ФИНАНСЫ РЕГИОНА

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Economic Effects of Public Investment Activity in Rural Municipalities of Eastern Poland [1]

For several years, the development of regions of Eastern Poland has been supported with funds from the European Union (EU) special programme entitled «Eastern Poland». Its goal is to stimulate the economic and social development of this part of Poland, which is one of the least developed regions in the EU. These funds are aimed at reducing development disproportions between Eastern Poland and other regions. Therefore, the question about the effects of applying financial support from public funds of these regions is justified. Our research attempts not only to find an answer to this question, but also to fill the research gap explaining the role of some factors in the reduction of regional disparities in rural areas. The paper aims to identify the factors and effects of public investment activity in rural municipalities in Eastern Poland against all rural municipalities in the country. The research hypothesis assumes that there is a positive relation between the level of municipal investment activity and the share of the municipalities' tax revenue in the overall budget revenue, and that the level of municipal investment activity depends on geographical location of rural areas. The research covered all rural municipalities in five regions of Eastern Poland, while data have been obtained from Central Statistical Office in Poland for the period 2004–2017. A percentage share of investment spending of rural municipalities in the overall budget expenditure was used as a measure of investment activity. The study used a comparative analysis method, descriptive statistics (mean, coefficient of variation), as well as one-factor analysis of variance and linear correlation. The research has shown that investment activity in rural municipalities in Eastern Poland during the analysed period was slightly lower than in the country as a whole, with remarkable differentiation among particular municipalities. There is no single factor defining the investment capacities of local authorities, however, relatively big differences in the receipt of EU funds by rural municipalities in Eastern Poland. The findings show that the proximity to highly developed regions did not energise the economic growth of rural municipalities in Eastern Poland to the same extent as the proximity to larger cities. The research results can be used by public sector institutions in rural development programmes, including measures to improve the effectiveness of the financial investments from public funds to increase the quality of life of rural inhabitants.

Keywords: investments, rural municipalities, Eastern Poland, geographical location, natural environment, interregional proximity, EU funds, demographic changes, unemployment rate, entrepreneurship

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Экономические последствия государственной инвестиционной деятельности в сельских муниципалитетах Восточной Польши

В течение последних лет развитие регионов Восточной Польши поддерживается за счет средств специальной программы Европейского союза «Восточная Польша», нацеленной на стимулирование экономического и социального роста. Выделенные средства направлены на преодоление диспропорций в развитии между Восточной Польшей и другими регионами страны. В связи с этим актуальным становится изучение проблемы финансовой поддержки этих регионов со стороны государства. Цель настоящего исследования — не только ответить на этот вопрос, но и восполнить пробел в исследованиях, объясняющих влияние различных факторов на сокращение различий между регионами. В статье определяются предпосылки и результаты государственной инвестиционной деятельности в сельских муниципалитетах Восточной Польши и сравниваются с остальными сельскими муниципалитетами страны. Предполагается, что существует положительная связь между муниципальной инвестиционной активностью и долей налоговых поступлений муниципалитетов в общих доходах бюджета, а муниципальная инвестиционная деятельность зависит от географического положения сельских территорий. На основе данных за 2004–2017 гг., предоставленных Статистическим управлением Польши, были проанализированы данные по муниципалитетам пяти воеводств Восточной Польши. Для оценки инвестиционной деятельности использовалась доля инвестиционных расходов сельских муниципалитетов в общих расходах бюджета. Были применены такие методики, как сравнительный анализ, описательная статистика (среднее значение, коэффициент вариации), а также однофакторный дисперсионный анализ и линейная корреляция. Исследование показало, что в течение анализируемого периода инвестиционная деятельность в сельских муниципалитетах Восточной Польши была несколько ниже, чем по стране в целом; между отдельными муниципалитетами наблюдалась значительная дифференциация. Единого фактора, определяющего инвестиционные возможности местных властей, не существует. В то же время, наблюдаются существенные различия в получении сельскими муниципалитетами Восточной Польши средств из фондов ЕС. Определено, что близость к высокоразвитым регионам повлияла на экономический рост сельских муниципалитетов Восточной Польши в меньшей степени, нежели близость к крупным городам. Результаты исследования могут быть использованы государственными учреждениями для создания программ сельского развития, а также выработки мер по повышению эффективности государственной финансовой поддержки улучшения качества жизни сельских жителей.

Ключевые слова: инвестиции, сельские муниципалитеты, Восточная Польша, географическое положение, природная среда, межрегиональная близость, фонды ЕС, демографические изменения, уровень безработицы, предпринимательство

Introduction

Developmental problems in rural areas pose significant economic and social challenges due to the important functions these areas perform. As Niedzielski [1] notes, the functions are differentiated in the literature by various criteria but are mainly divided into internal, concerning rural areas alone, and external. The type of functions depends on specific features of the local environment. For example, non-productive functions are present in areas attractive for their natural resources and different functions in places characterised by rapid urbanisation.

The high diversity and broad understanding of rural area functions is reflected in their division into the following categories:

— green functions, related to the sustainable management of land resources, animal breeding and maintaining the biodiversity of the natural environment;

— blue functions, regarding water resources management and energy generation from renewable sources (water and wind);

— white functions, arising from the important role of agriculture in providing food security;

— yellow functions, concerning the cohesion and viability of rural areas, and the quality of life of rural inhabitants, including the fulfilment of their social and cultural needs [2].

The implementation of the above functions is important not only for rural inhabitants (ensuring expected income and improving living conditions, thus preventing the depopulation of the country-

side), but also for society as a whole (care for the environment, providing high-quality agricultural products, improving the management of land and water resources [3, 4, 5, 6].

The need for the broader realisation of the functions of rural areas at the European Union (EU) level was underlined in the Cork Declaration 2.0 of 2016 [7]. The Declaration highlighted the role of rural areas and their inhabitants in implementing the objectives of sustainable development as defined by the United Nations, especially due to the economic, environmental and social diversity of the countryside in Europe. The Declaration also emphasised that the value of rural resources lies mainly in their capacity to provide secure, sustainable and high-quality food resources, expanding the scope of the bioeconomy, counteracting climate changes and reducing the mining of fossil fuels.

Rural areas show quite remarkable internal differentiation due to demographic features, the economic structure, the level of technical and social infrastructure components, as well as features of the environment [2, 8].

Thus, on the one hand, rural areas perform economic, social and environmental functions, which are of importance not only from a local point of view; on the other hand, various obstacles hinder or sometimes even preclude the performance of these functions. This refers, in particular, to the increasing disappearance of traditional village functions (agricultural function, natural environment values, cultural identity and heritage of rural inhabitants) in areas closer to cities, and to the growing developmental gap between peripheral rural areas, more central rural areas and urbanised spaces (low income, poor access to infrastructure, insufficient use of native resources) [9, 10, 11].

Developmental problems in rural areas are particularly seen in Eastern Poland, which is characterised not only by lower economic development but also weak infrastructure and slower advancement (compared to other regions in Poland) of entrepreneurship. Simultaneously, rural areas in Eastern Poland enjoy natural resources, which are potentially excellent conditions for the development of various forms of tourism. In addition, since 2007, Eastern Poland has benefited from a special European Union programme which supports the economic and social development of particular regions and local communities and whose objective is to enhance measures for reducing the developmental disparity between this part of Poland and other regions [12, 13].

A special role in the process of energising rural areas is played by local government authori-

ties, which influence the creation of conditions for the development of entrepreneurship by enhancing such infrastructural components, facilitating the launch and growth of businesses (roads, water and sewage infrastructure, waste disposal). Additionally, local governments directly influence the inhabitants' quality of life by investing in social infrastructure (education, culture, health care and leisure facilities), which, in turn, shapes the scale and direction of migration processes in rural areas [14].

Among the three tiers of local government in Poland (municipalities /gminy/, counties /powiaty/, regions /województwa/), municipal authorities play the most important role, as it is on this level that decisions are made on the improvement of basic components of technical and social infrastructure important for the inhabitants and the business people. This originates from the systemic placement of such units in the structure of local government (municipal authority as the basic self-government unit) and results in a broad scope of tasks, including investment, which is correlated with significant flow of public money to municipal budgets used to finance municipal infrastructure.

Thus, it can be assumed that investments by municipal authorities remarkably facilitate the intensification of the economic and social development of rural areas, while reducing inter- and intra-regional developmental disparities, which requires extensive investment on the part of local governments in poorly developed rural areas mainly present in Eastern Poland.

Research conducted so far has revealed relatively weak development of key infrastructure in rural areas of Eastern Poland as compared to other regions in Poland [15, 16]. Therefore, a question arises about why this is so, especially when local authorities in rural municipalities in Eastern Poland benefit from special EU funds support. In the present research, it has been assumed that rural municipalities in Eastern Poland have a lower investment capacity than average Polish municipalities due to a relatively low budget revenue, caused by a low share of their tax revenue in the overall budget revenue. The main research objective is to determine key factors shaping the public investment capacity of rural municipalities in Eastern Poland and the effects of their investment activity against all rural municipalities in Poland. The research hypotheses assume:

H1. There is a positive relation between the level of municipal investment activity and the share of the municipalities' tax revenue in the overall budget revenue, related with the number of economic entities per 1000 inhabitants;

H2. The level of municipal investment activity depends on geographical location of rural areas (suburban, state border and municipalities in proximity of more developed regions).

Materials and Methods

The research was conducted based on data from the Local Data Bank of Statistics Poland in Warsaw. For each analysed feature, an average value was calculated for 2004–2017 (in the case of funds obtained by municipal authorities from the EU, this was an average value for 2006–2017). The analysis included numerical data for all rural municipalities in five regions of Eastern Poland: Lubelskie, Podkarpackie, Podlaskie, Świętokrzyskie and Warmińsko-Mazurskie. The research covered a total of 489 local authority units, which at the end of 2017 had the status of a rural municipality. The choice of the five regions named above was dictated by the fact that they are the less developed regions in Poland and, therefore, benefit from special financial support within the «Eastern Poland» programme (between 2007 and 2013 the programme was called «Development of Eastern Poland»). Thus, as these rural areas in Poland need to minimise developmental disparities with other regions, they require profound investment activity on the part of municipal authorities. A measure of such activity was calculated as a percentage share of investment spending of rural municipalities in the overall budget expenditure. In order to define more precisely the level of investment capacity of municipalities and the scale of their differentiation, rural municipalities in Eastern Poland were divided into quartile groups. Subsequently, relations were analysed between these groups along with factors ingluencing the level of budgetary revenue that could impact local governments' investment capacities. The following were deemed to be the effects of investment activity:

— demographic changes and unemployment rate;

— degree and features of entrepreneurship.

The study used a comparative analysis method, descriptive statistics (mean, coefficient of variation), as well as one-factor analysis of variance and linear correlation.

The importance of Local Government Investments for the Development of Rural Areas

Rational management of public money is based on the conscious determination of goals for gathering and spending such resources. A remarkable part of public monies is spent by local government units (in 2018, local governments' revenue was 53 % of the state budget revenue). In such circumstances, it is entirely reasonable to research the cause and effect relationship between public money spending and local governments' interventions in developmental processes in terms of improving the quality of life of inhabitants and the operation conditions of economic entities [17]. One of the aspects of such research is an assessment of the significance of local government investments as a factor energising economic and social development at the local level.

As Poniatowicz [18] notes, however, local government investments are strategic in nature, as they mainly concern infrastructure projects, which involve high expenditure and continuously burden local budgets due to the current maintenance of constructed facilities. Yet, at the same time, the development of local infrastructure improves the investment attractiveness of municipalities, which is an essential factor for the competitiveness of the local economy. Moreover, the status of the infrastructure influences the inhabitants' quality of life by increasing access to public services.

The importance of investments by municipal authorities in Poland is additionally proven by a high share of investments in relation to gross domestic product (GDP) made by local government sub-sectors. In the years 2010–2013, this value ranged between 2.3 and 3.3 %, while in EU-28 it was lower by half [18].

A common measure to illustrate the investment capacity of local government units is the relation between the amount of investment spending and the overall budgetary expenditure of municipalities. Detailed data reflecting the differences in that measure among rural municipal governments in Eastern Poland against the background of their financial situation are presented in Table 1.

The average share of investment spending of rural municipalities in Eastern Poland against the overall budgetary expenditure for 2004–2017 is close to the all-Polish index. Its differentiation among municipalities in Eastern Poland, however, is highly significant. As shown in Table 1, the reason for the differentiation is not the overall condition of finances in rural municipalities, as the level of budgetary revenue per capita and its structure and dynamics do not show remarkable differences between the designated groups of municipalities. Only municipalities from quartile 4 have the total revenue that is slightly higher than in other municipalities. Similarly, they have a vaguely higher share of tax revenue against the total budgetary

Table 1

Share of investment spending of rural municipalities in Eastern Poland in the overall expenditure in the years 2004–2017 in relation to their revenue level and structure

Details	Poland (rural municipalities)	Rural municipalities in Eastern Poland					Assessment of the significance of differences between means[*]
		Total	Municipal investment spending against total expenditure (%)				
			up to 13.6 Q1	13,6–16,4 Q2	16,4–19,8 Q3	19,8 and above Q4	
Number of municipalities	1,555	489	121	123	120	125	—
Share of municipal investment spending in the overall expenditure (%)							
Mean	17.6	16.7	11.1	14.9	17.9	22.9	$F = 902.5$ $p = 0.000$[**]
Variance coefficient V (%)	29.2	28.0	16.8	5.1	5.6	12.5	—
Total municipalities' revenue per capita (in Polish Zlotys — PLN)							
Mean	2,945.9	2,853.6	2,811.0	2,801.0	2,821.4	2,977.4	$F = 5.228$ $p = 0.001$[**]
Variance coefficient V (%)	39.1	14.5	11.0	11.3	14.4	18.4	—
Dynamics, 2004 = 100	269.3	273.2	272.0	276.7	273.3	270.9	—
Share of municipalities' tax revenue in the total revenue (%)							
Mean	34.6	28.7	27.6	27.8	27.0	32.4	$F = 8.402$ $p = 0.000$[**]
Variance coefficient V (%)	36.9	34.0	25.9	30.2	30.5	40.6	—
Amount of funds gained by municipalities from the European Union per capita in the years 2006–2017 (in Polish Zlotys — PLN[***])							
Mean	421.7	435.4	304.6	385.5	403.9	641.3	$F = 11.125$ $p = 0.000$[**]
Variance coefficient V (%)	117.6	114.4	92.6	122.7	104.2	104.1	—

Notes: [*] assessment of the significance of differences between means carried out with single factor variance analysis; [**] statistically significant differences; [***] 1 PLN = 0,254 USD (currency course — 24.06.2020).
Source: own analysis based on data from the Local Data Bank of Statistics Poland in Warsaw.

revenue. Therefore, variance analysis shows that for those features, the differences between the means in the designated groups of municipalities are statistically significant. In addition, notable differences between those municipalities with the highest share of investment spending and other municipalities are seen in EU funding secured by local authorities, which is also confirmed by the conducted variance analysis. This means that higher activity in obtaining European funds may be related to the investment capacities of local authorities of rural municipalities. Research results found in the literature are confirmed here, showing the positive influence of EU funds on the dynamics of regional development of communities, which were active in obtaining such funds [19]. EU funding which fed local budgets in the years 2006–2017 varied significantly also within each group (high variance coefficients) which, in turn, undermines the previous statement, meaning that each quartile group included municipalities strongly differentiated in using European funds. It should also be noted that rural municipalities in Eastern Poland were moderately more active in

obtaining EU funds compared to an average Polish municipality.

As mentioned above, investments by local authorities are considered to be an effective method to improve the inhabitants' quality of life and increase the investment attractiveness of local communities. One of the effects for rural areas should be the inhibition of migration and the improved use of human resources. The relevant numerical data are presented in Table 2.

A characteristic feature of rural areas in Eastern Poland is a long-term depopulation tendency. In the years 2004–2017, only municipalities with the highest tendency to invest experienced a slight increase in numbers of inhabitants, yet this intensification was weaker than for rural municipalities in Poland overall. At the same time, other municipalities in Eastern Poland suffered depopulation and the rate was quite similar in each quartile group, although investment capacities were quite different among the groups.

This investigation does not answer the question about all possible reasons for this tendency, but based on these comparisons, it can be con-

Demographic situation and non-agricultural businesses [*1] in rural municipalities of Eastern Poland in relation to the share of municipal investment spending against the total expenditure in the years 2004–2017

| Details | Poland (rural municipalities) | Rural municipalities in Eastern Poland | | | | | Assessment of the significance of differences between means[*] |
| | | Total | Municipal investment spending in total expenditure (%) | | | | |
			up to 13.6 Q1	13,6–16,4 Q2	16,4–19,8 Q3	19,8 and above Q4	
Population changes (dynamics, 2004 = 100)							
Mean	102.9	98.5	97.2	97.5	97.5	101.7	—
Variance coefficient *V* (%)	12.5	9.5	6.5	7.6	8.0	13.1	—
Population density (people per 1 km²)							
Mean	69.9	56.4	53.6	53.8	55.1	62.9	$F = 1.437$ $p = 0.231$
Variance coefficient *V* (%)	88.3	73.1	79.2	69.8	59.3	79.1	—
Unemployment rate *(registered unemployed individuals against the number of individuals of working age in %)*							
Mean	9.5	10.6	12.1	10.7	10.4	9.1	$F = 15.937$ $p = 0.000$[**]
Variance coefficient *V* (%)	39.8	34.2	32.4	32.9	30.6	34.5	—
Economic entities per 1,000 individuals of working age							
Mean	100.5	83.3	79.0	80.1	83.9	89.9	$F = 5.756$ $p = 0.001$[**]
Variance coefficient *V* (%)	35.4	27.7	19.5	27.3	26.0	32.8	—
Dynamics, 2004 = 100	124.4	121.4	120.3	122.9	120.8	121.6	—
Share of economic entities run by individuals							
Mean	79.6	77.9	76.7	77.7	78.1	79.1	$F = 3.777$ $p = 0.011$[**]
Variance coefficient *V* (%)	6.2	7.5	6.7	7.3	7.9	7.6	—
Share of economic entities with more than nine employees							
Mean	4.9	4.8	5.0	4.9	4.7	4.7	$F = 1.163$ $p = 0.323$
Variance coefficient *V* (%)	28.0	27.7	24.2	27.8	30.0	28.7	—

Notes: [*] assessment of the significance of differences between means carried out with single factor variance analysis; [**] statistically significant differences.

Source: own analysis based on data from the Local Data Bank of Statistics Poland in Warsaw.

[*1] Agricultural enterprises were excluded from this investigation due to their marginal role as income tax payers and creators of new jobs in Polish economy and specially in Eastern Poland.

cluded that the investment by authorities of rural municipalities in Eastern Poland was not a decisive factor for increasing their attractiveness as a place of living and reducing depopulation of the countryside. It should be noted that in the same period, the number of inhabitants of rural areas throughout Poland increased, meaning that the tendency typical for the eastern regions of Poland was contrary to the all-Polish one, while the population density in Eastern Poland is far lower than the national average for rural areas in Poland. In this respect, only municipalities with the highest investment capacities (quartile 4) show slightly better demographic values compared to the rest, yet the population density there (despite the growth of the number of inhabitants between 2004–2017)

was materially lower than the national. Another typical feature is a quite strong internal dissimilarity of each of the designated groups in respect of population density, as proven by high variance coefficients.

One of the reasons for countryside depopulation in Eastern Poland may be the high unemployment rate combined with the lower than national advancement of entrepreneurship rate measured by the number of economic entities per 1,000 individuals of working age (Table 2).

In 2004–2017, the unemployment rate in rural areas of Eastern Poland was higher than the national rate, with remarkable internal differences. The biggest problem was instability of the labour market that was more pronounced in municipali-

Correlation coefficient between the share of investment spending against the overall expenditure and the selected features of rural municipalities in Eastern Poland

Details	Total revenue per capita (PLN)	Share of tax revenue against the total revenue (%)	Amount of EU funds per capita (PLN)	Population density	Unemployment rate (%)	Number of economic entities per 1,000 inhabitants of working age
Share of investment spending against the total budget expenditure (%)	0.21*	0.22*	0.28*	0,05	−0.30*	0.23*

Notes: * statistically significant dependencies, at $p < 0.05$.
Source: own calculations based on data from the Local Data Bank of Statistics Poland in Warsaw.

ties that allocated a relatively low portion of their budgets for investments. The same group of municipalities was characterised by the lowest number of economic entities per 1,000 inhabitants of working age. The only positive element was that they had the highest percentage of economic entities with more than nine employees, but differences between the designated groups of municipalities were small in this respect, meaning that they did not affect the labour market situation. Additionally, the variation analysis shows that differences among means in the designated groups of municipalities for such features as unemployment rate, number of economic entities per 1,000 inhabitants of working age and the share of businesses run by individuals are statistically significant (Table 2).

In order to identify the connections between the selected features for rural areas in Eastern Poland and municipal investment capacity more accurately, a linear correlation calculation was performed (Table 3).

Based on the presented calculations, the conclusion is drawn that only in the case of population density there was no statistically significant correlation, including the share of investment spending against the overall budget expenditure. Other correlations turned out to be statistically significant but of low intensity. There is no single dominant feature. This can be treated as a confirmation of previous observations of the positive influence of high investment activity on the part of local authorities on the entrepreneurship development and improvement of the labour market situation. At the same time, municipal investment capacities are clearly related to the support from European funds, which, in turn, has an effect on the level and structure of budgetary revenue.

Municipal Investments versus Geographical Location

In order to explain the significant diversification of investment capacities and their economic effect in rural municipalities in Eastern Poland, communities were divided into four groups according to their spatial location:

— suburban — sharing administrative borders with provincial capital cities (current and former)

— border — located in the direct vicinity of the national border

— municipalities in the proximity of more advanced regions which do not belong to Eastern Poland

— other.

Such a division should allow for the assessment of the influence of cities on the investment capacity of rural municipalities and the dynamics of economic changes in their territories. It was also assumed that economic effects of the investment activity of peripherally located municipalities can vary depending on whether they are placed along the state border (being an EU border) or whether they share borders with other regions of Poland. Border municipalities are not usually perceived as attractive for private investors and, thus, their development requires remarkable support from institutions, which use instruments of regional and local policy. An example of the Basel cross-border metropolitan region located across Switzerland, France, and Germany shows that national borders play a diminishing role in the formation of policy networks, information exchange and decision-making. Similar conclusions were made about labour market cross-border integration between 15 EU countries [20, 21, 22]. Meanwhile, proximity to regions with a higher degree of economic growth may accelerate the development of municipalities in regions with lower economic development. Such an assumption seems justified in light of research conducted in various regions in the world, which shows that geographic vicinity facilitates the creation of a network of connections between companies, and enhances cooperation, which supports the innovation process [23, 24, 25, 26]. It forms a foundation for a «business

ecosystem» where, just like in the case of natural ecosystems, changes in the nearest surroundings (positive or negative) have a ripple effect affecting neighbouring local communities. This way, new cooperation options may arise, but also new risks [27, 28].

Thus, if the proximity of rural municipalities in Eastern Poland to more highly developed regions (Pomorskie, Kujawsko-Pomorskie, Mazowsze, Małopolska, Łódzkie regions) would accelerate their own development, then positive measures should include a high level of entrepreneurship, low unemployment and, as a result, growing numbers of inhabitants. It can also be assumed that the occurrence of such positive effects could reduce the importance of the investment activity of local governments in stimulating developmental processes, as the dynamics of such processes would be driven, to a significant extent, by an expansion of a cooperation network of Eastern Poland companies with businesses operating in neighbouring, economically more advanced regions.

Indexes depicting the scale of investment activity of rural municipalities depending on their location, as well as measures to assess their economic situation are presented in Table 4.

As shown in Table 4, the geographic location of rural municipalities in Eastern Poland (location in the vicinity and periphery of cities) was of negligible importance for their investment activity in the years 2004–2017 as there were no notable differences in terms of the share of investment spending against the overall budgetary expenditure among the designated groups of municipalities. The ratio in suburban municipalities, most active in this respect, is identical to the national average (Table 1), while the lowest investment capacity was observed for municipalities, which share borders with regions with higher economic development. The differentiation scale, however, was remarkably lower there than in the case of demographic features or the advancement of entrepreneurship. Only suburban municipalities increased their number of inhabitants in the period 2004–2017, and the scale was higher than the national average. In the same period, population dropped in municipalities of other types (mostly along the border where population density is very low). Similar differences were observed for the unemployment rate and the level of entrepreneurship. In this respect, the best ratios were achieved by suburban municipalities, while those in the proximity of more advanced regions did not differ much from border or other municipalities. It should be noted here that for most of the analysed features, variation coefficients were relatively low

(except for the population density), which proves a significant uniformity of the designated types of municipalities.

The ratios presented in Table 4 demonstrate that the adjacency of rural areas in Eastern Poland to better developed regions has not yet brought positive effects, such as the acceleration of the average entrepreneurship advancement rate, improvement of the labour market situation and reversal of the depopulation process. Correlation analysis reveals a statistically significant and positive relation between the share of budgetary investment spending, the number of economic entities per 1,000 individuals of working age and the share of economic entities run by individuals in that group of municipalities. The lack of positive effects of the interregional proximity can have various reasons:

1) low attractiveness of rural areas in Eastern Poland as a place for investing due to low demographic potential (countryside depopulation with low population density, low quality of human capital)

2) weak infrastructure necessary for business and life, which is caused by the relatively low investment activity of most municipal authorities;

3) weak impact of Eastern Poland's neighbours on their surroundings due to negligible differences in economic development between Eastern Poland and neighbouring regions, insufficient to initiate cooperation processes.

Unpacking the implications of each of the reasons would require additional detailed research.

Whilst interregional proximity was not shown to be a factor accelerating the development of rural areas in Eastern Poland, their location in the vicinity of larger towns and cities has a positive effect on the direction and dynamics of economic changes (a relatively low unemployment rate, a notably higher number of economic entities per 1,000 inhabitants of working age, and a statistically significant relation between these features and the share of investment spending in municipal budgets). These characteristics of suburban areas result in an increasing number of inhabitants, which only occurred in that group of municipalities. It should also be noted that all tendencies typical for suburban municipalities observed in the period 2004–2017 did not receive remarkably strong support from local government investments than in other municipalities. This can be understood as evidence of an important pro-developmental phase of urban centres, which radiate to their direct surroundings and thus stimulate rural development. If ratios for rural municipalities in Eastern Poland, however, are compared

Investment scale, demographic situation and non-agricultural businesses in rural municipalities of Eastern Poland depending on their spatial location in the years 2004–2017

Details	Rural municipalities in Eastern Poland depending on spatial location			
	A	B	C	D
Number of municipalities	83	59	64	302
Share of budgetary investment spending in the total expenditure (%)				
Mean	17.6	17.1	16.2	16.6
Variance coefficient *V* (%)	29.0	30.7	27.7	27.5
Population changes (dynamics, 2004 = 100)				
Mean	106.0	94.2	98.4	97.5
Variance coefficient *V* (%)	14.1	6.8	6.4	7.2
Population density (people per 1 km²)				
Mean	77.6	27.1	53.0	56.2
Variance coefficient *V* (%)	80.2	66.4	61.7	60.5
Correlation coefficient	−0.01	0.07	−0.18	0.11
Unemployment rate (registered unemployed individuals against the total number of individuals of working age in %)				
Mean	9.3	12.9	10.8	10.4
Variance coefficient *V* (%)	25.9	34.2	35.5	32.9
Correlation coefficient	−0.47[*]	−0.43[*]	−0.21	−0.27[*]
Economic entities per 1,000 individuals of working age				
Mean	96.0	84.4	81.7	79.7
Variance coefficient *V* (%)	29.2	45.6	18.3	21.0
Correlation coefficient	0.40[*]	0.12	0.36[*]	0.15[*]
Dynamics, 2004 = 100	126.7	110.1	125.0	121.5
Share of economic entities run by individuals				
Mean	79.5	73.3	79.2	77.9
Variance coefficient *V* (%)	6.8	8.3	6.9	7.1
Correlation coefficient	0.07	−0.04	0.26[*]	0.22[*]
Share of economic entities with more than nine employees				
Mean	4.7	5.0	5.0	4.9
Variance coefficient *V* (%)	29.0	32.7	30.1	25.5
Correlation coefficient	−0.09	0.02	−0,15	−0.13[*]

Notes: A — suburban municipalities, B — border municipalities, C — municipalities in the proximity of more advanced regions, D — other municipalities; [*]statistically significant dependencies, at p<0.05.
Source: own analysis based on data from the Local Data Bank of Statistics Poland in Warsaw

with the national average ratios (Tables 1 and 2), the positive distinctive features in the eastern regions of Poland (positive migration balance, relatively low unemployment rate, highest number of businesses per 1,000 inhabitants of working age compared to other types of municipalities) only approximate the national average values. Thus, it can be assumed that suburban municipalities in other regions of Poland are characterised by higher development than the same type of municipalities in Eastern Poland. This means that the positive impact of cities is insufficient to significantly reduce the developmental disparities between Eastern Poland and the rest of the regions.

In this context, a question arises not only about options to reduce effectively such differences but also about the rationality of their reduction. As Stanny [29] notes, the development of rural areas is by nature different, and the issue remains unsolved whether policy in rural areas should strive for the reduction of differences or accept their presence and choose instruments to control the development of rural areas, taking into account developmental rates and conditions of local communities. If the ultimate objective is to improve the inhabitants' quality of life, then, in Stanny's opinion, the same goal can be achieved in various local settings by using different methods. With such an approach, coherence does not have to imply going against the differentiation of structures and functions, while it should be understood as achieving similar levels of quality of life in various structural conditions and systems.

Following that approach, a condition for the economic and social development of local com-

munities is the optimum use of their resources, which depends not only on the quantity and quality of such resources (natural resources, human and social capital) but also on the availability of basic components of technical and social infrastructure [30, 31] improving the inhabitants' quality of life and reducing the costs of businesses, depending on municipal authorities' investment activity. Based on the numerical data depicting the directions and dynamics of changes in the number of inhabitants and population density in rural municipalities (Table 4), it can be stated that an acceptable quality of life is provided by suburban areas, which is proven by the increasing number of citizens.

The other types of local communities, despite their spatial location, experienced depopulation in the period 2014–2017, which might have been caused by the failure to improve the quality of life expected by a significant group of citizens. It means that local public investment activity in peripheral rural areas needs to be strengthened to improve yellow functions, concerning cohesion processes and high quality of rural inhabitants' life.

Municipal Investments versus Natural Environment Values

The basic natural resource of rural areas in Eastern Poland, which should stimulate their development, is the natural environment, which constitutes the foundation for enhancing tourism. For this reason, more attention should be paid to understanding how environmental concerns can be more effectively integrated into rural development practices [32]. In order to assess this resource, a comparative analysis was conducted on economic features of rural municipalities, which were divided into four groups according to the share of protected areas in their region. The starting point for the comparison was the assessment of the scale of municipal investments in relation to the share of areas covered by various forms of environmental protection. An assumption was made that, to use natural resources for tourism purposes, municipal authorities should focus on maintaining their quality, which can be observed in infrastructural investments in sewage systems, waste-water processing plants, waste disposal or water networks. Other elements of tourism infrastructure of which municipal authorities are in charge include leisure areas, cultural facilities, municipal roads and local transport networks. Aspects of the natural environment can either facilitate or hinder the development of various functions of rural areas.

This includes both the development of agricultural and non-agricultural activities related to forest management, water management, tourism, maintaining biodiversity, protection of the environment, landscape shaping, protection of cultural heritage, etc. [33]. On the one hand, it can create limitations on legally protected areas; on the other hand, it can be an energising factor for the development of some sectors of the rural economy (e.g. tourism, leisure) [34, 35, 36, 37, 38]. The data in Table 5 show that, in Eastern Poland, almost half of the rural municipalities (47.0 %) are entities with no legally protected areas or their share in a larger protected area is small and reaches up to 25 %.

Municipalities with the highest share of protected areas against their total area (i.e. 75 % and more) constitute 18.0 % of the total rural municipalities. It should be added that in the case of all rural municipalities in Eastern Poland, the share of protected areas against their total area is approximately 36.0 % and is similar to the national average, which is 32.5 %. Thus, in rural municipalities in Eastern Poland, the share of investment spending by local authorities against the overall expenditure is not related to features of the natural environment.

In all four types of municipalities categorised according to the share of protected areas, the share of municipal investment spending is on a similar level, although it is highest in the group of municipalities with the highest share of protected areas. It can be interpreted that local public investments in Eastern Poland have an insignificant impact on green rural areas functions (natural environment protection). It should be added that in all four groups, differentiation of this feature is quite high (Table 5). Changes in population in the period 2004–2017 and the unemployment rate in rural municipalities in Eastern Poland are also unrelated to the natural environment, as population numbers only increased in the group of municipalities where protected areas were 25–50 % of the total. This group also showed the highest unemployment rate.

Additionally, correlation analysis showed a statistically significant dependence between municipal investment spending and population density, as well as unemployment rate and economic entities run by individuals. It should be mentioned that in all four groups designated by share of protected areas, differentiation of population changes in the period 2004–2017 is negligible, while for unemployment rate, it is quite high (Table 5).

The higher is the share of protected areas in the municipality, the lower is the population den-

Investment rate, demographic situation and non-agricultural businesses in rural municipalities of Eastern Poland in respect to the share of protected areas in the years 2004–2017

Details	Rural municipalities in Eastern Poland by share of protected areas against the overall area			
	up to 25 %	25–50 %	50–75 %	75 % and above
Number of municipalities	230	95	76	88
Share of municipal investment spending against the overall expenditure (%)				
Mean	16.7	16.1	16.4	17.9
Variance coefficient V (%)	27.2	30.9	23.6	29.2
Population changes (dynamics, 2004 = 100)				
Mean	97.1	100.4	99.5	99.3
Variance coefficient V (%)	8.5	10.3	8.2	11.2
Population density (people per 1 km²)				
Mean	62.3	54.3	49.5	49.1
Variance coefficient V (%)	76.5	61.7	69.6	68.4
Correlation coefficient	0.03	0.23*	−0.12	0.11
Unemployment rate (registered unemployed individuals against the total number of individuals of working age in %)				
Mean	9.5	12.0	11.4	11.1
Variance coefficient V (%)	33.0	34.9	30.5	30.9
Correlation coefficient	−0.32*	−0.44*	−0.30*	−0.13
Economic entities per 1,000 individuals of working age				
Mean	78.6	80.2	88.2	94.6
Variance coefficient V (%)	21.3	26.4	26.6	34.8
Correlation coefficient	0.24*	0.19	0.18	0.24*
Dynamics, 2004 = 100	123.0	124.8	117.1	118.5
Share of economic entities run by individuals				
Mean	77.5	77.2	78.1	79.6
Variance coefficient V (%)	7.4	7.4	6.6	7.9
Correlation coefficient	0.13	0.28*	0.04	0.13
Share of economic entities with more than nine employees				
Mean	4.9	5.1	4.8	4.5
Variance coefficient V (%)	25.4	26.0	31.7	31.1
Correlation coefficient	−0.06	−0.19	−0.09	−0.12

* statistically significant dependencies, at $p < 0.05$.
Source: own analysis based on data from the Local Data Bank of Statistics Poland in Warsaw.

sity and the higher is the development level of non-agricultural businesses, peaking and approaching the national average for municipalities with the highest share of protected areas. Additionally, correlation analysis shows that there is a statistically significant and positive relation between the proportion of municipal investment spending and the number of economic entities per 1,000 inhabitants of working age (Table 5). This is most likely the result of the high tourist attractiveness of these municipalities, which opens the door for tourism-related businesses. The advancement of entrepreneurial activities is, however, still lower than the national average for rural municipalities, indicating quite poor use of the natural resources of Eastern Poland for energising the development of the rural economy. Additionally, the dynamics of new businesses creation was lower in a period 2004–2017 in this type of rural areas, de-

spite good natural conditions for tourism and recreation activities.

Conclusion

Based on the conducted analysis of the factors shaping the investment capacities of rural municipalities in Eastern Poland and their economic effects, some general observations can be formed.

Despite the important role of local authorities in accelerating the processes of economic and social development at the local level, the investment activity of rural municipalities in Eastern Poland in the period 2004–2017 was lower than the Polish average, which may lead to the further increase of disparities between eastern and other regions of Poland.

The scale of diversification of investment activity among rural municipalities in Eastern Poland during the researched period was truly high, in-

dicating the significant polarisation of local communities in this respect that may lead to increasing internal disparities in economic and social development.

There is no single factor defining the investment capacities of local authorities; however, relatively big differences in the receipt of EU funds by rural municipalities in Eastern Poland and the statistically significant correlation between the two variables lead to the conclusion that these funds play an important role in supporting local government investments.

Thus, Hypothesis 1 on the special role of the municipalities' tax revenue as a factor determining investment activity has not been fully supported. Although a statistically significant correlation between the two features has been found, similar relations were also present in the case of two other characteristics of municipalities' revenue. Municipalities with the highest share of investment spending against the overall budgetary expenditure (quartile 4) showed the lowest unemployment rate, highest number of economic entities per 1,000 inhabitants of working age and a primarily positive migration balance in the period 2004–2017. This should be interpreted as a positive effect of the high investment activity of those municipalities, which has improved the inhabitants' quality of life and has created good conditions for business.

The research shows that the proximity to highly developed regions did not energise the economic growth of rural municipalities in Eastern Poland to the same extent as the proximity to larger cities (Hypothesis 2).

This may be deemed a confirmation of the important role of the urbanisation process in the development of rural areas. Conversely, natural resources in Eastern Poland did not prove to be a factor, which would motivate very strong investment activity for environmental protection or result in improving the attractiveness of local communities as a place of living. The presented research outcomes have not fully explained the reasons behind the low investment activity in the number of municipalities in Eastern Poland, despite the widespread absorption of European Union funds.

This issue would require additional detailed study and so would the question regarding the poor impact of the proximity to economically and socially developed regions.

The wide spectrum of factors affects public investment activity in rural areas and its economic effects and only some of them could be of the interest in this paper. Future research should focus on a process of demographic changes, especially in peripheral areas, as well as on a dynamics of interregional proximity, cross-border cooperation or private investments activity and its economic, social and environmental effects.

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