

Article

Role of Local Investments in Creating Rural Development in Poland

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Abstract: Poland's rural areas are characterised by a significant degree of development diversity, especially in the case of communes—the smallest territorial units. For development to take place, the entity responsible for its creation must incur the necessary investment expenditures. By implementing the public tasks assigned to them, communes are responsible for ensuring sustainable local development, which indirectly affects regional development and shapes the development of the entire country. Therefore, this article aims to assess the level and diversity of rural commune investment activities and their impact on the development of Poland's rural areas. The empirical research conducted was aimed at verifying the following hypothesis: "The highest investment activity can be observed primarily in rural communes located in Eastern Poland". The Regions of Eastern Poland are characterised by their peripheral location, both in the country and all of the EU. The research covered the 2007–2018 period due to a particular increase in local investment projects thanks to such factors as obtaining EU funding, as well as others. The research included one- and multidimensional analyses of the phenomenon examined with the use of the TOPSIS method to obtain the value of the synthetic measure of the rural commune investment activity level. The designated investment activity classes were the basis for the analysis of their links with their location within the macroregion, as well as their socio-economic status. The research has shown that the most pro-investment municipalities are located primarily in the Southern and Eastern Macroregions while those spending the least on investment projects are situated in the North-Western and Northern Macroregions. Thus, the research hypothesis put forth in the article has been confirmed. This delimitation is due to additional state resources being provided to the less developed eastern areas of Poland. Citizens living in these regions can not only take advantage of the funding provided as part of the Regional Operational Programmes, but also the Eastern Poland Programme dedicated to helping them.

Keywords: local investment; EU funding; local development; rural areas; rural policy analysis; economic and social impact analysis



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1. Introduction

Rural development—also called the social and economic development of rural areas—is a broad concept and includes economic growth and development, as well as social changes. The condition necessary for the economic development of rural areas is economic growth, whereas and the one required for social and economic development is social development. The socio-economic development of rural areas is defined as a process of desirable qualitative, quantitative and structural changes in the social, cultural, economic, and infrastructure areas, which is aimed at improving the living conditions of the rural population [1,2].

Creating the best possible conditions for the development of local communities, especially in rural areas, requires the implementation of pro-development investment projects. Such projects are related to quantitative and qualitative changes in the technical and social infrastructure. This is why activities aimed at creating and developing elements of such infrastructure are becoming increasingly vital [3]. However, infrastructure development requires the reduction of not only the quality gap but also the quantitative shortages. Therefore, systematic actions are needed to improve the state of infrastructure in local government units.

Poland's local government unit system is comprised of communes, counties and voivodeships. By late 2018, there were 16 voivodeships and 314 counties in Poland. Communes are the most numerous local government units, with 2478 of them existing in Poland at the time [4]. Commune types include:

- rural communes, which are located in rural areas and are the most numerous category among Poland's local government units,
- urban communes—i.e., towns and cities,
- urban-rural communes, which include towns/cities and their surrounding rural areas.

By implementing the public tasks assigned to them, communes are responsible for ensuring sustainable local development, which indirectly affects regional development [5] and shapes the development of the entire country [6]. Promoting and strengthening rural development is vital for shaping the proper conditions for the long-term development of rural areas. Statistics Poland defines "rural areas" as areas outside the administrative boundaries of cities, which include rural communes and rural parts of urban-rural communes. In 2018, rural areas amounted to 93% of Poland's total area, with nearly 40% of the Polish population living in such areas as well [7]. The Polish countryside is characterised by its dispersed settlement network, which includes around 53 thousand rural localities, including 43 thousand villages [4].

Public expenditure is needed to implement the required pro-development activities. They make it possible to implement public tasks, including such vital ones as investment project implementation, which prove that a long-term perspective is indeed being considered [8]. Based on the public funding allocation criterion, one can distinguish both current and property-related expenditures, including investment project expenditures [9]. Investment project expenditures are related to the achievement of an entity's medium- and long-term objectives while current expenditures are the ones allocated to any current activities. The essence of this division makes it possible to determine both the preferences and the hierarchy of needs of public authorities based on the ratio between the two expenditure types. Additionally, whenever a particular level of public funds is reached, a "competition" between the two types of public spending begins as there is not enough money to finance all projects [10]. This may lead to some projects—subjectively deemed not to be priorities—being abandoned. Investment project expenditures may also be limited due to the need to cover the current ones. The essence of investment project expenditures is that they leave something behind. As such, it is necessary to allocate funds for such projects as part of public spending plans.

Implementation of investment projects by local government units—thereby strengthening their investment activity—is vital for every country, as it has a positive impact on its development [8]. Local government unit investment activity is marked by making investment expenditures, whereas their size depends on the nature of the public tasks performed and the units' financial capabilities. Therefore, investment activity depends on the local government unit's financial situation [11]. Investment activities serve to improve the living conditions of the local communities and to better meet their needs. Thus, the effects of such investment projects are quite difficult to measure. Local government unit investment activities differ from those undertaken by business entities as the latter are typically aimed at maximising profits.

The financial situation of rural communes influences the development of other areas of their functioning and indicates their economic development potential [12]. Financing

activities undertaken by rural communes is particularly important. Earmarking funds for infrastructure investment projects is much easier when a bigger budget is available. When starting such a project, it is necessary to secure funds for its completion and subsequent exploitation. Implementation of investment projects by rural communes requires that a stable source of their financing be provided.

Gaudemet and Molinier [13] indicate that investment needs in developing countries such as Poland are serious and any sacrifices that must be made to implement them are justified. Compared to other European countries, Poland is characterised by a significant infrastructure gap resulting from both its historical background and the lack of capital. Kozłowski [14] indicates that the largest gaps exist in the case of local road systems, public transport and housing. Considering the current spending level, it will take several decades to eliminate them (i.e., to bring them to the same state as in Western Europe). Heating and waste management needs remain high while those concerning the water and sewage systems are relatively low. To rectify many years of neglect, it is necessary to expand technical and social infrastructure investment projects [15]. This is particularly vital in the case of rural communes, in the case of which such infrastructure elements are much less developed than in other local government units. Investments projects are essential for growth and economic development [16,17], which results in improved prosperity. There is a visible link between infrastructure improvement and the acceleration of economic growth, and consequently, development [18,19].

The main objective of this article is to assess the level and diversity of rural commune investment activities and their impact on the development of Poland's rural areas. The empirical research conducted was aimed at verifying the following hypothesis: "The highest investment activity can be observed primarily in rural communes located in Eastern Poland". The Regions of Eastern Poland are characterised by their peripheral location, both in the country and all of the EU. For Poland, the problem of peripherality is particularly vital due to the historical spatial inequality of social and economic development and the division into the more developed Western Poland, as well as Eastern Poland, which is traditionally associated with a lower level of economic development. Research carried out by such scholars as Kozera and Głowicka-Wołoszyn [20] shows that the functions performed by rural communes located in the latter region are still primarily related to agriculture. Therefore, Eastern Poland's rural communes must show high investment activity. Investment outlays are an important factor in economic growth.

2. Research Materials and Methods

Empirical research on the assessment of the level and diversity of commune investment activity, as well as their impact on rural development in Poland, was conducted based on secondary data from Statistics Poland [4,21]. The results are presented in Polish currency (the key data was converted to euro as per the weighted average exchange rate of the National Bank of Poland [22]). The research covered the 2007–2018 period due to a particular increase in local investment projects thanks to such factors as obtaining EU funding, as well as others. Local government units in Poland are among the main entities creating and implementing development policies and are also among the most important EU funding recipients. The subject scope of the research included rural municipalities in Poland, which constitute more than 60% of all basic Local Government Units (LGUs) [4].

Achieving the research goal and verifying the research hypothesis required empirical research, which was conducted in two stages. The research on the evaluation of the level and diversity of rural commune investment activity included a one-dimensional and a multidimensional (synthetic) analysis. The first stage of the research involved assessing the level of investment activity of all basic local government units, divided into rural, urban and urban-rural communes based on the analysis of investment expenditures (in absolute terms and per capita). The one-dimensional analysis was based on the application of selected methods of descriptive statistics (measures of position and variability) in relation to the most important indicators reflecting the subject of the study. Their averages were

the basis for the analysis of their connections with the commune size, quantified by the population. Due to the lack of normality of the distribution of the variables analysed in the groups selected, a Kruskal-Wallis nonparametric variance analysis was carried out, which proves the statistical significance of the differences.

The second stage of the research involved the assessment of the level and diversity of rural commune investment activities. Local government unit investment activity is a complex phenomenon, which can be described using simple distribution. Due to the multidimensional nature of the phenomenon analysed, a synthetic evaluation of its level among rural communes was conducted using the TOPSIS method (The Technique for Order of Preference by Similarity to Ideal Solution) [23]. The procedure for building the synthetic feature included six stages, which are presented in Table 1.

Table 1. The stages of constructing a synthetic measure of the rural commune investment activity level using the TOPSIS method.

Steps	Description of Steps	Calculation Formulas
Step 1. Selection of simple features for research	Substantive selection of simple features for research and their verification in terms of statistics	×
Step 2. Normalisation of simple feature values	Using the classic standard score procedure	$z_{ik} = \frac{x_{ik} - \bar{x}_k}{s_k}, \tag{1}$
Step 3. Determining the coordinates of model objects for the positive and negative ideal of development	The coordinates of the positive (A^+) and negative ideal (A^-) of development are determined as the maximum and minimum values, respectively, in a set of normalised values of simple features, excluding outliers and extreme values	$A_k^+ = \begin{cases} \max_{i=1, \dots, N} (z_{ik}), & \text{if } z_{ik} \in [Q_{1k} - 1.5 \cdot IQR_k, Q_{3k} + 1.5 \cdot IQR_k] \text{ for } i \in [1, \dots, N], \\ Q_{3k} + 1.5 \cdot IQR_k, & \text{if } \max_{i=1, \dots, N} (z_{ik}) > Q_{3k} + 1.5 \cdot IQR_k \end{cases} \tag{2}$
		$A_k^- = \begin{cases} \min_{i=1, \dots, N} (z_{ik}), & \text{if } z_{ik} \in [Q_{1k} - 1.5 \cdot IQR_k, Q_{3k} + 1.5 \cdot IQR_k] \text{ for } i \in [1, \dots, N], \\ Q_{1k} - 1.5 \cdot IQR_k, & \text{if } \min_{i=1, \dots, N} (z_{ik}) < Q_{1k} - 1.5 \cdot IQR_k \end{cases} \tag{3}$
Step 4. Calculating the distance of each object from the positive and negative ideal of development	Calculating the distance of each assessed i -th multiple-feature object from the positive and negative ideal of development with the use of Euclidean distance	$d_i^+ = \sqrt{\sum_{k=1}^K (z_{ik} - z_k^+)^2}, \quad d_i^- = \sqrt{\sum_{k=1}^K (z_{ik} - z_k^-)^2} \tag{4}$
Step 5. Calculating the value of the synthetic measure	With the use of Euclidean distances from the positive (d_i^+) and negative ideal of development (d_i^-)	$S_i = \frac{d_i^-}{d_i^- + d_i^+} \tag{5}$

where: x_{ik} —the value of the k -th trait in the i -th object (rural commune), \bar{x}_k, s_k the arithmetic mean and standard deviation for the k -th value of the trait, respectively; z_{ik} —normalised values of the k -th trait in the i -th object; Q_{1k}, Q_{3k} —the first and third quartile of the value of the k -th the trait, respectively; IQR_k —quartile deviation of the k -th value of the trait. Source: Own elaboration based on Wysocki [24], Kozera and Wysocki [25], Głowicka-Wołoszyn and Wysocki [26].

The first stage of constructing the synthetic feature included choosing the simple features describing the communes selected (based on substantive and statistical criteria), as well as determining their preference directions pertaining to the general criterion analysed (i.e., investment activity level). Due to the varying population of the particular local government units, the basic indicator taken into account in the assessment of the units' investment activity was the level of expenditures per capita (x_1) and per square kilometre (x_2), as well as their share in the total expenditures (x_3) and the level of funding obtained by the local government units to finance and co-finance EU projects per capita (x_4). Investment expenditures in relation to overall expenditures reflect the scale of development-oriented engagement of city authorities within the framework of their financial potential. Most frequently, due to considerable fluctuations of investment expenditures, not only the mean but also aggregate values pertaining to investment expenditures were taken into account in the assessment of the level of investment activity in local government entities. To construct the value of the synthetic measure of the rural commune investment activity level in the

2007–2018 period, the cumulative values of the x_1 , x_2 and x_4 indices from the examined period were considered, as well as the average value—the median value of the x_3 index. Taking the statistical premises into account (i.e., the mutual correlation of simple features), each of them was used in the construction of the synthetic feature. All simple features were considered to stimulate the local government unit investment activity level.

In the next step (2), the classic standard score method was applied to normalise the values of simple features. Step 3 included determining the coordinates of the model objects—the positive and negative ideal of development. They are typically defined as the maximum and minimum values, respectively, in a set of normalised values of simple features. However, real data sets may also contain unusual feature values—outliers and extremes—which may result from the specificity of the examined phenomenon. This is also the case in the analysis of Poland’s rural commune investment activity level. Since they can have a significant impact on the results of the analysis (e.g., the typological classification), they require special attention (as pointed out by Wysocki [24], Kozera and Wysocki [25], Głowicka-Wołoszyn and Wysocki [26], Kozera et al. [27]). Thus, the coordinates of the positive (A^+) and negative ideal (A^-) of development were determined as the maximum and minimum values, respectively, in a set of normalised values of simple features, excluding outliers and extreme values. Since model values in the object linear ordering methods are determined separately for each feature, a one-dimensional approach to identifying outliers was used in the research, i.e., the quartile criterion [23,24]. The values of a single feature are considered an outlier if they are outside the following range: $[Q_{1k} - 1.5 \cdot IQR_k, Q_{3k} + 1.5 \cdot IQR_k]$ (Table 1).

The coordinates of model objects were the basis for calculating the distance of each rural commune analysed from the positive and negative ideal of development (step 4) using Euclidean distances. In the last step—step 5—the values of the synthetic measure (S_i) of the rural commune investment activity level were constructed based on the estimated Euclidean distances using the TOPSIS method (with $0 \leq S_i \leq 1$) (Table 1).

The determined values of the synthetic measure were the basis for the linear ordering of the rural communes examined according to its non-increasing values. Based on them, typological classes of Poland’s rural commune investment activity levels were distinguished arbitrarily by dividing the surveyed commune population into five classes: $0.80 < S_i \leq 1.00$ —class 1 (very high), $0.60 < S_i \leq 0.80$ —class 2 (high), $0.40 < S_i \leq 0.60$ —class 3 (average), $0.20 < S_i \leq 0.40$ —class 4 (low), $0.00 \leq S_i \leq 0.20$ —class 5 (very low investment activity level). At the same time, substantive identification of the typological classes was carried out using active features (ones used in the construction of the synthetic measure value), as well as passive features—ones representing the socio-economic situation of the entities examined. The designated investment activity classes were the basis for the analysis of their links with their location within the macroregion, as well as their socio-economic status. For this purpose, a multi-dimensional table was used and the Chi-square statistic was calculated.

The importance of the given social and economic situation indicators in separate typological classes of rural commune investment activity level was indicated using the so-called mean difference pseudo-test. This test is used to identify characteristics in separate typological classes. Type identification consists in determining the basic values of descriptive statistics—intraclass averages for metric characteristics. The value of the test is the following quantity [24]:

$$t_{ck(d)} = \frac{\bar{x}_{ck} - \bar{x}_k}{s_{ck}} \quad (6)$$

The value of this test measures the distance between the class average (\bar{x}_{ck}) and the overall average (\bar{x}_k) of the k -th characteristic in units of the standard error of the class mean, where:

$s_{ck}^2 = \frac{N - N_c}{N - 1} \cdot \frac{s_k^2}{N_c}$ —is an average variance in case of a dependent draw (without replacement) of c -th class objects ($c = 1, \dots, C$),

s_k^2 —is an empirical variance of the k -th feature in the sample,

$\frac{N-N_c}{N-1}$ —is the so-called finite sample N correction.

The greater the absolute value of the test assigned to a given feature, the more characteristic the feature is. The mean difference pseudo-test values obtained were the basis for distinguishing the characteristics in typological classes using the following value scale [24]:

- $t_{ck(d)} \in (-\infty, -3 > v < 3, +\infty)$ — there is a very high concentration of the k -th feature in the c -th class (the feature is highly characteristic—negatively or positively),
- $t_{ck(d)} \in (-3, -2 > v < 2, 3)$ — there is a high concentration of the k -th feature in the c -th class (the feature is moderately characteristic—negatively or positively),
- $t_{ck(d)} \in (-2, 2)$ — there is an average concentration of the k -th feature in the c -th class (the feature does not stand out and is not characteristic).

Additionally, the significance of socio-economic indicator changes in the 2016–2018 period was compared to that in the 2007–2009 period. Due to the lack of normal distribution, non-parametric statistics were used in this case, i.e., the Wilcoxon signed-rank test.

To assess the existing links between the location of communes within the macroregions and the level of investment activity, a fraction pseudo-test was used. The latter was applied to identify the characteristic categories of unmeasurable features in separate classes of rural commune investment activity levels, i.e., the belonging of the local government units examined to macroregions (which made it possible to verify the research hypothesis put forth in the article). The value of this test measures the distance between i -class fractions of a sample in units of the standard error of the class fraction [24]

$$t_{ck(f)} = \frac{p_{ck} - P_k}{s_{ck}} \quad (7)$$

where:

p_{ck} —a fraction of objects distinguished based on the k -th category in c -th class,

P_k —a fraction of objects distinguished based on the k -th category in a sample,

$s_{ck}^2 = \frac{p_{ck}(1-p_{ck})}{n_c} (1 - p_c)$ —is a fractional variance in the case of a dependent draw (without replacement) of n_c objects of the c -th class from among N of sample objects,

$(1 - p_c)$ —is the so-called finite sample correction, where $p_c = \frac{n_c}{N}$.

Fraction test values allow classifying categories (levels) of non-metric traits (e.g., a particular commune's being part of a macroregion) in relation to each class to characteristic and non-characteristic. The distribution of this statistic can be approximated with the use of the standard normal distribution. The more the absolute statistical value assigned to a particular category is higher than 2, the more characteristic it is [24].

3. Literature Review

3.1. Development Policy and the Importance of Rural Areas

Rural development plays a key role in implementing sustainable development policies [28–30]. Due to its importance, sustainable development is of high interest to the United Nations and is the subject of many detailed UN studies. The latest sustainable development framework was established in 2015 at the 2030 Agenda for Sustainable Development summit held in New York. At the summit, world leaders adopted the “Transforming our world: the 2030 Agenda for Sustainable Development” [31] document, which identified 17 Sustainable Development Goals—including ones specifically related to agriculture and rural development. They include Goal 1—No Poverty, Goal 2—Zero Hunger, Goal 8—Decent Work and Economic Growth, Goal 12—Responsible Consumption and Production, and Goal 15—Life on Land.

The Sustainable Development Goals are globally-oriented, with the planned action time-frame extending up to 2030. “The Sustainable Development Goals are the blueprint to achieve a better and more sustainable future for all. They address the global challenges we face, including poverty, inequality, climate change, environmental degradation, peace and justice” [32]. Sustainable development is examined in five areas—people, planet, prosperity, peace, partnership. It is evaluated comprehensively while taking into account

the economic, social and environmental dimensions. The Sustainable Development Goals are designed to ensure a balance between these dimensions. The basic issues accompanying the sustainable development principles include achieving the desired rate of economic growth and development, observing social justice to the greatest extent possible, as well as maintaining the proper condition of the natural environment.

The implementation of the Sustainable Development Goals is a vital part of the European Union policy, which particularly contributes to improving convergence between the EU Member States. The Sustainable Development Goals are included in all of the European Commission's priority actions, with the "European Green Deal" [33] being especially noteworthy. It is a plan for the sustainable development of the EU economy and is an integral part of the strategy to implement the UN 2030 Agenda for Sustainable Development. It should be noted that the European Commission defined a programme to ensure sustainable development by 2030 and identified actions to ensure a sustainable future for Europe as early as 2016, in a document called "Next steps for a sustainable European future. European action for sustainability" [34]. The EU's agriculture and rural development policies significantly affect the implementation of the UN 2030 Agenda for Sustainable Development. Sustainable development, i.e., the need to treat and resolve all problems—including social, economic and environmental ones—equally on a local, regional and international scale, is one of the EU's guiding principles.

The EU rural development policy, known as the "second pillar" of the Common Agricultural Policy (CAP), aims to improve agricultural competitiveness, ensure sustainable management of natural resources and climate protection, and ensure balanced territorial development of rural areas. These objectives are being implemented through both national and regional rural development programmes (RDPs), which are co-financed by the European Agricultural Fund for Rural Development (EAFRD) and the national budgets of EU Member States. In the 2014–2020 programming period, EUR 100 billion of EAFRD funding has been allocated to the RDPs, with EUR 13.6 billion allocated to Poland—the largest support received for agricultural and rural area transformation after Italy, France and Germany. Financial assistance for rural areas as part of CAP also includes EUR 8 billion from the Next Generation EU fund. Additionally, the European Union permits the transfer of up to 25 per cent of the CAP allocations from the income support pillar to the rural development pillar and vice versa in the 2021–2027 period [35].

This policy is also implemented through the cohesion policy financial instruments, i.e., the European Regional Development Fund and European Social Fund, which are complementary to the EAFRD. It must be noted that any funding spent under the cohesion policy affects both rural and urban areas simultaneously, and therefore, its contribution to rural change is difficult to determine [35].

Resolving development disparities is one of the crucial objectives of the European Union [36]. Although the idea of territorial cohesion has gained importance after 2013 due to the Treaty of Lisbon [37] and the Agenda of the European Union 2020 [38], these issues were reflected in EU regulations before that time [39]. The European Parliament resolution of 2006 states that this cohesion is the fundamental objective of the European Union and that all its citizens shall be provided with access to public services. Territorial cohesion was also mentioned, i.e., in Territorial Agenda of the EU. Towards a more competitive and sustainable Europe of diverse regions [40] and First Action Programme for the Implementation of the Territorial Agenda [41]. Relevant provisions in this respect are also stipulated by the Green Paper on Territorial Cohesion Turning territorial diversity into strength [42]. According to these provisions, territorial resources should be used in a more sustainable way, supporting the development of smaller settlement units and limiting the significance of larger cities [43]. Poland, in support of the idea of the Green Paper, pointed to the implementation of the objective pertaining to equal living conditions and equal conditions of conducting business activities regardless of location [44].

In general, the fundamental issues of territorial cohesion are based on several assumptions. Firstly, each area should use its own resources (i.e., also financial resources).

Concentration is another important aspect. Large cities benefit from the concentration of people and businesses by drawing considerable revenues from local taxes and fees, and their share in the income tax. Limiting this concentration and providing incentives for the flow of people and businesses to other areas, including rural areas, will increase their attractiveness. What makes this possible is the implementation of investments. It is investments in transportation, power networks, or broadband Internet that this third area of cohesion policy is composed of. Improving the availability of peripheral rural areas is crucial here. The last issue is building cooperation among local governments, especially in such domains as environmental protection, i.e., fields, for which no limits can be set, and only joint action can result in success in this respect [39,43].

Despite the policies implemented, both cohesion- and rural area-related, research by such scholars as Kolodziejczyk [45] shows a lack of convergence at the municipal level in Poland. Inequalities remain high [17,46]. Standar [47] proved that the differences in cumulative investment values for the 2007–2016 period proved to be statistically significant and directly proportional to the municipality development level. No convergence processes were observed in the case of the rural municipalities analysed; conversely—divergence occurred. This is related to the limited revenue potential of municipalities, especially rural ones. Such municipalities find it difficult even to guarantee their financial contribution or pay for investment projects before receiving EU reimbursement, let alone fully financing capital-intensive infrastructure investment projects. As shown by OECD research [48], the increasing number of tasks transferred to Polish municipalities effectively limits their fiscal potential.

It is worth noting that the OECD recommendations for efficient rural policies emphasize the need to involve a broad spectrum of participants in the multi-level governance process and not just the authorities. While Poland is making progress in this regard, cooperation between the private sector and local authorities remains insufficient [49]. The impact of public investment projects on growth partly depends on governance quality. Governance quality is correlated with growth and public investment projects alike, especially at the local government level [50].

In recent years, especially after Poland's accession to the European Union, much attention has been paid to the problems, prospects and threats to rural development. Polish rural areas are characterised by a significant degree of development diversity, especially at the communal level. The research conducted by the Institute of Rural and Agricultural Development of the Polish Academy of Sciences [17], as well as the Foundation for the Development of Polish Agriculture [51].

Diagnosing the status of and changes in rural areas is important in any development-related research. Rural areas can be characterised based on various criteria. This includes criteria related to their function, the population's living standards, the level of economic development, as well as competitiveness. The functions of rural areas are among the most important criteria of their typology from the point of view of recognising their development potential [20]. Rural areas still perform primarily agricultural functions, but under the multifunctional development of rural areas policy, dynamic development of non-agricultural sectors has been visible in recent years as well. Rural areas differ in their economic, social, natural and cultural development. This diversity creates good conditions for differentiating their development directions [52].

Rural development can also be analysed from a local development perspective. Local development is a complex concept and there is no uniform definition of what it is; therefore, it may be understood in different ways. Local development is an outcome of the local economy—defined as a complex process—in which local authorities stimulate the economic development of a given local government unit, e.g., a rural commune, through the use of proprietary resources and the involvement of external partners [53]. Local development is widely considered to consist in the creation of the best possible living conditions in the local environment, which are based on internal development factors and are complementary to regional development [54]. Local development is often understood as a specific process

of introducing vital changes in the local social and territorial system. This arrangement is usually distinguished by specific features of space, culture and economy, as well as a characteristic hierarchy of needs and values [55]. The direction and dynamics of local development are influenced by the size and type of resources, as well as their availability and use. Local development is associated with positive qualitative, quantitative and structural changes in a given area, e.g., rural commune. Such changes include improvements in the standard of living of the area's inhabitants, as well as the functioning conditions for business entities [56]. Different outcomes of rural development depend on factors that stimulate such development, however, barriers that hinder and limit development must also be considered in this case [57].

Local and regional development theories consider the role of exogenous and endogenous factors. Exogenous factors, i.e., external ones, are those that have nothing to do with local conditions and their emergence in a given area may either start or intensify sustainable development. They include changes in the macro-economic environment, particularly caused by the changing economic situation, as well as the influx of external capital in the form of financial development aid for public investment projects [58], e.g., as part of EU funding. These factors play a fundamental role in the so-called top-down development models, in which developmental impulses are induced by the state. The latter include the so-called classical theories—e.g., by Smith, Ricardo, Keynes, Kondratiev. Polarisation concepts by such authors as Schumpeter, Myrdal, Peroux and Hirschman [59,60] can also be mentioned here.

Endogenous factors are strongly related to the potential of the given local government unit and include physical conditions, as well as human, natural, relational and organisational resources in the given area. Endogenous factors act in conjunction with exogenous factors and typically contribute to economic development only when they occur together [61,62], however, according to Spellerberg et al. [63], strengthening the endogenous potential is more important. Theories based on this potential have been gaining traction since the 1970s. Considerations by such authors as Tinbergen, Maier, Scheer and Glatz are based on the bottom-up concept of stimulating development by the residents and autonomous local governments [59,60]. The involvement of local leaders, who can supervise various projects and help the residents integrate, plays a key role here. Rural areas are subject to various socio-economic processes with different dimensions, ranging from local, through regional, national and continental, all the way to global ones. Each of these dimensions has its own specific characteristics. The most important universal phenomena, typical not only for Polish rural areas, particularly include: the ageing of the rural population, migration outflows, adopting urban patterns and the climate change [52]. When analysing the issues of rural development in Poland, including the territorial requirements of the specific areas, it is also necessary to consider the priorities of rural development policy at the EU level [64].

The development of tourist functions based on tourist services may be the stimulating factor for rural area advancement. Thus, it would consist in the sustainable development of non-agricultural functions in rural areas that stimulates their multifunctional development. An increased number of tourists visiting the given rural area means increased importance of tourism for the given municipality's economy. Rural areas have long been a popular destination of choice for tourists [65–67]. Tourists primarily visit places with remarkable natural and landmark qualities. Conservation of traditional buildings using natural materials, as well as ensuring technical sustainability and energy efficiency of buildings, also play a vital role in the development of tourism functions in rural areas [68]. Yet, providing rural tourism services on an increasing scale comes with such risks as pollution and distortion of the rural landscape.

Modern infrastructure is among the most important factors determining the sustainable and balanced development of rural areas. However, the way infrastructure is perceived has changed along with our civilisation's progress. Its evaluation criteria are no

longer limited only to its quantity, but also include user satisfaction, performance quality, as well as its impact on humans and the environment [69].

Proper solutions must be found to ensure an efficient and effective impact on the local development processes and applying a long-term approach instead of a short-term one is helpful in this regard. A vital task for commune authorities is to implement policies that promote social and economic development. Analysing the investment activity of rural communes is important because each such commune has a chance to develop. Implementing investment projects, which in the case of local government units are related to the performance of public tasks, is a key factor leading to the development of rural communes.

3.2. Local Investments and Their Impact on Rural Development

In the theory of economics the most-quoted and at the same time most general definition of investment was put forward by Hirshleifer [70]. He understands investment as relinquishing present consumption to obtain profits in the future. However, this definition cannot be fully applied to investments realised by local government entities due to their specific nature and scope of conducted tasks. Investments realised by local-government entities are not aimed at gaining economic profits, but primarily at satisfying the needs of local-government communities.

The development of rural communes cannot be a matter of chance; structured, coordinated and comprehensive actions are necessary to achieve the objectives intended. The development of every local government unit depends on the implementation of investment projects and infrastructure investments have a positive impact on the development of such units. Investment projects carried out by rural communes contribute to the development of the local social and technical infrastructure. Investment projects may be complementary (e.g., waterworks and sewage systems), substitutable (e.g., energy carriers), undertaken jointly (e.g., constructing a road along with lighting), mutually exclusive or such that one of them necessitates that the other takes place. The target functions of local infrastructure investment projects aimed at supporting the development of local government units should foster the strengthening of spatial ties between settlement units and serve to create a technical base for service and production activities and proper conditions for the transformation of the local government unit's manufacturing structure [71]. Modern, comprehensive and well-developed infrastructure is an unquestionable asset for any local government unit.

Implementing investment projects in local government units is based on spending financial resources to increase the future tangible (direct and measurable) and intangible (indirect and non-measurable) benefits of the local government community [72]. Investment project spending takes place with permanent financial constraints and is related to the hope of obtaining future benefits and other positive effects [73]. The implemented investment projects should have a positive impact on the local development in the future and, through the increased income potential, improve the possibilities of financing further investments [74].

Infrastructure built using public financial outlays is public property [75–80]. Access to infrastructure elements determines the quality of the citizens' social and economic life. Moreover, it serves a vital function for local development and the state of any existing infrastructure can influence such development as well [14].

The implementation of investment projects by rural communes primarily serves the local economic development and the fulfilment of public tasks assigned to these communes. Today's investment decisions made by rural communes are a key factor in shaping their future. Local government unit investment projects are often unprofitable. Therefore, it is necessary to consider the resources needed for their further maintenance, i.e., the increases in current expenditure on the operation and repairs of any facilities constructed, already at the project planning stage [81].

The local government unit financing system must be shaped in such a way as to ensure that there is enough budget income to cover the expenses incurred as a result of the tasks being implemented [82]. Own income is particularly vital for investment

project implementation, especially with the increasing current expenditure [83]. In terms of income, rural communes are the most diverse group. On the one hand, some of them are strongly linked to urban centres, and as such, they benefit from the high economic activity and housing development within their own boundaries as well. This is also reflected by their income (property taxes, shares in income taxes, i.e., PIT and CIT). On the other hand, most of them are peripheral, with a significant share of agricultural land and a low level of entrepreneurship resulting in a limited budget income [84]. Due to the need to carry out public tasks assigned to them, they have problems with executing investment projects that would bring them up to a higher level of development [85] and the limited number of such projects negatively affects their economy [86]. Investment projects carried out by local government units often require significant financial expenses, which rural communes simply cannot afford. EU funding is an important source of money for such projects. In the case of Poland, significant territorial diversity in investments co-financed by the European Union is evident [87]. The availability of EU funding allows rural communes to increase the number of their investment projects and serves to support coherent local development.

The implementation of tangible investment projects contributes to the improvement of the communal infrastructure, which also affects local development. The development of such infrastructure has a wide impact and affects various areas, e.g., it increases the competitiveness of local government units and supports the development of the information society [88]. Since their implementation has an impact on improving the state of the environment and the quality of life of the inhabitants, in addition to strongly affecting the economic development of local government units, municipal investment projects are technical instruments for stimulating sustainable development [89].

Transport infrastructure plays a special role in economic development [90,91]. It is also particularly important for rural areas. The growth of transport infrastructure provides many benefits for the whole economy, with its impact on the development of local government units being especially vital. By facilitating the flow of labour resources and improving trade, such projects contribute to reducing regional development disparities [92]. The condition of transport infrastructure also largely determines the business attractiveness of rural communes. Additionally, regions with improved access to markets tend to be more efficient and competitive than those without it, and having an efficient transport system allows such areas to overcome their peripherality [93]. Moreover, the lack of developed road infrastructure prevents the removal of the significant development differences between the country's various regions. Transport investments contribute to the improvement of safety, comfort and travel quality. The incurred expenditures enable the improvement of road surfaces, reduced number of accidents on the modernised road sections, better transport accessibility and shorter time needed to reach the destinations in the area, as well as other benefits. As indicated by the Ministry of Agriculture and Rural Development [94] one of the most serious barriers to the development of Poland's rural areas is the underdeveloped technical infrastructure. The highly unsatisfactory condition of both the local transport infrastructure and public transport services in these areas severely limits their development. The sanitary infrastructure in such areas also does not provide an adequate quality of life for their inhabitants. Inefficient energy systems and under-funded social infrastructure also pose significant problems. Compared to the urban population, the rural one has 50% fewer people with higher education, vocational and general secondary education, and post-secondary education. Although the number of rural area business entities registered in the REGON system is increasing, the number of such entities per 10,000 residents in cities remains twice as high as in the case of rural areas. While more positive employment rate trends have been observed in rural areas in recent years, one must not forget about the problematic nature of measuring employment due to hidden unemployment and persons working in the so-called "grey market". The average monthly disposable income per capita in rural households amounts to 70% of that obtained in urban ones, resulting in the proportion of people at risk of extreme poverty in rural areas being 2–3 times higher than in urban areas [46,94]. Chmielewska [95] also states that rural households having

fewer modern durable goods is yet another barrier to rural development. She notes that the primary issues of rural areas are quite simply a poorer quality of life and a lower degree of need fulfilment.

Making investment decisions in rural communes is the local governments' response to society's expectations, which is based on the available financial resources and the catalogue of public tasks assigned to them. Investment projects carried out by rural communes affect their ability to compete for new residents and entrepreneurs. They also contribute to eliminating the existing differences in the rural development level, as evidenced by research conducted by Standar and Kozera [60], as well as others. Implementing investment projects in rural communes brings various benefits, with the most important being the improvement of the inhabitants' living conditions and the business situation of economic entities, as well as attracting new people and companies to the area. Access to good infrastructure is an incentive to start and run a business within the boundaries of a given local government unit. Moreover, it indicates the structure of benefits offered to external entities and determines the existence of local ones, often providing them with a competitive advantage as a result [96]. Local government units make investment expenditures to build and expand social and technical infrastructure to meet the needs of their inhabitants. This leads to the creation of an investment spiral—well-thought-out investment ventures result in subsequent ones—which is the most effective method of preventing unemployment [74]. The scale of investment projects in rural communes can be treated as an indicator of their development and financial condition. Moreover, the current investment decisions made in rural communes shape the local government units' future as well. Investment implementation indicates that a rural commune is orientated towards long-term development. Good infrastructure serves to improve the quality of social and economic life and is the basis for the area's further development.

4. Results of Empirical Research

4.1. Assessment of the Level of Investment Activities Carried out by Rural Communes in Poland

The research on the identification of the reasons for the diversity in local development, including that of rural areas, identifies a number of factors, such as, for example, uneven distribution of production factors and their ineffective use in individual regions, different functional type, peripheral location, low human capital, lack of network connections [17,20,97]. At the same time, increasing attention in this respect is devoted to the financial-economic aspects of local development, especially investments—both private and public [60,98–102]. This is because these issues seem of particular significance, especially in the context of the possibility to stimulate the development of less developed local government units by increasing expenditures on public investment projects, including those implemented by local governments. The interest of communes in finances is therefore determined by the role of the local government in fostering and creating local social-economic development.

Based on applicable Polish legislation [103–106], local government units are responsible for the implementation of a wide range of tasks related to the provision of public services and the shaping of development processes. The basic entities of the local government sector in Poland, i.e., communes, have the widest possibilities to influence the living standards of local communities. The commune is responsible for all local issues and, to this end, it has been provided with adequate income, and at the same time, it became responsible for the implementation of a range of investment tasks [103]. It should be emphasised that expenditure policy properly conducted by a local government unit contributes to the development of its areas [107].

The empirical research conducted demonstrates that, in absolute terms, investment activity is carried out most actively by communes. In 2018 investment expenditures of communes amounted to nearly PLN 25.8 billion (EUR 6.1 billion), which is almost half of the total investment expenditures realised by all local government entities. From an analysis of all the period discussed, i.e., the years 2007–2018, the cumulative investment

expenditures of communes amounted to more than PLN 197 billion (EUR 46.3 billion, at constant 2018 prices), which constituted 42% of the total expenditures realised by all local government entities. In the analysed period, rural communes realised the highest investment expenditures among basic units of local government, as in the years 2007–2008, accumulated investment expenditures of communes amounted to PLN 91 billion (EUR 21.4 billion), i.e., more than half of the total investment expenditures realised by all communes. The highest investment expenditures were realised by those communes in the years 2009–2011 and in the years 2017–2018 (Table 2).

An analysis of the level of implemented investment projects in the years 2010–2016 shows a decrease in their value. A particularly visible reduction was observed in the investment expenditures of communes in 2016 as related to 2015. In most of the communes in the analysed period there was a reduction of the share of total investment expenditures, which was influenced by a high increase in current expenditures. This increase was primarily caused by the implementation, from 1 April 2016, of a new programme, “*Family 500+*” under the Act on Assistance of the State in Raising Children [108]. In addition to a high increase of current expenditures, the factor that contributed to the lowering of the investment expenditures’ share in total expenditures, and the lowering of the absolute level of this group of expenditures, was the lower level of obtained EU subsidies. This was a result of, i.a., the transitional period in the disbursement of EU funds between the old and the new perspective, in the case of which the period for preparing EU procedures was extended, and competitions for local governments were not launched until the second half of 2016. The year 2016, as indicated by, among others, Zawora [109], was for most communes a time of preparing projects for the new perspective.

Taking into account the level of expenditures per capita, rural communes are in the first place among all types of communes. In the years 2007–2018 cumulative investment expenditures amounted to PLN 8336.6 (EUR 1951.1) per capita for an average rural commune, that is by over 20% more than in the case of urban communes. Rural communes in Poland are diversified in terms of area, and demographic and economic potential. Demographic and economic potential are among the main determinants of local government units’ own income potential, which in turn determines the capability and investment activity of these entities. Agriculture still remains the fundamental function of rural communes. Research carried out by Kozera and Głowicka-Wołoszyn [20] shows that half of the rural communes have typically agricultural functions, characteristic of rural areas, and only one in twenty rural communes has lost its rural character and performs typically residential and industrial functions. And nearly every fifth rural commune experiences multifunctional development.

Table 3 presents indicators illustrating the level of investment activity of rural communes depending on their size (measured by population) in the years 2007–2018. The research took into account all indicators showing the level of investment activity of municipalities—lowest-level entities of Poland’s local government sector—available in national databases. Statistically significant differences between the average levels of the analysed rates of investment activity between rural communes of different sizes were confirmed with the use of the non-parametric Kruskal-Wallis one-way analysis of variance. The research shows that the size of the analysed entities influences in a statistically significant way their investment activity (values of the test for respective groups of communes in Table 3 are as follows: $KW = 22.57$, $KW = 339.48$, $KW = 72.10$ and $KW = 53.95$ at the level of significance $p = 0.05$). In the analysed period, an average rural commune allocated PLN 7354 (EUR 1727) per capita to investment expenditures. Definitely, the highest level of investment expenditures was characteristic of the largest communes with a population of 20 thousand and more, i.e., PLN 10,317.3 (EUR 2423.3) per capita. The largest rural communes are at the same time characterised by the highest diversity in this respect, as indicated by, among other factors, the highest value of the coefficient of variation of investment expenditures per capita for this group of local government units.

Table 2. Level of investment expenditures of communes by administrative types in Poland in the years 2007–2018 (at constant 2018 prices).

Description	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Cumulative Level of Expenditures in the Years 2007–2018
capital expenditures in PLN billions													
(total) local government units	32.4	36.5	47.6	48.2	44.0	35.4	34.2	40.8	38.3	25.3	34.0	51.0	467.6
total communes, of which:	12.8	14.9	18.0	21.9	19.1	14.3	13.1	15.5	14.6	11.0	16.3	25.8	197.4
urban communes	3.0	3.6	4.2	4.6	4.0	3.0	2.5	3.0	2.9	2.3	3.3	5.3	41.8
urban-rural communes	4.1	4.8	5.9	7.0	6.3	4.8	4.3	5.0	4.8	3.7	5.4	8.5	64.6
rural communes	5.7	6.4	8.0	10.3	8.9	6.5	6.3	7.4	6.9	5.0	7.5	12.1	91.0
investment expenditures in PLN per capita													
(total) local government units	849.2	956.1	1245.8	1251.5	1141.6	919.6	888.3	1059.1	997.5	658.1	884.7	1328.3	12,179.8
total communes, of which:	503.0	583.7	707.4	846.8	738.1	549.9	508.0	598.1	566.9	427.3	631.8	999.6	7660.5
urban communes	495.5	590.3	688.8	740.6	642.7	485.3	414.3	500.7	479.9	391.6	562.8	889.6	6882.0
urban-rural communes	479.3	567.8	683.3	800.0	711.4	543.9	486.7	571.0	544.0	414.9	608.0	945.7	7355.8
rural communes	526.0	592.4	737.0	944.7	813.8	591.1	576.6	673.3	632.9	456.7	688.6	1103.4	8336.6

Source: Own calculations based on data obtained from [4].

Table 3. Indicators illustrating the level of investment activity of rural communes by population in Poland in the years 2007–2018

Description	Level of Investment Expenditures per Capita (in PLN) ^a	Level of Investment Expenditures per km ² (in PLN) ^a	Share of Investment Expenditures in Total Expenditures (%) ^b	Level of Funds Obtained by Communes for the Financing and Co-Financing of EU Projects per Capita (in PLN) ^a
Total rural communes				
Minimum	1751.6	417.6	2.6	34.6
Lower quartile	5841.1	2586.7	12.6	1261.9
Median value	7354.3	3912.7	15.9	1863.8
Mean ^c	8177.4	5943.1	16.4	2175.2
Upper quartile	9260.7	6307.3	19.7	2693.9
Maximum	216,558.2	104,826.1	41.6	15,512.3
Positional coefficient of variation (%)	23.2	47.5	22.4	38.4
Rural communes with less than 5 thousand inhabitants				
Minimum	1751.6	417.6	2.6	115.8
Lower quartile	5694.3	1899.1	11.5	1438.9
Median value	7221.0	2847.9	14.8	2177.8
Mean ^c	7932.0	3354.2	15.1	2512.9
Upper quartile	9269.5	3941.2	18.3	3106.7
Maximum	49,250.1	44,215.9	41.6	11,489.2
Positional coefficient of variation (%)	24.8	35.9	22.8	38.3
Rural communes with 5–20 thousand inhabitants				
Minimum	2113.2	664.8	4.1	246.0
Lower quartile	5862.9	3207.2	13.2	1166.8
Median value	7373.9	4756.7	16.4	1721.8
Mean ^c	8216.4	6953.2	17.0	1986.4
Upper quartile	9175.8	7888.6	20.0	2473.9
Maximum	216,558.2	104,826.1	40.7	15,512.3
Positional coefficient of variation (%)	22.5	49.2	20.8	38.0
Rural communes with 20 thousand inhabitants or more				
Minimum	5869.2	7404.0	16.0	34.6
Lower quartile	8164.5	11,745.2	18.6	878.8
Median value	10,317.3	21,291.3	22.0	1513.3
Mean ^c	11,942.8	25,564.2	23.7	1532.8
Upper quartile	15,645.6	29,640.9	27.4	1818.1
Maximum	32,302.6	75,454.0	40.0	3753.2
Positional coefficient of variation (%)	36.3	42.0	20.0	31.0

^a, cumulative values in the years 2007–2018, real values at constant 2018 prices. ^b, median for the years 2007–2018. ^c, statistically significant differences at the level of $p = 0.05$ between average levels of indicators were confirmed with the use of the non-parametric Kruskal-Wallis one-way analysis of variance (this type of analysis was used due to the lack of normal distribution). Source: Own calculations based on data obtained from [4].

The research has demonstrated that with the increasing number of inhabitants, the level of investment expenditures per km² also increases. While in the analysed period rural communes allocated the average amount of PLN 3912.7 (EUR 919.0) per km² to investment projects, the communes with 20 thousand and more inhabitants allocated as much as PLN 21,291.3 (EUR 5000.8) per km² for this purpose. This is because population density illustrates the demographic potential of a given territorial unit. On the one hand, the higher demographic potential of a municipality translates into a higher level of income (e.g., from property and personal income taxes), with the latter being a vital factor that creates local development and municipality investment activity. On the other, a larger population means increased social and public needs compared to less developed territorial units. As pointed out by Dworakowska [110] and others, the determinants related to the current situation

of a local government unit play the most important role among all factors affecting its investment project undertaking and implementation activities. This group is, however, highly diversified, as indicated by, among others, the high value of the interquartile range which is as much as PLN 17,895.7 (EUR 4203.3) per km². Diversity in terms of the level of investment expenditures in PLN per km² is very high in the total group of rural communes, but also in particular types of rural communes differing as to the number of inhabitants. This results from, as mentioned before, the high diversity of the analysed local government units in terms of performed functions and the level of socio-economic development, as indicated by the research conducted by Rosner and Stanny [17].

Funds obtained from the EU have become an important factor in the development of rural areas. In the analysed years, Poland has become its largest beneficiary. About two-thirds of public investments were financed from structural funds and the Cohesion Fund, as confirmed by the research carried out by, i.e., Gorzelak [111]. The implemented cohesion policy has contributed to broadening the scope of influence of large urban centres on their regional environment and to the dynamic development of the least developed areas, including rural areas. The largest amounts of funds for financing and co-financing of EU projects were obtained by the smallest rural communes, i.e., PLN 2177.8 (EUR 511.5) per capita, and the smallest amounts were obtained by rural communes with the largest population, i.e., PLN 1513.3 (EUR 355.4) per capita. There is also considerable regional diversity in this respect. This is because in the analysed years, most funds for financing and co-financing of EU projects were obtained by rural communes in the Eastern Macroregion—that is PLN 2282.6 (EUR 536.1) per capita, and the least by rural communes from the North-Western Macroregion—that is PLN 1474.4 (EUR 346.3) per capita [4]. For many local governments, obtaining EU subsidies was an opportunity to accelerate development processes and bridge the qualitative and quantitative infrastructural gap. According to the survey conducted by Sierak [112], about 20% of investment tasks annually were financed from EU funds. Sierak [112] also indicates two main directions of the allocation of EU funds. The first direction is water-supply and sewage investments, including, above all, the extension of the sewage system and waste treatment infrastructure, and the second one—projects of construction and modernisation of roads and footpaths.

In order to assess the level and diversity of investment activity of rural communes, due to the multidimensionality of the phenomenon under study, the values of the synthetic measure were constructed with the use of the TOPSIS method. Four simple features were taken into account in the construction of the synthetic measure of the level of investment activity of the analysed local government units, i.e., the level of real cumulative investment expenditures in PLN per capita, level of real cumulative investment expenditures in millions of PLN per km², the share of investment expenditures in total expenditures (average for the years 2007–2018), and level of real cumulative funds obtained to finance and co-finance EU projects in PLN per capita for the years 2007–2018. The obtained values of the synthetic measure of investment activity of rural communes ranged from 0.027 to 1.0. According to the arbitrary division, five typological classes of rural communes were distinguished in Poland with different levels of investment activity in 2007–2018. For the selected typological classes, intraclass values of financial indicators showing the level of investment activity of the analysed local government units were calculated. The results of the typological classification of the analysed rural communes in terms of investment activity are presented in Tables 4 and 5 and in Figure 1.



Figure 1. Spatial diversification of investment activity level of rural communes in Poland in the years 2007–2018. Legend: Urban and urban-rural municipalities not included in the survey are marked in white; typological classes were distinguished based on the value of the synthetic measure—a very high investment activity level was ascribed to municipalities with the highest values of the synthetic measure constructed, whereas a very low investment activity level was ascribed to those with the lowest values of the synthetic measure (Table 4, see Research Materials and Methods). Source: Own calculations based on Table 4.

Table 4. Typological classes of the level of investment activity of rural communes in Poland in the years 2007–2018 (average values—medians).

Description	Typological Class /Level of Investment Activity					Total
	I	II	III	IV	V	
	Very High	High	Average	Low	Very Low	
Synthetic measure value	$S_i \in (0.80, 1.00>$	$S_i \in (0.60, 0.80>$	$S_i \in (0.40, 0.60>$	$S_i \in (0.20, 0.40>$	$S_i \in <0.00, 0.20>$	
Number of communes	123	375	529	427	93	1547
Percentage of communes (%)	8.0	24.2	34.2	27.6	6.0	100.0
Level of investment expenditures per capita (in PLN)	12,852.1	9578.9	7416.9	5569.0	3982.9	7354.3
Level of investment expenditures per km ² (in PLN)	7471.6	5247.3	3954.0	2867.2	1760.4	3912.7
Share of investment expenditures in total expenditures (%)	25.7	20.2	16.1	12.2	8.3	15.9
Level of funds obtained by communes for the financing and co-financing of EU projects per capita (in PLN)	4072.7	2571.0	1868.3	1397.6	823.3	1863.8

Source: Own calculations based on data obtained from [4].

Table 5. Rural communes by macroregion arranged in terms of typological classes of investment activity level in Poland in the years 2007–2018 ^a.

Description	Typological Class /Level of Investment Activity					Total (Number and Percent of Rural Communes in the Macroregion)
	I Very High	II High	III Average	IV Low	V Very Low	
South-Western macroregion	12	28	32	32	9	113
Percent from the column	9.8	7.5	6.0	7.5	9.7	7.3
Percent from the line	10.6	24.8	28.3 ^N	28.3	8.0	
Northern macroregion	19	53	72	81	15	240
Percent from the column	15.4	14.1	13.6	19.0	16.1	15.5
Percent from the line	7.9	22.1	30.0	33.8 ^N	6.3	
Eastern macroregion	20	107	116	92	16	351
Percent from the column	16.3	28.5	21.9	21.5	17.2	22.7
Percent from the line	5.7 ^N	30.5 ^P	33.0	26.2	4.6	
North-Western macroregion	4	35	66	65	30	200
Percent from the column	3.3	9.3	12.5	15.2	32.3	12.9
Percent from the line	2.0 ^N	17.5 ^N	33.0	32.5 ^N	15.0 ^N	
Central macroregion	23	38	70	60	8	199
Percent from the column	18.7	10.1	13.2	14.1	8.6	12.9
Percent from the line	11.6 ^P	19.1 ^N	35.2	30.2	4.0	
Southern macroregion	19	63	86	46	3	217
Percent from the column	15.4	16.8	16.3	10.8	3.2	14.0
Percent from the line	8.8	29.0 ^P	39.6 ^P	21.2 ^P	1.4	
The Mazowieckie Voivodeship macroregion	26	51	87	51	12	227
Percent from the column	21.1	13.6	16.4	11.9	12.9	14.7
Percent from the line	11.5 ^P	22.5	38.3 ^P	22.5 ^P	5.3 ^P	
Total rural communes	123	375	529	427	93	1547
Percent from the column	8.0	24.2	34.2	27.6	6.0	100

^a Determination of significance for the class on the basis of the fraction pseudo-test: ^P—highly significant and positive, ^N—highly significant and negative. Source: Own calculations based on data obtained from [4].

The research conducted shows that class I, characterised by a very high level of investment activity comprised 8 percent of all rural communes. This resulted from the highest level of investment expenditures which in the discussed class amounted on average to PLN 12,850 (EUR 3018) per capita (i.e., more than three times as much as rural communes with the lowest investment activity). They constituted 25.7 percent of all investment expenditures in the analysed period. In turn, 24 percent of all rural communes had a high level of investment activity. A characteristic feature of these communes was also a high level of per capita investment expenditures—which was higher than average—i.e., PLN

9578.9 (EUR 2249.8) per capita. In the communes in the typological classes I and II, a high level of investment expenditures per km² was also recorded, amounting to PLN 7471.6 (EUR 1754.9) and PLN 5247.3 (EUR 1232.5) per km² respectively.

Class I local government units with a very high level of investment activities were mainly rural communes of the Central Macroregion and in the Mazowieckie Voivodship Macroregion. However, when the very high and high level of investment activities was considered, it was mainly characteristic for rural communes in the eastern and southern part of the country (Figure 1). As can be seen from data presented in Table 5, as many as 38 percent of all communes in the Southern Macroregion and more than 36 percent of all rural communes in the Eastern Macroregion consisted of classes I and II. The poorest results were observed in this respect in the case of communes in the North-Western Macroregion where less than one in five communes was characterised by a very high and high level of investment activity, and it was characteristic of these communes to be classified as class IV and V (with the lowest level of the analysed phenomenon). Thus, the empirical research carried out made it possible to verify positively the research hypothesis posed, assuming that “The highest investment activity is observed primarily in rural communes located in Eastern Poland”. This is because a feature which was highly characteristic for the analysed communes was their classification as class II, with a high level of investment activity (based on the values of a fraction pseudo-test) (Table 5, Figure 1).

The average level of investment activity was observed in about a third of rural communes which comprised class III. They were characterised by a level of all investment activity rates similar to average. The share of total investment expenditures of rural communes comprising the discussed class was 16.1 percent, i.e., by nearly 10 percentage points less in relation to communes comprising class I with the highest level of the analysed phenomenon, but it was also by half less than in the case of communes with the lowest investment activity levels (Table 4). The highest percentage of rural communes with an average investment activity level, i.e., nearly 40 percent, was recorded in the Southern and Mazowieckie Voivodship macroregions (Table 5).

The lowest investment level, in turn, was observed in the case of rural communes comprising classes IV and V. Class IV, characterised by a low investment activity level, comprised 427 local government units, i.e., nearly 28 percent of all rural communes. Class V, in turn, characterised by a very low investment activity level, comprised 93 entities, i.e., 6 percent of the analysed local government units. A characteristic feature of rural communes comprising the discussed typological classes was the lowest level of all the partial financial indicators which illustrate the level of investment activity. A particularly low level of investment expenditures per capita was observed in the last typological class where it amounted to PLN 1760.4 (EUR 413.5) per capita, and constituted only 8.3 percent of all expenditures of these entities. These communes obtained by far the least funds for the financing and co-financing of EU projects, namely PLN 823.3 (EUR 193.5) per capita on average, whereas the average value for all rural communes was twice as high (Table 4). Definitely, the lowest level of investment activity was observed in rural communes of two macroregions, namely the North-Western and Eastern macroregion in which nearly half of all communes were characterised by a low investment activity level (Table 5).

4.2. Investment Activity of Rural Communes and the Development Level of Rural Areas in Poland

The socio-economic development of rural areas, as highlighted by, among others, Stanny and Strzelczyk [113], is a process aimed at improving the life quality and level of the rural population, implemented by forming such economic and social structures in the local community that would enable the generation of fair income for its residents, improve their access to public goods and services, and counteract unfavourable phenomena (such as, for example, the monofunctionality of the local economy, agrarian overpopulation, depopulation, unemployment, poverty, social marginalisation, communicative peripherisation). The assessment of rural area development should include, among other things, the demographic structure, labour market situation, the deagrarianisation level of the local

economy, the characteristics of the agricultural and non-agricultural sector. Based on an analysis of the average values of ratios showing the socio-economic situation in the selected classes of rural communes with different levels and investment activities, their changes can be noted in the years 2016–2018, as compared with the years 2007–2009. All these changes were positive and significant enough to be confirmed in the Wilcoxon signed-rank test (except for the feature related to the size of business entities, whose change proved statistically insignificant) (Table 6).

Table 6. A comparison of dependent samples in terms of the socio-economic situation of rural communes in Poland in the years 2007–2009 and 2016–2018 (results of the Wilcoxon signed-rank test).

Description	Wilcoxon Signed-Rank Test	
	Test Values	Significance Level
Population density (population per km ²)	11.39	0.000
Rate of natural increase per 1000 people	16.59	0.000
Migration balance per 1000 people	10.38	0.000
Percentage of the unemployed in the total working-age population (%)	33.29	0.000
Percentage of councillors with higher education (%)	17.81	0.000
Number of foundations, associations and social organisations per 1000 residents	33.66	0.000
Number of enterprises in industry and services in general	29.54	0.000
Beneficiaries of social community care per 10 thous. residents	33.40	0.000
The number of entities entered to the National Business Register (REGON) per 10 thous. residents	32.69	0.000
The number of natural persons conducting business activities per 10,000 population	29.77	0.000
The number of entities with 50 or more employees per 10 thous. working-age population	0.10	0.920
Number of accommodation places per 1000 residents	6.86	0.000
Average floor space per capita (in m ²)	33.90	0.000
Percentage of all homes with central heating systems (%)	34.04	0.000
Percentage of the total population using the sewage system (%)	32.14	0.000
Percentage of the total population using a gas distribution network (%)	24.61	0.000

Source: Own calculations based on data obtained from [4].

The conducted empirical research also included the analysis of the quantitative relations between investment activity level of rural communes and selected ratios illustrating the socio-economic situation of these entities. The conducted research demonstrated that, in general, the higher the level (class) of investment activity, the more favourable results of ratios illustrating the socio-economic situation of rural communes. Communes comprising classes I and II with a very high and high level of investment activity have particularly positive characteristics related to population changes (population growth and positive migration balance), a favourable labour-market situation, higher education of councillors and a favourable structure of entrepreneurship. The above-mentioned characteristics of the socio-economic situation of rural communes influence the amounts of taxes and fees determining the overall income potential, which in turn influences investment opportunities. Moreover, the stable financial situation resulting from favourable conditions and adequate policy of the authorities is highly important for maintaining financial liquidity, or the ability to incur debt, which are of particular importance for the implementation of investment projects, especially of those co-financed by the EU. Local government units

comprising classes IV and V with a low and very low level of investment activity show, in turn, a negative character of almost all of the analysed ratios illustrating the socio-economic situation. The phenomenon of depopulation, higher unemployment rates and poor accommodation services are evident, which is indicative of low attractiveness of rural areas for living, conducting business activities or rendering tourist services (Table 7).

Along with the socio-economic development of rural areas, an increase in the number of their population is observed. Natural demographic changes are slow, and changes caused by migrations of various intensity are short-term and more dynamic. The migration inflow is primarily related to the neighbouring cities. On the other hand, in the typical rural areas, including especially those on the peripheries, one could expect the outflow of residents to cities and countries offering better living and working conditions. Investments implemented by local government units contribute to the improvement of living conditions of the local community, including the communication accessibility of suburban areas. The residents of suburban areas, in addition to the benefits of the proximity of a city, for example of a workplace, access to education and a variety of services, also use the benefits of living in the countryside, such as surrounding green areas, cleaner air, cheaper residential options, etc. The conducted research, therefore, shows that there is a relationship between the level of investment activity and the density of population and migration balance. In the analysed period, the density in rural communes increased, but it was particularly the case of communes with a higher level of investment activity (from 75.3 persons per km² in the years 2007–2009 to 81 persons per km² in the years 2016–2018), and its decrease (even if relatively small) was observed in local government units with its lowest levels. At the same time, among rural communes with the lowest investment activity levels, the highest negative migration balance was observed (it amounted to −3.3 persons per 1000 population, with the average for all rural communes amounting −0.1 persons per 1000 population in the years 2016–2018) (Table 7).

Improving the condition and quality of rural infrastructure, including such technical infrastructure as sewage and gas systems, is of considerable significance for reducing the distance between cities and the countryside and improving the attractiveness of rural areas. In the analysed period, as a result of investment projects implemented by local government units, the percentage of the population using the sewage system significantly increased—from 22.2 percent in the years 2007–2009 to 37.8 percent in the years 2016–2018 (an increase of 15.6 percentage points). The research conducted demonstrated that in the rural areas with the highest levels of investment activity, the highest increase of the percentage of the population using the sewage system was observed (by more than 20 percentage points in the typological class I, and by 18.5 percentage points in class II). In Poland, the gas distribution network is relatively underdeveloped, especially in the rural areas, and in the analysed period positive changes occurred in this respect (from 13.5 percent in the years 2007–2009 to 16.2 percent in the years 2016–2018). Among rural communes with the highest level of investment activity, the highest percentage of the population using gas distribution system (amounting to nearly 20 percent), and also the highest increase of this percentage was observed (by 4 and 5.2 percentage points respectively).

Table 7. The socio-economic situation of rural areas with different levels of investment activity in the years 2007–2009 and 2016–2018 (average values—medians) ^a.

Description	Years	Typological Class /Level of Investment Activity					Total
		I	II	III	IV	V	
		Very High	High	Average	Low	Very Low	
Population density (population per km ²)	2007–2009	75.3	76.3	69.8	64.5	45.6 ^N	68.9
	2016–2018	81.0	81.5	72.8	65.8	45.3 ^N	72.0
Rate of natural increase per 1000 people	2007–2009	0.5	0.5	0.5 ^P	0.2 ^N	0.3	0.4
	2016–2018	−0.3 ^P	−0.4 ^P	−0.6 ^P	−1.1 ^N	−1.4 ^N	−0.7
Migration balance per 1000 people	2007–2009	3.2 ^P	3.1 ^P	0.5	0.2 ^N	−2.5 ^N	1.1
	2016–2018	2.0 ^P	1.8 ^P	−0.3 ^N	−1.3 ^N	−3.3 ^N	−0.1
Percentage of the unemployed in the total working-age population (%)	2007–2009	8.0 ^P	7.9 ^P	8.4	9.1 ^N	10.4 ^N	8.6
	2016–2018	5.4 ^P	5.1 ^P	5.5	5.8 ^N	6.5 ^N	5.5
Percentage of councillors with higher education (%)	2007–2009	23.6	21.8	21.6	20.7	17.9	21.3
	2016–2018	30.5 ^P	30.0 ^P	27.5	28.5	24.9	28.5
Number of foundations, associations and social organisations per 1000 residents	2007–2009	93.2	92.5	91.7 ^N	91.6 ^N	89.9 ^N	91.9
	2016–2018	95.3 ^P	94.8 ^P	94.3	93.9 ^N	92.1 ^N	94.3
Beneficiaries of social community care per 10 thous. residents	2007–2009	1234.7	1213.6	1321.6	1374.7	1596.4	1319.7
	2016–2018	817.0	779.9	845.4	893.0	969.9	847.9
The number of entities entered to the National Business Register (REGON) per 10 thous. residents	2007–2009	667.4	636.1	585.4	563.9	555.5	596.5
	2016–2018	798.0	761.6	700.4	672.3	649.2	712.2
The number of natural persons conducting business activities per 10,000 population	2007–2009	53.7	51.6 ^P	47.2 ^N	45.6 ^N	44.1 ^N	48.1
	2016–2018	62.6	60.6 ^P	55.2 ^N	53.3 ^N	50.1 ^N	56.3
The number of entities with 50 or more employees per 10 thous. working-age population	2007–2009	6.4 ^P	4.8	4.8	4.1 ^N	4.4	4.7
	2016–2018	6.1 ^P	5.0 ^P	4.7	4.2 ^N	4.1 ^N	4.7
Number of accommodation places per 1000 residents	2007–2009	38.2	36.1	14.8 ^N	8.2 ^N	7.5 ^N	19.6
	2016–2018	44.8	38.5	16.5	9.3 ^N	10.2	21.7
The percentage of farms with an area of 15 ha and more in the total number of farms (%)	2007–2009	36.8	40.4	40.7 ^N	46.1 ^P	59.9 ^P	42.9
	2016–2018	36.8	40.4	40.7 ^N	46.1 ^P	59.9 ^P	42.9
Average floor space per capita (in m ²)	2007–2009	87.3	88.0 ^P	86.1	84.8 ^N	82.1 ^N	86.1
	2016–2018	93.9	94.3 ^P	91.8	90.4 ^N	86.8 ^N	91.9

Table 7. Cont.

Description	Years	Typological Class /Level of Investment Activity					Total
		I	II	III	IV	V	
		Very High	High	Average	Low	Very Low	
Percentage of all homes with central heating systems (%)	2007–2009	62.7	63.4	61.1	61.7	60.2	61.9
	2016–2018	69.8	69.9 ^P	67.7 ^N	68.2	66.9	68.5
Percentage of the total population using the sewage system (%)	2007–2009	26.1	24.8 ^P	21.7	19.9 ^N	19.9	22.2
	2016–2018	49.2 ^P	43.3 ^P	37.0	32.6 ^N	29.6	37.8
Percentage of the total population using a gas distribution network (%)	2007–2009	14.7	15.7	15.3 ^P	10.8 ^N	4.7 ^N	13.5
	2016–2018	18.7	19.9 ^P	17.5	12.9 ^N	5.9 ^N	16.2
The number of natural persons conducting business activities per 10,000 population	2007–2009	53.7	51.6 ^P	47.2 ^N	45.6 ^N	44.1 ^N	48.1
	2016–2018	62.6	60.6 ^P	55.2 ^N	53.3 ^N	50.1 ^N	56.3
The number of entities with 50 or more employees per 10 thous. working-age population	2007–2009	6.4 ^P	4.8	4.8	4.1 ^N	4.4	4.7
	2016–2018	6.1 ^P	5.0 ^P	4.7	4.2 ^N	4.1 ^N	4.7
Number of accommodation places per 1000 residents	2007–2009	38.2	36.1	14.8 ^N	8.2 ^N	7.5 ^N	19.6
	2016–2018	44.8	38.5	16.5	9.3 ^N	10.2	21.7
The percentage of farms with an area of 15 ha and more in the total number of farms (%)	2007–2009	36.8	40.4	40.7 ^N	46.1 ^P	59.9 ^P	42.9
	2016–2018	36.8	40.4	40.7 ^N	46.1 ^P	59.9 ^P	42.9
Average floor space per capita (in m ²)	2007–2009	87.3	88.0 ^P	86.1	84.8 ^N	82.1 ^N	86.1
	2016–2018	93.9	94.3 ^P	91.8	90.4 ^N	86.8 ^N	91.9
Percentage of all homes with central heating systems (%)	2007–2009	62.7	63.4	61.1	61.7	60.2	61.9
	2016–2018	69.8	69.9 ^P	67.7 ^N	68.2	66.9	68.5
Percentage of the total population using the sewage system (%)	2007–2009	26.1	24.8 ^P	21.7	19.9 ^N	19.9	22.2
	2016–2018	49.2 ^P	43.3 ^P	37.0	32.6 ^N	29.6	37.8
Percentage of the total population using a gas distribution network (%)	2007–2009	14.7	15.7	15.3 ^P	10.8 ^N	4.7 ^N	13.5
	2016–2018	18.7	19.9 ^P	17.5a	12.9 ^N	5.9 ^N	16.2

^a, Designation of feature-to-class relevance on the basis of mean difference pseudo-test: ^P—highly relevant and positive, ^N—highly relevant and negative. Source: Own calculations based on data obtained from [4].

Along with the increase in the level of technical infrastructure development, an increase in the level of entrepreneurship in rural areas is observed. It should, however, be noted that the largest number of business entities is located in rural areas which surround large cities, and the smallest number—on the peripheries. The concentration of non-agricultural business activity in the areas in the vicinity of cities results from their being better equipped with technical infrastructure and a better education structure of the population. The research has shown that the higher the level of investment activity, the higher the number of natural persons conducting business activities per 1000 population. In the group of communes comprising classes I and II it was more than 60, and in the groups classified as the last class—class V of investment activity, there were slightly more than 50 natural persons conducting business activities per 1000 population. In rural communes with the highest investment activity, a relatively higher number of large entities with 50 or more employees per 10 thousand working-age population was observed as compared with other rural communes (6.1, with the average for all communes amounting to 4.7 enterprises with 50 or more employees per 10 thousand working-age population) (Table 7).

5. Discussion and Conclusions

The local government in Poland is the key provider of public tasks. As a result, their implementation also means that it is the largest investor. The empirical research conducted demonstrates that, in absolute terms, investment activity among local government units is carried out most actively by communes. An analysis of the entire discussed period, that is the years 2007–2018, shows that the cumulative investment expenditures of communes amounted to more than PLN 197 billion (EUR 46.3 billion) which constituted 42 percent of all expenditures realised by all local government units, of which every second zloty was spent by rural communes. It is worth noting that also per capita, their investment potential is higher than that of local governments. This proves the immense significance of rural communes as the creators of processes that promote development. The level of these expenditures was changing in the analysed period. It can be noted that the increased intensity of investment processes occurred at the time of the inflow and absorption of EU funds.

The conducted research has proved that the investment activity of the analysed entities is influenced in a statistically significant way by their size. When analysing all the ratios of investment activity taken into account in the study—investment expenditures per capita and per km², and their share in total expenditures, and the level of funds obtained by local government units for the financing and co-financing of EU projects per capita—the relationship that should be noted is that the larger the population of a local government unit, the higher their level. It should be emphasised that for this influence to be positive, the increase in the number of residents has to provide adequate budgetary revenues which will cover the increased ongoing and investment needs. The research studies carried out before did not provide a clear solution to this problem. The positive impact was proven by, among others, Brusca et al. [114], Navarro-Galera et al. [115]. On the other hand, Allers et al. [116], Ashworth et al. [117], Wang et al. [118], Capalbo and Grossi [119] proved that an increase in the number of population increases disparities between the inflow of budgetary funds and implementation of the expenditure policy.

The results of the synthetic measure of investment activity level point to its considerable diversity among rural communes. For example, local government units comprising class I with a very low level of investment activity in the years 2007–2018 allocated almost 4 times more funds to investment projects than local government units comprising class V with a very low level of investment activity.

The assigned classes of investment activity of rural communes were the basis for conducting an analysis of their relationships with their location in a macroregion which turned out to be statistically significant. The most pro-investment communes are mainly located in the Central and Mazowieckie Voivodeship macroregions, and communes with a very high and high level of investment activity, are rural communes from the Eastern

and Southern macroregions. Entities implementing relatively the smallest number of investment projects are mainly rural communes from the North-Western and the Northern macroregions. Thus, the empirical research carried out made it possible to verify positively the research hypothesis posed, assuming that “The highest investment activity is observed primarily in rural communes located in Eastern Poland”. This delimitation is due to additional state resources being provided to the less developed eastern areas of Poland. Citizens living in these regions can not only take advantage of the funding provided as part of the Regional Operational Programmes, but also the Eastern Poland Programme dedicated to helping them.

The conducted research demonstrated that, in general, the higher the level (class) of investment activity, the more favourable results of ratios illustrating the socio-economic situation of rural communes. Communes comprising classes I and II with a very high and high level of investment activity have particularly positive characteristics related to population changes (population growth and positive migration balance), a favourable labour-market situation, higher education of councillors and a favourable structure of entrepreneurship. On the other hand, local government units comprising classes IV and V with a low and very low level of investment activity were characterised by the phenomenon of depopulation, higher unemployment rates and poor accommodation services, which is indicative of low attractiveness of rural areas for living, conducting business activities or rendering tourist services. The above-mentioned results concerning the relationship between the socio-economic and financial situation, so important for the implementation of investment processes, are also confirmed by the findings of other researchers. As far as demographic factors are concerned, the importance of population inflow was confirmed by Arunachalam et al. [120], Rodriquez Bolivar et al. [121], of population density—by Carruthers and Ulfarsson [122], and of the age structure of residents—by Kloha et al. [123], Rodriquez Bolivar et al. [121].

The level of implemented investment is also influenced by the policy of local authorities. The importance of these factors was analysed by, among others, Giosi et al. [124], Brusca et al. [114], McDonald III [125], Ashworth et al. [117]. Park [126] proved that inefficient tax collection negatively affects financial stability. Lack of proper supervision over investment projects, reluctance to raise taxes and pressure from local interest groups cause the overall increase of expenditures. As far as the importance of the activities undertaken by local governments to implement investment processes is concerned, it should be noted that the deterioration of their financial situation translates into development processes, both at the local level and at the level of the entire economy. This is a particularly important issue today when both local finance and the entire financial sector will be affected by the global COVID-19 pandemic.

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