

## Article

# The Role of Local Finance in Overcoming Socioeconomic Inequalities in Polish Rural Areas

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**Abstract:** Poland is affected not only by a persistent regional differentiation but also by an internal polarization of regional development levels, particularly in rural areas. Local government authorities, especially municipalities, play an important role in bridging inequalities in socioeconomic rural development. This is because the investment capacity depends on the efficiency and effectiveness of local public finance. Note that the fight against inequalities is related to the issues of sustainable development. Therefore, the main purpose of this paper is to assess the changes in the level of socioeconomic inequalities between rural municipalities and the importance of local public finance in bridging these inequalities, as illustrated by the example of Poland. The objective formulated above emanates from the research hypothesis advanced by the authors which assumes that a strong relationship exists between one's own income and investment potential, on one side, and the socioeconomic development level of Polish rural municipalities, on the other. In the first stage of research, the levels of socioeconomic development of the municipalities surveyed were assessed with a synthetic indicator estimated using the TOPSIS method (Technique for Order Preference by Similarity to an Ideal Solution). The indicator served as a basis for building the typological classes of socioeconomic development at the municipal level. Following this, selected descriptive statistics methods were used to describe the typological classes of socioeconomic development. The second stage of research consisted of assessing the quantitative relationships between the development level and the financial situation of entities surveyed. This was done using the Pearson linear correlation coefficient and the pseudo-test of differences of means. As demonstrated in the analyses, Polish rural municipalities witnessed an improvement in their socioeconomic development level and a simultaneous reduction in development disparities. Also identified were the relationships between local public finance and development levels of rural municipalities. The empirical study also allowed us to confirm the research hypothesis formulated in this paper.

**Keywords:** socioeconomic inequalities; convergence; local finance; public sector; rural development; sustainable development

## 1. Introduction

Development means positive quantitative and qualitative changes which consist of leveraging available regional resources to improve the region's welfare and support the aims of equality [1]. To make this happen, the responsible entity must incur investment expenditure. In Poland, that entity is the local government, primarily including the municipalities (as the basic authorities in that sector). Since 1991, a three-level local government model has been in place in Poland. In addition to basic units (municipalities), it includes districts and voivodeships. Municipalities are charged with the broadest

scope of tasks. The municipal government has a legal personality, owns assets and has the capacity to collect incomes allocated to ongoing activities and investments [2,3]. Polish municipalities fulfill tasks related to (without limitation) technical and social infrastructure, environmental protection and land use management [3].

Public investments, including local government investments, are usually infrastructural expenditures with a long lifecycle. These can also be considered capital expenditure used to finance hard (physical) infrastructure projects and soft infrastructure projects (related to creating and developing human capital, innovations and R & D) [4,5]. Investment expenditure at the local government unit (LGU) level not only results in improving the standards and conditions of living for the local community but also drives local development. Indeed, municipal investments have a remarkably broad extent of positive effects of importance on both the local community and the entire local economy (including entrepreneurs based in the municipality). These effects include the demand effect which emerges when the infrastructure is created, and the supply effect which is manifested in the long term and is equated with benefits provided by the strengthened competitiveness of LGUs [6,7]. As noted by several authors, including P. McCann [8], local development policies are usually driven by supply and are focused on improving the conditions for investments by enhancing the infrastructure. Local government activities should therefore promote future socioeconomic development of local government communities.

In recent years, Poland has experienced major transformation processes due to the implementation of multiple investments, including those co-financed by the European Union (for a broader description, see A. Standar 2018 [9], A. Standar 2018 [10]). However, the development level of all Polish regions continues to be below the European Community average. The highest level of development was recorded in the Mazowieckie voivodeship where per capita GDP stood at 65% of the Union average in 2017. Conversely, the lowest level was found in eastern Poland voivodeships (Lubelskie, Podkarpackie, Podlaskie) with a per capita GDP not in excess of 30% of the Union average [11]. What also needs to be emphasized is that Poland demonstrates considerable intra-regional disparities, especially at the lowest (municipal) administrative level (NUTS 5). As noted by M. Stanny et al. [12], Poland is affected not only by a persistent regional differentiation but also by an internal polarization of regional development levels. Extremely large inequalities continue to be observed in the levels of socioeconomic development of rural municipalities (cf. [13]) which make up more than 60% of the total number of basic units of the Polish local government sector. As shown in a number of studies, including those by A. Kozera and R. Głowicka-Wołoszyn [14] and A. Rosner and M. Stanny [13], their primary functions continue to be related to agriculture. However, as the socioeconomic development progresses, and as the migration and suburbanization processes emerge, many rural municipalities shift from a purely agricultural function to residential and service functions [12,15]. Differences between local government units are a natural and obvious phenomenon; the problem is the scale and the convergent or divergent trends of differences rather than the differences themselves.

Note that the fight against inequalities is related to the issues of sustainable development. In accordance with the lines of rural development [16], rural areas should become an attractive place for working, living, relaxing and carrying out an agricultural or non-agricultural business; at the same time, their unique natural, landscape and cultural values should be preserved for future generations. Therefore, based on the sustainable development concept, the farming process should take the needs of future generations into account. Instead of being focused on profit maximization, businesses should also consider their impacts on the environment which, if degraded, can significantly affect the economy [17]. In economic terms, the sustainable development concept means meeting one's objectives while taking account of the costs of one's decisions. Sustainable development also means economic growth that promotes greater cohesion (including reducing social fragmentation, ensuring equal opportunities, and fighting against marginalization and discrimination).

Local government authorities (in Poland: municipalities, as mentioned earlier) play an important role in bridging inequalities in socioeconomic rural development. Inequalities are defined as being the opposite of equality, and involve social, economic, political and other issues. This can be interpreted as

a situation where the largest possible number of municipalities find themselves in a good socioeconomic standing. In this paper, socioeconomic development was assumed to be a multifaceted aspect, and was therefore quantified using a synthetic indicator in which the differences between the levels correspond to the extent of socioeconomic inequalities. The efficiency and effectiveness of local public finance are conditions for changes in infrastructural facilities available in rural areas which, in turn, are largely decisive for the lines of rural development. Hence, from a cognitive and applicative perspective, it is important to explore the relationships between local government finance and socioeconomic development level of rural areas.

The main purpose of this paper is to assess the changes in the level of socioeconomic inequalities between rural municipalities and the importance of local public finance in bridging these inequalities, as illustrated by the example of Poland. The objective formulated above emanates from the research hypothesis advanced by the authors which assumes that a strong relationship exists between one's own income and investment potential, on one side, and the socioeconomic development level of Polish rural municipalities, on the other.

The role of local finance in fighting socioeconomic inequalities across rural areas, as illustrated by the example of Poland, is an extremely important topic because of its cognitive and utilitarian aspects. Poland is among the largest beneficiaries of the EU cohesion policy. Since joining the European Community in 2004, Poland has accessed huge amounts of money in support of narrowing the socioeconomic gaps, especially in rural areas which make up over 90% of the national territory. A large part of these funds is allocated to local government units, including rural municipalities which account for 60% of all basic Polish LGUs. Also, Poland implements its national policy for regional development. In turn, the assumption behind the Polish system of local government financing is to support poorer units, including rural municipalities. Incomes of rural municipalities are equalized with the use of subsidies (the compensating and the balancing part); the system for implementing EU projects gives preference to units at lower development levels. Hence, it is reasonable to assess the changes in the level of socioeconomic disparities between the smallest territorial units, i.e., municipalities (especially including rural municipalities), and the role of local finance in fighting inequalities in development levels in a context of assessing the system for the allocation of Union and national public funds.

## 2. Materials and Methods

Two-stage empirical research was necessary to verify the research hypothesis and to meet the defined objective. The first step consisted of assessing the levels of socioeconomic development of the rural municipalities surveyed in 2005–2007 and 2015–2017. Because of the multidimensionality of the process considered, the socioeconomic development of municipalities was assessed using a synthetic indicator estimated based on TOPSIS (*Technique for Order Preference by Similarity to an Ideal Solution*) [18]. Three-year median values (calculated for 2005–2007 and 2015–2017) of one-year indicators (simple characteristics) were used to eliminate fluctuations. Typological classes of socioeconomic development at the municipal level were built based on the estimated value of the synthetic indicator. Descriptive statistics methods were also used later in this study; the resulting differences in synthetic indicator values were presented in a box plot.

The second stage of research consisted of assessing the financial situation of Polish rural municipalities in typological classes of socioeconomic development levels, as identified earlier. Also, an assessment was conducted on quantitative relationships between the development level and the financial situation of these municipalities. The above relationships were explored using the Pearson linear correlation coefficient. In turn, the pseudo-test of difference of means was used to assess the importance of particular indicators of the financial situation in typological classes of socioeconomic development levels of rural municipalities.

Rural municipalities located in one of the Poland's largest regions, the Wielkopolskie voivodeship, were selected for the case study (N = 113). The Wielkopolskie voivodeship demonstrates relatively large disparities between rural municipalities with different typological functions (agricultural,

residential, industrial or tourist), as corroborated in research by numerous authors, including A. Kozera and R. Głowicka-Wołoszyn [14] and A. Rosner and M. Stanny [13]. The empirical study was based on data retrieved from the Local Data Bank (Polish Central Statistical Office) [19], the *Województwo wielkopolskie—podregiony, powiaty, gminy* (Wielkopolskie voivodeship: sub-regions, districts, municipalities) yearbook (Poznań Statistical Office) [20] and *Wskaźniki do oceny sytuacji finansowej jednostek samorządu terytorialnego* (Indexes for the assessment of local government units' financial standing) (Polish Ministry of Finance) [21].

The first step of the research was an assessment of socioeconomic development levels of Polish rural municipalities in the Wielkopolskie voivodeship, based on synthetic indicators for 2005–2007 and 2015–2017. The socioeconomic development level can be regarded as a complex multi-criterion hierarchical structure. It includes the primary criterion (socioeconomic development level) and secondary criteria extending over different aspects of development (e.g., social conditions, infrastructural development level, economic development level). Particular criteria are based on simple characteristics of the objects concerned (Table 1).

**Table 1.** Simple characteristics used for the construction of the synthetic indicator of socioeconomic development of municipalities.

Item	Designation	Secondary Criterion	Name of the Characteristic
1	$x_1$	Demographic situation	Population density (per km <sup>2</sup> )
2	$x_2$		Population growth rate per 1000 population
3	$x_3$		Net migration rate per 1000 population
4	$x_4$	Social situation	Percentage of unemployed people in the total working-age population (%)
5	$x_5$		Share of councilors at tertiary education levels (%)
6	$x_6$		Number of foundations, associations and social organizations per 1000 population
7	$x_7$		People employed in the industrial, construction and service sectors per 100 working-age population
8	$x_8$		Share of social assistance beneficiaries in the total population (%)
9	$x_9$	Local economy	Number of operators entered into the REGON register per 10,000 population
10	$x_{10}$		Number of natural persons engaged in a business per 1000 population
11	$x_{11}$		Number of operators with 50 or more employees per 10,000 working-age population
12	$x_{12}$		Number of beds in accommodation facilities per 1000 population
13	$x_{13}$	Agriculture	Share of farms with an area of 15 ha or more in the total number of farms (%)
14	$x_{14}$	Housing conditions	Average usable floor area per person (m <sup>2</sup> )
15	$x_{15}$		Share of apartments equipped with central heating (%)
16	$x_{16}$	Infrastructure	Share of population served by a sewerage network (%)
17	$x_{17}$		Share of population served by a gas network (%)

Source: Own study.

Six steps can be identified in the process of building a synthetic characteristic. The first step, based on substantive and statistical criteria, includes selecting simple characteristics of the objects (municipalities), and determining the way they affect the general criterion considered (i.e., socioeconomic development

level). Based on substantive grounds, 17 simple characteristics were selected (Table 1) to reflect the demographic and social situation, local economy, infrastructure, agriculture and housing conditions in rural municipalities covered by this study. Based on statistical grounds, 10 simple characteristics ( $x_2, x_3, x_4, x_5, x_7, x_8, x_9, x_{11}, x_{16}$  and  $x_{17}$ ) were selected to be used for the construction of the synthetic indicator of socioeconomic development of rural municipalities in the Wielkopolskie voivodeship (Table 1).

Characteristics considered to have an inhibitory effect were converted into opposite characteristics with the use of a negative coefficient transformation [22]:

$$x_{ik} = a - b \cdot x_{ik}^D, \quad (1)$$

where:

$x_{ik}^D$  Value of characteristic  $k$  with an inhibitory effect ( $k \in I_D$ ) for object (municipality)  $I$  ( $i = 1, \dots, N$ ),

$x_{ik}$  Value of characteristic  $k$  ( $k = 1, \dots, K$ ) converted into a variable with a stimulating effect for object (municipality)  $i$ ,

$a, b$ : constants set arbitrarily, usually  $a = 0$  and  $b = 1$ .

In the next (2nd) step, which was the normalization of simple characteristics, the classic standardization method was used:

$$z_{ik} = \frac{x_{ik} - \bar{x}_k}{s_k}, \quad (2)$$

where:

$x_{ik}$  Value of characteristic  $k$  in object  $i$ ,

$\bar{x}_k, s_k$  Arithmetic mean and standard deviation, respectively, for characteristic  $k$ .

The normalization of simple characteristics was performed for the aggregate of average figures from 2005–2007 and 2015–2017 (referred to as object-years) in order to ensure comparability of results in the periods considered and to reveal the development trend followed by the complex process under consideration.

The coordinates of ideal objects are determined in the next (3rd) stage. Usually, they are defined as the positive ideal solution [22]:

$$A^+ = \left( \max_i(z_{i1}), \max_i(z_{i2}), \dots, \max_i(z_{iK}) \right) = (z_1^+, z_2^+, \dots, z_K^+) \quad (3)$$

and the negative ideal solution:

$$A^- = \left( \min_i(z_{i1}), \min_i(z_{i2}), \dots, \min_i(z_{iK}) \right) = (z_1^-, z_2^-, \dots, z_K^-) \quad (4)$$

However, real-world datasets may include unusual values (outliers or extreme characteristics) resulting from the specifics of the phenomenon under consideration. This is the issue encountered when assessing the socioeconomic development level of Polish rural municipalities. These observations may have a significant impact on the results of the analysis (e.g., a typological classification), which is why they require special attention. In such cases, according to empirical research by F. Wysocki and his team [23–26], if an assumption is made that the maximum and minimum values of the characteristics in reference methods for linear ordering (e.g., TOPSIS) are module objects, it results in most objects being excessively distant from the ideal values of simple characteristics. For instance, if the distribution of simple characteristics has a strong right-side asymmetry, most objects will be located far away from the positive ideal solution and very close to the negative ideal solution (in TOPSIS). As a consequence, the values of the synthetic indicator will be low and concentrated in the bottom part of its range ( $<0; 1>$ ). In turn, the reduced range of the synthetic indicator may entail problems with identifying the development levels of the phenomenon considered. In reference methods for linear ordering, ideal solutions are set separately for each characteristic. Therefore, the method for the identification of outliers proposed in this paper relies on a single-dimensional approach: the quartile criterion – used to

draw *box plots* introduced by J. W. Tukey [26] (cf. [24]). The values of a single characteristic are found to be outliers if located outside the following interval [27,28]:

$$[Q_{1k} - 1.5 \cdot IQR_k, Q_{3k} + 1.5 \cdot IQR_k], \quad (5)$$

where:

$Q_{1k}, Q_{3k}$  First and third quartile, respectively, of values of characteristic  $k$ ,

$IQR_k$  Quartile deviation for values of characteristic  $k$ .

Based on the quartile criterion (6), the coordinate of the ideal positive solution ( $A_k^+$ ) for characteristic  $k$  (having a stimulating effect) is defined as [24]:

$$A_k^+ = \begin{cases} \max_{i=1, \dots, N} (z_{ik}), & \text{if } z_{ik} \in [Q_{1k} - 1.5 \cdot IQR_k, Q_{3k} + 1.5 \cdot IQR_k] \text{ for } i \in [1, \dots, N], \\ Q_{3k} + 1.5 \cdot IQR_k, & \text{if } \max_{i=1, \dots, N} (z_{ik}) > Q_{3k} + 1.5 \cdot IQR_k, \end{cases} \quad (6)$$

and the negative ideal solution  $A_k^-$  is defined as:

$$A_k^- = \begin{cases} \min_{i=1, \dots, N} (z_{ik}), & \text{if } z_{ik} \in [Q_{1k} - 1.5 \cdot IQR_k, Q_{3k} + 1.5 \cdot IQR_k] \text{ for } i \in [1, \dots, N], \\ Q_{1k} - 1.5 \cdot IQR_k, & \text{if } \min_{i=1, \dots, N} (z_{ik}) < Q_{1k} - 1.5 \cdot IQR_k. \end{cases} \quad (7)$$

Hence, the coordinate of the positive ideal solution  $A_k^+ = Q_{3k} + 1.5 \cdot IQR_k$ , and the coordinate of the negative ideal solution  $A_k^- = Q_{1k} - 1.5 \cdot IQR_k$  are assigned to all outliers of characteristic  $k$  found in intervals  $[Q_{3k} + 1.5 \cdot IQR_k, \max_{i=1, \dots, N} (z_{ik})]$  and  $[\min_{i=1, \dots, N} (z_{ik}), Q_{1k} - 1.5 \cdot IQR_k]$ , respectively [24].

The coordinates of reference objects provide a basis for calculating the distance of each object (municipality) under consideration from the positive ideal solution ( $A^+$ ) and the negative ideal solution ( $A^-$ ) using the Euclidean formula. If the value of characteristic  $k$  (having a stimulating effect) of object  $i$  was found to be an outlier, the distance of that object from the positive or negative ideal solution is 0 (step 4) [22]:

$$d_i^+ = \sqrt{\sum_{k=1}^K (z_{ik} - z_k^+)^2}, \quad d_i^- = \sqrt{\sum_{k=1}^K (z_{ik} - z_k^-)^2}, \quad (8)$$

The TOPSIS method [18] was used to create the synthetic indicator (step 5).

$$S_i = \frac{d_i^-}{d_i^- + d_i^+}, \quad (i = 1, \dots, N), \quad (9)$$

with  $0 \leq S_i \leq 1$ .

Values of the synthetic indicator calculated above provide a basis for linear ordering of rural municipalities in a non-ascending sequence. In step 6, this was the basis for identifying the typological classes of socioeconomic development level of Polish rural municipalities in the Wielkopolskie voivodeship. The quartile approach (dividing the population into four classes) was chosen arbitrarily. At the same time, the typological classes of rural development levels were also identified based on substantive grounds.

The second stage of research consisted of assessing the quantitative relationships between the socioeconomic development level and the financial situation of rural municipalities in the Wielkopolskie voivodeship. Therefore, the Pearson linear correlation coefficients were estimated between the values of the synthetic indicator of socioeconomic development levels and the values of indicators used to assess the financial condition in the entire group of rural municipalities and in the identified typological classes. The pseudo-test of difference of means was used to identify specific indicators of the financial



situation in typological classes of socioeconomic development levels of rural municipalities. It is calculated as follows [22,29,30]:

$$t_{ck(d)} = \frac{\bar{x}_{ck} - \bar{x}_k}{s_{ck}}. \quad (10)$$

The test value measures the distance between the class mean ( $\bar{x}_{ck}$ ) and the general mean ( $\bar{x}_k$ ) of characteristic  $k$ ; the distance unit is the standard error of the class mean;

$s_{ck}^2 = \frac{N-N_c}{N-1} \cdot \frac{s_k^2}{N_c}$  – is the variance of means in the case of sampling of  $N_c$  objects of class  $c$  ( $c = 1, \dots, C$ ) without replacement;

$s_k^2$  is the empirical variance of characteristic  $k$  in the population,

$\frac{N-N_c}{N-1}$  is the finite population  $N$  correction factor.

The distribution of class means is approximated with the normal distribution (at a 0.95 confidence level). Therefore, the mean value of a specific characteristic in the class is assumed not to differ from the general mean within the limits of the standard error of the mean ranging from  $-1.96$  to  $+1.96$ . Such a characteristic is not considered to be specific. The greater is the absolute value of the test for a characteristic, the more specific it is. The values of the pseudo-test of differences of means were the basis for identifying the specific characteristics in typological classes with the use of the following scale [22]:

1.  $t_{ck(d)} \in (-\infty; -3 > v < 3; +\infty)$  very high intensity of characteristic  $k$  in class  $c$ ; the characteristic is highly specific (in positive or negative terms);
2.  $t_{ck(d)} \in (-3; -2 > v < 2; 3)$  high intensity of characteristic  $k$  in class  $c$ ; the characteristic is moderately specific (in positive or negative terms);
3.  $t_{ck(d)} \in (-2; 2)$  average intensity of characteristic  $k$  in class  $c$ ; the characteristic does not stand out and is not specific.

### 3. Role of Local Government in Promoting Development and Fighting Against Socioeconomic Inequalities: A Theoretical Background

Regional development extends over a broad spectrum of economic policy issues related to the need to use appropriate resources which may either contribute to or constrain regional wealth (in absolute or relative terms). As a consequence, regional development is related to two priorities: the optimum use of rare inputs; and social, economic and territorial coherence [1]. Generally, regional development includes all changes at regional level, especially as regards three components: regional economic potential and competitive edge and the standards and quality of living for the population [31,32]. Note that regional and local developments are equally important processes, the terms being used with respect to larger territorial units (e.g., regions) and smaller ones (e.g., municipalities), respectively [33]. In the context of a structural socioeconomic shift towards a worldwide/global economy, the interest in regional problems provides an essential counterbalance [34,35]. According to A. Spellerberg et al. [36], it is important to strengthen the endogenous potential in order for the regions to remain well-positioned in the national and international environment because effective regions are believed to fuel economic development.

For a long time now, sustainable regional development has encouraged the researchers to measure the disparities between regions, identify the reasons for such disparities and assess the impact of political measures taken to address the undesired inequalities. Table 2 presents a review of key theories on this matter, grouped by the level at which momentum for development is generated. According to top-down development theories, regional development should be driven by strong state intervention measures. Additionally, these theories can be divided into classical approaches and polarization theories. Conversely, in accordance with the bottom-up concept, development should be driven by autonomous territorial government authorities based on endogenous factors.

The grounds for an economic analysis of the theory of regional growth were laid by classical economists, such as Smith and Marshall. The basics of the modern theory of economic growth can be found in work by R. Solow [36,37], who proved that in the world of neoclassical economics, the regional

growth rate (measured as income per capita) is inversely proportional to the initial income per capita. That thesis is an optimistic outlook for poor regions [1].

In turn, Schumpeter and Tinbergen are believed to be the pioneers of the *convergence concept* (see [38–42]) which builds on Ricardo's comparative costs theory. The assumption behind Ricardo's concept is that less developed countries may derive benefits from trade based on differences in labor efficiency and cost. Note, however, that benefits arising from trade require that production be exports-oriented rather than intended for internal purposes. As noted by Tinbergen, while trade actually does equalize incomes between both countries (the rich and the poor one), this is a conditional process. First of all, the poor country must participate in the global market economy. Secondly, it should own physical capital to create enough jobs to accelerate production growth. The second condition is what makes the convergence concept stand apart from the theory of comparative costs. Generally, the essential recommendation of the convergence theory for underdeveloped countries is to import capital; this is because capital value is low in countries at lower development levels, and additional capital resources can bring greater effects than in a developed country. In early 1990s, several scientists, including Barro and Sala-Martin, carried out research on income convergence in Europe. This was a reply to the dilemmas emerging in the European Union: do the incomes follow a convergence or a divergence process? The researchers believe that income convergence at regional level is not common [40,42].

An appropriate allocation of funds (grants, subsidies) by national or European Union authorities is the instrument designed to narrow the gap between regions. Aid may be allocated evenly or preferentially (to support less developed/poor municipalities or more effective/rich ones); the selection of the allocation criterion has long been subject to discussion [43–45]. As noted by Spellerberg et al. (2007) [36], there was broad consensus in Germany that their government should provide support for disadvantaged regions. Currently, there is a doctrinal shift based on the conviction that support should rather be focused on strong regions that are expected to provide momentum for weaker towns through development diffusion processes. Note, however, that due to limited amounts of public funds, there is a considerable risk that support for weaker regions would be strongly reduced.

According to G. Henckel [46], regional differences have since long been noticed by the European Union. The Committee of the Regions and the European Regional Development Fund were established to provide support for regions. The fight against inequalities is also mentioned in the Maastricht Treaty which sets it as the main priority for the European Union. Moreover, the largest portion of funds disbursed under the regional policy is allocated to support for convergence processes. The issue of converge and its reasons have long been of particular interest for scientists around the world, including R. Capello and P. Nijkamp [1], R.J. Barro and X. Sala-i-Martin [47] and K. Dervish [48]. Complex convergence/divergence processes were examined at a global level (e.g., A.J. Korotayev et al. [49]) or in the context of selected continents or areas (e.g., [50–52]). As regards developed countries, note that some authors examined the various aspects of convergence processes in OECD members (e.g., [53,54]), including at a regional (below-national) level, especially in Europe. Researchers who explored that context include J.P. Elhorst [55], C.M. Aumayr [56], E. Marelli and M. Signorelli [57], Y. Le Pen [58], M. Bartkowska and A. Riedl [59]. Today, political decision-makers and economists are also interested in growth and convergence processes to find out whether poor countries/regions are capable of catching up with rich ones. Many modern-day experts believe that advanced economies will continue to dominate, which means convergence processes will fail [39]. As noted by D. Quah [39], the global economy entered a new era of convergence around 1990 when average incomes per capita in emerging and developing markets (considered jointly) started to rise much faster than in developed economies. The classification into rich and poor countries, which has been an inherent part of reality since the industrial revolution in early 1800s, now becomes blurred. The key question is whether the new convergence will continue progressing.

According to G. Nell and M. Signorelli [60], one of the major reasons for disproportions is the lack of infrastructure and of the network effect. For instance, areas without telecommunications



coverage cannot access new technologies. As a consequence, the dependent communication and information technologies (e.g., Internet) are also unavailable. Development disparities are also driven by an inadequate (e.g., corrupt) institutional environment, demographic and social aspects and, finally, financial performance (see [61]). As noted by G. Henckel [46], peripheral areas are affected not only by economic weaknesses but also by deteriorated social determinants.

**Table 2.** Main types and authors of development theories.

Main Types of Development Theories	Groups of Development Theories	Development Theories	Selected Authors
Top-down development (1) Classical approach	Neoclassical economics	Basic neoclassical model	Smith A. (1776)
		Theory of comparative advantage	Ricardo D. (1817)
	Keynesian model	Heckscher–Ohlin theory of factor proportions	Heckscher E. (1919); Ohlin B. (1930)
		Basic Keynesian model	Keynes J. M. (1936)
Top-down development (2) Polarization theories	Stage models	Theory of economic base	North D. C. (1955); Rittenbruch K. (1968)
		Rostow's stages of growth	Rostow W. W. (1960)
	Sustainable and unsustainable development theories	Kondratiev waves	Kondratiev N. D. (1926)
		Product lifecycle theories	Vernon R. (1966)
	Growth poles	Sustainable development	Nurkse R. (1953); Rosenstein-Rodan P.N. (1961)
		Unsustainable development	Hirschman A.O. (1958); Streeten P. (1964)
Top-down development (2) Polarization theories	Growth poles	Sectoral polarization	Schumpeter J. A. (1964); Peroux F. (1964)
		Regional polarization	Myrdal G. (1957)
	Growth poles and hierarchical diffusion	Sectoral and regional polarization	Hirschman A. O. (1958); Kaldor N. (1970)
		Growth poles concept	Peroux F. (1964); Paelinck J. (1965); Boudeville J. R. (1956); Pottier P. (1963)
Top-down development (2) Polarization theories	Core-periphery theory	Theory of innovation and of innovation process phases	Schumpeter J. A. (1964)
		Theory of sectoral and regional growth poles	Lausen J. M. (1969)
Top-down development (2) Polarization theories	Core-periphery theory	Core-periphery theory (Prebisch)	Prebisch R. (1959)
		Core-periphery theory (Friedmann)	Friedmann J. (1973)

Table 2. Cont.

Main Types of Development Theories	Groups of Development Theories	Development Theories	Selected Authors
Bottom-up development	Historical perspective of development processes	Theory of long-term alternation between development phases	Walter P. P. (1980); Stohr W. B. (1981)
	Theory of basic needs	Redistribution and growth strategy	Chenery H. H. S. (1974); ILO/MOP (1979); Tinbergen J. (1976)
		Strategy of alternative development	Report from Cocoyoc (1974); Hammarskjold Foundation (1975); Roman Club Report (1975); Stohr W. B. (1974)
	Self-centered development theory and selective separation	Theory of dependency Theory of self-centered development and selective separation	Frank A. G. (1978) Senghaas D. (1977)
	Theory of independent regional development	Regional policy concept	Stohr W. B. (1981); Uhahne (1985); Maier G. (1987)
		Concept of independent regional development Concept of regional development through activation of sub-sectoral potential	Scheer G. (1981); Glatz H. (1981) Hahne U. (1992)
	Theory of use of endogenous potential	Regional self-fulfillment concept of intraregional flows of an innovative regional environment	Maier G. (1987)

Source: [62].

Note that rural transformation results in the emergence of a problem which is how to delimit urban areas from urbanized areas. In Poland, the scope of mobility and suburbanization processes becomes increasingly broader. These trends resulted in the urbanization of the rural lifestyle and in the emergence of “intermediate cities” [63]. As a consequence, the lines between poor rural areas and rich cities become increasingly blurred. In Poland, rural communities located in the area of impact of big cities of regional importance are often wealthier than many urban local government units. The group of polarization theories indicates the importance of location as a determinant of development and shows how the peripheral environment can derive growth momentum from its backbone.

In turn, bottom-up development theories indicate the important role of endogenous factors, including the strength of impact of local government authorities. Local government activities are supposed to include an effective management of public finance and use of local resources. Local government authorities can stimulate the economy through budgetary instruments, including earmarked investment expenses [64]. Sustainable Agriculture and Rural Development (SARD) is an important concept from the perspective of rural development. It emerged due to the need for an increase in agricultural production; the heterogeneous environmental impacts of agriculture; and the importance of rural areas for ecosystems and quality of living [65]. These authors [65] believe that the sustainable rural development shall govern all rural activities. Polish rural areas are strongly heterogeneous in economic and social terms. In particular, a tremendous gap can clearly be seen between development levels of the technical infrastructure; appropriate water supply and discharge of waste water can be regarded as the most urgent problems affecting rural areas [16]. The absence of the relevant infrastructure can result in the marginalization of the entire region because of the feedback loop between the infrastructure level and general development level. On the one hand,

the infrastructure development level is a component of the general development level. On the other hand, poorly developed municipalities are unlikely to attract investors, tourists and residents; this translates into their financial condition (e.g., small revenue from the share in PIT and CIT) which, in turn, is the condition for enhancements. Therefore, there is need for supporting the development of infrastructure, especially in poorer rural and urban-rural financially disadvantaged municipalities that are unable to bear such large amounts of investment expenditure [66].

Although addressed in a number of studies, sustainable development continues to attract much interest. Its definition, main components and their importance are debated between the researchers. While the concept of sustainable agriculture is broadly discussed and needs to be further explored, less scientific efforts are dedicated to sustainable rural development which therefore requires even more attention [17].

In summary, this paper is consistent with the theories of regional development, primarily including the theory of use of endogenous potential and the polarization theories. From the perspective of local government processes, the theories of use of endogenous potential are of particular importance. According to most of these concepts, regions should be self-reliant and need to leverage their own internal potential. In the context of the financial condition of Polish municipalities, the above means that the government supports the municipalities with the general subsidy and targeted grants. While this support is obviously desirable, it is usually spent on ongoing operators. The income potential grows (and, as a consequence, so does the investment potential) when the unit uses its own inputs, such as own and organizational capital (including employee experience, adequate skills, activity of local authorities). In turn, polarization theories are of great importance for the understanding of today's regional disparities. These concepts help understand why, although funds have been allocated to regions at lower levels of socioeconomic development for many years, they continue to lag behind and the disproportions remain enormous.

#### 4. Results and discussion

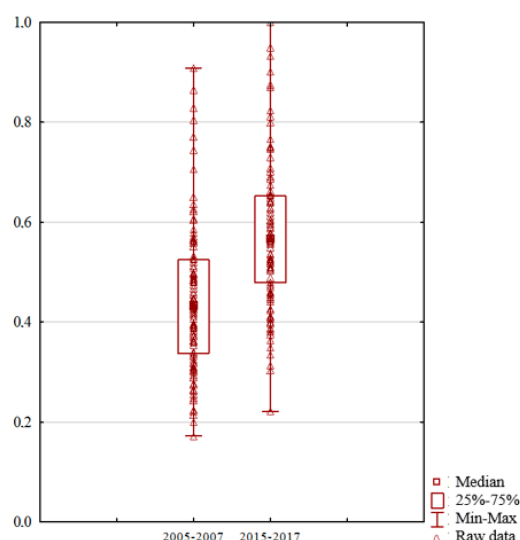
##### *4.1. Results of Empirical Research, Part 1—Assessing the Socioeconomic Development Level of Polish Rural Municipalities Located in the Wielkopolskie Voivodeship*

In recent years, especially after Poland's accession to the European Union, rural areas have attracted increased interest. Much attention is paid to their problems and outlooks and to threats they face in their development process. On the one hand, this resulted in an accelerated infrastructural transformation of many Polish municipalities [67]. On the other hand, the reason why rural areas attract interest is that according to the methodology for the delimitation of rural areas used by the Central Statistical Office, they make up over 90% of the national territory and are home to nearly 40% of the total population [19]. In the Wielkopolskie voivodeship, rural areas represent over two thirds of the territory, with more than half of basic local government units being rural municipalities. The region is strongly heterogeneous in terms of functions fulfilled by rural areas [14]. This translated into large differences in socioeconomic development levels between the LGUs.

The socioeconomic development level of rural municipalities in the Wielkopolskie voivodeship in the context of the European integration was assessed based on the values of the synthetic indicator developed using the TOPSIS methods. The results of empirical research are presented in Figure 1, in Tables 3 and 4 and in Map 1. The finding from empirical research is that the general level of socioeconomic development of rural municipalities in the region covered by this study was higher in 2015–2017 than in 2005–2007 (Figure 1). In 2005–2007, the synthetic indicator of socioeconomic development level varied in the range of 0.172 (municipality of Olszówka) to 0.909 (municipality of Suchy Las). In 2015–2017, it varied in the range of 0.221 (municipality of Wierzbinek) to 1.000 (municipality of Komorniki). This means an increase in the range of the synthetic indicator (from 0.736 in 2005–2007 to 0.779 in 2015–2017) and in the median of the indicator which provides a picture of the development level of an average rural municipality in the Wielkopolskie voivodeship (from 0.433 in 2005–2007 to 0.567 in 2015–2017). Hence, the empirical research revealed not only an increase in the

general development level of rural municipalities surveyed (as reflected by the increase in the average level of the synthetic indicator) but also a reduction in the socioeconomic development gap between them. This is evidenced by the declining value of the coefficient of variation for the synthetic indicator which was 33% in 2005–2007 and went down to 25% in 2015–2017. However, rural municipalities of the Wielkopolskie voivodeship continue to be relatively strongly heterogeneous in terms of the socioeconomic development level.

The quartile approach (based on the values of the synthetic indicator) was used to identify four classes of rural municipalities at different levels of socioeconomic development (*high*, *medium-high*, *medium-low* and *low*). As shown by empirical research, the proportion of rural municipalities at *high* and *medium-high* levels of socioeconomic development was higher in 2015–2017 than in 2005–2007 (by 8.8 and 33.6 percentage points, respectively). Also, between these periods, there was a considerable decline in the share of rural municipalities at a *medium-low* level of socioeconomic development (by as much as 38.1 percentage points). In 2005–2007, most rural municipalities (nearly 64%) in the region surveyed were at a *medium-low* level, with only every twentieth being at a *high* development level. In turn, in 2015–2017 nearly 60% and over 14% of rural municipalities in the Wielkopolskie voivodeship were at *medium-high* and *high* levels of socioeconomic development, respectively (Table 3, Figure 2). Hence, this study found that Polish rural areas experienced a positive change in their development levels. Most importantly, note that in addition to improvements in the general level of socioeconomic development, there was an accelerated progress in narrowing the gap between underdeveloped and best developed municipalities.



**Figure 1.** Box-plot of the synthetic indicator of the socioeconomic development level of Polish rural municipalities located in the Wielkopolskie voivodeship. Source: Own calculations based on [19].

**Table 3.** Classification of Polish rural municipalities located in the Wielkopolskie voivodeship by socioeconomic development level.

Typological Class	Development Level	Thresholds for the Synthetic Indicator	Number of Municipalities		Percentage of Municipalities (%)		Change (Percentage Points)
I	high	<0.75, 1.00	6	16	5.3	14.2	8.8
II	medium-high	<0.5, 0.75	29	67	25.7	59.3	33.6
III	medium-low	<0.25, 0.5	72	29	63.7	25.7	−38.1
IV	low	<0.0, 0.25	6	1	5.3	0.9	−4.4

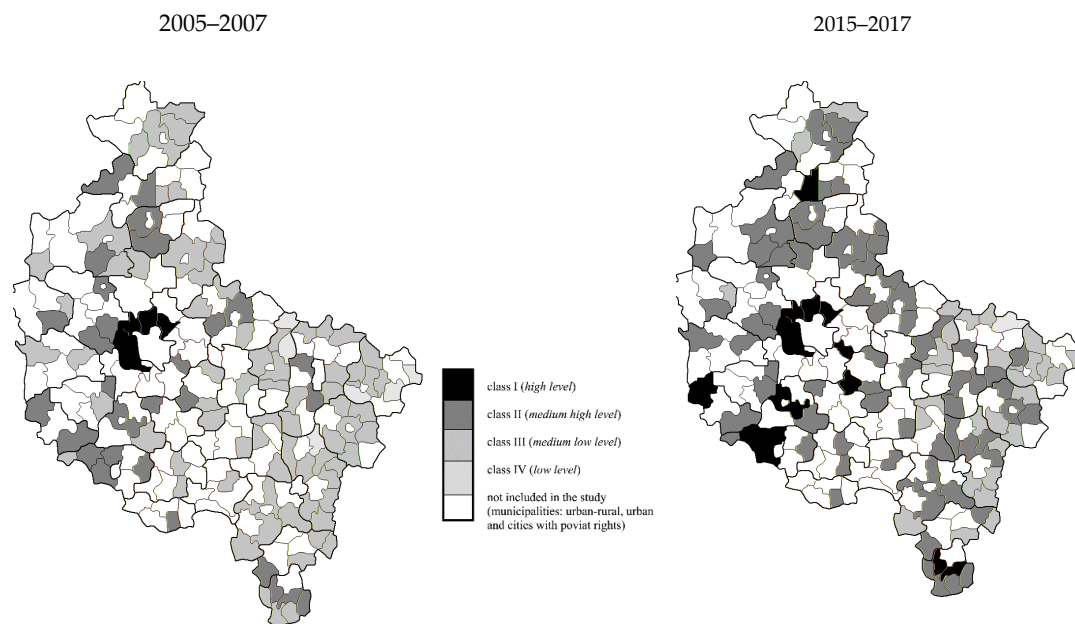
Source: own calculations based on [19].

**Table 4.** Identification of typological classes of socioeconomic development level of Polish rural municipalities located in the Wielkopolskie voivodeship (a selection of simple characteristics).

Specification		Typological Class/Socioeconomic Development Level				Total
		I High	II Medium-High	III Medium-Low	IV Low	
Distance from the region's central city of Poznań (km)	2005–2007	15.1	76.4	112.0	137.0	91.3
	2015–2017	42.2	85.4	137.0	125.0	91.0
Population density (per km <sup>2</sup> )	2005–2007	160.1	56.7	52.6	49.0	56.9
	2015–2017	91.6	56.4	53.5	50.5	59.7
Net migration rate per 1000 population	2005–2007	42.3	2.3	−1.0	−2.3	0.1
	2015–2017	4.3	−0.4	−1.0	−4.8	−0.4
Share of unemployed people in the total working-age population	2005–2007	3.2	6.2	10.4	12.8	8.9
	2015–2017	1.8	3.7	4.9	8.4	3.3
Share of councilors at tertiary education levels in the total number of councilors (%)	2005–2007	48.9	23.3	17.8	6.7	20.0
	2015–2017	46.7	26.7	13.3	0.0	4.7
People employed in the industrial, construction and service sectors per 100 working-age population	2005–2007	41.4	17.6	11.3	8.3	13.8
	2015–2017	35.7	14.3	8.2	12.5	14.0
Share of social assistance beneficiaries in the total population (%)	2005–2007	4.4	8.8	12.0	11.4	10.7
	2015–2017	4.7	6.0	8.7	12.2	6.4
Operators entered to the REGON register per 10,000 population	2005–2007	1212.3	723.4	578.4	469.6	626.1
	2015–2017	1203.7	811.2	645.7	434.4	784.2
Operators with 50 or more employees per 10,000 working-age population	2005–2007	19.9	13.2	3.9	0.0	5.3
	2015–2017	14.9	6.50	2.36	6.4	6.4
Share of people served by a sewerage network in the total population (%)	2005–2007	45.6	34.4	25.4	13.0	27.3
	2015–2017	70.4	52.2	27.1	3.5	49.4
Share of people served by a gas network in the total population (%)	2005–2007	61.4	6.4	0.0	0.0	0.0
	2015–2017	60.3	2.3	0.03	0.1	1.5

Source: own calculations based on [19,20].





**Figure 2.** Territorial delimitation of socioeconomic development levels of Polish rural municipalities in the Wielkopolskie voivodeship in 2005–2007 (**left**) and 2015–2017 (**right**). Source: Own study.

Undoubtedly, since the beginning of the economic transformation, rural areas have undergone a process of socioeconomic change which gained particular momentum after Poland's accession to the European Union. The above is consistent with research findings presented in the *Rural Poland* report [68]. As the socioeconomic development progresses, many rural municipalities shift from a purely agricultural function to residential and service functions. This is especially true for those favorably situated vis-à-vis big cities or busy roads. In the Wielkopolskie voivodeship, rapid rural development is particularly noticeable in municipalities surrounding the region's capital city of Poznań. The functional shift and the increase in the level of socioeconomic development of many rural municipalities surrounding big cities are largely driven by suburbanization which means people moving from urban to suburban areas. As a consequence, suburban areas witness a rapid growth of population and business development. In 2015–2017, as much as 14.2% of all rural municipalities in the Wielkopolskie voivodeship were at a *high* level of socioeconomic development, most of them located in the Poznań Metropolitan Area. The Poznań Agglomeration, i.e., the Poznań Metropolitan Area, is the term most commonly used to refer (based on various criteria) to the strongly urbanized region in the central part of Greater Poland. It is one of the main elements of today's settlement system, not only nationally but also in Europe. It is considered to be one of the key European settlement systems according to both ESPON (European Spatial Planning Observation Network) and to METREX (The Network of Metropolitan Regions and Areas) [69]. An important factor of impact on the functioning of local government units is the institutional rent, defined as the benefits from the proximity of regional authorities (especially voivodeship-level authorities) with strong competences or a large financial capacity. This is an important exogenous factor of development for local government units [70]. Compared to other rural municipalities, rural municipalities at a *high* level of socioeconomic development are distinctively characterized by a high demographic potential (high population density and positive net migration rate), a high economic potential (large number of economic operators per 10,000 population, large number of people employed in the industrial, construction and service sectors per 100 working-age population) and a high share of total population served by sewerage and gas supply networks. In this context, note that in rural municipalities at a *high* development level, nearly half of councilors had a tertiary education (Table 4).

In 2015–2017 compared to 2005–2007, there was a considerable reduction (by as much as 38 percentage points) in the number of rural municipalities at a *medium-low* level of socioeconomic

development. As a consequence, in 2015–2017, 25.7% and barely 1.0% of the total number of rural municipalities were at a *medium-low* and *low* level, respectively (Table 3). Compared to other units, these municipalities demonstrate several distinctive characteristics, including a population density and economic activity level below the average for rural municipalities, a negative net migration rate and a high unemployment rate. Their low level of socioeconomic development is reflected by the fact that approximately each tenth resident is a beneficiary of social aid schemes (Table 4). Municipalities at *medium-low* and *low* levels of development are located mainly in the eastern part of the voivodeship, relatively far away from the region's central city of Poznań (Figure 2).

One of the major findings of this research is the confirmation of differences in socioeconomic development levels and in functions between rural municipalities located in the eastern and western part of the Wielkopolskie voivodeship. *High* and *medium-high* levels dominate in rural municipalities located in the eastern part of the region. Many rural municipalities, especially those located around the city of Poznań (regional center) are no longer rural in nature; now, they fulfill residential and service functions. Conversely, rural municipalities located in the eastern part of the region are generally at *medium-low* and *low* levels of socioeconomic development, and their local economies fulfill only one function (agriculture) (Table 4).

#### 4.2. Results of Empirical Research, Part 2—Assessing the Quantitative Relationships Between the Socioeconomic Development Level and Financial Situation of Polish Rural Municipalities Located in the Wielkopolskie Voivodeship

Interest in local finance is driven by the role played by basic local government units in Poland (municipalities) in creating local socioeconomic development. Therefore, the second stage of research was focused on assessing the quantitative relationships between the financial situation and socioeconomic development of Polish rural municipalities, as illustrated by the example of the Wielkopolskie voivodeship. Empirical research found that a relationship exists between the general development level and financial performance of rural municipalities surveyed. The highest positive correlation was observed between the socioeconomic development level and the share of own incomes in total municipal incomes and between the development level and the amount of municipal incomes derived from income taxes (which are state revenue) per capita. In view of the above, it may be concluded that the higher the rating of the municipalities' income situation, the higher the level of socioeconomic development. What matters from the perspective of the ability to freely create local development is the LGUs' own income potential. This is because own income collected by local government units is usually the main source of financing for their own tasks, assigned as provided for in international and national regulations, primarily including the *European Charter of Local Self-Government* (which lays down the framework characteristics of LGU financing) [71] and the *Constitution of the Republic of Poland* [2]. Therefore, the municipalities' own income potential is the condition for durable local development, and vice versa. As provided for in the Constitution [2], own incomes of municipalities include any and all incomes of local government units except for general subsidies and targeted grants. The Act on Incomes of Local Government Units [72] provides a list of all components thereof, including incomes from: local taxes and fees (e.g., property tax, agricultural tax), property (sale, lease) and shares in central-level PIT and CIT. The latter category is the second major factor of municipal development. Note that while the impact of own incomes declined between the two points in time covered by this study, the importance of incomes from PIT and CIT increased. This situation was the consequence of changes in functions fulfilled by rural municipalities. Due to suburbanization, many of them shift from agricultural functions (which are typical of rural areas) towards developing residential or industrial functions [14]. As a *hinterland for cities*, rural units become attractive places to live and run a business in. This is a determinant for the level and structure of incomes they derive from PIT and CIT. As a result of these transformations, rural areas lose their nature and collect less money from agricultural tax (of primary importance to them) while earning more from central-level taxes, especially PIT.

When analyzing the findings presented in Table 5, note the high negative correlation between incomes from general subsidies (except for the educational part) and the level of socioeconomic development of rural municipalities. This should be considered obvious, having in mind that other parts of the subsidy (compensatory and educational) are an instrument intended to balance the budgets and support poorer units. The principles for establishing and the principles and procedure for granting different parts of the general subsidy are detailed in the Act on Incomes of Local Government Units of 13 November 2003 [72].

In turn, a moderate correlation was found between the indicators of the municipalities' general financial condition (related to the operating surplus) and property investment expenditure, on one side, and the socioeconomic development level of rural municipalities surveyed, on the other. The operating surplus (difference between current incomes and current expenditure) indicates the investment potential and the ability to meet liabilities, i.e., the general financial condition. Therefore, as a logical conclusion, local government units cannot develop without these funds. In turn, the relationship between the development level and investment expenditure is fully justified: it is hard to expect development processes without investment expenditure. In Poland, local government units make up a considerable part of economic processes. As part of their own tasks, they take investment measures to improve the conditions and standards of living for the population through development processes and improvements to technical and social infrastructure. Indeed, investments made by local government units have a remarkably broad extent of positive effects which are of importance not only to the local community but also to the entire local economy (including entrepreneurs based in the municipality). Usually, two categories of investment effects can be identified: the demand effect which emerges when the infrastructure is created, and the supply effect which is manifested in the long term and can be equated with benefits provided by the strengthened competitiveness of the LGU concerned [6].

The relatively weak correlation between the development level and the indebtedness of rural municipalities can also be regarded as an interesting finding (Table 5). Because of the extensive scope of tasks performed by LGUs, funds derived from budgetary incomes are often not enough to cover all expenses planned in the budget. Therefore, to meet social expectations to the fullest possible extent and maintain a high level of investment expenditure, LGUs rely on refundable financing. This allows them to operate in a situation where incomes do not match the costs of tasks they fulfill. Also, this is a way to maintain a high level of investment expenditure for LGUs with a low investment potential (especially including rural municipalities that are purely agricultural in nature). Over the study period, many rural municipalities undertook to implement a series of investment projects (especially infrastructural projects) co-financed by the Union. Refundable financing was used for that purpose [40]. Note that the investments currently carried out by rural municipalities can create conditions for their future development. This is because local development is a long-term process of economic transformation. The absence of a relationship between indebtedness and development level of rural municipalities can also result from the implementation of unsuccessful investments financed with refundable funds. When planning investments, local authorities should take account not only of direct implementation costs but also of future operating expenses. Hence, it is important to analyze the "costs" and "benefits" of investments planned because if unsuccessful, they often cause financial problems to the LGU concerned. The benefits from having an increasingly sophisticated infrastructure should exceed the related costs. As noted by B. Dafflon and K. Beer-Toth [73], debt is one of the natural ways to fulfill a unit's tasks. It provides an alternative way of financing, especially if the LGU cannot deliver its own funds, and evidences its efficiency in using all available sources of financing.

**Table 5.** Linear correlation coefficients between the indicator of socioeconomic development and sub-indicators of the financial situation of rural municipalities located in the Wielkopolskie voivodeship in 2005–2007 and 2015–2017.

Specification		Typological Classes/Socioeconomic Development Level				Total
		I High	II Medium-High	III Medium-Low	IV Low	
Own incomes per capita (PLN)	2005–2007	0.61	0.33 *	0.07	0.47	0.35 **
	2015–2017	0.62 **	0.09	0.01	×	0.51 **
Share of own incomes in total incomes (%)	2005–2007	0.72 *	0.01	0.35 **	0.64	0.73 **
	2015–2017	0.80 **	0.26 **	0.00	×	0.66 **
Per capita income derived from income taxes which are state budget revenue (PLN)	2005–2007	0.32	0.22	0.28 **	0.37	0.69 **
	2015–2017	0.80 **	0.30 **	0.13	×	0.69 **
Per capita income derived from local taxes (PLN)	2005–2007	0.66	−0.28	0.14	0.20	0.46 **
	2015–2017	0.52 **	0.07	−0.05	×	0.41 **
Operating surplus per capita (PLN)	2005–2007	0.57	−0.03	0.07	−0.59	0.49 **
	2015–2017	0.64 **	−0.07	−0.17	×	0.42 **
Investment expenditure per capita (PLN)	2005–2007	0.62	0.17	0.12 **	−0.83	0.54 **
	2015–2017	0.72 **	0.05	−0.44 **	×	0.45 **
Total liabilities per capita (PLN)	2005–2007	0.44	−0.23	−0.07	−0.10	0.25 **
	2015–2017	0.48 *	0.22 *	−0.13	×	0.36 **

\*\*, \* mean statistically significant correlation coefficients at  $\alpha = 0.05$  and  $\alpha = 0.1$ , respectively. × means the correlation coefficient between the characteristics considered cannot be calculated in a single-element class. Source: own calculations based on [19,21].

The empirical research analyzed more than just the quantitative relationships between the socioeconomic development level and the financial situation indicators for all rural municipalities of the voivodeship considered. A more in-depth analysis was carried out to explore the quantitative relationships in four groups of municipalities defined by levels of socioeconomic development. Empirical research found that the group of municipalities at a *high* level of development (class 1) exhibited the greatest number of statistically significant relationships between development levels and financial situation indicators (except for only one indicator covered by this study) (Table 5). Only one significant correlation was discovered in municipalities at a *medium-high* level of development (class 2). In turn, no correlation was found to exist between development levels and financial situation indicators in municipalities at a *medium-low* level of development. Finally, in the group of least developed rural municipalities (class 4), quantitative relationships were found between their development levels and two indicators of financial situation (Table 5).

High development levels of rural municipalities are determined by a high level of own incomes; revenue derived from income taxes which are state revenue; operating surplus; property investment expenditure; and indebtedness. This means that municipalities can become *drivers of development* provided that they have a considerable potential of own incomes derived from their own activities; take measures to encourage the inflow of new residents and enterprises; and are able to use diversified financing channels for their investments, including repayable funds. In turn, the group of rural municipalities at a *low* development level (class 4) witnessed negative correlation with the operating surplus indicator and with the investment expenditure indicator. This reflects their poor general condition which has a direct adverse effect on their investment capacity and, thus, on development processes.

Rural municipalities grouped in class 1 (at a *high* level of development) generally demonstrate the most advantageous and highly specific financial performance (Table 5). First of all, that group of local government units enjoys the highest level of financial autonomy (i.e., independence from the state budget and broad discretionary powers) measured with own income indicators. Financial autonomy is driven by the largest transfers of funds derived both from local taxes and fees and from the share in central-level PIT and CIT. Their investment capacity and ability to meet liabilities are at the highest level, as evidenced by the operating surplus indicators. As a consequence, these local governments report the largest average amounts of investments per capita. Because of the scale of their investment projects, local authorities use debt instruments to the relatively largest extent (if converted into per capita figures); in the 2015–2017 period alone, this resulted in a large portion of incomes being diverted to debt servicing. Note that the amounts of debt were so important that the debt servicing ratio went beyond the acceptable threshold of 15%. Pursuant to Article 169 of the Public Finance Act of 2005 [73], that limit was applicable until the end of 2013. However, the Ministry of Finance continues to calculate it in order to compare the financial situation of Polish local government units.

Rural municipalities grouped in class 2 (at a *medium-high* level of development) have an average level of financial autonomy. As another particularity, they allocated a large part of expenditure to investments in 2005–2007. However, it was only half of the amounts invested by local government units grouped in class 1. In that period, these municipalities relied on repayable instruments, as evidenced by large amounts of debt per capita and the highest share of debt in total incomes (Table 5).

Rural municipalities grouped in class 3 (at a *medium-low* level of development) were also characterized by the largest amounts of funds derived from state budget. This is related to a low contribution of own incomes to total municipal income and to its components (Table 5). As also confirmed by operating surplus indicators, they have a limited investment potential which translates into low investment expenditure. Moreover, the relatively low operating surplus (which is decisive for their capacity to incur debt) resulted in a reduced use of alternative sources of finance for investments, such as repayable instruments.

Similar disadvantageous figures are characteristic of group 4 which demonstrates a *low* level of development. Limited own income potential and high indebtedness are of particular importance in



this class. Hence, this group of rural municipalities is exposed to the strongest business risk in the entire region under consideration [74]. Under these circumstances, it is difficult to allocate considerable amounts of funds to investments, although these are the very municipalities who should invest much more than other ones in order to accelerate changes brought by development. Therefore, it may be very difficult, if not impossible, to overcome the underdevelopment of these local governments.

The analysis reveals some changes between the 2015–2017 and 2005–2007 sub-periods in average values of financial situation indicators in the defined classes of municipalities at different levels of socioeconomic development (Table 6). Considering that Poland enjoyed a favorable economic situation over the study period, an improvement in per capita figures should be expected. This results not only from an advantageous internal situation but also from considerable amounts of funds transferred by the European Union which were used to implement many investment projects. In view of the above, the decline in the rural municipalities' own income potential should be considered an important finding. While the difference was ca. 17% for municipalities at a *high* level of development (class 1), those at a *medium-low* level saw their own income potential decrease by nearly a half. That group had very little financial autonomy in 2015–2017, considering that as much as 70% of their incomes were derived from the state budget. What should also be noted is that municipalities at a *medium-low* level of development (class 3) allocated more funds to investments in 2015–2017. However, compared to the most developed LGUs, this was still not enough (even though class 1 local governments reduced their investment expenditure). It needs to be emphasized that all local government groups considered increased their indebtedness and the related debt servicing costs which went beyond the safe limit of 15% in representatives of class 3 [75]. This is a very worrying phenomenon because in the long run, it can result in a reduction of investment expenditure as the authorities will look for additional funds to repay the debt. As a consequence, this will hamper their already slow development processes.

#### 4.3. Discussion and Political Implications

Development levels vary considerably across European Union countries. For many years, it has been a topic of interest to both researchers (as mentioned by R. Capello and P. Nijkamp [1]) and political decision-makers who have developed a framework for regional policy development since the 1950s [76]. With the Lisbon Treaty entering into force in 2009, economic and social cohesion was supplemented with territorial cohesion. This is documented in Article 3 of the Treaty: The Union shall promote economic, social and territorial cohesion and solidarity among Member States [77]. Cohesion is a high-profile issue to the EU, as reflected by subsequent reports on economic, social and territorial cohesion. The last three were delivered in 2010, 2014 and 2017 [78–80]. The analyses of the European Commission prove that disproportions exist both between and within countries. Although regional disproportions in Poland are large, a similar situation exists in other countries. However, the development of all Polish regions is below the European Union average [80,81]. The empirical research also demonstrated that regional disparities in the level of socioeconomic development have reduced once again and follow a convergence trend. Also, Poland is among the countries who report the greatest improvements in that respect. Researchers who explored the topic of regional disparities and convergence processes include J.P. Elhorst [55], C.M. Aumayr [57], E. Marelli and M. Signorelli [57], Le Pen [58], M. Bartkowska and A. Riedl [59].

**Table 6.** Financial situation of Polish rural municipalities at different levels of socioeconomic development located in the Wielkopolskie voivodeship in 2005–2007 and 2015–2017.

Specification		Typological Class/Socioeconomic Development Level				Total
		I High	II Medium-High	III Medium-Low	IV Low	
Own incomes per capita (PLN)	2005–2007	3007.3	2107.0	2091.3	2033.6	2140.9
	2015–2017	2508.7 **	1550.1	1194.3 *	1745.1	1596.3
Share of own incomes in total incomes (%)	2005–2007	74.1 **	41.9 **	30.6 *	25.3 *	35.5
	2015–2017	53.9 **	37.8	29.5 *	38.0	37.9
Per capita income derived from income taxes which are state budget revenue (PLN)	2005–2007	725.2 **	291.5 **	178.8 *	146.8 *	235.0
	2015–2017	1069.8 **	539.3 *	405.8 *	269.4	577.8
Per capita income derived from local taxes and fees (PLN)	2005–2007	1066.1 **	394.8	310.8 *	243.4 *	368.9
	2015–2017	997.4 **	600.5	463.2 *	715.3	622.5
Share of operating surplus in total incomes (%)	2005–2007	30.5 **	12.0	9.9 *	10.6	11.6
	2015–2017	17.1 **	10.9 *	9.9 *	8.6	11.5
Operating surplus per capita (PLN)	2005–2007	961.2 **	247.2	208.5 *	208.0	258.4
	2015–2017	766.4 **	443.0 *	399.2 *	374.2	476.9
Property investment expenditure per capita (PLN)	2005–2007	1239.9 **	406.2	276.6 *	290.6	361.8
	2015–2017	790.9 **	443.8 *	387.1 *	484.3	478.7
Share of property investment expenditure in total expenditure (%)	2005–2007	37.4 **	19.0 **	13.0 *	14.9	16.0
	2015–2017	18.3 **	11.7 *	10.9 *	14.4	12.4
Per capita income derived from the general subsidy (without the educational part) (PLN)	2005–2007	4.3 *	159.9 *	292.9 **	358.2	246.9
	2015–2017	91.3 *	366.0	564.6 **	304.4	377.5
Total liabilities per capita (PLN)	2005–2007	505.1	409.4 **	283.6 *	270.6	327.0
	2015–2017	1028.7 **	681.2	514.8 *	1050.6	691.0
Share of total liabilities in total incomes (%)	2005–2007	18.3	19.6 **	13.6 *	13.6	15.4
	2015–2017	22.7	17.4	13.1 *	23.3	17.1
Share of capital and interest repayments in total incomes (%)	2005–2007	6.0	6.6	5.3	4.2	5.6
	2015–2017	22.0 **	14.8	12.7 *	22.7	15.3

\*\*, \* designate highly specific characteristics in typological classes (identified based on the pseudo-test of differences of means); \*\* designates a high intensity of characteristic  $k$  in class  $c$ ; \* designates a low intensity of characteristic  $k$  in class  $c$ . Source: own calculations based on [18,20].

In Poland, there is increased interest in local disparities in socioeconomic development levels [12,13,82–84]. Inequality issues are mentioned in the key legal acts that govern the Polish regional policy, i.e., the 2007–2015 National Development Strategy [85] and the 2007–2013 National Strategic Reference Framework [86]. The policy implemented by regional public authorities is consistent with the Development Strategy for the Wielkopolskie Voivodeship by 2020 (issued in 2005) [87] and the 2010–2020 National Strategy for Regional Development: Regions, Cities, Rural Areas (issued in 2010) [87]. Both documents place emphasis on the existence and extent of internal disparities in the Wielkopolskie voivodeship. Authors who analyzed the disparities in development levels, incomes and economic situation within the Wielkopolskie voivodeship include M.W. Gaczek [88], P. Motek [89] as well as M. Dolata and T. Czyż [90]. At the lowest (municipality, NUTS 5) level, including in rural municipalities, these disproportions were examined and confirmed to exist by A. Rosner and M. Stanny [13], M. Stanny and her team [12] and A. Kozera and R. Głowicka-Wołoszyn [14]. Moreover, in her research [12,13], Stanny proved the existence of a positive correlation between the development level of territorial units and financial aspects. Also, empirical research by Satoła and his team [91] suggests that a relationship exists between the level of own income potential, on one side, and the development level and functional type of Polish rural municipalities. Therefore, in order to enhance their financial autonomy, the authorities of these municipalities must take measures to attract new residents or stimulate entrepreneurship. In turn, to do so, they must invest (mainly including their own funds). Thus, the dependence between development and own revenues is obviously a closed-loop relationship. Note that a low own potential also reduces access to external funds, whether repayable (such as debt instruments) or non-repayable (e.g., EU subsidies). As can be seen, the inability to additionally tap into these sources restricts the development; this is how a vicious circle is triggered which can only be stopped by an effective policy implemented at the local government level.

The literature hardly provides any clues as to the impact of local finance on socioeconomic instability. Instead, the analyses focus on assessing the determinants of the financial situation of local government units [92]. Research by E. Wibbels and J. Rodden [93] and H. Wolman [94] also suggests that a relationship exists between own incomes and GDP per capita (which is considered to be the basic indicator of development levels). In turn, research by H. Blochliger and her team [95] suggest that the municipality's expenditure policy is related to its development level.

## 5. Conclusions

An increase in the level of socioeconomic development of rural municipalities was observed in Poland in the context of European integration (see Stanny [12]), as confirmed by empirical research carried out in the Wielkopolskie voivodeship. The research found that in addition to an increase in the average level of socioeconomic development (measured with the synthetic indicator), rural municipalities also became more homogeneous in this respect. This suggests that positive convergence processes took place. This is evidenced by the fact that the coefficient of variation for the synthetic measure of socioeconomic development level decreased over the study period in the municipalities surveyed, and by some municipalities moving from lower development classes to higher ones. The proportion of rural municipalities at high and medium-high levels of socioeconomic development was higher in 2015–2017 than in 2005–2007 (by 8.8 and 33.6 percentage points, respectively). Also, between these periods, there was a decline in the share of units at a medium-low level of socioeconomic development (by as much as 38.1 percentage points). Most importantly, note that in addition to improvements in the general level of socioeconomic development of Polish rural areas, there was an accelerated progress in narrowing the gap between underdeveloped and best developed municipalities.

The highest levels of development are characteristic of rural municipalities located in the immediate vicinity of the region's central city of Poznań. The study period witnessed the emergence of new clusters of rural municipalities at *high* and *medium-high* levels of development, mostly located in the western part of the voivodeship, especially in the vicinity of Leszno, Kościan, Kępno, Wolsztyn and

Piła. When comparing these research findings with the conclusions made by other Polish (e.g., [70,96]) and international [97,98] researchers, it can be noted that a relationship existed between the location and the general financial condition of municipalities. It is a great advantage for rural municipalities to be located close to a city (especially to a regional center) because it enables the development of non-agricultural functions. Such municipalities become urban dormitories or production and logistics centers. On the one hand, the inflow of new residents and entrepreneurs drives revenue from local taxes and fees which are determinant for the income potential and the (extremely important) investment capacity. On the other hand, such units report greater demand for investments, and the construction of the required infrastructure is a capital-intensive project. Therefore, these municipalities have the greatest financial autonomy and the largest investment capacity; as a consequence, they implement the biggest investments.

In turn, municipalities at a *low* level of development are located in peripheral regions. They have a low level of own incomes while facing high levels of indebtedness, resulting in a high business risk, as indicated by many authors, including R. Kata [74]. Under these circumstances, it is difficult to allocate considerable amounts of funds to investments, and it may be very tough, if not impossible, to overcome the underdevelopment of these local governments.

The increase in the level of socioeconomic development of rural municipalities is the combined result of many factors. Local development is also strongly impacted by local government finance. Indeed, empirical research found that a relatively strong correlation exists between the financial situation of the total group of rural municipalities and their development level in the region considered (Wielkopolskie voivodeship). The development level is particularly strongly correlated with the rural municipalities' own income potential and with their investment potential. In view of the above, it may be concluded that the higher the rating of the municipalities' income situation, the higher the level of socioeconomic development. What matters from the perspective of the ability to freely create local development is the LGUs' own income potential. In this context, it is particularly important for the municipalities to have their own income potential in order to be able to freely drive local development. This is because for the municipalities, own income is usually the main source of financing for their own tasks. In turn, a moderate correlation was found between the indicators of the municipalities' general financial condition (related to the operating surplus) and property investment expenditure, on one side, and the socioeconomic development level of rural municipalities surveyed, on the other. The operating surplus (difference between current incomes and current expenditure) indicates the investment potential and the ability to meet liabilities, i.e., the general financial condition. Therefore, as a logical conclusion, local government units cannot develop without these funds. In turn, the relationship between the development level and investment expenditure is fully justified: it is hard to expect development processes without investment expenditure. Hence, the empirical study allowed us to confirm the research hypothesis advanced by the authors which assumes that a strong relationship exists between the level of own income and investment potential and the socioeconomic development level of Polish rural municipalities.

We need to note the high negative correlation between incomes from general subsidies (except for the educational part) and the level of socioeconomic development of rural municipalities. This should be considered obvious, having in mind that other parts of the subsidy (compensatory and educational) are an instrument intended to balance the budgets and support poorer units.

In the future, if the strong relationship between the financial situation and development level of rural municipalities persists, it may bring growing divergence processes and may result in discontinuing the implementation of the sustainable development concept. Today, the Polish law provides support for weaker units (including through subsidies, soft loans and pre-financing for EU grants). The European Union, too, has for many years, allocated the largest amounts of funds to meet the convergence objective as part of its policy for reducing regional disparities [76]. Polish beneficiaries, including municipalities, have accessed a considerable part of these funds. As a consequence, certain natural differences in true income potential between the municipalities become blurred. However, the question

arises about what will happen after a restriction or discontinuation of these preferential measures. In such a situation, own funds earned by the municipalities will become the basis for investments. Therefore, measures taken to enhance their own income potential should be regarded as the key challenge faced by Polish rural municipalities. With greater own incomes, local government authorities will enjoy more discretionary powers and greater financial autonomy when implementing investments to reduce disparities in the levels of socioeconomic and promote sustainable development. The empirical research and analyses conducted by the authors do not fully exhaust the issue of the role of local finance in fighting socioeconomic inequalities in rural municipalities. However, they provide a basis for further analyses of the extent and conditions of this phenomenon.

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