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The Impact of the COVID-19 Pandemic on the Investment Potential and Activity of Rural Municipalities in Poland

Abstract: The COVID-19 pandemic posed significant challenges for local governments, as economic restrictions reduced their revenues while simultaneously increasing expenditures on healthcare, support for entrepreneurs, and the adaptation of public services. Rural local governments, with lower income potential and greater reliance on external funding, were particularly vulnerable to these difficulties. This may have delayed their investments and slowed their development. The primary aim of this study was to assess the impact of the COVID-19 pandemic on the investment potential and activity of rural municipalities in Poland. The empirical research was conducted based on data from the Local Data Bank of Statistics Poland and the Ministry of Finance in Poland, which was processed using basic descriptive statistics and taxonomic methods. The study revealed that the COVID-19 pandemic influenced the variation in investment potential and investment activity of rural municipalities, while contributing to their overall increase.

Keywords: investment potential, investments, development, local government units (LGU), rural municipalities, COVID-19 pandemic.

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1. Introduction

Most investments in the area of public services are implemented by public entities, primarily local government units (Sekuła 2012). Local governments play a key role in stimulating development through capital expenditure, which in Poland, similarly as in many other European countries, account for approx. half of all public investment outlays. This underlines their importance in stimulating economic activity and improving the quality of life for the local communities (Swianiewicz, Łukomska 2020; Wyszkowska, Wyszkowski 2016). The municipality as the basic territorial administration unit in Poland, serves the role of an initiator and supports local development processes in its area (Kłosiewicz-Górecka, Słomińska 2001). As was observed by McDonald III (2015), Giosi et al. (2014) as well as Brusca, Manes Rossi and Aversano (2015), the policy implemented by local authorities significantly affects the level of investments.

At present, apart from endogenous factors a considerable role in the financial management is exercised by local government units. Poland, being the greatest beneficiary of the EU subsidies, since 2004 has undergone significant transformation processes (Standar 2018a, 2018b). Analyses concerning this period indicate that without the support of EU funds many investments could not have been realised, while support from the Cohesion Fund considerably accelerated economic growth and improved the quality of life for residents in many regions (Pawlikowska 2024; PAP 2016). In the opinion of Daniłowska (2011) and Parlińska (2014, 2012), local inhabitants are fully aware of the wide scope of this support and expect their local government units to utilise it.

The COVID-19 pandemic was another important factor that markedly influenced the work of local governments. Apart from their standard public responsibilities, local government units had to face new challenges related to support for the healthcare system, local businesses and inhabitants. It was a test both for the organisational structures and financial resources of local government units (Klimek 2022). As indicated by Franek (2022), local government units had to cope with unprecedented hardships connected with response to the COVID-19 pandemic, despite experiencing unexpected budget challenges of considerable scale (Dutta, Fischer 2021). Since many of their outlays are by definition fixed, a method to find additional funds to mitigate the effects of the pandemic might include reducing investment activity (Franek 2022; OECD 2021; Maher, Hoang, Hindery 2020). Cuts in investment outlays are typically one of the first steps undertaken by public authorities faced by financial restrictions. For local government units, which have limited potential to implement any stabilisation

policy, such a response was understandable and predictable (Swianiewicz, Łukomska 2020). Nevertheless, a decline in investments may bring about long-term negative consequences and decisions on such budgetary cuts are typically made already at early stages of the crisis.

What is essential, due to their unique conditions, the situation of rural municipalities differs considerably from that of other types of local government units. They receive less tax revenue, mainly due to their lower demographic and economic potential, as well as greater dependence on agriculture. Due to their scattered building development, as well as limited access to infrastructure and public services, rural municipalities are in a more difficult financial situation and face greater challenges in the realisation of investments and provision of public services compared to urban municipalities. Moreover, rural municipalities also vary greatly in terms of their financial situation depending on their functional type (Kozera 2018). Although agriculture continues to play a key role in their economy, in the course of socio-economic development processes, many of those municipalities have been changing in terms of their functions from agricultural activity to residential and service functions (Stanny, Rosner, Komorowski 2023; Kozera, Głowicka-Wołoszyn 2018).

In the context of the COVID-19 pandemic, studies investigated the unique effect of the pandemic on rural municipalities in Poland, particularly in terms of their investment potential. Most analyses focused on the overall financial situation, changes in the income potential primarily in cities, as well as general economic trends. Rural municipalities, which struggle with different development challenges (e.g. smaller resources, lower own revenue, greater dependence on agriculture or tourism) have been neglected as a research subject. In order to identify capabilities and barriers to investments, it is crucial to assess the investment potential of rural municipalities. This facilitates efficient management of available financial resources, absorption of external funds and planning of priority projects. In view of new challenges faced in the wake of the pandemic, such an approach promotes municipalities' sustainable local development and ensures their financial stability.

The primary aim of this study was to assess the impact of the COVID-19 pandemic on the investment potential and activity of rural municipalities in Poland. For this purpose, the following research questions were proposed: What was the investment potential and investment activity of rural municipalities compared to other types of municipalities? What was the impact of the COVID-19 pandemic on changes in the level of investment potential, its diversification and development potential of rural municipalities?

2. Investment Potential and Investment Activity of Local Government Units in the Context of the COVID-19 Pandemic

As the basic local government units, municipalities are assigned the broadest range of tasks to fulfil (Parlińska 2010), including, among other things, public transport, social security, housing, environmental protection, culture and education (Ustawa 1990). To realise these tasks, they not only require adequate financial resources (Jędrzejewski 2007), but also need to manage them efficiently (Salachna 2014). As indicated by Satoła (2015), a lack of sufficient funds may have a negative impact both on the execution of these assigned tasks and on the budget itself. Financial investment resources allocated by the municipality come from its revenue and income (Cichocki 2013). Revenue includes, e.g. taxes, shares in PIT and CIT, fees, targeted grants, subsidies, as well as income from municipal property (Ustawa 2003). Municipalities acquire some of these funds on their own (e.g. real property tax, income from property), while some are collected through state tax authorities (e.g. shares in PIT and CIT). Effective collection of these levies is crucial for the financial stability of municipalities (Park 2004). In turn, income comes from both internal sources (e.g. disposable financial resources, surplus from previous years) and external sources (e.g. credits, loans, municipal bonds) (Ustawa 2009).

Following the act on public finance, investments made by local government units are capital expenditure. "Investment is a process consisting in the allocation of resources, burdened with a risk to gain benefits in the future" (Kozłowski 2012). In order to make the local government strong and competitive, local authorities have to continuously undertake investment activity (Górniak, Sierak 2011). Investments that improve both the condition of the environment and the quality of life for their residents while supporting the economic growth of the municipality are referred to as municipal investments.

Municipal investments are characterised, among other things, by problems in determining their economic outcomes, a long implementation period, technical indivisibility, complementarity and high capital intensity (Kozłowski 2012). Additionally, investments by local government units, particularly in the case of infrastructure, are connected with the need to incur considerable outlays over an extended period of time, while upon their completion they need to be maintained, which generates additional operating costs. Given the above, local government units should rationally manage their finances and prior to planning any investment each local government unit should precisely evaluate its financial standing (Misterek 2008). Investments may act as a multiplier in the economy, which means that one investment may stimulate additional investment activity and contribute to economic growth. An example may be provided by the construction of infrastructure, which

results in increased economic activity in the region (Marcinek 2014; Kozłowski 2012). Investments in infrastructure contribute to a long-term increase in revenue of municipalities, as well as changes and an expanded structure of municipal property (Kozłowski 2012).

Investments are an essential condition for development (Filipiak 2008). As indicated by Rohima et al. (2017) development is a multifaceted process. This leads to an accelerated economic growth, as well as positive changes in the social structure, while generating higher incomes and alleviating poverty. It also facilitates satisfaction of basic needs, improves the standard of living and exposes the local community to various business and social activities (Todaro, Smith 2011). Investments – both public, private and foreign – have a significant, positive effect on economic growth. Public investments, as a key development driver, are in line with the concept of the endogenous development policy (Dieter Biehl) and the endogenous development model (David Alan Aschauer) (Skica 2020).

As was observed by Zawora (2014), there is an interdependence between local development and the financial standing of a given local government unit. Finances constitute the basis for the realisation of public tasks and determine conditions for local economic development. In turn, thanks to income from taxes and local fees, this development influences the financial standing of the local government unit, thus determining its investment activity. The investment potential of a municipality comprises e.g. adequate own income, transfer income from the state budget, capacity to acquire external nonreturnable funds, such as EU subsidies, creditworthiness (i.e. the capacity to take out and repay debts), efficient management of financial resources, and appropriate planning and management of investments (Wyszkowska 2018; Gubernat-Ulatowski 2016). In the opinion of Dylewski (2010), in literature on the subject, the terms "investment potential" and "investment capacity" are treated as synonyms. Gubernat-Ulatowski (2016) also stressed interrelationships between these terms and concepts from other categories, such as financial potential and investment activity.

In the opinion of Zawora (2014), the investment capacity of municipalities is influenced by the scope of their financial independence, both in terms of revenue and expenditure. The degree of expenditure self-reliance to a considerable extent depends on the level and structure of revenue, thus, the focus is rather on revenue self-reliance. It is stressed that having one's own high revenue makes it possible to run a more effective local development policy (Brzozowska et al. 2013; Kornberger-Sokołowska 2012). In order to assess investment potential, it is advisable to apply not only indicators comprising revenue, but also those related to expenditure and the relationships between revenue and expenditure. For example, Zawora (2014) recommended operating surplus, the self-financing rate and measures connected

with the amount of capital expenditure, while Gubernat-Ulatowski (2016) also included debt ratios. Since the 2000s, the Ministry of Finance in Poland has started develop indicators assessing the financial standing of local government units within the framework of actions aiming at improved management of public finances. At present, the recommended set of indicators (MF 2023) comprises many new measures, adjusted to include revenue, as well as the level and repayment of debt instruments, which are used in this study.

Investment capacity of local government units depends not only on the manner of finance management by local authorities, but also on exogenous factors. In this respect, the outbreak of the COVID-19 pandemic was such a factor. The first cases of the coronavirus were reported towards the end of 2019 in China, while only four months later the number of cases worldwide exceeded a million. In Poland, the first case of COVID-19 was confirmed on 4 March 2020 (MZ 2020). The pandemic was defined as a black swan (Goodell 2020; Wind et al. 2020), i.e. a phenomenon generating extreme consequences, since it caused not only millions of cases and numerous deaths worldwide, but also serious economic disturbances on a global scale. The effects of the pandemic have been compared to the financial crisis of 2008 or even the economic consequences of WWII. In response to the development of the pandemic, successive lockdowns were imposed, which considerably restricted human mobility as well as closing down or at least limiting economic activity (Czech et al. 2020; Gossling, Scott, Hall 2020; Mazzoleni, Turchetti, Ambrosino 2020).

As indicated by Kostyk-Siekierska (2021), in the initial phase of the pandemic, the increase in revenue of Polish local government units in relation to the previous year was lower than predicted. Costs generated by the pandemic additionally reduced the current surplus, although no direct threat was reported to the liquidity of local government units. In his study, Tabis (2023) showed that during the pandemic, local government units incurred unpredicted expenditure, while simultaneously proceeds from PIT, CIT, property lease and public transport decreased, which resulted in a deterioration of their financial situation and hindered execution of their tasks. Local government units not only received less income due to the lockdowns imposed, but also provided aid to local entrepreneurs by releasing them from the obligation to pay taxes. Swianiewicz and Łukomska (2020) indicated that in the first period of the pandemic, it was big cities that suffered most, as their revenue is considerably dependent on PIT proceeds. In the opinion of Malinowska-Misiąg (2022), results of the first post-pandemic analyses indicate that generally the situation of municipalities was not as difficult as had been expected, although the effect of the pandemic varied. Gołaszewski (2020) observed that the situation of local government units might have been much worse if it had not been for the Government Fund for Local Investments (Polish: Rządowy Fundusz Inwestycji

Lokalnych [RFIL]). Massive subsidies from that fund offset deficits and created an artificial surplus. Funds recorded in the budgets of local government units as their own resources could be allocated only to investments (ZMP 2021; Gołaszewski 2020).

The COVID-19 pandemic may also have had a negative effect on rural local government units, primarily due to a decrease in their revenue from local taxes. For less affluent municipalities, frequently dependent on external funds, this reduction of their revenue resulted in a significant deterioration of their financial potential. As a consequence many capital-intensive investments were suspended, which slowed down development of these rural areas and deepened the gap between rural and urban areas. Moreover, rural local government units had to incur additional costs related to the purchase of personal protection equipment, disinfection of public spaces, as well as support for their residents and local businesses. The pandemic also highlighted the importance of Internet access, which facilitated online education, work and administrative services. In rural areas, Internet access is frequently limited. This situation was also acerbated by problems in the agricultural sector, which in many rural municipalities plays an important role in the local economy. Disturbances in the supply chains, difficulties with the sale of produce and shortages of workforce had a negative impact on the financial situation of farmers, and more broadly – on households in rural areas (Daniłowska et al. 2024; Głowicka et al. 2024).

3. Source Materials and Research Methods

This study investigated basic local government units in Poland, i.e. municipalities (overall almost 2,500). In the first stage of the investigations all types of the basic local government units (rural, urban and urban-rural municipalities, as well as towns with county rights) were analysed, whereas the second part of the study focused solely on rural municipalities (Figure 1). The rural municipalities studied, constituting the most numerous type of local government units, play a significant role in the administrative division of Poland, while at the same time having a limited financial potential and greater dependence on external funding. Thus the analysis of these units is crucial for the evaluation of the effectiveness of public policy and sustainable development in less urbanised areas. Urban-rural municipalities were excluded from a detailed analysis because their financial data are reported as consolidated data, which prevents precise allocation of the index values to a specific functional area (i.e. an urban or rural area). Inclusion of these local government units would distort comparability of results and would adversely affect the credibility of conclusions concerning the specific character of solely rural municipalities.

The period of this study covered the years 2019–2022. Although the adopted time range for the analyses is short, it had a significant effect on the financial situation

and investment potential of these territorial units. The first year investigated in this study, 2019, was a period before the outbreak of the COVID-19 pandemic, whereas 2022 was the time when the epidemic situation started to improve compared to the previous years. Depending on the epidemic, at a given time various restrictions were imposed or lifted. The year 2022 was also the last year, for which the Ministry of Finance in Poland published the latest set of indicators assessing the financial situation and investment potential of local government units (MF 2023). Other empirical data were collected from the Local Data Bank (Statistics Poland 2024). Given the significantly higher inflation level in Poland during the period analysed, in order to eliminate the effect of price variability, financial data per capita are presented in constant prices of 2022. The most important data are given in EUR applying the weighted average exchange rate of 2024.

Empirical analyses were conducted in two stages (Figure 1). The first stage aimed to answer the research question of what the investment potential and investment activity of rural municipalities was compared to other types of municipalities. This stage comprised a univariate analysis of selected indexes showing the level of investment potential and investment activity of municipalities. For this purpose a set of indexes was applied, as presented in Table 1. Assessment of the investment potential of local government units based on financial indicators makes it possible to determine the stability of their financial situation and the extent of their investment capacity. When evaluating the investment potential of municipalities, their operating surplus per capita is typically considered, along with this surplus in relation to current revenue. Both indexes are used to assess the capacity of local government units to generate financial surplus, which may be allocated to development. In the context of rural municipalities, this is of particular importance, since the operating surplus frequently indirectly determines the ability to apply for external funding, as this surplus may be used as the required own contribution. A high level of operating surplus indicates a good financial standing and development potential of a given municipalities. This shows that after covering current expenses the unit has disposable financial resources, which may be allocated to investments, repayment of debts or may constitute a financial reserve. In contrast, a low or negative surplus may indicate financial strain, a risk of indebtedness or a lack of capacity to finance new projects in the absence of external support (MF 2023).

Apart from standard indicators, it is also advisable to analyse new indicators proposed by the Ministry of Finance. These include indicators showing the investment potential of municipalities per capita, as well as the potential in relation to property expenditure. Investment potential refers to the development potential of municipalities after their liabilities such as credits, loans, or bonds have been repaid. This shows the degree to which the municipalities' revenue,

excluding credits, loans and bond issue, after covering current expenditure and repayment of debts, may finance their investment outlays. If the value of this index is below 100%, it may mean the need to take a new credit or loan for development outlays. In turn, value exceeding 100% indicates that a municipality is able to realise investments with no need to incur new liabilities (MF 2023). The selection of new indicators proposed by the Ministry of Finance of the Republic of Poland for the assessment of municipalities' investment potential may be justified by several significant arguments resulting from their characteristics and advantages in relation by traditional measures. Firstly, new indicators (previously not applied to assess the phenomenon investigated) take into consideration a broader financial context of a municipality, which more realistically reflects the actual potential to realise investments. The indicator of investment potential facilitates a more reliable assessment of the capacity to finance future investments, because it shows the part of investments from current revenue after liabilities have been paid that may be executed, without the need to use credits or issue bonds. This means that this index takes into consideration indebtedness, which in turn facilitates a more balanced assessment of financial stability of a given municipality and its capacity for further development, consequently being the key to its long-term investment potential. Indicators such as operating surplus may fail to include these liabilities, which leads to less accurate assessments. Additionally, a more precise analysis of investments, based on the new indicators, includes not only current investments, but also the capacity to realise future projects with no risk of excessive indebtedness, which is crucial for the municipality's sustainable development. Traditional indexes frequently focus on current investments, disregarding the long-term development potential. New indicators proposed by the Ministry of Finance provide a more comprehensive picture of the financial situation of municipalities, including both the capacity to finance current expenditure and the potential to realise investments without excessive indebtedness. Thanks to the above, they better meet the requirements for a reliable assessment of the investment potential of municipalities, facilitating more precise strategic and financial planning. In turn, indexes for capital expenditure per capita and in relation to total expenditure are useful for the assessment whether a given municipality fulfils its development function, or rather it is able only to meet its current needs. High values of these indexes show high intensity of investments, while low levels may suggest limited investment activity or lack of financial means. These indexes are frequently used in comparisons between municipalities to assess efficiency of utilisation of funds for development.

The second stage of the study aimed at answering research question of what the impact of the COVID-19 pandemic was on changes in the level of investment potential, its diversification and development potential of rural municipalities.

Investment potential of municipalities is a multifaceted phenomenon, thus it was assessed in rural municipalities in the years 2019 and 2022 using the TOPSIS method (Technique for Order of Preference by Similarity to Ideal Solution). The method was applied to construct values of the synthetic measure for the level of investment activity in rural municipalities within the following five steps.

Table 1. Indexes for the assessment of investment potential and investment activity of municipalities

Tabela 1. Wskaźniki do oceny potencjału inwestycyjnego i aktywności inwestycyjnej gmin

Name of index	Formula	Unit of measure
Indicators assessing investment potential		
Level of operating surplus per capita	$\frac{N_o}{L}$	PLN
Share of operating surplus in current revenue	$\frac{N_o}{D_b} \times 100$	%
Investment potential per capita	$\frac{Pbzwr + \left(Do - Wb - Rs\right)}{L}$	PLN
Investment potential in relation to property expenditure	$\frac{Pbzwr + \left(Do - Wb - Rs\right)}{Wm} \times 100$	%
Indicators assessing the level of investment activity		
Utilisation of investment potential	$\frac{Wm}{Pbzwr + \left(Do - Wb - Rs\right)}$	%
Level of property expenditure (investment outlays) per capita	$\frac{W_m}{L}$	PLN
Share of property expenditure (investment outlays) in total expenditure	$\frac{W_m}{W_o} \times 100$	%

Key: N_o – operating surplus, L – population size, D_b – current revenue, P_{bzwr} – budget income excluding credits, loans, issue of securities, D_o – total revenue, W_b – current expenditure, R_s – repayment of principal payments on credits and loans, W_m – property expenditure incurred for investments, W_o – current expenditure.

Source: own study based on the MF (2023).
Źródło: opracowanie własne na podstawie MF (2023).

The first step in the construction of the value of the synthetic measure when assessing the investment potential of rural municipalities was based on indicators presented in Table 1. All the proposed characteristics were considered to be stimulants for the level of investment potential of municipalities. A set of simple

characteristics established on the basis of substantive premises was further verified statistically in terms of the informative potential of these characteristics (the degree of their correlation with other characteristics) and discriminative power (i.e. their variability in relation to the objects investigated). Based on the statistical verification, none of the simple characteristics was rejected.

In the second step in the construction of the value of the synthetic measure, consisting in the normalisation of values for simple characteristics, the classical standardisation procedure was applied:

$$z_{ik} = \frac{x_{ik} - \bar{x}_k}{s_k}, \tag{1}$$

where:
x_{ik} – the value of k-th characteristic in i-th object (rural municipality),
$\overline{x}_k$, s_k – arithmetical mean and standard deviation, respectively, for k-th characteristic.

The normalisation procedure for values of simple characteristics was conducted jointly for data from 2019 and 2022 (the so-called object-years) in order to maintain comparability of the research results for the years investigated and to determine development trends for the phenomenon analysed.

In the next step (step 3) coordinates of model objects were determined. Typically, the maximum and minimum values are adopted as model units for a given simple characteristic as coordinates of the model and antimodel of development respectively, whereas they are less often model values established by experts. As shown by this study, in the former case this approach frequently proves to be far from optimal (cf. Łuczak, Wysocki 2013). If a set of values characteristics includes those with outlying values or with strong skewness, then adoption of maximum and minimum values from the set of values of these characteristics as model coordinates will consequently lead to excessive deviation from typical values of those investigated and to a reduced range of variation in values of the measure of development constructed (Wysocki 2010). As a result, the values of the synthetic measure obtained may cover only a small part of the potential range of its variability (typically defined by the [0, 1] range) and then it may be difficult to identify development types for the objects analysed (Kozera, Wysocki 2016). In the case of assessment of the level of investment potential in rural municipalities, a very high diversification is observed in this phenomenon (a high level of variation and asymmetry). Since model values in the model method for linear ordering of objects (e.g. TOPSIS), in the proposed approach to the identification of outlying values a univariate approach, i.e. the quartile criterion, is applied separately for each of the characteristics. Values of a single characteristic are considered outliers if they are found outside the range (Trzęsiok 2014):

$$\left[Q_{1k} - 1,5 \times IQR_k, Q_{3k} + 1,5 \times IQR_k\right], \tag{2}$$

where:

Q_{1k}, Q_{3k} – the first and the third quartile, respectively, from the value of *k*-th characteristic,

IQR_k – interquartile range from the value of *k*-th characteristic.

Based on the quartile criterion adopted, the coordinate for the development model $\left(A_k^+\right)$ for *k*-th characteristic (stimulant) is defined as:

$$A_k^+ = \begin{cases} \max\limits_{i=1,\ldots,N}\left(z_{ik}\right), \ if \ z_{ik} \in \left[Q_{1k} - 1,5 \times IQR_k, \ Q_{3k} + 1,5 \times IQR_k\right] \ for \ i \in [1,\ldots,N], \\ Q_{3k} + 1,5 \times IQR_k, \ if \ \max\limits_{i=1,\ldots,N}(z_{ik}) > Q_{3k} + 1,5 \times IQR_k \end{cases} \tag{3}$$

whereas that of the development antimodel $\left(A_k^-\right)$ as:

$$A_k^- = \begin{cases} \min\limits_{i=1,\ldots,N}\left(z_{ik}\right), \ if \ z_{ik} \in \left[Q_{1k} - 1,5 \times IQR_k, \ Q_{3k} + 1,5 \times IQR_k\right] \ for \ i \in [1,\ldots,N], \\ Q_{1k} - 1,5 \times IQR_k, \ if \ \min\limits_{i=1,\ldots,N}(z_{ik}) < Q_{1k} - 1,5 \times IQR_k \end{cases} \tag{4}$$

All outlying observations of the *k*-th characteristic found in the $[Q_{3k} + 1,5 \times IQR_k, \max\limits_{i=1,\ldots,N}(z_{ik})]$ and $[\min\limits_{i=1,\ldots,N}(z_{ik}), Q_{1k} - 1,5 \times IQR_k]$ranges are thus ascribed the coordinate of the model equal to $A_k^+ = Q_{3k} + 1,5 \times IQR_k$, while that for the antimodel $A_k^- = Q_{1k} - 1,5 \times IQR_k$ respectively.

Coordinates of the model objects constitute the basis for calculations in the next step in the construction of the value of the synthetic measure for the deviation of each evaluated object (i.e. rural municipality) from the development model $\left(A^+\right)$ and antimodel $\left(A^-\right)$, i.e. using Euclidean distances (Wysocki 2010):

$$d_i^+ = \sqrt{\sum_{k=1}^{K}\left(z_{ik} - z_k^+\right)^2}, \ d_i^- = \sqrt{\sum_{k=1}^{K}\left(z_{ik} - z_k^-\right)^2}. \tag{5}$$

In the last step (step 5), based on the estimated Euclidean distances in the construction of the value of the synthetic measure, the TOPSIS method was applied (Hwang, Yoon 1981).

$$S_i = \frac{d_i^-}{d_i^- + d_i^+}, (i = 1,\ldots, N), \tag{6}$$

while: $0 \le S_i \le 1$.

Established values of the synthetic measure for the level of investment potential constituted the basis for linear ordering of the rural municipalities investigated according to its non-increasing values. On their basis (S_i) the following typological classes were arbitrarily identified for the level of investment potential: <0.80, 1.00> – *very high level* (class I), <0.60, 0.80) – *high* (class II), <0.40, 0.60) – *average* (class III), <0.20, 0.40) – *low* (class IV), and <0.00, 0.20) – *very low* (class V).

To characterise the classes distinguished, the average values (medians) were calculated for the indexes showing investment potential (the so-called active characteristics participating in the construction of values of the synthetic measure) and average values (medians) of selected indexes illustrating investment activity of rural municipalities (the so-called passive characteristics).

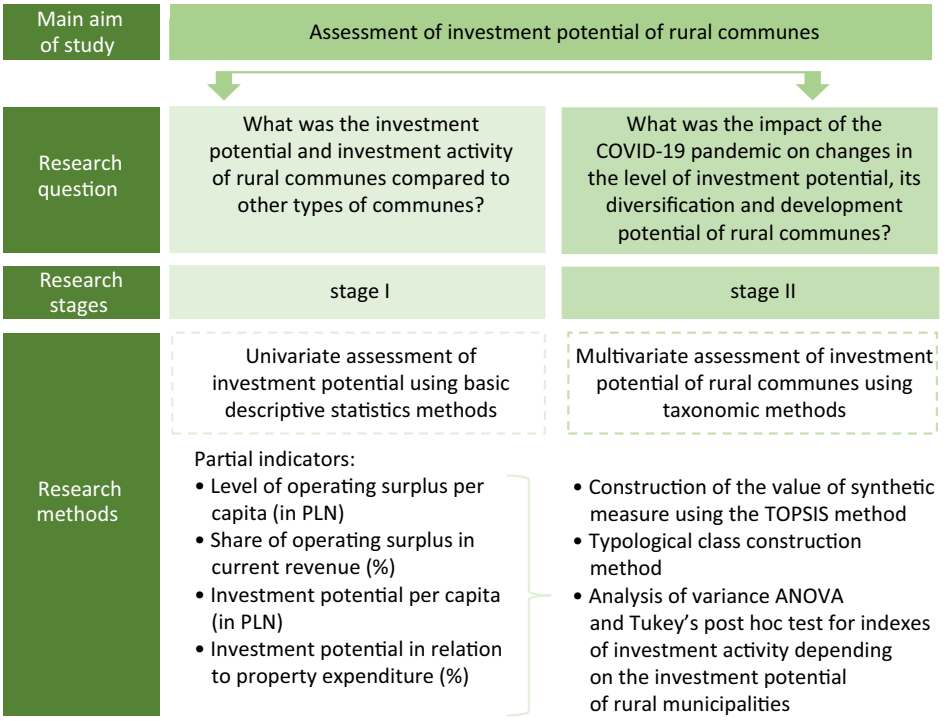


Figure 1. Research stages in the assessment of the investment potential of rural municipalities

Rysunek 1. Etapy badawcze oceny potencjału inwestycyjnego gmin wiejskich

Source: own study.
Źródło: opracowanie własne.

In the second stage of the study, the analysis of variance (ANOVA) was also used, followed by Tukey's post-hoc test in order to provide an in-depth assessment of the diversification in the levels of investment activity in rural municipalities depending on their investment potential in the years 2019 and 2022. Analysis of variance made it possible to verify whether the differences observed between groups of municipalities are statistically significant, rather than being purely accidental or random. Given the large size of the investigated sample, no formal tests were conducted to verify the normal distribution for individual groups, since, in accordance with the central limit theorem, with large samples, the distribution of means approaches a normal distribution even if the distribution of variables in the population diverges from a normal distribution. In turn, Tukey's test makes it possible to indicate specific pairs of groups, between which differences are found (Stanisz 2006). Application of these methods was justified in view of the character of data and the aim of this study, i.e. identification of relationships between investment capacity and the actual level of investments realised in rural municipalities.

The analysis focused on the regional diversification in investment potential of rural municipalities and the impact of their affiliation to Functional Urban Areas (agglomeration and no-agglomeration municipalities) on the level of this potential. For this purpose, the analyses used data from the Statistics Poland database on delimitation of rural areas (Statistics Poland 2025).

4. Results of Empirical Studies

4.1. Investment Potential and Investment Activity of Rural Municipalities Compared to the Other Local Government units in Poland During the COVID-19 Pandemic

In the first stage of the study, analyses were conducted on the average level and variability of selected indicators showing investment potential and investment activity of rural municipalities compared to the other administrative types of municipalities. The first of the indicators analysed, i.e. investment potential per capita, in the pre-pandemic year was on average PLN 1,097. The highest value of this indicator was recorded in twelve metropolises[1] and towns with county rights, i.e. in the largest local government units in Poland in terms of demography and economy. At that time, the average investment potential of rural municipalities was 4% greater than the mean for all administrative units, whereas its lowest level was found in urban-rural municipalities (Table 2).

[1] This group includes: Wrocław, Lublin, Bydgoszcz, Łódź, Kraków, Warszawa, Rzeszów, Białystok, Gdańsk, Katowice, Poznań and Szczecin.

Table 2. Selected descriptive statistics for the level of investment potential in municipalities depending on their administrative types in Poland in the years 2019–2022 (in PLN per capita)

Tabela 2. Wybrane statystyki opisowe dla kształtowania się wysokości potencjału inwestycyjnego gmin w układzie typów administracyjnych w Polsce w latach 2019–2022 (w PLN per capita)

Descriptive statistics	Years	Type of municipalities					Overall
		urban	rural	urban-rural	cities with county rights	metropolises	
Investment potential (PLN per capita)*							
Median	2019	1,024.6	1,141.9	1,007.6	1,138.3	1,502.6	1,097.2
	2020	1,153.4	1,473.4	1,259.6	1,413.5	1,374.4	1,390.8
	2021	1,652.9	2,231.7	1,834.5	1,987.8	2,106.0	2,061.9
	2022	1,537.1	2,444.8	1,823.8	1,439.4	1,591.0	2,164.7
Positional coefficient of variation (%)	2019	33.4	41.4	39.0	53.9	30.9	40.3
	2020	40.9	36.3	35.8	35.0	38.1	36.5
	2021	28.3	26.9	29.7	28.2	33.9	29.2
	2022	33.2	30.2	32.6	35.1	33.1	34.3
Investment potential in relation to property expenditure (%)							
Median	2019	111.5	116.6	113.2	101.2	78.8	114.6
	2020	138.1	165.4	156.7	114.6	82.7	158.0
	2021	197.2	227.7	203.7	160.8	136.2	212.6
	2022	150.3	176.7	155.9	124.2	112.8	166.7
Positional coefficient of variation (%)	2019	28.3	32.9	31.6	28.4	15.2	32.5
	2020	28.3	32.9	31.6	28.4	15.2	32.5
	2021	28.1	34.8	30.9	23.2	28.8	33.8
	2022	28.6	29.6	29.2	16.7	37.9	29.3
Utilisation of investment potential (%)							
Median	2019	88.7	85.0	87.2	97.2	126.9	86.2
	2020	72.4	60.2	63.5	87.3	121.0	62.9
	2021	50.4	43.7	49.0	61.4	73.5	46.8
	2022	66.6	56.5	64.0	79.8	88.7	59.8
Positional coefficient of variation (%)	2019	28.3	32.9	31.6	28.4	15.2	32.5
	2020	34.1	34.0	33.2	27.2	36.3	34.0
	2021	29.2	34.2	31.8	23.6	27.1	32.9
	2022	28.1	28.4	27.9	20.4	36.3	28.1

* Real values at constant 2022 prices.

Source: own study based on data from the MF (2023) and Statistics Poland (2024).
Źródło: opracowanie własne na podstawie danych MF (2023) i Statistics Poland (2024).

Of all the municipalities analysed, 28 units (1%) recorded a negative investment potential per capita, which means that current expenditure and repayment of instalments exceeded available funds for investments. Such a situation is dangerous, since it may lead to stagnation of development. The negative result was recorded in the case of 17 rural municipalities (1% of this type) and 11 urban-rural municipalities (2%). On the other hand, rural municipalities were dominant among the units with the greatest investment potential per capita – of the ten local government units with the highest value in this index, eight were rural municipalities. As a consequence, rural municipalities, next to towns with county rights, constituted the most diverse group of local government units in terms of their investment potential (Table 2, Figure 2).

In the years of the pandemic 2020–2022, compared to 2019, investment potential per capita increased considerably, while only in the case of rural municipalities was this increase regular. In the other types of these local government units, it decreased in 2022. The mean increase in investment potential between 2019 and 2022 was as high as 97%, with the greatest increase in rural municipalities (by 114%) and the lowest in metropolises (6%). Thus, the pandemic period caused considerable changes in the analysed potential. In the years 2020–2022 rural municipalities recorded a marked improvement in their investment potential, which is reflected in advantageous average indexes, exceeding means for all types of municipalities. Such a situation indicates that, despite the global crisis related to the COVID-19 pandemic, rural municipalities effectively increased their financial and investment potential. What is crucial is that this improvement was found not only in the most affluent units, which are typically better prepared to absorb external funds and realise development projects. An increase in investment potential was observed even or rather mainly in municipalities with lower levels of revenue, which may indicate greater accessibility of funds from central, national programmes (e.g. the Polish Deal [Polski Ład], the Government Local Investment Fund [Rządowy Fundusz Inwestycji Lokalnych]), and with the support being targeted at units suffering from financial deficits. Additionally, the fact that a negative investment potential was recorded in only six municipalities over three years suggests a general and stable character of this improvement, as well as potential reduction of territorial disparity in the capacity to realise public investments (Table 2, Figure 2).

The investment potential below 100% in relation to capital expenditure may indicate the need to take out a new credit line or loan in order to finance development-oriented measures, while the investment potential above 100% means that the government unit may implement investments without incurring new liabilities (MF 2023). In 2019, apart from 28 local government units characterised by a negative investment potential, 906 municipalities received a result below 100%.

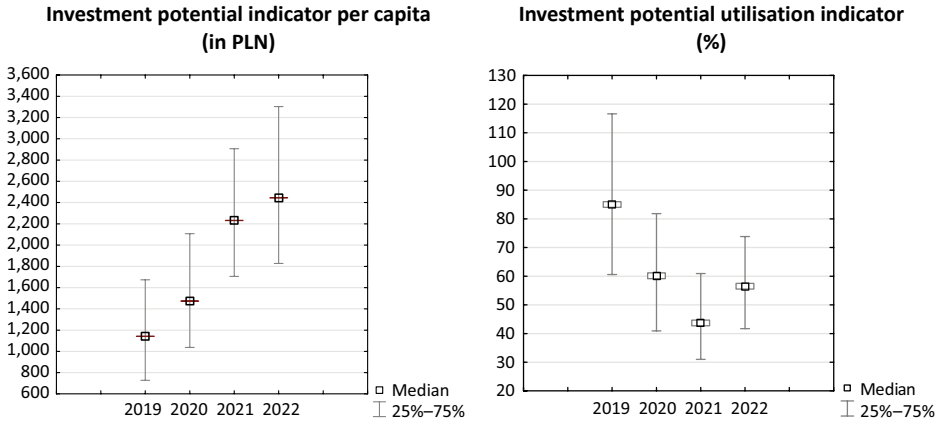


Figure 2. Box plots for investment potential indicators of rural municipalities in Poland (2019–2022) (real values at constant 2022 prices)

Rysunek 2. Wykresy „ramka-wąsy" dla wskaźników potencjału inwestycyjnego gmin wiejskich w Polsce (2019–2022) (wartości realne w cenach stałych z 2022 r.)

Source: own study based on data from the MF (2023) and Statistics Poland (2024).
Źródło: opracowanie własne na podstawie danych MF (2023) i Statistics Poland (2024).

This shows that 37% entities were forced to use repayable financial instruments.The other 63% were characterised by the advantageous investment potential above 100%, with some of them receiving very high values of this index. In ten municipalities, it exceeded 1000%, which indicates huge potential in relation to the actual investments. The group of most passive municipalities in terms of their investment capacity included rural local government units (of the ten with the highest capacity, eight were rural municipalities). The mean value of this index for municipalities in 2019 was 115%, in the pandemic period (until 2021), it increased by 98 p.p. to subsequently decrease to 167% in 2022. Metropolises were the local government units that used their potential to realise investments to the greatest extent, although they had additionally to utilise external debt instruments. The highest average value of this index was recorded in the rural municipalities, which, together with urban-rural municipalities, were growth leaders. In the years 2021–2022, the capacity of rural municipalities to implement investments on average was double the value of their actual investments. What is essential, during this time, as many as 91% municipalities attained a desirable result (over 100%). Variation in the value of the investigated index was slight and did not differentiate local government units depending on their administrative types (Table 2, Figure 2).

In the case of another indicator – the utilisation of investment potential – the higher its value, the better was the utilisation of funds, which reflects well on the investment policy of the local government units. When analysing Figure 2 and Table 2 it may be observed that the optimal utilisation of investment potential was recorded in the pre-pandemic year 2019, with the metropolises realising investments exceeding available funds, which indicates greater commitment to development-oriented actions. In the other local government bodies the investment policy was more conservative. During the pandemic, particularly in the year 2021, investments in relation to own capital declined markedly, as on average they amounted to as little as 47%. A particularly large decrease in the utilisation of investment potential was found for rural local government units, which even previously allocated the smallest part of available funds to investments. When analysing the results for 2022 the rebound effect and signs of recovery in investment activity may be observed. Such a course of changes may indicate cautious management of finances in the face of uncertainty, particularly in the case of rural municipalities. At the same time, in 2022, an increased utilisation of the investment potential may confirm restoration of investment activity after major pandemic restrictions had been lifted, and thanks to further support from effectively implemented development support programmes.

Operating surplus, both in relation to the number of local inhabitants and to revenue, is a key indicator describing the investment capacity of local government units. This results from the fact that this surplus is used directly to finance investments and repay previously incurred credits or loans, which indirectly increases the capacity of local government units to realise investments. In the years 2019–2021, both indexes (operating surplus per capita and operating surplus in relation to revenue) showed a desirable increase, followed by a slight decrease in 2022 (Table 3).

The year 2022 was unique, as it was characterised by the highest number of municipalities showing negative results, i.e. operating deficit. Such a situation was found in 70 municipalities (3% of local government units), primarily urban ones. This means that those entities did not have sufficient financial resources for day-to-day operations, which forced them to reduce investments. A comparison of the results for various administrative groups of municipalities showed the most advantageous results for the metropolises and rural municipalities. The metropolises exhibited considerably better average results (by as much as several hundred PLN per capita higher) compared to the other entities, while at the same time they experienced the greatest fluctuations in the values of the indicators. In rural municipalities, which also recorded higher-than-average levels of both indicators, the investment capacity continued to increase in 2021, which may be considered

Table 3. Selected descriptive statistics for the operating surplus in municipalities in terms of their administrative types in Poland (2019–2022; in PLN per capita)

Tabela 3. Wybrane statystyki opisowe dla nadwyżki operacyjnej w gminach w układzie typów administracyjnych w Polsce (2019–2022; w PLN per capita)

Descriptive statistics	Years	Type of municipalities					Overall
		urban	rural	urban-rural	cities with county rights	metropolises	
Level of operating surplus (PLN per capita)*							
Median	2019	370.5	527.5	461.8	465.7	710.1	490.1
	2020	279.4	560.3	444.2	325.7	315.1	506.2
	2021	585.9	674.5	604.8	772.5	1 057.7	644.2
	2022	260.3	782.2	499.6	260.8	343.0	630.8
Positional coefficient of variation (%)	2019	32.2	31.1	33.6	32.8	20.7	34.5
	2020	51.3	29.1	34.7	60.8	68.9	33.5
	2021	23.8	27.7	27.6	22.4	14.0	28.3
	2022	69.4	32.0	41.2	83.8	67.7	43.0
Share of operating surplus in current revenue (%)							
Median	2019	6.6	9.0	8.1	6.2	8.3	8.4
	2020	4.8	9.1	7.7	4.2	3.8	8.3
	2021	9.5	10.6	9.9	9.1	11.2	10.2
	2022	4.7	11.6	8.1	3.4	4.1	10.0
Positional coefficient of variation (%)	2019	31.2	30.8	30.7	30.7	20.5	31.9
	2020	47.3	27.7	32.6	53.2	70.9	31.4
	2021	24.4	26.6	27.6	18.7	12.7	26.7
	2022	62.0	28.7	38.2	78.6	75.8	37.1

* Real values at constant 2022 prices.

Source: own study based on data from the MF (2023) and Statistics Poland (2024).
Źródło: opracowanie własne na podstawie danych MF (2023) i Statistics Poland (2024).

advantageous. Rural municipalities were characterised by the highest degree of internal cohesion in terms of their investment potential, which shows a relatively uniform nature of their financial situation. What is more, it was rural municipalities that were dominant among municipalities with the greatest investment capacity. This indicates their growing financial strength and capacity to generate investment funds, despite difficult external conditions.

Indicators of property expenditure per capita and their share in total expenditure are crucial for the assessment how development- and investment-oriented the local government units are. High and growing levels of these indicators are desirable and such values were recorded first of all in the case of metropolises. In the period

before the pandemic their capital expenditure per capita exceeded the mean by 84%, while in 2022 this difference dropped to 15% (Table 4). Although the results for the metropolises were markedly different from those of the other local government units, the most dramatic decline was recorded in the case of the former. During the pandemic, the smallest fluctuations in the realisation of investments, quantified in terms of the amount and share of capital expenditure in total expenditure, were observed in urban local government units. In turn, despite a slight reduction in development-oriented investments in 2020, similar to the other administrative types, in the following years rural municipalities allocated increasing funds to investments. As a consequence, the average level of their investment activity

Table 4. Selected descriptive statistics for levels of capital expenditure of municipalities depending on their administrative types in Poland (2019–2022)

Tabela 4. Wybrane statystyki opisowe dla poziomu nakładów inwestycyjnych gmin w układzie typów administracyjnych w Polsce (2019–2022)

Descriptive statistics	Years	Type of municipalities					Overall
		urban	rural	urban-rural	cities with county rights	metropolises	
Level of property expenditure (investment outlays) PLN per capita*							
Median	2019	970.3	964.6	900.2	1,197.3	1,754.9	956.0
	2020	864.1	857.1	776.4	1,238.7	1,493.9	844.1
	2021	894.0	964.1	893.1	1,054.1	1,506.5	939.2
	2022	948.7	1,332.0	1,132.3	1,213.4	1,444.1	1,250.4
Positional coefficient of variation (%)	2019	34.0	47.1	40.5	34.9	17.0	44.3
	2020	41.8	44.1	41.3	36.2	6.0	43.9
	2021	35.7	41.4	38.0	30.3	16.4	39.8
	2022	33.6	37.3	35.4	32.7	19.5	37.3
Share of property expenditure (investment outlays) in total expenditure (%)							
Median	2019	15.1	15.2	14.5	14.5	17.8	15.0
	2020	12.8	13.1	12.1	13.6	15.8	12.9
	2021	13.6	14.4	13.9	12.6	15.7	14.1
	2022	15.3	18.8	16.6	14.9	15.3	17.7
Positional coefficient of variation (%)	2019	30.1	39.2	33.5	27.3	20.0	36.4
	2020	37.4	37.5	35.1	29.2	9.9	36.4
	2021	29.2	34.5	30.6	27.3	14.1	32.6
	2022	27.6	28.9	29.6	23.2	20.8	29.4

* Real values at constant 2022 prices.

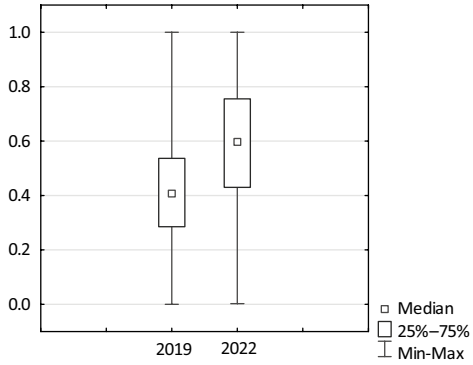
Source: own study based on data from the MF (2023) and Statistics Poland (2024).
Źródło: opracowanie własne na podstawie danych MF (2023) i Statistics Poland (2024).

in 2022 was close to that of the metropolises. What is interesting is that rural municipalities spent the largest part of their budgets on investments and in each of the years investigated their results were more advantageous than those of the other types of local government units. This is particularly surprising considering the fact that in the years of the pandemic, when local government units were burdened with additional current expenses, as a rule investments were cancelled. In the most dramatic year of 2020, over a third of local government units allocated less than 10% of their budgets to investments. In 2022, along with the economic recovery, local authorities were also undertaking to realise larger investments, and the number of municipalities with a low level of investments accounted for only 12% of all entities investigated. It also needs to be stressed that a certain group of local government units did not reduce their investments during the pandemic – in each of the years analysed there were some entities that allocated more than half of their budgets to development-oriented investment projects. Dispersion of the indicators of investment activity analysed was at a medium-low level, with the greatest diversification found for rural municipalities. It is difficult to state definitely whether entities investing more or less than the average were dominant, since values of the coefficients of skewness differed depending on the year and the administrative type of municipalities (Table 4).

4.2. Synthetic Evaluation of Investment Potential in Polish Rural Municipalities

The investigations using basic descriptive statistics methods showed a diversification of rural municipalities in terms of the level of selected indicators describing investment potential and its changes in 2022 in relation to 2019. In the second stage of the study this diversity was evaluated synthetically based on values of the synthetic measure calculated using the TOPSIS method. Analyses indicated that in 2022, compared to 2019, the general level of investment potential increased and its diversity decreased among rural municipalities in Poland (Figure 3, Table 5). The data presented in Figure 3 showed an increase in the average median for values of the synthetic measure (from 0.408 in 2019 to 0.595 in 2022), as well as the 10th and 90th percentiles.

Investigations not only showed an increased general level of investment potential for rural municipalities, but also a reduced diversity among these entities in terms of the phenomenon analysed. This is indicated by the decreasing value of the coefficient of variation for the synthetic measure, which in 2019 amounted to 43.8%, while in 2022 it was only 35.5% (Table 5). However, it needs to be stressed that the value of the coefficient of variation exceeding 30% still indicates a relatively high diversification of rural municipalities in terms of their investment potential.



Descriptive statistics	2019	2022
Minimum	0.000	0.000
Median	0.408	0.595
Maximum	0.999	0.999
10th Percentile	0.19	0.31
90th Percentile	0.68	0.86
Coefficient of variation (%)	43.8	35.5

Figure 3. Box plots for the synthetic measure of investment potential in Polish rural municipalities (2019–2022)

Rysunek 3. Wykresy „ramka-wąsy" dla syntetycznej miary potencjału inwestycyjnego w polskich gminach wiejskich (2019–2022)

Source: own study based on data from the MF (2023) and Statistics Poland (2024).
Źródło: opracowanie własne na podstawie danych MF (2023) i Statistics Poland (2024).

Table 5. Classification of Polish rural municipalities depending on the level of their investment potential (2019–2022)

Tabela 5. Klasyfikacja polskich gmin wiejskich w zależności od poziomu potencjału inwestycyjnego (2019–2022)

Specification	Typological class / *Level of investment potential*					Overall
	I	II	III	IV	V	
	very high	*high*	*average*	*low*	*very low*	
2019						
Number of municipalities	37	229	525	545	37	1,513
Percentage of municipalities (%)	2.4	15.1	34.7	36.0	2.4	100
2022						
Number of municipalities	268	482	453	266	44	1,513
Percentage of municipalities (%)	17.7	31.9	29.9	17.6	2.9	100.0
Change in the percentage of municipalities 2022/2019 (in p.p.)	15.3	16.7	−4.8	−18.4	−8.8	×

Source: own study based on data from the MF (2023) and Statistics Poland (2024).
Źródło: opracowanie własne na podstawie danych MF (2023) i Statistics Poland (2024).

In 2019, most rural municipalities had either an average or low investment potential (34.7% and 36% respectively). A relatively small part of rural municipalities exhibited a high (15.1%) or very high investment potential (2.4%). In 2022 compared to 2019 the general level of investment potential increased in rural municipalities, as evidenced by the considerable reduction in the percentage of rural municipalities representing a low and very low level potential (a decrease by 18.4 and 8.8 p.p.) at a considerable increase in the percentage of municipalities with a high and very high investment potential (by 15.3 and 16.7 p.p. respectively) (Table 5).

Table 6 presents interclass variability in the levels of partial indicators for investment potential (*active characteristics*) and investment activity (*passive characteristics*) of rural municipalities in the years 2019 and 2020. Both in 2019 and 2022, the greatest investment potential was observed for rural municipalities having the highest operating surplus per capita and their highest share in current revenue. Additionally, in the group of these municipalities, the index of investment potential per capita was the most advantageous. It shows the amount of financial resources a municipality may realistically invest. For example, in 2019, rural municipalities with a very high investment potential per capita were able to invest approx. 3,200 PLN, whereas in rural municipalities with a very low investment potential, it was less than 600 PLN. This means that rural municipalities with the greatest investment potential could spend approx. six times more per capita on investments in comparison to municipalities with the lowest investment potential. In turn, 2020 marked an increase in the average value of the investment-potential index for rural municipalities. For municipalities with a very high investment potential it amounted to over 3,600 PLN, while for those with a very low potential it increased to 1,100 PLN respectively. Although this increase was observed in all classes, the difference between groups of rural municipalities from both ends of the scale remained considerable.

It was also found that the higher the level of overall investment potential, the greater were the values of the investment-potential index in relation to total expenditure of rural municipalities (on average ranging from approx. 100% in municipalities with its lowest level (class 5) to over 200% in municipalities with its highest level (class 1). This index defines how high is the investment potential of a given municipality compared to its total expenditure. A high value of this index means that the municipality has a relatively high investment potential in relation to its total expenditure, which suggests that it is capable of spending a considerable part of its budget on investments. It also shows a high financial flexibility and an ability to realise a greater number of investment projects. In turn, a low value of this index indicates that only a small part of the budget may be allocated to investments,

which limits the capabilities of the municipality in the development of infrastructure or other investment projects.

Analyses also showed considerable diversity among rural municipalities in the utilisation of their investment potential both before and after the COVID-19 pandemic. Among all the rural municipalities in 2022 compared to 2019, the level of utilisation of their investment potential decreased (from 85% in 2019 to 56% in 2022). In 2019, municipalities with a very high investment potential used only slightly over 40% of their potential, whereas those with a very low potential exceeded 130%. This suggests that municipalities with a low potential were forced to incur greater investments in relation to available resources, whereas municipalities with a high potential could save money and exercise caution when making investments. In turn, in 2020, the situation was similar, i.e. in municipalities with a very high investment potential, its utilisation amounted to approx. 40%, while in municipalities with a very low investment potential, it dropped to approx. 105%, which means certain limitations for excessive investments. Municipalities with a very high investment potential have much greater investment opportunities, but in the years 2019 and 2020, they did not fully utilise available resources, which suggests a cautious approach to investments. In turn, municipalities with a low potential exhibited greater commitment to investments, which may lead to budget tensions.

Results of the analysis of variance (ANOVA) and Tukey's post hoc test indicate statistically significant differences in the level of investment activity (quantified by the level of capital expenditure per capita and its share in total expenditure) between groups of rural municipalities depending on the level of their investment potential. Generally, the higher the investment potential, the were greater the financial resources allocated to investments. Based on Tukey's post hoc test it may be stated that in 2019, rural municipalities with a very low investment potential differed significantly in terms of their investment activity measured by the level of capital expenditure per capita ($p < 0.05$) from rural municipalities with a medium, high and very high potential. Moreover, municipalities with a low investment potential differed significantly from those with its higher levels. In turn, in 2022 municipalities with a high investment potential showed statistically significant differences in relation to groups of local government units with its lower levels (Table 7).

In turn, similar to the capital expenditure per capita, when analysing the share of capital expenditure in total expenditure the analysis of variance indicates significant differences between municipalities with different levels investment potential in both years investigated. An increasing investment potential determined a statistically significantly growing share of the budget allocated to investment projects.

Table 6. Interclass diversity in investment potential and investment activity of Polish rural municipalities in the years 2019 and 2022

Tabela 6. Zróżnicowanie międzyklasowe potencjału inwestycyjnego i aktywności inwestycyjnej polskich gmin wiejskich w latach 2019 i 2022

Specification	2019						2022					
	Typological class / *Level of investment potential*					Overall	Typological class / *Level of investment potential*					Overall
	I	II	III	IV	V		I	II	III	IV	V	
	very high	*high*	*average*	*low*	*very low*		*very high*	*high*	*average*	*low*	*very low*	
Active features*												
Operational surplus per capita (in PLN)*	1,395.3	937.1	628.9	415.7	224.6	527.5	1,320.9	936.8	629.7	384.9	179.1	782.2
Share of operational surplus in current revenue (%)	18.6	15.1	10.7	7.1	3.8	9.0	18.4	13.7	9.9	6.1	2.9	11.6
Investment potential per capita (in PLN)	3,168.5	1,877.4	1,275.5	880.0	555.1	1,141.9	3,622.7	2,782.3	2,201.6	1,702.0	1,046.8	2,444.8
Investment potential in relation to capital expenditures (%)	239.4	138.4	130.5	109.9	73.3	116.6	249.4	186.0	167.2	135.8	90.6	176.7
Passive features**												
Utilisation of investment potential (%)	41.8	74.0	77.7	88.5	133.0	85.0	40.7	54.9	59.3	70.75	104.9	56.5
Investment expenditures per capita (in PLN)	1,452.5	1,329.3	995.7	846.2	844.8	964.6	1,404.6	1,429.8	1,293.0	1,271.3	1,168.1	1,332.0
Share of investment expenditures in total expenditures (%)	20.3	20.3	15.8	13.7	12.9	15.2	19.4	19.4	18.8	17.5	15.9	18.8

* Indicators per capita in real terms (at constant 2022 prices).
** Passive features are those that were not involved in the construction of the synthetic indicator value but are used to characterise the typological classes identified.

Source: own study based on data from the MF (2023) and Statistics Poland (2024).
Źródło: opracowanie własne na podstawie danych MF (2023) i Statistics Poland (2024).

Table 7. Results of the analysis of variance ANOVA and Tukey's post hoc test for indicators of investment activity depending on investment potential of Polish rural municipalities in the years 2019 and 2022

Tabela 7. Wyniki analizy wariancji ANOVA i testu post hoc Tukeya dla wskaźników aktywności inwestycyjnej w zależności od potencjału inwestycyjnego polskich gmin wiejskich w latach 2019 i 2022

2019						2022					
Level of investment activity	**Level of property expenditure (investment outlays) in total expenditure (PLN per capita)**					**Level of investment activity**	**Level of property expenditure (investment outlays) in total expenditure (PLN per capita)**				
$F = 25.09$ at $p = 0.00$	*very high*	*high*	*average*	*low*	*very low*	$F = 24.72$ at $p = 0.00$	*very high*	*high*	*average*	*low*	*very low*
very high		0.11	0.00*	0.00*	0.00*	very high		0.26	0.09	0.05	0.17
high	0.11		0.00*	0.00*	0.00*	high	0.26		0.00*	0.00*	0.01*
average	0.00*	0.00*		0.20	0.05*	average	0.09	0.00*		0.98	0.82
low	0.00*	0.00*	0.20		0.72	low	0.05	0.00*	0.98		0.94
very low	0.00*	0.00*	0.05*	0.72		very low	0.17	0.01*	0.82	0.94	
Level of investment activity	**Share of property expenditure (investment outlays) in total expenditure (%)**					**Level of investment activity**	**Share of property expenditure (investment outlays) in total expenditure (%)**				
$F = 26.10$ at $p = 0.00$	*very high*	*high*	*average*	*low*	*very low*	$F = 12.79$ at $p = 0.00$	*very high*	*high*	*average*	*low*	*very low*
very high		0.98	0.21	0.00*	0.00*	*very high*		0.16	0.17	0.01*	0.06
high	0.98		0.00*	0.00*	0.00*	*high*	0.16		0.00*	0.00*	0.00*
average	0.21	0.00*		0.00*	0.00*	*average*	0.17	0.00*		0.64	0.46
low	0.00*	0.00*	0.00*		0.74	*low*	0.01*	0.00*	0.64		0.87
very low	0.00*	0.00*	0.00*	0.74		*very low*	0.06	0.00*	0.46	0.87	

* $p < 0.05$ (statistically significant difference).

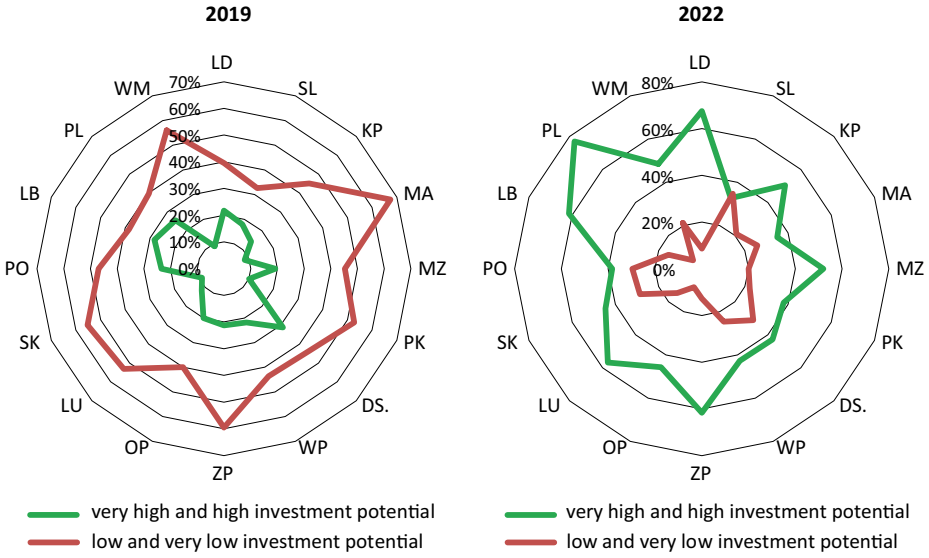
Source: own study based on data from the MF (2023) and Statistics Poland (2024).
Źródło: opracowanie własne na podstawie danych MF (2023) i Statistics Poland (2024).

Based on the results of Tukey's post hoc test, it was found that in 2019, municipalities with a very low potential in this respect differed significantly ($p < 0.05$) from municipalities with a medium, high and very high investment potential. Compared to municipalities with a low potential, these differences were non-significant. In turn, in 2022 again the results for municipalities with a very low, low and average investment potential deviated statistically significantly from those for local government units with a high level of this synthetic measure (Table 7).

Summing up, in both years investigated the ANOVA confirmed significant differences in investment activity (both in capital expenditure per capita and its share in total expenditure) between rural municipalities with different levels of investment potential. Results of Tukey's test indicate that in 2019 differences between municipalities were more marked, particularly between municipalities with a very low potential and those with a high and very high investment potential. In 2022 these differences decreased, which may suggest a certain convergence of investment policies. Nevertheless, municipalities with a low investment potential continued to show significant differences in investment activity compared to those with a higher potential.

Investigations showed regional diversification in the investment potential of rural municipalities, both before and during the COVID-19 pandemic. Spatial analysis of the disparity in the investment potential of rural municipalities indicates significant changes, which took place in the structure of this potential between 2019 and 2022. In 2019 a high proportion of units with a low and very low investment potential was dominant in the voivodships (provinces) of south-eastern Poland, particularly in Lesser Poland, Podkarpackie, Lubelskie and Świętokrzyskie, as well as those in northern Poland, i.e. West Pomeranian and Warmian-Masurian. In contrast, in the western and northern voivodships, such as Lower Silesian, Greater Poland or the Pomeranian, a higher share was recorded for rural municipalities with a relatively high investment potential. In 2022 in many voivodships an increase was observed for the percentage of rural municipalities classified in the groups with a high and very high investment potential. A particularly robust improvement was recorded in the Łódzkie, Podlaskie and Lubelskie voivodeships, where the percentage of units with a high potential ranged from 60% to 70%, while in the case of the Podlaskie it reached almost 80%. As previously mentioned, the changes identified may be associated with the impact of financial support mechanisms introduced in response to the COVID-19 pandemic, especially targeted programmes such as the Government Local Investment Fund or the Government Strategic Investment Programme (Rządowy Program Inwestycji Strategicznych – RPIS). These instruments strengthened the investment capacity of many rural municipalities, including those which had previously been in a relatively poorer fiscal situation.

As a result, this led not only to a general improvement in the investment potential, but also partial uniformisation of its territorial distribution. At the same time, the persistent differences between regions confirm that the investment potential of rural municipalities continues to be highly dependent on local revenue, the budget structure and the capacity to absorb external funds (Figure 4).



Key: DS – Dolnośląskie (Lower Silesian), KP – Kujawsko-Pomorskie (Kuyavian-Pomeranian), LU – Lubelskie, LB – Lubuskie, LD – Łódzkie, MA – Małopolskie (Lesser Poland), MZ – Mazowieckie (Masovian), OP – Opolskie, PK – Podkarpackie, PL – Podlaskie, PM – Pomorskie (Pomeranian), SL – Śląskie (Silesian), SK – Świętokrzyskie, WM – Warmińsko-Mazurskie (Warmian-Masurian), WP – Wielkopolskie (Greater Poland), ZP – Zachodniopomorskie (West Pomeranian).

Figure 4. The level of investment potential of rural municipalities by voivodeships in Poland in the years 2019 and 2022

Rysunek 4. Poziom potencjału inwestycyjnego gmin wiejskich według województw w Polsce w latach 2019 i 2022

Source: own study based on data from the MF (2023) and Statistics Poland (2024).
Źródło: opracowanie własne na podstawie danych MF (2023) i Statistics Poland (2024).

During the period investigated a marked improvement was observed in the investment potential of rural municipalities, both in the units located in agglomeration areas and those outside these areas. In 2019 municipalities with an average or low investment potential were predominant, with non-agglomeration

rural municipalities more often belonging to the group with a low or very low potential (jointly over 50% of these municipalities) in contrast to agglomeration municipalities (a little over a third of municipalities of this type). Agglomeration rural municipalities slightly more frequently showed a high or very high investment potential. In 2022 this structure changed significantly. The share of rural municipalities with a high and very high potential increased considerably in both groups, with this improvement being more evident in non-agglomeration municipalities. In the latter category, over half of rural municipalities were characterised by a high or very high investment potential, which may result from the intervention measures introduced during the post-pandemic period. At the same time, the percentage of municipalities with a low and very low investment potential decreased. What is important is that in 2022 non-agglomeration municipalities, which in 2019 had been in a relatively weaker position, attained better results compared to agglomeration municipalities in the highest classes of investment potential. This may indicate a more effective utilisation of external support and greater dynamics in units previously struggling with a financial deficit (Figures 4 and 5).

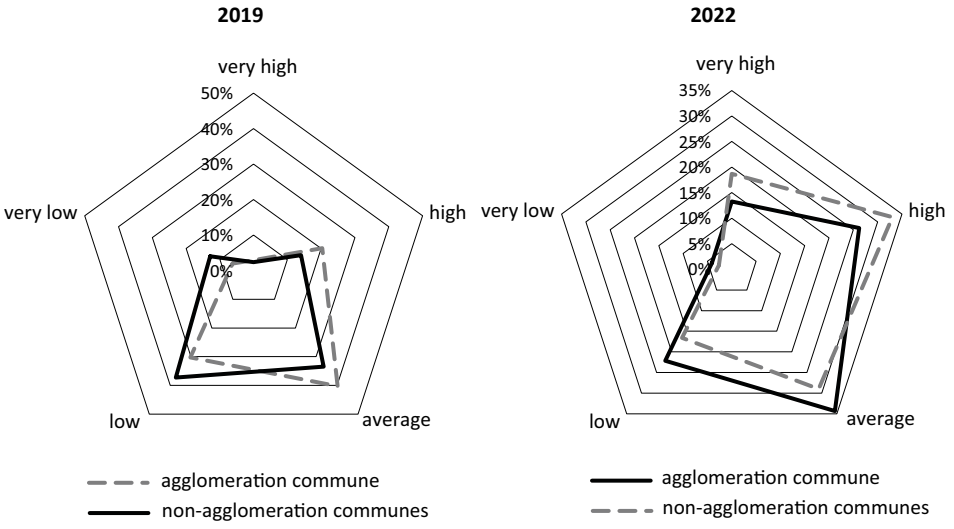


Figure 5. The level of investment potential of rural municipalities in agglomeration and non-agglomeration areas in Poland in the years 2019 and 2022

Rysunek 5. Poziom potencjału inwestycyjnego gmin wiejskich na obszarach aglomeracyjnych i pozaaglomeracyjnych w Polsce w latach 2019 i 2022

Source: own study based on data from the MF (2023) and Statistics Poland (2024).
Źródło: opracowanie własne na podstawie danych MF (2023) i Statistics Poland (2024).

5. Discussion

It is very difficult to determine the impact of the COVID-19 pandemic on finances of local government units. During this period several antithetical phenomena could be observed in Poland, some influencing revenue in the budgets of local government units, while others directly affecting their investments. When considering the revenue aspect, during the years analysed, highly important legal changes were introduced in the act on personal income tax. The tax reform assumed, among other things, income tax exemption for individuals aged below 26, a lowering of the tax rate first from 18% to 17% (in 2019 for taxpayers from the first tax bracket) and to 12% (in 2022 for taxpayers from the first tax bracket), as well as increasing tax-deduction amounts. As a consequence, these changes had a considerable effect on the revenue of local government units, since an approx. 7% share in PIT is credited to the municipality, where a given taxpayer settles his/her taxes. A reduction in these transfers in real terms lowered budget revenue, particularly in municipalities with the greatest demographic potential, while among rural municipalities, such a situation was found in those with developed residential (suburbanised) functions.

Another cause for the decreased revenues was connected with changes in the payment of huge social benefits within the framework of the so-called 500+ (presently 800+) programme. Until the middle of 2022 municipalities were payers of these benefits and their budgets were artificially increased to include these current social transfers; subsequently this task was assigned to the Social Insurance Institution (Zakład Ubezpieczeń Społecznych – ZUS). These targeted grants accounted for the major part (over 80%) of the amounts transferred to municipalities from the state budget for entrusted tasks transferred from the government administration to territorial administration units, thus their shifting was reflected in the reduction of current subsidies (GUS 2023).

On the other hand, the legislator introduced earmarked funds in response to the deteriorating financial situation of local government units during the COVID-19 pandemic. The Government Fund for Local Investments (Rządowy Fundusz Inwestycji Lokalnych – RFIL) was established with the assistance budget for local government units amounting to 12bn PLN, of which 5bn PLN were allocated to the budgets of municipalities and towns with county rights. More affluent entities received smaller amounts, while the maximum subsidy was 93.5bn PLN (Nelicki 2020). Another fund, the Government Road Development Fund (Rządowy Fundusz Rozwoju Dróg – RFRD), previously named the Local Road Fund (Fundusz Dróg Samorządowych – FDS), was established in 2019. From the very beginning the aim was to support road infrastructure investments realised by local government

units, particularly the construction, modernisation and repairs of municipality and country roads. Patrzałek and Gałecka (2022) indicated controversies related to the competition procedures for the selection of beneficiaries, due to the serious concerns triggered by central, administrative, political and discretionary tools and mechanisms for the allocation of public monies from these funds to budgets of municipalities and counties. Additionally, Polish authorities decided to assign extra funds, to the amount of a billion PLN, for tourism and resort municipalities, but the money was reserved only for municipalities located in the mountains. As it was stated by Sobko (2022), assistance addressed to mountain municipalities reflected their much greater financial problems compared to those affecting seaside ones. Overall in 2021 and 2022 Polish local government units received a total of 4.9bn PLN and 18.8bn PLN respectively from the COVID-19 Response Fund, of which municipalities were granted 3.6bn PLN and 16.5bn PLN, while towns with county rights were given 0.7bn PLN and 1.4bn PLN respectively. It is estimated that in 2022 alone these subsidies accounted for 9.6 of % total revenue of municipalities and 1.3 of % revenues of towns with county rights (GUS 2023). As can be seen, this aid was substantial.

Additionally, during the pandemic, it was permitted to use money from the fund for the prevention of alcohol-related problems for measures mitigating the COVID-19 pandemic and earlier payment of the subsidy was allowed, which aimed at improving liquidity of local government units. These territorial units were granted additional financial competences, including generation of operating deficit and taking debts above the indebtedness limit (Nelicki 2020).

As was observed by Patrzałek and Gałecka (2022), changes in the Polish tax system and the pandemic period indicated progressive dependence of local government finances on transfers from the state budget. Financial independence was successively seriously restricted and heavy dependence on the state budget resulted in problems with budget planning and realisation among local government units. Moreover, assessment of the impact of the pandemic on the financial standing of local government units is also hindered by a lack of transparency of public finance in Poland – particularly the number of earmarked funds established in recent years. Based on the review of literature, the authors of this study estimated the total loss of revenue on the part of local government units to be 8–9bn PLN, while expenditure on countering the pandemic was assessed at 1–2% current expenditure (Patrzałek, Gałecka 2022). In turn, Bąk and Dawidowicz (2023) confirmed that municipalities were rather passive when realising investments, despite the observed phenomena determining capital expenditure. Investments undertaken at that time were the outcomes of the completion of the EU multiannual financial framework 2014–2020 (and the resulting need to settle funds until the end of 2023), additional

programmes supporting investments of local government units (the funds discussed above), as well as growing costs of investment projects generated by high inflation.

In order to provide a broader interpretation of the results, it is advisable to refer to findings of other authors concerning the investment potential and response of local government units to the pandemic crisis. Local government units, including municipalities, played an essential role in mitigation of the consequences of the COVID-19 pandemic both in the social sphere (e.g. through support for the social welfare system) and the economic sphere, as stressed in the analyses presented by Daniłowska et al. (2024). This study underlined an increase in the investment potential of rural municipalities compared to that of metropolises. In turn, research results reported by Kwiatkowski, Tyszkiewicz and Wójcik (2021) showed that to a lesser extent rural municipalities suffered from the consequences of reduced revenue from personal and corporate income taxes, because their finances are based on more stable sources to a greater extent, such as non-targeted subsidies, grants and external funds. Compared to metropolises, whose revenue is more closely related to the business cycle fluctuations, rural municipalities exhibited a greater income resilience during the crisis.

A study by Czajkowski (2024) indicates that in the years 2021–2022 rural municipalities efficiently utilised both national and EU support programmes, which facilitated a rapid increase in capital expenditure. In contrast to urban municipalities, which frequently reduced their investments because of the current financial burdens, rural municipalities focused on reducing infrastructural disparities, particularly through modernisation of local road networks, water supply and sewerage infrastructure and educational institutions. Nevertheless, in the opinion of Czajkowski, their development was hampered by problems in securing their contribution.

Results presented by Kańduła and Przybylska (2021) indicated that tax deductions and exemptions, including deferred payments or reduced local payments, were much more often utilised in large cities rather than in rural municipalities. In contrast to the data reported by Ahrens and Ferry (2020), who suggested common use of these solutions, Kańduła and Przybylska showed their limited application in smaller territorial units. Moreover, further studies by these authors from 2022 indicated that the scale and character of the impact of the pandemic on local government units were determined by the level of decentralisation, income structure, capacity to absorb fiscal disturbances, as well as the effectiveness of support provided by the central administration bodies (Kańduła, Przybylska 2022; Chernick, Copeland, Reschovsky 2021; OECD 2021). In turn, Nemec and Špaček (2020) showed that the most dramatic consequences of the pandemic were suffered by small municipalities, large cities with their public transport infrastructure, and

tourism-oriented municipalities, which was also confirmed by Gordon, Dadayan and Rueben (2020) for the United States.

The research results are consistent with the BGK (2021, 2020) analysis, according to which rural municipalities experienced the impact of the pandemic, but its consequences were relatively mild. In contrast to the larger local government units, their budgets were burdened to a lesser extent with costs of anti-crisis measures and thus showed greater resilience to a decline in tax revenue. However, as BGK warned, the long-term investment restrictions may have an adverse influence on local development. In turn, investigations by Stasiowski (2021) indicate that among all the types of local government units, it was rural municipalities that least frequently declared a deteriorated financial standing. Only 33% of these municipalities indicated a worsening of their financial situation, compared to 59% towns with county rights. Moreover, 43% rural municipalities reported no changes in their revenue levels, which confirms their greater revenue resilience. In comparison to other local government units, it was rural municipalities that most often declared maintenance of the previous investment levels. These conclusions are partly consistent with the observations reported by Owsiak (2021), who stated that larger units, such as towns with county rights, were more intensely involved in countering the consequences of the pandemic, which was connected with the necessity to give up on some previously planned investments. Nevertheless, local government units generally treated investments as a tool to counter the crisis, with reductions affecting primarily projects of lesser strategic importance or those with no external co-financing.

In contrast to the findings presented above, Kwiatkowski, Tyszkiewicz and Wójcik (2021) suggested that the pandemic enhanced disparities between municipalities in terms of their capacity to realise investment projects. In their opinion, rural municipalities that had already been equipped with limited resources in the past suffered more seriously from the consequences of the pandemic, which may lead to a deterioration of public services provided in the future, particularly in the case of persisting negative revenue trends. This picture may be supplemented by the observations of Bartkowiak-Bakun (2021), who indicated that one of the less obvious, but nevertheless significant effects of the pandemic was the weakening of social bonds and erosion of local communities, which may have had long-term consequences for the development of social capital in rural municipalities.

6. Conclusions

The COVID-19 pandemic not only led to an epidemic crisis, but also had a considerable impact on the functioning of national economies, also including the activity of local government units. In Poland, similar to many other countries,

the lowest tier of territorial government is assigned key tasks, both connected with current activities and investments. The pandemic may have influenced the execution of these tasks because of restrictions introduced in the social and economic sphere connected with lockdowns, as well as new tasks being imposed, aiming at preventing and countering the consequences of the COVID-19 pandemic.

The analysis of the investment potential of rural municipalities showed that in 2022 compared to 2019 (i.e. prior to the pandemic) rural municipalities were superior in this respect compared to other local government units. In the case of some indicators rural municipalities attained even better results than towns with county rights or metropolises, which is particularly interesting in view of considerable differences in terms of their demographic and economic potential. The investment potential per capita and operating surplus indicators of rural local government units grew systematically, while in other local government units, a slowdown was observed, particularly in 2021. As a result, in the years 2021–2022 rural municipalities even had double funds they actually spent. Their highly cautious approach to the utilisation of their investment potential was confirmed by the growing investment capacity, which was manifested in the increasingly large investment projects. In the period investigated rural municipalities were the entities that recorded greatest increase in actual capital expenditure. This was also reflected in the budget structure, where the share of expenditure for development purposes was highest among the groups of local government units analysed in each year investigated.

Interesting conclusions from the analysis of investment potential of rural municipalities indicate their unique flexibility and adaptability when faced with challenges related to the COVID-19 pandemic. While larger urban centres such as metropolises felt negative economic consequences to a greater extent, it was rural municipalities that – despite their lesser demographic and economic resources – were able to maintain or even increase their investment capacity. However, despite these positive trends, 2022 proved to be a challenging year, particularly for municipalities with a more limited investment potential. The highest number of municipalities with an operating deficit in that year suggests that the long-term effect of the pandemic, along with other external factors, such as increased energy costs or inflation, may have been a considerable burden for local budgets. This shows how important it is to run a sustainable financial policy, which would not only facilitate the development of local government units, but also provide resilience to future crises. It may also be observed that growing investment capacities of rural municipalities may indicate new development trends in this sector, related to increased interest in local industry, green energy and digitalisation. Such trends may strengthen the position of rural municipalities as attractive locations both for living and running business activity, particularly in the post-pandemic period.

A synthetic assessment of the level of investment potential of rural municipalities showed that in 2019 most of them exhibited an average or low investment potential, and only very few of them attained its high or very high level. In 2022, compared to 2019, a marked increase was recorded in the general level of investment potential of rural municipalities. This phenomenon was reflected in the significant reduction of the percentage of municipalities with a low or very low potential and the considerable increase in the number of municipalities with a high or very high level of this indicator. Statistically significant differences were observed in the level of investment activity (measured by the level of capital expenditure per capita and its share in total expenditure) between various groups of municipalities depending on their investment potential. Generally, the higher the investment potential of a municipality, the greater were the funds allocated to investments. These differences were particularly marked and statistically significant compared to municipalities with extreme levels of investment potential.

The COVID-19 pandemic underlined the need for flexible management and investing in long-term sustainable solutions. Thanks to such an approach, rural municipalities may adapt more effectively to changing economic and social conditions, ensuring steady development in view of future challenges. These investments, particularly in areas related to green energy, digitalisation or social infrastructure, may play a key role in building sustainable resilience of these local government units, helping them to effectively respond to changes and challenges of the future.

References

Ahrens T., Ferry, L. (2020). Financial resilience of English local government in the aftermath of COVID-19. *Journal of Public Budgeting, Accounting and Financial Management*, *32*(5), 813–823. DOI:10.1108/JPBAFM-07-2020-0098.

Bartkowiak-Bakun N. (2021). *Badanie uwarunkowań rozwoju obszarów wiejskich województwa wielkopolskiego w kontekście kryzysu wywołanego przez COVID-19 (w poszukiwaniu innowacji organizacyjnych i społecznych)*. Materiał opracowany przez Uniwersytet Przyrodniczy w Poznaniu – Partner KSOW.

Bąk I., Dawidowicz D. (2023). Comparison of the financial situation of local government units before and during the Covid pandemic. *Scientific Papers of Silesian University of Technology: Organization and Management Series*, *168*, 43–56. DOI:10.29119/1641-3466.2023.168.3.

BGK (Bank Gospodarstwa Krajowego). (2021). *Przegląd pakietów pomocowych oferowanych przez wybrane państwa europejskie w odpowiedzi na kryzys COVID-19*. Warszawa: Bank Gospodarstwa Krajowego. https://www.bgk.pl/files/public/Pliki/Analizy_ekonomiczne/raport_BGK_narzedzia_pomocowe_COVID_styczen2021.pdf (access: 30th September 2024).

BGK (Bank Gospodarstwa Krajowego). (2020). *Badanie sytuacji finansowej jednostek samorządu terytorialnego w Polsce w świetle COVID-19*. Warszawa: Bank Gospodarstwa Krajowego. https://www.bgk.pl/files/public/Pliki/Analizy_ekonomiczne/Badanie_sytuacji_finansowej_jednostek.pdf (access: 30th September 2024).

Brusca I., Manes Rossi F., Aversano N. (2015). Drivers for the financial condition of local government: A comparative study between Italy and Spain. *Lex Localis – Journal of Local Self-Government*, *13*(2), 161–184. DOI:10.4335/13.2.161-184(2015).

Brzozowska K., Gorzałczyńska-Koczkodaj M., Kogut-Jaworska M., Zioło M. (2013). *Gospodarka finansowa w jednostkach samorządu terytorialnego*. Warszawa: CeDeWu.

Chernick H., Copeland D., Reschovsky A. (2021). The fiscal effects of the Covid-19 pandemic on cities: An initial assessment. *National Tax Journal*, *73*(3), 699–732. DOI:10.17310/ntj.2020.3.04.

Cichocki K. (2013). *Zarządzanie finansami i długiem samorządu terytorialnego w perspektywie wieloletniej*. Warszawa: Instytut Badań Systemowych PAN.

Czajkowski J.M. (2024). *Raport. Ogólna analiza sytuacji finansowej jednostek samorządu terytorialnego z terenu województwa śląskiego po zakończeniu 2023 r*. Katowice: Związek Miast Polskich.

Czech K., Karpio A., Wielechowski M., Woźniakowski T., Żebrowska-Suchodolska D. (2020). *Polska gospodarka w początkowym okresie pandemii COVID-19*. Warszawa: Wydawnictwo SGGW.

Daniłowska A. (2011). External financing of local governments' expenditure in the rural areas in Poland. *Zeszyty Naukowe Szkoły Głównej Gospodarstwa Wiejskiego w Warszawie. Problemy Rolnictwa Światowego*, *11*(3), 14–22. DOI:10.22630/PRS.2011.11.3.38.

Daniłowska E., Gruziel K., Kłoczko-Gajewska A., Wielechowski M. (2024). *Ekonomiczno-społeczne skutki pandemii COVID-19 dla rolnictwa w Polsce*. Warszawa: Wydawnictwo SGGW.

Dutta A., Fischer H. (2021). The local governance of COVID-19: Disease prevention and social security in rural India. *World Development*, *138*, 1–11. DOI:10.1016/j.worlddev.2020.105234.

Dylewski M. (2010). Wpływ spowolnienia gospodarczego na zdolność inwestycyjną JST. In: J. Sokołowski, M., Sosnowski, A., Żabiński (eds.). *Finanse publiczne* (pp. 125–134). Wrocław: Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu.

Filipiak B. (2008). Investment expenditures of Polish local government units as an element of promoting their development. *Public Administration*, *3*(19), 36–42.

Franek S. (2022). Konsekwencje kryzysu COVID-19 dla finansów jednostek samorządu terytorialnego w krajach UE. *Optimum. Economic Studies*, *109*(3), 55–68. DOI:10.15290/oes.2022.03.109.05.

Giosi A., Testarmata S., Brunelli S., Stagliano B. (2014). The dimensions of fiscal governance as the cornerstone of public sustainability: A general framework. *Journal of Public Budgeting, Accounting & Financial Management*, *26*(1), 94–139. DOI:10.1108/JPBAFM-26-01-2014-B005.

Głowicka-Wołoszyn R., Wołoszyn A., Stanisławska J., Oliveira A., Oliveira T. (2024). Impact of the COVID-19 pandemic on the financial situation of rural and urban households in Poland. *Sustainability*, *16*(19), 8516. DOI:10.3390/su16198516.

Gołaszewski M. (2020). *Wpływ załamania gospodarczego związanego z COVID-19 na finanse, sytuację zadłużeniową i płynnościową JST*. http://www.kongresadministracji.pl/wp-content/uploads/2020/06/Konsekwencje-zatrzymania-gospodarki-dla-finansow-jst-KZAS-06.2020-3.pdf (access: 29th September 2024).

Goodell J.W. (2020). COVID-19 and finance: Agendas for future research. *Finance Research Letters*, *35*, 101512. DOI:10.1016/j.frl.2020.101512.

Gordon T., Dadayan L., Rueben K. (2020). State and local government finances in the COVID-19 era. *National Tax Journal*, *73*(3), 733–758. DOI:10.17310/ntj.2020.3.05.

Gossling S., Scott D., Hall C.M. (2020). Pandemics, tourism and global change: A rapid assessment of COVID-19. *Journal of Sustainable Tourism*, *29*(1), 1–20. DOI:10.1080/09669582.2020.1758708.

Górniak R., Sierak J. (2011). *Ocena efektywności i finansowanie projektów inwestycyjnych jednostek samorządu terytorialnego współfinansowanych funduszami Unii Europejskiej*. Warszawa: Oficyna Wydawnicza SGH.

Gubernat-Ulatowski E. (2016). Potencjał finansowy i inwestycyjny a aktywność inwestycyjna jednostek samorządu terytorialnego. *Studia Ekonomiczne*, *294*, 47–58.

GUS (Główny Urząd Statystyczny). (2023). *Gospodarka finansowa jednostek samorządu terytorialnego 2022*. Analizy statystyczne. Warszawa: GUS.

Hwang C.L., Yoon K. (1981). *Multiple Attribute Decision-Making: Methods and Applications*. Berlin: Springer.

Jędrzejewski L. (2007). *Gospodarka finansowa samorządu terytorialnego w Polsce. Wybrane zagadnienia*. Gdańsk: Oficyna Wydawnicza Branta.

Kańduła S., Przybylska J. (2022). Odpowiedź polskich gmin na pierwszą falę kryzysu COVID-19. In: S. Kańduła, J. Przybylska (eds.). *Gospodarka w cieniu pandemii COVID-19* (pp. 75–98). Poznań: Uniwersytet Ekonomiczny w Poznaniu.

Kańduła S., Przybylska J. (2021). Financial instruments used by Polish municipalities in response to the first wave of COVID-19. *Public Organization Review*, *21*, 665–686. DOI:10.1007/s11115-021-00569-7.

Klimek M. (2022). Funkcjonowanie jednostek samorządu terytorialnego podczas pandemii COVID-19. *Studia Politologiczne*, *64*, 89–108. DOI:10.33896/SPolit.2022.64.6.

Kłosiewicz-Górecka U., Słomińska B. (2001). *Samorząd terytorialny a rozwój nowoczesnego handlu*. Warszawa: Difin.

Kornberger-Sokołowska E. (2012). *Finanse jednostek samorządu terytorialnego*. Warszawa: LexisNexis.

Kostyk-Siekierska K. (2021). Wpływ pandemii COVID-19 na sytuację finansową i funkcjonowanie jednostek samorządu terytorialnego. *Zeszyty Naukowe Małopolskiej Wyższej Szkoły Ekonomicznej w Tarnowie*, *51*(3), 29–45. DOI:10.25944/znmwse.2021.03.2945.

Kozera A. (2018). Własny potencjał dochodowy gmin wiejskich w Polsce. *European Policies, Finance and Marketing*, *19*(68), 95–106. DOI:10.22630/PEFIM.2018.19.68.9.

Kozera A., Głowicka-Wołoszyn R. (2018). Identification of functional types of rural communes in Poland. *Economic Sciences for Agribusiness and Rural Economy*, *1*, 109–115. DOI:10.22630/ESARE.2018.1.15.

Kozera A., Wysocki F. (2016). Problem ustalania współrzędnych obiektów modelowych w metodach porządkowania liniowego obiektów. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, *427* (*Taksonomia 27. Klasyfikacja i analiza danych – teoria i zastosowania*), 131–142.

Kozłowski W. (2012). *Zarządzanie gminnymi inwestycjami infrastrukturalnymi*. Warszawa: Difin.

Kwiatkowski K., Tyszkiewicz W., Wójcik M. (2021). *Raport. Finanse samorządów terytorialnych po pandemii. Od kryzysu do rozwoju*. Fundacja Ośrodek Rozwoju Polski–Fundacja Przyjezdny Kraj. https://www.senat.gov.pl/gfx/senat/userfiles/_public/k10/senat/zespoly/samorzad/raport_finanse-samorzadow-po-pandemii_forp_fpk__2021_11_25-1.pdf (access: 29th September 2024).

Łuczak A., Wysocki F. (2013). Zastosowanie mediany przestrzennej Webera i metody TOPSIS w ujęciu pozycyjnym do konstrukcji syntetycznego miernika poziomu życia. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, *278* (*Taksonomia 20. Klasyfikacja i analiza danych – teoria i zastosowanie*), 63–73.

Maher C.S., Hoang T., Hindery A. (2020). Fiscal responses to COVID-19: Evidence from local governments and nonprofits. *Public Administration Review*, *80*(4), 644–650. DOI:10.1111/puar.13238.

Malinowska-Misiąg E. (2022). Finanse jednostek samorządu terytorialnego w Polsce w pierwszym roku pandemii. *Optimum. Economic Studies*, *1(107)*, 48–63. DOI:10.15290/oes.2022.01.107.04.

Marcinek K. (2014). *Wprowadzenie do inwestowania*. Katowice: Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach.

Mazzoleni S., Turchetti G., Ambrosino N. (2020). The COVID-19 outbreak: From "black swan" to global challenges and opportunities. *Pulmonology*, *26*(3), 117–118. DOI:10.1016/j.pulmoe.2020.03.002.

McDonald B.D. III (2015). Does the charter from improve the fiscal adjustment. *Public Administration Review*, *75*(4), 609–618. DOI:10.1111/puar.12389.

MF (Ministerstwo Finansów). (2023). *Wskaźniki do oceny sytuacji finansowej JST w latach 2019–2022* [database]. https://www.gov.pl/web/finanse/wskazniki-do-oceny-sytuacji-finansowej-jst-w-latach-2019---2022 (access: 10th October 2024).

Misterek W. (2008). *Zewnętrzne źródła finansowania działalności inwestycyjnej jednostek samorządu terytorialnego*. Warszawa: Difin.

MZ (Ministerstwo Zdrowia). (2020). Pierwszy przypadek koronawirusa w Polsce. https://www.gov.pl/web/zdrowie/pierwszy-przypadek-koronawirusa-w-polsce (access: 29th September 2024).

Nelicki A. (2020). *Wpływ ustawodawstwa okresu pandemii COVID-19 na finanse jednostek samorządu terytorialnego*. Warszawa: Fundacja im. Stefana Batorego.

Nemec J., Špaček D. (2020). The COVID-19 pandemic and local government finance: Czechia and Slovakia. *Journal of Public Budgeting, Accounting and Financial Management*, *32*(5), 837–846. DOI:10.1108/JPBAFM-07-2020-0109.

OECD (Organisation for Economic Co-operation and Development). (2021). *The territorial impact of COVID-19: Managing the crisis across levels of government*. OECD Policy Responses to Coronavirus (COVID-19). Paris: OECD Publishing. DOI:10.1787/a2c6abaf-en.

Owsiak K. (2021). Władze samorządowe wobec presji na wydatki związane z kryzysem pandemicznym. *Finanse Publiczne*, *1*(13), 63–81.

PAP (Polska Agencja Prasowa). (2016). Rola samorządów. Znaczenie inwestycji w kreowaniu aktywności gospodarczej. Serwis Samorządowy. https://samorzad.pap.pl/kategoria/finanse/rola-samorzadow-znaczenie-inwestycji-w-kreowaniu-aktywnosci-gospodarczej (access: 27th September 2024).

Park K. (2004). To file or not to file: The causes of municipal bankruptcy in the United States. *Journal of Public Budgeting, Accounting & Financial Management*, *16*, 228–256. DOI:10.1108/JPBAFM-16-02-2004-B006.

Parlińska A. (2014). Role of repayable sources of financing the municipalities' expenditure in Poland. *Economic Science for Rural Development*, *33*, 74–82.

Parlińska A. (2012). Rola obligacji komunalnych w finansowaniu inwestycji samorządów terytorialnych w Polsce. In: R. Przygodzka (ed.). *Instrumenty i metody racjonalizacji finansów publicznych* (pp. 237–247). Białystok: Wydawnictwo Uniwersytetu w Białymstoku.

Parlińska A. (2010). *Public administration in Poland*. In: E. Marisova (ed.). *European Union Public Administration and Development Policies and Variations in V-4 Countries* (pp. 189–201). Nitra: Slovak University of Agriculture in Nitra.

Patrzałek L., Gałecka M. (2022). The impact of the COVID-19 pandemic on subnational finance: Polish experience. *Studies in Logic, Grammar and Rhetoric*, *67*(1), 499–516. DOI:10.2478/slgr-2022-0025.

Pawlikowska K. (2024). Inwestycje samorządowe – 20 lat Polski w Unii Europejskiej. https://regiony.rp.pl/inwestycje/art39862591-inwestycje-samorzadowe-20-lat-polski-w-unii-europejskiej (access: 27th October 2024).

Rohima S., Yuliana S., Bashir A., Hafiz N. (2017). Public infrastructure availability on development disparity. *Business and Economic Research*, *7*(2), 375–391. DOI:10.5296/ber.v7i2.11983.

Salachna J. (2014). Zakres przedmiotowy ustaleń zawieranych w WPF w świetle uregulowań ustawowych. In: J. Salachna (ed.). *Budżet samorządowy i wieloletnia prognoza finansowa. Projektowanie, wykonywanie, sprawozdawczość* (pp. 19–24). Gdańsk: ODDK.

Satoła Ł. (2015). Kondycja finansowa gmin w warunkach zmiennej koniunktury gospodarczej. *Journal of Agribusiness and Rural Development*, *1*(35), 115–123. DOI:10.17306/JARD.2015.13.

Sekuła A. (2012). Does the source matter? Generation of investment expenditures by different types of local government revenue. In: R. Brol, A. Sztando (eds.). *Local Economy in Theory and Practice: Local Development Governance Aspects* (pp. 32–43). *University*

of Economics, Wrocław: Uniwersytet Ekonomiczny we Wrocławiu. DOI:10.13140/RG.2.1.1920.4560.

Skica T. (2020). *Wpływ polityki gmin na rozwój lokalny. Cele strategiczne, polityki budżetowe oraz instrumentalizacja wsparcia*. Warszawa: Oficyna Wydawnicza ASPRA-JR.

Sobko R. (2022). The impact of the COVID-19 pandemic on local government finances – a case study of holiday resort communes in Poland. In: W. Nowiński, J. Rymarczyk, K. Starzyk (eds.). *COVID-19: Implication for the Economy* (pp. 113–131). Poznań: WSB University in Poznań Press. DOI:10.58683/9788372053749.06.

Standar A. (2018a). Access to EU funds vs. financial risks faced by rural municipalities of the Wielkopolskie Voivodeship. In: *Proceedings of the 19th International Scientific Conference "Economic Science for Rural Development" No 49, Jelgava, LLU ESAF, 9–11 May 2018* (pp. 169–177). DOI:10.22616/ESRD.2018.133.

Standar A. (2018b). Differences in accessing Rural Development Programme (RDP) factors on the support level: The example of municipalities in the Wielkopolska region. In: S. Egartner, J. Niedermayr, K. Wagner (eds.). *Innovation and Cooperation in Smart, Sustainable and Inclusive Rural Regions* (pp. 93–105). Warsaw–Vienna: Institute of Agriculture and Food Economics – National Research Institute.

Stanisz A. (2006). *Przystępny kurs statystyki z zastosowaniem STATISTICA PL na przykładach z medycyny. Tom 1: Statystyki podstawowe*. Kraków: StatSoft.

Stanny M., Rosner A., Komorowski Ł. (2023). *Monitoring rozwoju obszarów wiejskich. Etap IV. Dekada przemian społeczno-gospodarczych*. Warszawa: Fundacja Europejski Fundusz Rozwoju Wsi Polskiej, Instytut Rozwoju Wsi i Rolnictwa PAN. DOI:10.53098/MROW.2720-376X.

Stasiowski J. (2021). *Wpływ epidemii na działalność JST*. Fundacja Rozwoju Demokracji Lokalnej. https://frdl.org.pl/static/upload/store/frdl/RAPORTY/Wplyw_epidemii_na_dzialalnosc_JST.pdf (access: 10th September 2024).

Statistics Poland (2025). *Delimitation of Rural Areas*. https://stat.gov.pl/en/regional-statistics/classification-of-territorial-units/delimitation-of-rural-areas/ (access: 29th June 2025).

Statistics Poland (2024). Local Data Bank (database). https://bdl.stat.gov.pl/bdl/start (access: 10th September 2024).

Swianiewicz P., Łukomska J. (2020). *Finanse samorządu terytorialnego w dobie pandemii*. Warszawa: Fundacja im. Stefana Batorego. https://www.batory.org.pl/wp-content/uploads/2020/11/Finanse-samorzadu-w-dobie-pandemii.pdf (access: 29th September 2024).

Tabis D. (2023). Wpływ pandemii COVID-19 na sytuację finansową polskich samorządów. *Zeszyty Naukowe Małopolskiej Wyższej Szkoły Ekonomicznej w Tarnowie*, *51*(3), 29–45. DOI:10.25944/znmwse.2021.03.2945.

Todaro M.P., Smith S.C. (2011). *Economic Development*. 11th ed. Harlow: Prentice Hall.

Trzęsiok M. (2014). Wybrane metody identyfikacji obserwacji oddalonych. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, *327* (*Taksonomia 22. Klasyfikacja i analiza danych – teoria i zastosowania*), 157–166.

Ustawa (2009). Ustawa z dnia 27 sierpnia 2009 r. o finansach publicznych (Dz.U. 2009 nr 157 poz. 1240).

Ustawa (2003). Ustawa z dnia 13 listopada 2003 r. o dochodach jednostek samorządu terytorialnego (Dz.U. 2003 nr 203 poz. 1966).
Ustawa (1990). Ustawa z dnia 8 marca 1990 r. o samorządzie gminnym (Dz.U. 1990 nr 16 poz. 95).
Wind T.R., Rijkeboe M., Andersson G., Riper H. (2020). The COVID-19 pandemic: The 'black swan' for mental health care and a turning point for e-health. *Internet Interventions*, *20*, 100317. DOI:10.1016/j.invent.2020.100317.
Wysocki F. (2010). *Metody taksonomiczne w rozpoznawaniu typów ekonomicznych rolnictwa i obszarów wiejskich*. Poznań: Wydawnictwo Uniwersytetu Przyrodniczego w Poznaniu.
Wyszkowska D. (2018). Samodzielność finansowa gmin w opinii skarbników gmin w Polsce. *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, *518*, 159–172. DOI:10.15611/pn.2018.518.12.
Wyszkowska D., Wyszkowski A. (2016). Samorząd terytorialny jako inwestor publiczny w Polsce na tle innych krajów OECD. *Wiadomości Statystyczne*, *61*(12(667)), 58–69.
Zawora J. (2014). Możliwości finansowania inwestycji gmin wiejskich w Polsce. *Annals of the Polish Association of Agricultural and Agribusiness Economists*, *16*(6), 554–560.
ZMP (Związek Miast Polskich). (2021). *Samorządy z nadwyżką czy ukrytym deficytem*? https://www.miasta.pl/aktualnosci/samorzady-z-nadwyzka-czy-ukrytym-deficytem (access: 28th June 2025).

Wpływ pandemii COVID-19 na potencjał inwestycyjny i aktywność inwestycyjną gmin wiejskich w Polsce

Streszczenie: Pandemia COVID-19 stanowiła poważne wyzwanie dla samorządów terytorialnych, gdyż ograniczenia gospodarcze zmniejszyły ich dochody, a jednocześnie zwiększyły wydatki na ochronę zdrowia, wsparcie przedsiębiorców oraz dostosowanie usług publicznych. Szczególnie narażone na te trudności były samorządy wiejskie charakteryzujące się ogólnie niższym potencjałem dochodowym oraz większym uzależnieniem od środków zewnętrznych. Mogło to prowadzić do opóźnień w realizacji inwestycji i spowolnienia rozwoju gmin. Głównym celem opracowania była ocena wpływu pandemii COVID-19 na potencjał inwestycyjny i aktywność inwestycyjną gmin wiejskich w Polsce. Badania empiryczne przeprowadzono na podstawie danych pochodzących z Banku Danych Lokalnych Głównego Urzędu Statystycznego oraz Ministerstwa Finansów, które poddano analizie przy użyciu podstawowych statystyk opisowych oraz metod taksonomicznych. Wyniki badań wykazały, że pandemia COVID-19 wpłynęła na zróżnicowanie potencjału inwestycyjnego i aktywności inwestycyjnej gmin wiejskich, przyczyniając się jednocześnie do ich ogólnego wzrostu.

Słowa kluczowe: potencjał inwestycyjny, inwestycje, rozwój, jednostki samorządu terytorialnego (JST), gminy wiejskie, pandemia COVID-19.