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SOCIO-ECONOMIC POTENTIAL OF REGIONS – THEORY AND PRACTICE*

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Abstract

Research background: The paper refers to the social and economic potential of regions and their level of development. The crucial issue is not only how to measure the level of development but also their potential and what are the ways of defining this.

Purpose: The principal aim of this paper is an analysis and evaluation of the social and economic potential of poviats of the West Pomeranian Province through the prism of their level of development.

Research methodology: The measurements of the level of development were carried out using a synthetic measure of development. The level of poviats development was examined in aggregate for all specified factors and broken down into economic, socio-demographic, infrastructure and environmental protection factors. Data selection was made by using a factor analysis. As part of the study, a statistical analysis of potential factors was also carried out. The analysis refers to the following selected periods: 2008, 2014 and 2018 which allowed for an observation of phenomena over time in the investigated period. The research used the Central Statistical Office's annual statistics for the specific districts.

Results: The research results confirm the complexity of the study of the phenomenon of the level of socioeconomic development of LGUs, the large diversity of surveyed units regardless of the study period and their low level of development.

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Novelty: The novelty is that the analysis was conducted in stages, which allowed learning about the potential's nature on the one hand and the factors forming it on the other. A material element of the research was also identifying possible directions for the use of the findings.

Keywords: social and economic potential, potential's factors, level of districts' social and economic development, measurement of potential

JEL classification: C00, O10, R10, R11

Introduction

The social and economic potential is a very crucial matter in the economy. It can be considered at different levels of aggregation in the economy, as well as with reference to various entities or participants of economic life. The social and economic potential is a multidimensional category. It is difficult to define it unambiguously or to quantify it. The literature devoted to the issue features a number of studies addressing the measurement of the potential or elements that form it. The following studies, among others, discuss this issue: (Schumpeter, 1960; Łuniewska, Guzowska, 2001; Dwilińska, 2005; Młodak, 2006; Mackiewicz, Malinowska-Misiąg, Misiąg, Tomalak, 2006; Nagiełło, 2006; Krawczyk, 2007; Lubińska, Franek, Będzieszak, 2007; Nermend, 2008; Dylewski, Filipiak, Gorzałczyńska-Koczkodaj, 2004, 2011; Wiśniewski, 2011; Kopyściański, Rólczyński, 2013; Filipiak, Tarczyńska-Łuniewska, 2016, p. 13).

In the sphere of economics, the issues of potential-oriented research take a special place not only due to the specifics, nature or category of the potential. The direction of the practical use of findings that potential-related research holds is also crucial in this regard.

The study narrows down the direction of considerations to the social and economic potential of a selected group of local government units, where the potential was related to the level of their development in the social and economic sphere. The principal aim of this paper is therefore an analysis and evaluation of the social and economic potential of the districts of the West Pomeranian Province through the prism of the level of their development. The analysis took into account groups of factors that affect both the potential and the social and economic development of the districts. The level of districts' social and economic development was measured which made it possible to address the potential of both the province and the elements forming part of it. A statistical analysis of factors determining the social and economic development was also carried out within the research, thanks to which the occurrence of the potential in this regard was addressed. The analysis was carried out for three selected periods: 2008, 2014 and 2018. Such

an approach to the analysis allowed the observation of changes over time in the investigated period. The research employed yearly data for districts from the Central Statistical Office.

1. Potential, social and economic potential - definition, essence of the problem

The concept of potential in the economy and its synonymous concepts have yet to be clearly and precisely defined. In the literature, as well as research carried out for economic practice, there are a number of studies addressing this issue. The considerations conducted in the literature include a contextual approach to defining potential. An in-depth analysis of these questions was conducted, e.g. in the study by B. Filipiak and M. Tarczyńska-Łuniewska (2016, p. 13).

Potential can be defined as "efficiency, capacity, possibility, especially of the state in a particular field" or "resource of capabilities, capacity, production capacity inherent in something" (Tokarski, 1980; https://sjp.pwn.pl/doroszewski/potencjal;5479032.html (access 2019); Dwilińska, 2005, pp. 113–132; Wiśniewski, 2011, p. 155; Lubińska, Franek, Będzieszak, 2007, p. 77). It should be noted that it is the resources inherent in an entity, region or country that form potential. Authors W. Janasz and K. Kozioł-Nadolna (Janasz et al., 2011, p. 53) point out that resources constitute assets, but the second factor of potential are the possibilities for their use, that is competences. This approach confirms that potential is a complex category, taking into account a number of determinants. One can also say that potential consists of many partial factors. In special situations, potential can be considered from a narrower or a broader perspective. This may mean that potential as a general category, e.g. social and economic potential, is a resultant of partial potentials (Filipiak, Tarczyńska-Łuniewska, 2016, p. 13).

Investigating potential-related issues holds a special place in the economy. Potential is most often seen as: business potential, economic potential, or social and economic potential. The two first approaches in fact refer strictly to economic issues. The third term, apart from economic aspects (factors), takes into account social factors as well. Numerous definitions and terms relating to potential can be found in the economy, e.g. (Wójtowicz, p. 104; Ladd et al., 1989; Bartnicki, 2011, pp. 29–38). An interesting approach is also the methodological assumptions of the CSO (Markowski, 2011, pp. 27–49). It is worth highlighting that adopting a given definition of potential in the economy facilitates the identification and selection of elements forming it. It is all the more essential if the assumption is to measure potential.

In relation to LGUs (local government units), it can be said that potential has a complex, wider dimension. It is created by partial potentials reflecting the condition, resources and possibilities of a given administrative area (or region). It refers to a set of material, environmental

and human resources as well as knowledge and competence, experience or skills in employing those in the future. Table 1 presents the components of LGUs' general potential in terms of resources; however, such an approach may be an indication for identification of groups of measures (components, determinant) of potential in other terms, e.g. from the point of view of an enterprise, market, sector, etc.

	General LGU potential												
	Economic potential		Social potential		Technical potential	Environmental potential							
	Sets of components (variables)		Sets of components (variables)		Sets of components (variables)	Sets of components (variables)							
G.1	LGU (e.g. commune) budget	G.1	human resources (e.g. density of population)	G.1	technical infrastructure (e.g. roads in km)	G.1	condition and protection of the environment (e.g. arable land in relation to the surface area of agricultural land)						
G.2	national economy entities (e.g. total private entities against population)	G.2	commune budget expenditure on social infrastructure (e.g. expenditure on health care against total expenditure)	G.2	expenditure on technical infrastructure (e.g. expenditure on transport and telecommunication against total expenditure)	G.2	ecology-related expenditure (e.g. expenditure on environmental protection against total expenditure)						
G.3	`trade (e.g. number of shops against population)	G.3	housing economy (e.g. expenditure on housing economy against total expenditure)	G.3	other (e.g. specific features for a given LGU)	G.3	investment expenditure on environmental protection (e.g. expenditure on water management in relation to the surface area)						
G.4	labor market (e.g. total employed per 1 thousand residents)	G.4	healthcare (e.g. number of doctors per number of residents)			G.4	other (e.g. specific features for a given LGU)						
G.5	local government (e.g. commune councillors holding a degree in relation to number of councillors)	G.5	education (e.g. places in nurseries in relation to number of residents)										
G.6 G.7	accommodation facilities (e.g. total provided accommodation) other (e.g. specific features for a given LGU)	G.6	other (e.g. specific features for a given LGU)										

Table 1. Factors creating LGU general potential

Source: own compilation based on: Swianiewicz (1989), pp. 33–38; Jerczyński (1971), pp. 111–135; Ziółkowski (1997), pp. 101–124; Wysoki, Łuczak (2004), pp. 317–329; Polski (2004), p. 77; Ponikowski (2002), pp. 57–65.

The level of economic development depends on a number of interrelated factors. These factors illustrate the realization of conditions and occurrences in various spheres of social and economic life. Hence, an important element here is the interrelation occurring between potential and social and economic development. It can be said that there is interaction between these two categories. If, e.g. there is potential in a given area, realm or facility, development becomes more likely. The problem is the ability to make use of existing resources, and thus potential, in order to develop.

Using determinants of potential, a similar classification of factors affecting socioeconomic development may be done. In consequence, these factors will influence the level of socio-economic development and determine the social and economic potential. In general terms, this classification may cover the following groups of factors:

- social factors,
- economic factors,
- infrastructural factors,
- environmental factors, including ecological factors.

It is worth noting that this classification coincides with the factors taken into account in (Table 1).

Each group of general factors includes an array of detailed characteristics, thanks to which the level of social and economic development can be described (determined, measured). Such an angle highlights the complex nature of potential, taking into account at the same time various areas of its creation. In the question of measuring potential or the level of socio-economic development and their components, especially when using statistical methods, the adoption of such an approach to the problem facilitates the process of identification and selection of variables for the analysis.

2. Measurement Methods

When examining both the potential and the development of socio-economic entities it is a vital issue of which methods we choose to measure these two categories. It is important to take into consideration the methodological aspects associated with each phenomenon. We should also remember that only thorough knowledge of the level of socio-economic growth allows for a proper analysis and evaluation of its potential. In this respect we can use such methods as quantitative and qualitative analyses. The choice of a method depends on many factors that determine the potential or influence the process of socio-economic development. Moreover, what is important from the point of view of method selection and the analysis of the final results is the quality of data used in the process of measuring this potential.¹ Due to the specific nature of this subject of study, we can apply an individual approach, e.g. an expert-based method, which can prove particularly useful when identifying the factors (variables) of socio-economic development. The lack of a standard selection of measurement methods leads to the situation that the researcher often faces the dilemma of which tools to choose.

The final analysis results and the analysis itself have the highest cognitive value only if the measurement methods (quantitative and/or qualitative) meet the terms of their application. This aspect is also relevant for the practical value of the findings. The wrong approach to the subject of study in respect of its measurement can have negative consequences for any decision-making process based on the study. The question of proper measurement also draws our attention to the stages of examining the present research problem (Filipiak, Tarczyńska-Łuniewska, 2016, p. 13):

- a) the level of socio-economic development and its potential; the adequate procedures allow for constructing a socio-economic development index and, after its accurate reference and interpretation, the index of its potential. The role of the indices is measurement;
- b) the analysis of factors influencing the socio-economic development and determining its potential. Here, the application of adequate methods allows us to learn how the factors (and their structure) are taking shape, to observe their changes over time or to study their interplay.

Due to the complexity of the problem of measurement, two groups of methods can be taken into account: the quantitative methods referring mainly to quantitative factors, and the qualitative methods that deal with qualitative factors. This categorization results from the very nature of the factors. These methods can be a basis for constructing a measurement index. The use of the measurement methods aims at:^{2:}

- the assessment of the level of phenomena and processes taking place in the direct and indirect environment of LGUs or at different levels of LGUs aggregation,
- the analysis of phenomena and processes taking place in the LGUs and their environment as well as their changes over time,

¹ See more on the quality of data in Tarczyńska-Łuniewska (2013), pp. 132–139; Domański, Pruska (2000), pp. 61–76; Kordos (1988).

² See, e.g. Nowak (2001), p. 9. First and foremost, Nowak relates to the importance of analytical and research activities in reference to a corporate economic analysis. Nevertheless, these elements can play a vital role in assessing the potential of LGUs. We should have in mind, however, what kind of problem we are examining. Since it is the LGU potential, the analyst should remember about the areas of its creation.

- the research into the nature of processes taking place in the units at different stages of aggregation with the use of the statistical methods of a structure analysis,
- finding the interplay and quantitative relations within individual LGUs and among them (the interplay resulting from the specific character of the LGU operation),
- defining the influence of diverse factors on the processes taking place in the environment of and within LGUs.

With no intention to diminish the role of qualitative methods in the analysis of socioeconomic development, in the further part of the paper the author has focused on several quantitative methods. These methods make it possible to study statistical regularities, which help to expand knowledge about the phenomenon of interest, to describe the direction of its trends or to define the interrelations among its factors. The group of quantitative methods offers a wide choice of options. Therefore, the main criterion for selecting a proper method is its highest utility for the projected study. There two several types of quantitative methods:

- statistical-econometric methods,
- multidimensional comparative analysis methods.

The first group of methods allows researchers to examine statistical regularities for scientific purposes. It also contains methods that can be helpful when identifying quantitative factors of socio-economic development or potential. These are the variable specification methods that support the selection of variables (development factors, potential factors) and indicate their statistical significance from the research objective point of view.

The measurement of the most complex values requires the use of the multidimensional comparative analysis (MCA). These are the most adequate methods for investigating the level of socio-economic development or its potential. Their structure allows for the analysis and/or measurement of values that are aggregate and directly measurable, such as the socio-economic development or the potential of LGUs. Due to their specific character, these methods can be used when constructing the development level index or the LGU potential index. In this matter, the most useful are the linear ordering methods, particularly the ones based on the concept of Hellwig's synthetic measure of development (Hellwig, 1968, p. 324). Moreover, the knowledge of the essence of the multidimensional comparative analysis methods, including the linear ordering methods, can be helpful in creating new methods or measures to analyse and measure aggregate values. The MCA methods can be also applied to identify the factors (variables) of the LGU socio-economic development and potential. We can use here the variable specification methods, e.g. factor analysis, principal component analysis or the k-means analysis. The MCA methods have been extensively discussed in the reference literature. What is

more, they have been applied in a vast range of areas of economic studies (see e.g. Tarczyński, 1994; Tarczyński, Łuniewska, 2005; Hellwig, 1968, p. 324; Grabiński, Wydymus, Zeliaś, 1989; Grabiński, 1992; Gatnar, Walesiak, 2004; Batóg, 2006, pp. 43–56, 2009, pp. 382–389, 2010, pp. 344–350; Kompa, Witkowska, 2009, pp. 391–397, 2010, pp. 123–135; Dmytrów, 2018, pp. 88–96; Kompa, 2013, pp. 72–89; Nermend, 2006, pp. 127–129, 2012, pp. 201–211; Tarczyńska-Łuniewska, Nermend, 2013, pp. 85–100, 2015, pp. 138–171; Łuniewska, Tarczyński, 2006; Tarczyński, Łuniewska, 2005, pp. 421–431; Rozkrut, 2006, pp. 143–153, 279–282; Rozkrut, Rozkrut, 2006, pp. 518–525; Strahl, 2006; Tarczyński, Łuniewska, 2003; Walesiak, 1993).

3. Research methodology – empirical example

The research employed a statistical analysis in terms of potential's factors, which made it possible to address the likeness and/or differences occurring between them. Moreover, the evaluation of the factors in terms of their statistical quality was possible based on the designated measures. This information is crucial from the point of view of the analysis of the social and economic potential of local government units. Selected measures of the multidimensional analysis were used in the process of measurement of the potential. The research was carried out in the following stages:

- Statistical analysis of groups of potential's factors in the statistical analysis several methods of discovering structural regularities were used: the arithmetic mean, standard deviation, median and the coefficient of random variation. In terms of statistical measures, classical calculation formulas provided in the Excel spreadsheet were used.
- 2. Selection of factors (variables) of the potential with the use of grouping measures the factor analysis methods provided in Statistica 10.
- Measurement of the potential through the prism of the level of socio-economic development – synthetic measures of development were employed in this scope based on the concept of Hellwig's synthetic measure of development in its reference form, without weights. Calculation formulas can be found e.g. in (Hellwig, 1964, p. 324; Tarczyński, 1994, pp. 275–300).

The adopted survey design allowed learning about the social and economic potential of the West Pomeranian province from different perspectives:

 On the fractional level, where the analysis concerned component groups of potential's factors for the local government units (districts) forming the West Pomeranian province. Thereby the state and level of social and economic development of local government units was learned. The application of measures for grouping allowed the separation of factors that are key from the point of view of the essence of potential. Moreover, the socio-economic level of districts was measured using synthetic measurements of development.

2. On the general level, where based on the results of the analysis on the fractional level the potential of the West Pomeranian province was addressed.

The analysis was carried out for three selected periods: 2008, 2014 and 2018. Such an approach to the analysis allowed the observation of changes in time in the investigated period. The periods of 2008, 2014 and 2018 were chosen for two reasons. First of all, the complete data specified for the study were available and comparable. The intention was also to check the socio-economic situation of poviats in the period covering the year 2008 of the global economic crisis and the period after the crisis (2014 and 2018). In this way, one can refer to the situation that was when the crisis lasted. The year 2014 will allow us to assess the situation of the level of socio-economic crisis and whether it had an impact on the economic and social situation of poviats. The year 2018 is an assessment of the level of development in retrospect, almost 10 years from the time when the economic crisis began.

Observation in the proposed periods will allow for synergy and the inertia of processes taking place in the economy and their impact on the level of socio-economic development. The research used the Central Statistical Office's annual statistics for the districts.

In conformity with the aforementioned classification, the groups of socio-economic development factors were defined. The factors were selected according to the approach based on grounds of substance related with the analysed subject. Consequently, a set of variable 'candidates' was created. The results of this selection are shown in (Table 2). Its content was a base primary to the analysis.

Then a statistical analysis of the selected factors of socio-economic development was performed. Its findings are shown in (Table 3).

When analysing the data in (Table 2), it is clear that the West Pomeranian poviats differ in terms of the variables under observation, which is confirmed by the high coefficients of variation (Vs). On average and for each variable, they significantly exceed the good level of variation in a statistical sense (0–10%). Such a situation shows that there are considerable disproportions among poviats in terms of socio-economic factors. This situation is not favourable from the point of view of socio-economic development for both the LGUs and the voivodeship as a whole. When we refer the findings of this analysis to sustainable regional development, we can clearly see the

disproportions. The statistical analysis relates to the state of the examined data concerning the factors of socio-economic development in three periods of time: 2008, 2014 and 2018. When assessing the potential, however, we should look at the factors (variables) from a different angle, i.e. we have to take into consideration the possibilities offered by poviats that can be used and promoted for the purpose of improving the local socio-economic development. Hence, from the point of view of the potential, the statistical analysis should be more detailed and extended by a qualitative analysis of poviats.

		Econom	ic factors									
Employed persons to total number of citizens	Unemployment rate in %	Capital expenditures in Enterprises per capita in PLN	Gross value of fixed assets per 1 inhabitant in PLN	Entities entered in the REGON register per 10,000 population	Average monthly gross wage and salary in PLN							
X1	X2	X3	X4	X5	X6							
Dwellings per 1,000 population	Revenue of poviats budgets per capita PLN	Investment expenditure per capita	Expenditure of poviats budgets per capita in PLN	Expenditure on public debt servicing on 1,000 PLN total budget revenue								
X7	X8	X9	X	11								
Socio demographic factors												
X12	X13	X14	X15	X16	X17							
Natural increase per 1,000 population	Deaths per 1,000 population	Infant deaths per 1,000 live births	Population at working age to total population	Divorces per 1,000 population	Marriages per 1,000 population							
X18	X19	X20	X21	X22	X23							
Average useful floor area per 1 person in m2	Population density per 1km2	Population per generally available pharmacy	Beds in general hospital per 10,000 Population	Number of school	Stationary in- patient health care facilities per 10,000 Population							
]	Infrastructure and en	nvironmental factors	8								
X	24	X25	X26	X	27							
The length of the in relation to the length of the supply	sewerage network ength of the water network	Persons using the water supply system in % of population	Persons using the sewage system in % of population	Persons using the of pop	e gas system in % ulation							

Table 2. Factors of socio-economic development/potential - the primary base

Source: own calculations.

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Vs (%)			18	42	63	52	19	7	94	13	54	14	36		-67	6	57	1	7	13	14	42	17	70	15	25	31	2	31	11	
St.Dev.	8		0.04	4.80	1,695.40	18,290.50	213.20	296.50	3.50	160.20	103.10	174.00	2.60		1.20	0.90	2.30	0.00	0.30	0.20	3.70	23.50	575.60	16.30	0.80	9.20	0.21	1.88	13.79	8.48	
Median	201		0.20	11.90	1,917.50	30,190.00	1,047.00	3,972.30	2.30	1,278.60	165.10	1,220.80	6.70	-	-1.90	10.50	3.60	09.0	4.50	1.80	25.00	49.00	3,337.50	22.50	5.00	35.50	0.65	95.50	45.20	74.81	
Mean			0.20	11.50	2,709.90	34,962.30	1,122.90	4,034.20	3.70	1,269.50	192.60	1,263.50	7.20		-1.80	10.50	4.00	09.0	4.60	1.80	26.70	55.70	3,418.40	23.40	5.30	36.80	0.66	95.66	44.91	75.57	
Vs (%)			17.00	26.00	42.00	53.00	19.00	8.00	67.00	12.00	66.00	13.00	33.00	-	-905.00	10.00	66.00	2.00	7.00	16.00	10.00	41.00	16.00	60.00	25.00	22.00	0.36	0.02	0.34	0.12	
St.Dev.	4	S	0.03	5.39	1,072.37	13,857.35	206.35	261.80	1.75	124.89	84.51	139.92	481.00	: Factors	1.30	06.0	3.60	0.00	0.30	0.30	2.50	23.10	598.30	13.00	11.80	1.10	0.24	1.98	14.74	7.98	
Median	201	nomic Factor	0.15	22.90	2,070.45	21,654.00	1,018.50	3,310.91	2.10	1,055.77	123.33	1,064.94	13.80	Demographic	-0.30	9.50	4.30	0.60	4.90	1.70	23.80	49.50	3,482.00	21.80	46.00	5.00	0.60	95.55	44.65	66.45	
Mean		Eco	0.16	20.36	2,578.25	25,986.49	1,086.06	3,305.36	2.62	1,059.08	129.03	1,063.77	14.58	Social and	-0.10	9.40	5.40	09.0	4.90	1.80	24.70	55.80	3,639.60	21.80	47.50	4.90	0.67	95.58	43.63	66.03	
Vs (%)			11	22	105	84	138	13	122	13	71	18	33	-	76	10	39	2	~	20	~	37	18	62	29	28	50	ŝ	44	12	oruary 2020).
St.Dev.	8		0.00	6.00	1,981.60	13,451.60	2,125.60	268.00	3.50	87.20	60.60	162.40	3.40	-	1.00	06.0	2.50	0.00	0.40	0.40	1.80	20.30	901.10	19.30	13.60	1.20	0.28	3.18	17.40	7.98	tatgov.pl (Feb
Median	200		0.20	29.30	1,109.00	11,193.00	1,015.80	2,047.80	2.00	679.20	67.10	861.30	9.30	-	1.30	9.40	5.80	0.70	5.80	2.30	21.90	48.10	4,863.00	26.40	48.00	4.00	0.50	91.50	42.10	66.45	sed on www.s
Mean			0.20	27.80	1,878.40	16,108.30	1,543.70	2,142.10	2.90	677.60	85.00	893.00	10.30		1.30	9.10	6.40	0.70	5.90	2.30	22.50	54.30	4,899.80	31.30	47.60	4.20	0.57	91.31	39.89	66.03	ulculations bas
Variable			X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11		X12	X13	X14	X15	X16	X17	X18	X19	X20	X21	X22	X23	X24	X25	X26	X27	Source: own ca

At the second stage the variables were selected (from the primary base) by means of factor analysis methods. Based on the factor analysis findings, the set of variables was reduced and the subsequent selection of variables for the sake of further analysis was made – see (Table 4).

	Economi	c Factors		Socio-Demographic Factors								
Variable	Factor Principa Lo	loadings. Extr l Components padings are >0	action: (Marked .7)	Variable	Factor loadings. Extraction: Principal Components (Marked Loadings are >0.7)							
	F1	F2	F3		F1	F2	F3	F4				
X1	-0.620	0.043	-0.518	X12	-0.813 -0.012 -0.373 -							
X2	0.807	-0.322	0.294	X13	0.946	0.065	-0.098	0.035				
X3	-0.629	-0.431	-0.097	X14	-0.120	0.303	0.791	0.099				
X4	-0.852	-0.239	0.362	X15	-0.955	-0.008	0.076	0.006				
X5	-0.222	0.161	-0.706	X16	0.212	-0.706	-0.302	-0.087				
X6	-0.816	-0.188	0.277	X17	-0.657	-0.570	0.302	-0.008				
X7	-0.606	-0.080	-0.277	X18	-0.405	-0.039	0.087	-0.010				
X8	0.150	-0.818	-0.322	X20	-0.389	0.548	-0.569	-0.063				
X9	0.161	-0.800	-0.111	X21	0.098	0.070	0.472	-0.616				
X10	0.272	-0.607	-0.054	X22	-0.089	-0.600	0.025	0.574				
X11	0.508	0.123	-0.646	X23	0.265	-0.492	-0.039	-0.651				
Expl. Var.	3.622	2.108	1.684	Expl. Var.	3.362	1.828	1.518	1.254				
Prp. total	0.329	0.192	0.153	Prp. total	0.306	0.166	0.138	0.114				
		Infrast	ructure and	Environmental	Factors							

Table 4. Factors of socio-economic development/potential - after reduction

Variable	Factor loadings. Extraction: Principal Components (Marked Loadings are >0.7) F1
X24	-0.674
X25	-0.885
X26	-0.889
X27	-0.897
Expl. Var.	2.831
Prp. total	0.708

Source: own calculations by means of Statistica 10.

At the last stage of the study, the synthetic measures of development were determined to depict the development levels of poviats. The following variants were applied:

- a) for individual groups of factors: the level of development for economic factors (LoD_ EF); the level of development for socio-demographic factors (LoD_SDF); the level of development for infrastructure and environmental protection factors (LoD_I-EF);
- b) for the groups in total the level of development for the groups of factors in total (LoD_TF).

Additionally, the changes in the level of socio-economic development in the West Pomeranian poviats in the years 2008, 2014 and 2018 were examined (see Tables 5, 6, 7).

	LoD_TF	oD_TF R		R	LoD_TF	R	Changes (%)			
Poviats	20	08	20	14	20	18	2014 to 2008	2018 to 2014		
Białogardzki	0.045	16	0.036	17	0.151	11	-21	323		
Choszczeński	0.090	13	0.113	11	0.147	12	25	30		
Drawski	0.082	14	0.156	10	0.089	15	90	-43		
Goleniowski	0.336	2	0.310	3	0.292	2	-8	-6		
Gryficki	0.166	7	0.205	7	0.234	5	24	14		
Gryfiński	0.272	4	0.192	8	0.270	4	-29	40		
Kamieński	0.165	8	0.005	18	0.189	8	-97	3556		
Kołobrzeski	0.300	3	0.348	2	0.143	13	16	-59		
Koszaliński	0.041	17	0.207	6	0.362	1	402	75		
Łobeski	0.005	18	0.058	16	0.061	17	1141	6		
Myśliborski	0.115	11	0.167	9	0.284	3	45	70		
Policki	0.475	1	0.580	1	0.064	16	22	-89		
Pyrzycki	0.160	9	0.105	13	0.160	10	-35	52		
Sławieński	0.103	12	0.084	15	0.201	7	-18	138		
Stargardzki	0.227	5	0.253	5	0.165	9	11	-35		
Szczecinecki	0.198	6	0.274	4	0.104	14	38	-62		
Świdwiński	0.046	15	0.103	14	0.206	6	124	99		
Wałecki	0.137	10	0.111	12	0.005	18	-19	-96		
ave	0.1	.65	0.1	.84	0.1	74				
st.dev.	0.1	21	0.1	37	0.0	92				
Vs (%)	7	4	7	4	5	3]			

 Table 5. Poviat development level for the groups of factors in total in 2008 and 2014 including changes over the time of observation

Source: own calculations.

Data in Table 5 show that on average in the period of study the West Pomeranian poviats were on a low level of development (the mean value of the development measure was 0.165

in 2008, 0.184 in 2014 and 0.175 in 2018). Please note that the applied synthetic measure of development ranges between (0; 1). The closer the measure is to one, the closer the investigated object is to the adopted development model. Moreover, the measure of variation reveals the discrepancy in the socio-economic development of the observed LGUs: for years 2008 and 2014 Vs = 51% and in 2018 Vs = 51%. Such a situation was not beneficial both for the poviats and for the voivodeship in general. A comparison of measures over time (2008-2018) indicates that the meter is not stable over time. The analysis of the socio-economic level measured by means of statistical methods helps to view the problem on a general basis, from the point of view of the whole voivodeship. Yet, the synthetic measures for individual poviats are also interesting. They allow for identifying the best developed poviats (e.g. the Goleniowski poviat with the development measure of 0.336 in 2008, 0.310 in 2014 and 0.292 in 2018) or the worst developed ones (e.g. the Łobeski poviat with 0.005, 0.058, and 0.061 respectively). Although the best obtained measure is much lower than 1, it still seems to be high in comparison to the lowest one. Such a situation confirms the dispersion of development levels in individual LGUs. The analysis of changes over time in synthetic measures of development indicates that the increased tendencies in the researched years were in the poviats of: Choszczeński, Gryficki, Koszaliński, Łobeski (even it is the worst poviat), Myślborski and Świdwiński. The individual analysis of the measures of development also shows that not all the poviats saw improvement in their socio-economic development. The Goleniowski and Wałecki poviats have decreased tendency of measures of development in the whole period of study. In general, observation of changes in the level of development of poviats in the analyzed years indicates a lack of stability in this respect.

The level of socio-economic development of poviats can be related to their socioeconomic potential. This can be done on the basis of the synthetic development measure rooted in the development pattern. The difference between 1 and the value of the development measure calculated for a given poviat (i.e. the deviation from the pattern) can be treated as its existing, but untapped socio-economic potential. This particular information is vital from the point of view of poviat voivodeship management. Therefore, the knowledge of factors shaping the socio-economic development provides more information about a given LGU (which indirectly determines its potential) and helps identify the factors that directly constitute its potential. It is a role of management bodies to skilfully use this information with a view to activating this 'sleeping' potential, thus encouraging local socio-economic development. So, referring to the changes in the values of synthetic measures, we can say that in some LGUs where the measure rose over time the existing potential was fully exploited. Data in (Table 5) refer to the analysis of the development of poviats made with an overall approach, i.e. by joint consideration of all the groups of factors (socio-demographic, economic, infrastructural, and environmental). Due to the complex nature of the issue of socio-economic development, it seems worthwhile considering an individual approach in the studies on this process, which means constructing poviats development measures for selected groups of factors. This approach makes it possible to address the issue of both development level and potential. Individual synthetic measures determined for selected factors reveal the poviats development levels in individual groups. Thanks to the analysis of these measures we can indicate which group of factors is a leading one and has a considerable impact on the overall picture of local development. Such an approach is also important from the point of view of local potential. The present study addressed this problem as well. The analysis results are shown in (Tables 6 and 7).

The analysis of data in (Table 6) leads to conclusions similar to those obtained when determining the synthetic development measures in a general approach. Here we can also see large discrepancies among the synthetic measures calculated individually for the groups of factors. The coefficients of variance in all years of interest significantly exceed the interval of good variance in a statistical sense. Vs in 2008, 2014 and reached: for LoD_EF - 87.8% and 68.2% and 58.9%, for LoD S-DF - 69.7%, 62.7% and 46.3%, for LoD I-EF - 38.8%, 56.1% and 49.9% respectively. Although for two variants of measures of development: LoD EF and LoD S-DF in the analysed period of time the coefficient dropped, its level still indicated deep discrepancies among the poviats as well as among the factors. Also the average level of synthetic measures for the groups of factors was very low. In turn, analyzing synthetic measures of development for the poviats by groups of factors, it can be seen that within the framework of groups of measures for poviats they are also differentiated. In principle, none of the poviats has a high level of synthetic measures in all periods and for all variants of measure. None is also stable in the level of measures point of view. This confirms the instability and diversity of development in the studied areas: economic, socio-demographic and infrastructure and the environment.

Table 6. Poviat development level for individual groups of factors in the years 2008-2018

Я		3	4	~	7	9	1	2	15	5	13	18	6	10	16	17	12	14	11			
LoD_I- EF	2018	0.528	0.499	0.416	0.432	0.451	0.572	0.543	0.162	0.485	0.259	0.009	0.347	0.345	0.143	0.107	0.271	0.172	0.309	0.336	0.168	49.9
R		9	12	14	4	10	5	9	13	2	17	1	16	8	3	11	15	Г	18			
LoD_S- DF	2018	0.326	0.262	0.195	0.426	0.299	0.358	0.301	0.202	0.464	0.106	0.560	0.185	0.302	0.449	0.284	0.187	0.308	0.008	0.290	0,134	46.3
R		16	7	11	12	6	13	17	5	2	10	3	18	15	14	-	~	4	6			
LoD_EF	2018	0.062	0.360	0.196	0.181	0.371	0.159	0.055	0.373	0.440	0.209	0.415	0.007	0.123	0.135	0.528	0.322	0.388	0.280	0.256	0,151	58.9
R		8	11	3	5	9	13	14	1	18	15	6	2	12	16	4	7	17	10			
LoD_I-EF	2014	0.299	0.233	0.461	0.333	0.254	0.158	0.120	0.483	0.007	0.108	0.323	0.462	0.218	0.107	0.341	0.303	0.055	0.234	0.250	0.140	56.1
R		17	8	12	3	6	4	18	6	2	14	15	1	7	10	5	13	11	16			
LoD_S- DF	2014	0.021	0.233	0.187	0.363	0.301	0.361	0.007	0.232	0.425	0.131	0.122	0.618	0.248	0.220	0.324	0.185	0.218	0.084	0.238	0.149	62.7
R		10	14	12	4	7	8	11	2	5	15	6	1	18	17	6	3	16	13			
LoD_EF	2014	0.150	0.126	0.144	0.376	0.230	0.200	0.145	0.496	0.269	0.108	0.238	0.511	0.006	0.045	0.158	0.380	0.097	0.131	0.212	0.144	68.2
Я		6	5	2	4	6	13	14	1	18	17	8	3	11	15	7	10	16	12			
LoD_I-EF	2008	0.410	0.493	0.578	0.537	0.479	0.365	0.336	0.598	0.011	0.154	0.425	0.545	0.387	0.265	0.467	0.393	0.238	0.373	0.392	0.152	38.8
R		18	11	14	4	9	2	12	5	7	16	17	1	6	8	3	15	13	10			
LoD_S- DF	2008	0.006	0.181	0.086	0.320	0239	0.398	0.176	0.314	0.255	0.037	0.022	0.562	0.282	0.244	0.334	0.056	0.103	0.182	0.211	0.147	69.7
К		8	18	15	1	10	4	6	5	6	1	7	2	13	16	12	3	17	14			
LoD_EF	2008	0.113	0.004	0.027	0.363	0.094	0.246	0.213	0.222	0.104	0.084	0.172	0.354	0.035	0.014	0.072	0.299	0.005	0.035	0.136	0.120	87.8
Poviats		Białogardzki	Choszczeński	Drawski	Goleniowski	Gryficki	Gryfiński	Kamieński	Kołobrzeski	Koszaliński	Łobeski	Myśliborski	Policki	Pyrzycki	Sławieński	Stargardzki	Szczecinecki	Świdwiński	Wałecki	ave	st.dev.	Vs (%)

Source: own calculations.

Descista	Chang	ges in years 2014	4/2008	Chang	ges in years 2018	3/2014
Poviats	LoD_EF	LoD_S-DF	LoD_I-EF	LoD_EF	LoD_S-DF	LoD_I-EF
Białogardzki	33	251	-27	-59	1,459	76
Choszczeński	3,177	29	-53	186	13	115
Drawski	433	119	-20	36	4	-10
Goleniowski	4	13	-38	-52	17	30
Gryficki	144	26	-47	61	-1	78
Gryfiński	-19	-9	-57	-20	-1	262
Kamieński	-32	-96	-64	-62	4,393	352
Kołobrzeski	123	-26	-19	-25	-13	-66
Koszaliński	159	67	-36	64	9	6,781
Łobeski	30	254	-29	93	-19	139
Myśliborski	38	451	-24	75	361	-97
Policki	44	10	-15	-99	-70	-25
Pyrzycki	-83	-12	-44	1,960	22	59
Sławieński	208	-10	-59	203	104	34
Stargardzki	119	-3	-27	235	-13	-69
Szczecinecki	27	228	-23	-15	1	-10
Świdwiński	1,851	112	-77	299	41	210
Wałecki	275	-54	-37	114	-90	32

Table 7. The changes over the time of observation for poviats level of development(for groups of factors) (%)

Source: own calculations.

Synthetic measures calculated for the groups show which group of socio-economic factors is predominant in a given poviat. In other words, the synthetic measures reveal which groups of factors determine the local development level (create growth) or the local potential. When analysing the dynamics of changes in the development levels by the groups of factors (Table 7) we find out in which of the groups the changes were the biggest and what their direction was. Here, the increments in various groups of factors differ significantly. When addressing the local potential, the assumptions related with the synthetic measure should be applied. The analysis of the data presented in (Table 7) shows that the unused potential is where the synthetic measures are the lowest. Such inference results on the one hand from the specifics of the construction of the synthetic measure used to describe the level of development of poviats. On the other hand, it should be remembered that the synthetic measure arises as a resultant of the factors that create it. Identifying low, "weighing" factors for measure size or high, positive factors may, therefore, be important for assessing the potential of a local government unit.

The findings of the individual analysis are also a valuable source of information from the perspective of local or regional development. Moreover, it is easier to identify the groups of factors influencing LGU development and determining their potential.

Conclusions

The potential is a complex notion and can be seen from many angles, such as its constituent factors, elements or information. We can say that the potential is represented by diverse factors coming from different areas of socio-economic development, of both an economic and non-economic nature. We should also take into consideration aspects of environmental protection and geography which in certain situations are also responsible for building the LGU potential. As the present study shows, it is appropriate to measure it by means of quantitative methods: the statistical/econometric methods including the multidimensional ones. The measurement performed with the use of the selected methods of structure analysis (arithmetic mean, median, standard deviation or the coefficient of variance) helps to ascertain the nature of phenomena influencing the socio-economic development. From the point of view of the local potential, it is vital to identify the existing, rather than the untapped assets. Then we can further investigate the ways and directions of using this information. Due to the specific character of the examined problem, the findings of the present analysis can usefully be applied in studies on LGU management or in sustainable development programmes.

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