independent entity with autonomy in the use of resources in the process of carrying out public tasks. Its local economic, financial and social resources, as well as information resources, determine the level of development. The basis for the proper and effective operation of poviats is the provision of appropriate financial resources. They consist of both the so-called own income as well as transfers from the state budget in the form of, inter alia, general subsidies and targeted subsidies. The main aim of the article is to assess the spatial differentiation of the level of financial independence of poviats in Poland in 2007-2019 using a synthetic measure. The empirical data on poviats in Poland was collected through information available from the Local Data Bank of the Central Statistical Office. The financial independence of poviats is radically diversified. There are significant differences regarding its level between the east and west of Poland. The western part of the country is characterized by better independence and financial situation. The study showed that the level of financial independence was shaped primarily by own income, income from PIT (personal income tax) and CIT (corporate tax), transfers from the state budget, and investment expenditure. The development of poviats depends on financial independence. The possessed financial resources are the basis for the operation and the condition for the implementation of its current and investment tasks. The potential of the poviats is built, among others, by professional activity of inhabitants, local labor market, entrepreneurship, infrastructure, condition of the natural environment, financial situation, increase in the quality and scope of public services and investments. Financial independence is correlated with the level of local development. It translates into disproportions in terms of the possibilities of meeting local needs, meeting current and future obligations.

Keywords: local financial independence, income independence, expenditure independence, poviats, synthetic measure.

ASSESSMENT OF SPATIAL DIFFERENTIATION OF FINANCIAL INDEPENDENCE OF POVIATS IN POLAND (2007–2019)

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1. Introduction

A powiat is an independent entity with autonomy in the use of resources in the process of carrying out public tasks. Its local resources (economic, financial, social and information resources) determine the level of development. The effectiveness of powiats' operations requires an appropriate level of financial situation and the appropriate shaping of resources and principles of operation, or setting goals and methods of achieving them (Dziekański, 2021). The independence of powiats is a self-governing activity in the implementation of public tasks.

The basis for the proper and effective operation of powiats is the provision of appropriate financial resources (Dyk, 2012). They consist of both the so-called own income as well as transfers from the state budget in the form of, *inter alia*, general subsidies and targeted subsidies. The process of powiat financial management relates to their current functioning as well as to strategic activities. The assessment of the financial situation and independence, with the use of appropriate tools, provides information about the current situation of powiats, allows for the determination of differences in relation to other units, as well as for the determination of development opportunities or determination of their attractiveness (Dylewski, 2011). It is a spatially polarized phenomenon. Particular powiats differ from each other in terms of the degree of development and potentials: demographic, economic, financial, social, and innovative potential (Kalinowski, 2005).

Determinants of the financial situation of powiats may be shaped by the area in which they occur, and may also be independent of it (Dennis, 2004; Standar, 2017). The possessed financial resources constitute the foundation of the powiats' functioning and condition the implementation of all kinds of tasks, the provision of local public services in a continuous and effective manner, as well as the settlement of related financial obligations (Bath, 2001; Navarro-Galera *et al.*, 2016; Stavins, Wagner and Wagner 2003). Knowledge of the state of finances allows local authorities to make comparisons with other entities and is helpful in making financial decisions (Stanny and Strzelczyk, 2018).

Financial independence may be the subject of analysis, both in legal and economic terms (Filipiak, 2011; Poniatowicz, 2018; Surówka, 2019). Kopańska points out that independence should be treated as a relative value of the powiat, as it constitutes the power to independently make decisions about one's own development (Kopańska, 2003; Siregar and Pratiwi, 2017). Jastrzębska points out that she considers the essence and scope of independence in terms of subjects and objects (Jastrzębska, 2004). Self-government independence should not be equated with complete independence from the state, but with a precise definition of the scope of interference by the state administration in the area of independent operation of local self-government bodies. It is difficult to assess the degree of financial independence of local government units (Tarno, 2004; Strzelecki, 2014).

The authors equate financial independence with the description of the financial situation of local government units. It is an important aspect of the functioning of powiats which, along with communes, perform most of the public tasks determining the quality of life, access to social services, culture, education, infrastructure, and public investments,

thus shaping financial security and the ability to pay liabilities and perform tasks (Stanny and Strzelczyk, 2018; Kotarba, 2014; Zaleśny, 2015).

Financial independence can be considered on the basis of various levels (income, expenditure, organizational, financial, etc.) on which it occurs. It depends on the type of a given unit, the ability to raise funds, owned assets, the location of a given local government unit (the so-called location rent), its tourist and landscape values and infrastructure development (Marcysiak and Prus, 2017; Prus and Sikora, 2021). The independence of self-government is determined by many important legal issues, among which a special role is played by the legal personality of poviats, equipping them with certain assets, and decentralization of public authority in close connection with the principle of subsidiarity (Poniatowicz, 2015). This indicates a holistic (systemic) approach to the analyzed problem. An important problem in assessing the degree of financial independence of local government units is the selection of appropriate measures. The factor which determines the degree of actual independence is the adjustment of income to the expenses that it has to incur while performing the statutory tasks.

2. Materials and methods

The main aim of the article is to assess the spatial differentiation of the level of financial independence of poviats in Poland in 2007–2019 using a synthetic measure. The presented years of analysis result from the programming period of EU funds, hence 2007 is the beginning of the programming period (2007–2013), 2019 is the last year of complete and up-to-date data collected at the level of poviats in Poland (related to the programming scope 2014–2020).

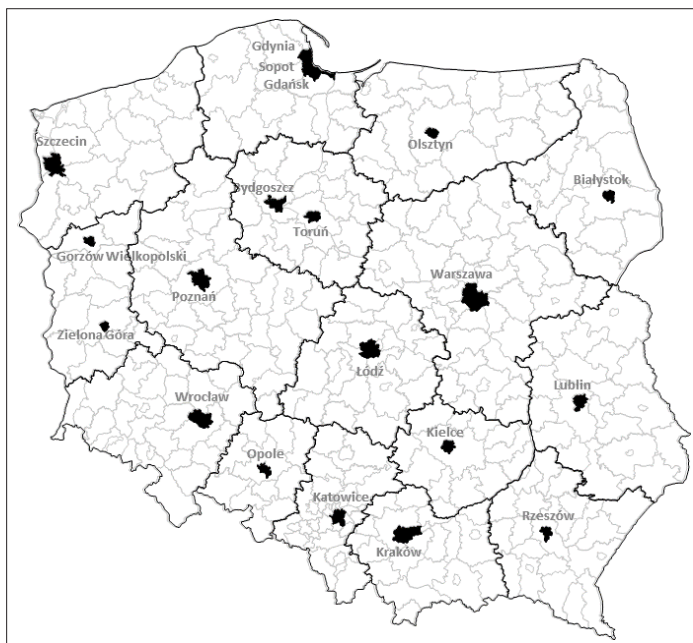


Figure 1: Poviats in Poland (research area)

Source: Dziekański et al., 2021

Empirical data on poviats in Poland was collected with information available from the Local Data Bank of the Central Statistical Office (BDL CSO) (Statistics Poland, 2019b). A poviat (LAU 1, Figure 1) is a local self-government community, all inhabitants and territory, i.e. a unit of basic territorial division, covering the area from a few to a dozen or so communes, or the entire city area with poviat rights (i.e., municipalities with the status of a city to which poviat rights have been granted). Cities with poviat rights were excluded from the analysis due to their specificities. They are a specific combination of commune and poviat self-governments, hence the scope of their tasks is extended, as they carry out not only commune tasks, but also poviat tasks (Statistics Poland, 2019a; Regulation of the Council of Ministers of August 7, 1998; Act of July 24, 1998; Act of June 5, 1998). The research area is mainly arable land (60.0% of country area), forests (30.2%), other building elements, such as residential areas, industrial areas, recreation and leisure areas, land under water and agricultural — wasteland (as of December 2019).

In research on the financial independence of poviats in Poland, and especially in spatial comparative analyzes, it is helpful to use a synthetic measure. The measure replaces a large set of diagnostic features describing the financial independence of poviats (Table 1). In the conditions of a changing local economy, the level of financial independence is determined by many socio-economic and political factors. The differences that can be noticed in the principles of constructing these measures concern the method of taking into account the characteristics of stimulant (S) and destimulant (D), selection of the normalization formula, and determination of the analytical form of the aggregating function. Regular financial independence tests allow for the verification of the achievement of poviat goals. The measure allows for control of financial independence (Prus *et al.*, 2021; Dziekański *et al.*, 2020; Dziekański and Prus, 2020).

Table 1: List of variables describing the financial independence of poviats

	Measure name	unit	S/D
X1	own income / total income	%	S
X2	own income minus income from PIT and CIT * / total income	%	S
X3	own income plus subsidy / total income	%	S
X4	total subsidy / income	%	D
X5	total grant / income	%	D
X6	operating surplus / total income	%	S
X7	PIT income / total income	%	S
X8	CIT income / total income	%	S
X9	capital expenditure / total expenditure	%	S
X10	running expenses / total expenses	%	D
X11	liabilities / own income	%	D
X12	own interest / income	%	D

S stimulant / D destimulant; variables X2, X3 were removed from the structure of the synthetic measure;

* Poviats have a share in the personal income tax (PIT) and corporate tax (CIT).

Source: Authors' own study

The analysis of the financial independence of poviats from the point of view of the possibility of free disposal of incomes and the implementation of expenses was made on the basis of a set of variables, described in Table 1. Selected indicators show the financial independence of a given unit in relation to the income and expenditure side of the budget, or provide more precise information on the financial independence of the audited local government unit.

In the analysis of the spatial differentiation of the financial independence of poviats, a synthetic measure was based on the procedure presented in Table 2.

Table 2: Stages of building a synthetic measure of financial independence of poviats

Step 1

Selection of diagnostic variables (based on substantive and statistical criteria, information potential) describing financial independence and their verification.

Description of step and calculation formulas

Observation matrix :

$$X_{ij} = \begin{bmatrix} X_{11} & X_{12} & \dots & X_{1m} \\ X_{21} & X_{22} & \dots & X_{2m} \\ \dots & \dots & \dots & \dots \\ X_{n1} & X_{n2} & \dots & X_{nm} \end{bmatrix} \quad (1),$$

where: X_{ij} – denotes the values of the j -th variable for the i -th object,

i – object number ($i = 1, 2, \dots, n$),

j – variable number ($j = 1, 2, \dots, m$).

Step 2

Division of variables into stimulants and destimulants.

Description of step and calculation formulas

Determining the direction of the preferences of the variables in relation to the considered criterion.

The correctness of determining the nature of the variables can be verified by defining the direction of correlation of individual variables with the decision variable (the main research criterion).

Step 3

Normalization of variables according to the zero unitarization method. The purpose of unitarisation is to obtain variables with a uniform range of feature values.

Description of step and calculation formulas

Diagnostic variables usually have different titters and different ranges of variation, which makes it impossible to compare and add them directly (Malina, 2004; Walesiak, 2005). To change this situation, stimulants were subjected to the zero unitarisation procedure according to the formula:

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

$$z_{ij} = \frac{\max_i x_{ij} - x_{ij}}{\max_i x_{ij} - \min_i x_{ij}}, \text{ where } x_i \in D \quad (3),$$

where: S – stimulant, D – destimulant,
 $i = 1, 2 \dots n; j = 1, 2 \dots m,$
 $\max_{x_{ij}}$ – the maximum value of the j -th variable,
 $\min_{x_{ij}}$ – the minimum value of the j -th variable,
 x_{ij} – means the value of the j -th feature for the tested unit
(Wysocki and Lira, 2005; Kukuła, 2000; Dziekanski *et al.*, 2020).

In the zero unitarization method, there is a fixed point of reference, which is the range of the normalized variable:

$$R(x_{ij}) = \max\{x_{ij}\} - \min\{x_{ij}\} \quad (4).$$

The research was carried out dynamically, determining the values of $\min\{x_{ij}\}$ and $\max\{x_{ij}\}$ for the entire period, ie 2007–2019.

After transformation, the diagnostic variables are standardized in the interval [0; 1] (Grabiński, Wydymus and Zeliaś, 1989). The value of 1 means that the variable obtained the maximum value among all the examined objects in the whole examined period of time. A value equal to 0 means that the object took the minimum value (Wysocki and Lira, 2005; Młodak 2006). As a result of the unitarization process, a matrix of feature values was obtained Z_{ij} :

$$Z_{ij} = \begin{bmatrix} z_{11} & z_{12} & \dots & z_{1m} \\ z_{21} & z_{22} & \dots & z_{2m} \\ \dots & \dots & \dots & \dots \\ z_{n1} & z_{n2} & \dots & z_{nm} \end{bmatrix} \quad (5),$$

where: Z_{ij} is the unitary value of the j -th variables for the i -th object.

Step 4

Determination of the value of the synthetic measure using the TOPSIS method (Technique for Order Preference by Similarity to an Ideal Solution).

Description of step and calculation formulas

In the first stage of calculating the TOPSIS measure, the distances of each assessed object from the standard and anti-standard were calculated, according to the formula:

$$d_i^+ = \sqrt{\frac{1}{n} \sum_{j=1}^n (z_{ij} - z_j^+)^2} \quad (6),$$

$$d_i^- = \sqrt{\frac{1}{n} \sum_{j=1}^n (z_{ij} - z_j^-)^2} \quad (7),$$

where: n – means the number of variables forming the standard and anti-standard,

z_{ij} – means the unitized value of the j feature for the tested unit,

z_j^+, z_j^- – means the standard and anti-standard object

(Wysocki, 2010; Zalewski, 2012).

TOPSIS synthetic measure was determined on the basis of the formula:

$$q_i = \frac{d_i^-}{d_i^- + d_i^+}, \text{ where } 0 \leq q_i \leq 1, i = 1, 2, \dots, n \quad (8),$$

where: $q_i \in [0; 1]$; d_i^- – is the distance of the object from the pattern (from 0),
 d_i^+ – it is the distance of the object from the pattern (from 1).

Higher values of the q_i measure indicate a more favorable situation of the examined powiat (Hwang and Yoon, 1981 *apud* Bieniasz, Gołaś and Łuczak, 2013; Zalewski, 2012).

Step 5

Linear ordering of objects. Identification of the typological group for the entire area of variability of the synthetic measure, the measures of descriptive statistics and autocorrelation were determined.

Description of step and calculation formulas

On the basis of the value of the synthetic measure, designation of 5 typological classes of powiat's financial independence, the value of percentiles was adopted as the threshold of subsequent groups.

Spatial autocorrelation is a situation where the occurrence of one phenomenon in one spatial unit causes the increase or decrease of the probability of that phenomenon occurring in neighboring units (Bivand, 1980; Getis, 2008). Global statistics I Moran allows to determine the general similarity of spatial units in terms of the studied phenomenon. According to Upton and Fingleton (1985), the Moran global coefficient was determined on the basis of the following formula:

$$I = \frac{\sum_{i=1}^n \sum_{j=1}^n w_{ij} (x_i - \bar{x})(x_j - \bar{x})}{S_o \sigma^2} \quad (9),$$

The local version of the Moran statistics is the most popular analysis known as LISA (Local Indicators of Spatial Association). It determines the similarity of a spatial unit to its neighbors and examines the statistical significance of this relationship. The local form of the I Moran coefficient for observations i is given by the formula:

$$I_i = \frac{(x_i - \bar{x}) \sum_{j=1}^n w_{ij} (x_j - \bar{x})}{\sigma^2} \quad (10),$$

where: n – number of spatial objects (number of points or polygons),
 x_i, x_j – these are the values of the variable for the compared objects,
 \bar{x} – is the average value of the variable for all objects,
 w_{ij} – elements of the spatial weight matrix (weights matrix standardized with rows to one),

$$S_o = \sum_{i=1}^n \sum_{j=1}^n w_{ij},$$

$$\sigma^2 = \frac{\sum_{j=1}^n (x_j - \bar{x})^2}{n}, \text{ – variance.}$$

The I Moran statistic takes a value from the interval (-1, 1), where the value '0' means no spatial autocorrelation, negative values are negative autocorrelation (<-1, 0; units with different values occur next to each other in space, differentiation of the examined objects), positive values signal a positive spatial correlation (0, 1>; units with similar values occur next to each other, forming clusters) (Janc, 2006; Zeliaś, 1991; Suchecki, 2010).

Source: Authors' own study based on Prus *et al.*, 2021; Dziekanski *et al.*, 2020;

Dziekański and Prus, 2020; Stanny and Strzelczyk, 2018.

In order to build a synthetic measure of financial independence, the selection of diagnostic variables was adopted as the first step. When it comes to analyzing spatial differentiation, data availability is key. The choice of the variable was made on the basis of the current research literature, as well as the availability of data (as part of the BDL CSO). From the set of variables, those characterized by low spatial variability (coefficient of variation < 0.10) and high correlation of variables (according to the inverted matrix method; Table 1, point 1) were removed. All variables selected for the analysis are characterized by sufficient discriminant ability (variables X2, X3 were removed from the study) (Malina, 2004).

In the next stage of the study, the variables were divided into stimulants and destimulants, taking into account the direction of the preferences of the variables in relation to the analyzed research criterion. Most of the variables are obvious and result from the substantive experience of the researcher and the analysis of the literature (Table 1, point 2) (Grabiński, 1985).

The process of normalization of variables was performed successively in accordance with the zero unitarization method (Rogowski and Krysiak, 1997; Hellwig, Siedlecka and Siedlecki, 1995; Hellwig, 1968; Hellwig, 1990). The goals of unitarization are to standardize the nature of the variables, to bring the different variables to mutual comparability, to replace the different ranges of variability of individual variables with a constant range, to eliminate negative values from the calculations (Table 1, point 3) (Kolenda, 2003).

The last step was to determine a synthetic measure (describing the financial independence of poviats) based on the TOPSIS method (Technique for Order Preference by Similarity to an Ideal Solution) (Wójcik-Leń *et al.*, 2019). The higher the index value ($q_i [0,1]$), the higher the level of financial independence (Hwang and Yoon, 1981 *apud* Bieniasz, Golaś and Łuczak, 2013; Pietrzak, 2016; Behzadian *et al.*, 2012).

This method allows the assessment to be made using an unlimited number of criteria. Its significant advantage is its readability, computational simplicity, indication of a positive and negative pattern, and a large number of alternative criteria that can be used (Jahanshahloo, Lotfi and Izadikhah, 2006; Hwang and Yoon, 1981 *apud* Bieniasz, Golaś and Łuczak, 2013; Velasquez and Hester, 2013; Özcan, Çelebi and Esnaf, 2011; Zavadskas, Zakarevicius and Antucheviciene, 2006; Huang, Keisler and Linkov, 2011). This enables a multidimensional look at the level of this phenomenon in individually examined objects, conducting comparative analyzes of objects (in spatial and time terms) and their linear ordering and classification (Table 1, point 4) (Dziekański, 2016a; Dziekański and Prus, 2020; Lenormand and Deffuant, 2013). The adopted method therefore enables a numerical description of complex phenomena that cannot be directly measured and allows to present the situation of regional / local differentiation of the level of the studied phenomenon (in a holistic approach), including many categories: economic, social, ecological and spatial.

In order to interpret the obtained measures, the division into typological groups (according to percentile values) was used (Nowak, 1990). The size of the synthetic measure in the first group means a better unit, and in the following groups — weaker units. The scatter plot with the line of fit was also presented and the autocorrelation analysis was performed (Table 1, point 5) (Dziekański, 2016b; Zeliaś and Malina, 1997).

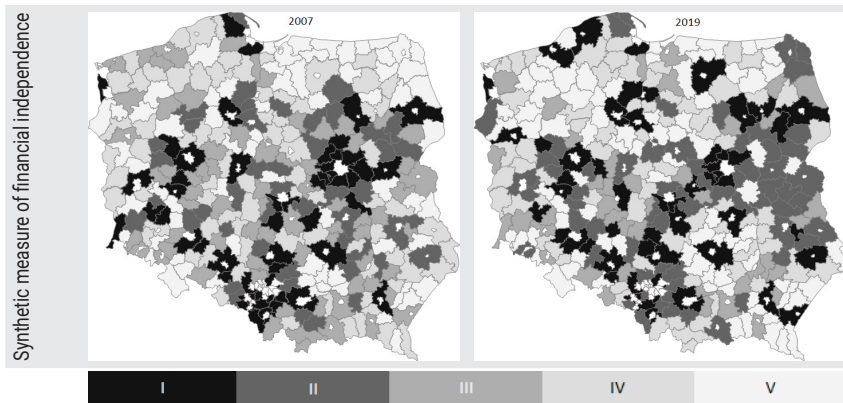
Spatial autocorrelation (positive (positive), negative (negative) or zero (no autocorrelation)) is defined as the influence of a phenomenon occurring in a spatial unit on the probability (increase or decrease) of its finding in adjacent spatial units (Bivand, 1980; Getis, 2008). Positive spatial autocorrelation occurs when we observe the spatial accumulation of high or low values of the observed variables. Negative autocorrelation means neighboring high values with low values in the space, and low values with high values (Suchecki, 2010). Lack of spatial autocorrelation implies spatial randomness (i.e., high and low values of the observed variables are distributed independently) (Kopczewska, 2006). By analyzing the result of autocorrelation, it is possible to determine clusters of objects similar to each other. Knowing and understanding the structures of space enables better anticipation of changes and facilitates taking actions in development policy (Sikora, 2009). The global and local I Moran spatial correlation coefficient can be used to investigate spatial relationships (Longley *et al.*, 2006; Anselin, 1995; Cliff and Ord, 1973). Global statistics I Moran allows to determine the general similarity of spatial units in terms of the studied phenomenon. Local statistics of spatial autocorrelation indicate statistically significant clusters of similar values in neighboring locations. Moreover, they allow the identification of the maximum distance of perceivable interdependencies in space (Global Moran Statistics, 2019; Anselin and Bera, 1998; Moran, 1950). To illustrate the spatial relationship, the I Moran statistics were calculated, using the Queen matrix standardized by rows to one (calculations were made in the PQStat program).

3. Results

Financial independence is a condition for sustainable and multifunctional socio-economic development. The position in the ranking of poviats was determined by the level of own income, transfers, income from PIT and CIT, investment expenditure, and the level of socio-economic development.

As a result of the research procedure, the spatial differentiation of poviats (314) in Poland in 2007–2019 due to the level of financial independence was shown (Figure 2). The classification of poviats was carried out on the basis of percentiles, which were threshold values for subsequent groups. In 2007, the synthetic measure of financial independence ranged from 0.40 to 0.65, and in 2019 from 0.45 to 0.67. The decrease in the range measure (from 0.25 to 0.22) indicates smaller spatial disproportions of poviats in terms of financial independence.

Figure 3 shows the spatial differentiation of own income, transfers (sums of subsidies and subsidies), income from PIT and CIT, investment expenditure of poviats in Poland in 2007 and 2019. In 2007, own income in relation to total income ranged from 0.13 to 0.64 and in 2019 from 0.20 to 0.68, transfers from 0.34 to 0.80 and 0.22 to 0.75, respectively, total income from PIT and CIT from 0.06 to 0.50 and 0.07 to 0.53 and capital expenditure from 0.01 to 0.37 and 0.01 to 0.45. The poviats of the voivodships of Western Poland found themselves in a better situation than in the weaker Eastern Poland, where the nature of the problems adversely affecting the socio-economic situation and the development



Note: White coloring indicates cities with poviat rights not being part of the analysis; black indicates the best units, lighter coloring indicates the weaker units.

Figure 2: Synthetic measure of financial independence of poviats in Poland in 2007–2019

Source: Authors' own study based on the BDL CSO data

prospects of this area have a structural dimension, resulting from historical conditions. From the point of view of the development potential, the poviats in Eastern Poland are unfavorably conditioned by the low effectiveness of the structure of the economy and the labor market, the constant outflow of inhabitants to other regions or a low level of innovation. They are additionally strengthened by the effects of the region's peripheral location on the external border of the European Union. These poviats are an example of peripheral areas, both in terms of spatial (geographical distance, directly related to the historical aspect, geographical location, diversification of the economic structure and social issues) and non-spatial (economic, social, organizational and institutional distance), which reflects the level of socio-economic development of these areas (poviats of Eastern Poland) (Strzelecka, 2008).

Financial independence determines the possibility of timely fulfillment of financial obligations and determines the continuity of service provision. Statistical characteristics of the synthetic measure of financial independence and own income, the sum of PIT and CIT income, transfers from the state budget and investment expenditure in Poland in 2007 and 2019 indicate the relative stability of the analyzed phenomenon in the case of the financial independence measure, in the case of own income a slight decrease in differentiation, in the case of tracers and capital expenditures, a slight increase in differentiation (Table 3).

Each region has its own endogenous potential which, in connection with the exogenous potential, may constitute an opportunity for the development of the area. Appropriate potential contributes to an increase in the standard of living, a better social situation, and greater public safety. The county's potential is the result of a combination of local conditions, it determines its possibilities and directions of development. They define the development capacity in particular areas of development, such as, inter alia, demographic resources, regional ecosystem, infrastructure, regional economy. At the same time, there is

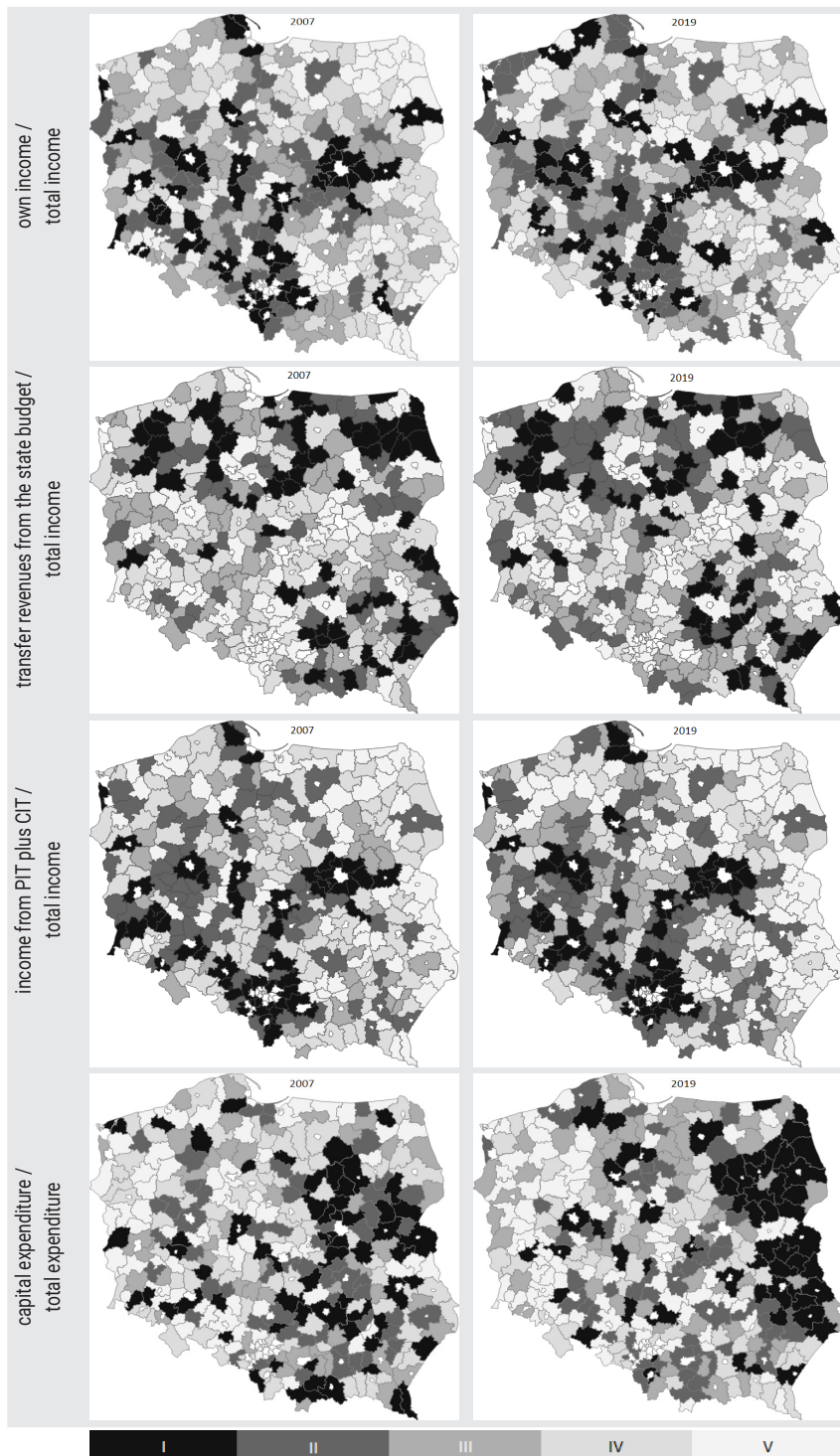


Figure 3: Spatial differentiation of own income, transfers from the state budget, income from PIT and CIT, investment expenditure of poviats in 2007 and 2019 in Poland

Source: Authors' own study based on the BDL CSO data

Table 3: Statistical characteristics of the measure of synthetic financial independence, own income, total PIT and CIT income, transfers from the state budget and investment expenditure in Poland in 2007-2019

	qi financial independence		Own income / total income		PIT + CIT / total income		Transfers / total income		Capital expenditure / total expenditure	
	2007	2019	2007	2019	2007	2019	2007	2019	2007	2019
Min	0.40	0.45	0.13	0.20	0.06	0.07	0.34	0.22	0.01	0.01
Max	0.65	0.67	0.64	0.68	0.5	0.53	0.8	0.75	0.37	0.45
Gap	0.25	0.22	0.51	0.48	0.44	0.46	0.46	0.53	0.36	0.44
Standard deviation	0.04	0.04	0.09	0.09	0.08	0.08	0.09	0.10	0.08	0.09
Coefficient of variation	0.09	0.08	0.31	0.24	0.48	0.43	0.14	0.19	0.59	0.50
Positional coefficient of variation	1.00	1.00	0.98	1.03	1.04	1.03	0.99	0.97	1.09	1.06
Quartile range	0.04	0.06	0.09	0.12	0.07	0.09	0.09	0.13	0.1	0.12
Skewness (asymmetry)	1.21	0.7	1.3	0.74	1.87	1.39	-1.17	-0.5	0.89	0.75
Kurtosis (measure of concentration)	2.14	0.31	1.97	0.05	3.79	2.09	1.38	-0.09	0.45	0.43

Source: Authors' own study based on BDL CSO data

a growing interest in the development of small territorial units of a homogeneous nature, with similar environmental, social and economic conditions.

The Pearson correlation coefficient between the value of the synthetic measure of financial independence and the elements of the financial situation of poviats in 2007 and 2019 is presented in Figure 4. The added correlation index occurred between the measure of financial independence and own income (2007 – 0.8559; 2019 – 0.8007), the sum of income from PIT and CIT (0.8324, 0.6787), investment expenditure (0.4233, 0.5808), negative with the level of transfers from the state budget (-0.8331, -0.9082). The indicators show the spatial stability of the studied area in terms of financial independence and the possibility of generating income from own sources. It can be an indicator of sustainable development and allows for more flexible spending of funds (including for investment purposes). The high value of the correlation with the share in taxes constituting state budget revenues (PIT, CIT) may indicate the dependence of municipalities on state budget revenues.

The values of the global Moran I statistics indicate the occurrence of a different level of the studied phenomenon in units distant in relation to the neighboring ones. On the basis of the obtained values, it can be noticed that in the analyzed period there is a decrease in the value of the I Moran measure (Moran's I 2007 – 0.067534; 2019 – 0.037272) for the financial independence measure. A decreasing value of a measure indicates a weakening spatial relationship. This means there is a tendency to concentrate similar values (i.e., high and low) in the area of the studied variable in a given region. Based on the data, it can be concluded that the values of the Moran's global statistics for the studied area have signifi-

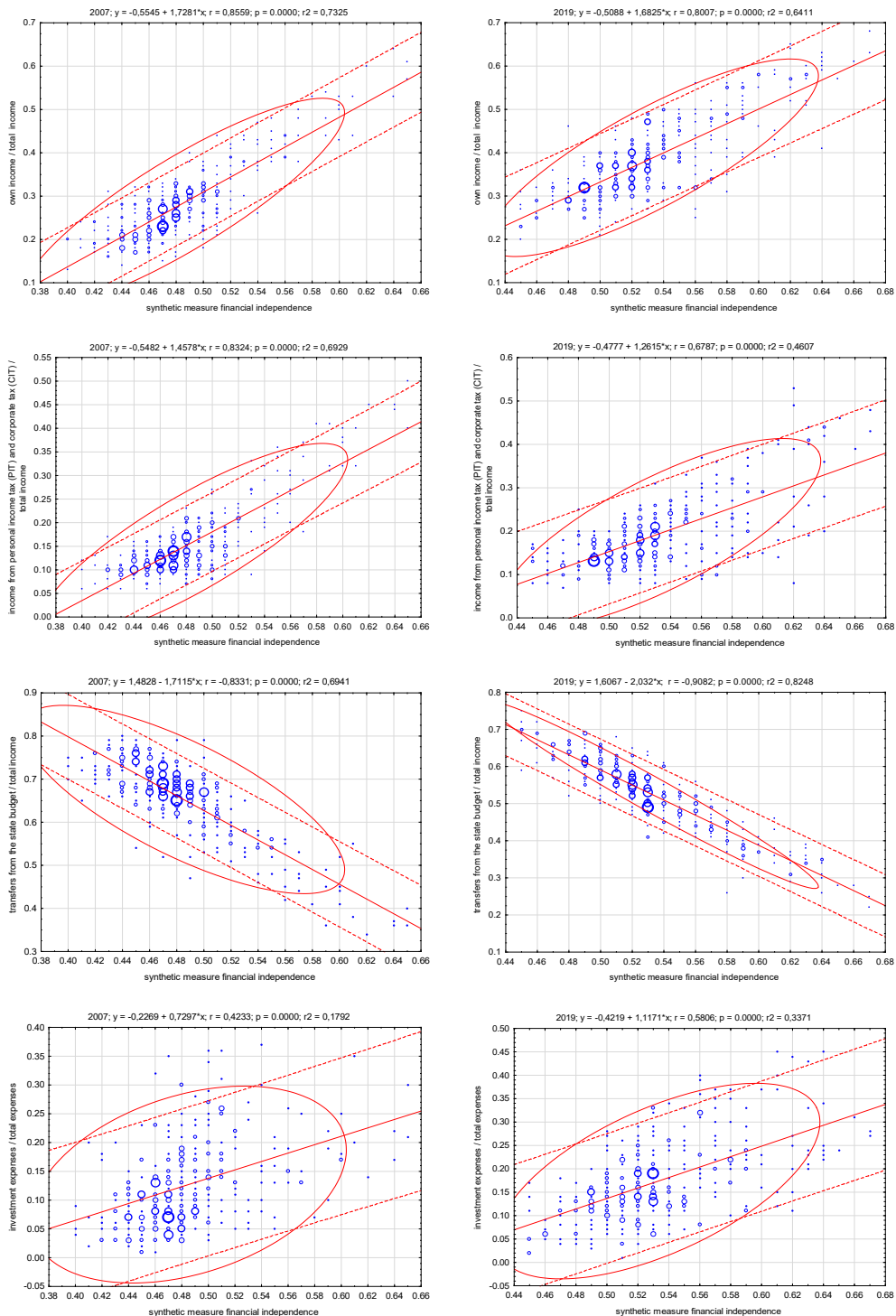


Figure 4: The relation of the synthetic measure of financial independence to the elements of the financial situation of poviats in Poland in 2007 and 2019

Source: Authors' own study based on the BDL CSO data

cant and greater values than the expected value of this statistic, which indicates a positive spatial autocorrelation. In the analyzed case, there is therefore a tendency to cluster units with a similar value of the development measure in the vicinity (Table 4).

Table 4: Values of global I Moran statistics for the measure of financial independence in terms of poviats in Poland

	2007	2019
Moran's I	0.067534	0.037272
Expected I	-0.00264	-0.00264
Assuming normality		
Variance I.	0.001171	0.001171
Statistics of Z	2.050313	1.166109
P value	0.040334	0.24357
Assuming randomness		
Variance I.	0.001169	0.001169
Statistics of Z	2.052282	1.16727
P value	0.040142	0.243101

Source: Authors' own study based on the BDL CSO data

The local statistics of I Moran were successively determined for each poviat. The obtained values of this statistics are presented in Figure 5. In the years 2007–2019, the local Moran statistics for poviats in Poland are significant and greater than zero, which means that these units are surrounded by regions with significantly similar values of the synthetic financial independence measure. The figure also shows that the areas of concentration of the measure of financial independence are dispersed over the territory of Poland.

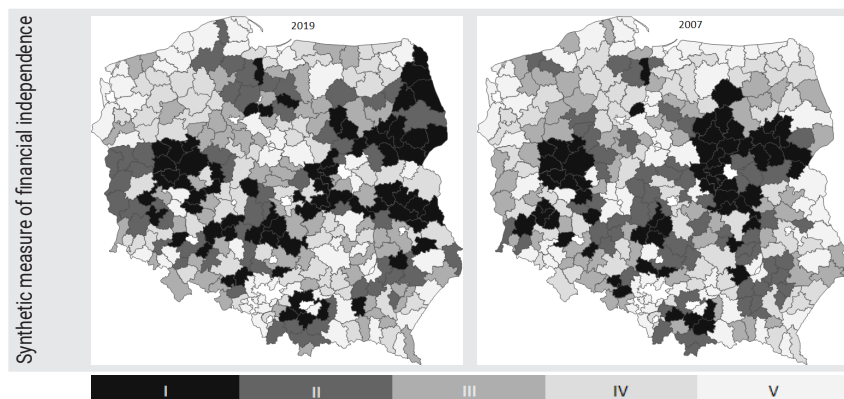


Figure 5: Spatial differentiation of the measure of financial independence of poviats in Poland in 2007 and 2019 according to the value of local statistics I Moran

Source: Authors' own study based on the BDL CSO data

4. Discussion

Poviats operate in a complex environment. In the activities of poviats, the management of financial resources, which affects the economic situation, becomes of special importance (Travers, 2012). The determinants of poviats' operation are interactive. They are a series of interrelated factors. They create a multidimensional space. The activities of poviats (operational, tactical and strategic) are carried out in the multidimensional space of local resources (including the natural, economic, social, infrastructural environment). They refer to endogenous and exogenous resources (interdependent and interrelated, *inter alia*, economic, social, infrastructural and natural factors, as indicated in Table 2), the use of which is to ensure qualitative and quantitative changes in the local economy. The socio-economic differentiation of regions results in different conditions for running a business and a different level of living conditions of the inhabitants (Capello, 2014). Due to the geographic and natural conditions and the effect of socio-economic factors, individual regions of the country are characterized by a different economic situation. The level of sustainability of development determines the intensity of public aid made available in individual regions, as well as the amount of EU funds allocation (Stiglitz, 2004; Churski, 2008; Iyer, Kitson and Toh, 2005; Spychała, 2016).

The financial potential and proper financial management influence the proper functioning and development of poviats. A good financial situation is the goal of the commune and the result of previously made decisions and the related development opportunities (Pawlik and Karpinska, 2019). Own income potential is a stable source of budget supply and, to the greatest extent, resistant to changes in the economic situation, the value of stable sources of income also grows, which increases their financial independence (Satoła, 2019). Through the prism of finances, a comprehensive assessment of the functioning of the powiat and its development possibilities can be made. Local finances are an area where the consequences of inefficient management are particularly evident. It is very important to learn, evaluate and correctly interpret financial phenomena, processes and problems related to the management of local government financial resources (Sobczyk, 2016).

Providing income independence makes the poviats the hosts of the local economy, the creators of social and economic development in a given area. It also ensures an improvement in the efficiency of managing public funds (Neneman and Swianiewicz, 2013). The analysis of income independence requires an analysis of the stability and efficiency of income sources and the possibility of a real influence of local authorities on shaping these sources (Poniatowicz, 2015). Income is also an important factor that allows to accelerate development or increase the quality and standard of tasks performed so far (Filipiak, 2016). Ensuring a high level of own incomes (their high share in total incomes) helps to better meet the needs of the inhabitants and is the basis for the sustainable development of local governments. The decrease in own incomes is a disturbing situation which, on the one hand, may be the result of demographic and social changes within the poviats, and on the other hand, it hampers financial management and contributes to limiting their socio-economic development. Expenditure independence of poviats means the right to decide on the types of tasks performed, as well as on the manner, scope and amount of

expenses incurred in order to finance these tasks. This independence is limited by the scope of their competences, defined by law. Its scope is determined by the type of tasks, the scope of legal regulations, the scope of fixed expenses, the level of own income and balancing income, enabling the financing of tasks (Kosek-Wojnar and Surówka, 2002).

Kozera, Głowicka-Wołoszyn and Wysocki (2016) indicate that financial independence is an important factor of socio-economic development. Peripheral regions, unlike larger urban centers, are characterized by a much lower income potential. A lower level of financial independence is a barrier to multifunctional development (Kozera, Głowicka-Wołoszyn and Wysocki 2016). According to Głowicka-Wołoszyn, changes in the assessment of financial independence of cities with powiat status are related to the general economic situation in the country. One should also take into account the unfavorable demographic changes in these units. They may contribute to lowering the level of their financial independence (Głowicka-Wołoszyn, 2017). Financial independence of powiats is not a permanent category. It is limited in various ways, which results, among others, from the actions of the state at the central level, and is also determined by the financial condition of a given territorial unit (Kargol-Wasiluk, Dziemianowicz and Boltromiuk, 2019; Kotarba and Kołomycew, 2014).

5. Conclusions

The article presents the results of the research on the financial independence of the districts in Poland in 2007–2019, using a synthetic measure. It allowed to indicate the spatial differentiation of financial independence by powiats. There are significant differences in its level between the East and West of Poland. The Western part of the country is characterized by better independence and financial situation. The study showed that the level of financial independence was shaped primarily by own income, income from PIT and CIT, transfers from the state budget, and investment expenditure.

The development of powiats depends on financial independence. The possessed financial resources are the basis for the operation and the condition for the implementation of its current and investment tasks. The potential of the powiat is built, among others, by professional activity of inhabitants, local labor market, entrepreneurship, infrastructure, condition of the natural environment, financial situation, increase in the quality and scope of public services and investments.

Financial independence is correlated with the level of local development. It translates into disproportions in terms of the possibilities of meeting local needs, meeting current and future obligations. Assessment of the independence and development of powiats allows for the control of the state of finances, as well as the analysis and diagnosis of activities and tasks performed. It also allows for the assessment of the achieved effects, detection and determination of factors influencing the implementation of undertaken projects and determination of the expected results.

The results of the research conducted give local governments the opportunity to compare their own financial independence with the situation of neighboring powiats or with

similar economic and social conditions. Conclusions drawn on this basis may allow local authorities to identify potential directions for optimizing the structure of local finances or the development process.

The adopted methodology of the research procedure is additionally transparent, as it enables the presentation of results with a single numerical value, the consideration of this complex issue in a static approach, as well as the indication of dynamic processes related to the finances and socio-economic development of spatial units. This is its main advantage and the rationale for choosing this method. Another advantage of the synthetic measure is the ordering of the obtained values so that it is possible to define and compare the situation of individual spatial units. At the same time, it is an objective approach that enables a comprehensive analysis of the researched units (holistic approach to the examined problem). The synthetic indicator allows to present the situation of regional / local differentiation of the level of the studied phenomenon, including many categories: economic, social, ecological and spatial.

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