

MANAGEMENT OF INVESTMENT ACTIVITIES AND DEVELOPMENT POTENTIAL OF MUNICIPAL GOVERNMENTS IN THE SILESIAN AND GREATER POLAND VOIVODESHIP IN CRISIS CONDITIONS

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Purpose: Managing local governments' investment and development activities is a complex problem, conditioned by the appropriate financial potential and the involvement of many entities. The article's main aim is a comparative analysis and assessment of the investment and development potential of municipal governments in the Silesian and Greater Poland Voivodeships in the conditions of the crisis resulting from the COVID-19 pandemic.

Design/methodology/approach: The article undertakes research based on the indicator analysis of the budget management of municipal governments, which was extended with a multi-criteria analysis of TOPSIS linear ordering. Determining financial condition classes allowed us to indicate whether the COVID-19 pandemic influenced the surveyed entities' development potential and investment activities.

Findings: The indicator analysis of the budgetary management of municipal governments allowed for a comparative determination of the development potential of municipal governments in two voivodeships and to assess their investment activities in 2019-2021. Research has shown that 2020 and the onset of the COVID-19 pandemic resulted in a slowdown in investment activity and a very large increase in the self-financing rate. The municipalities of the Silesian and Greater Poland Voivodeships were characterized by high investment and financial potential, although the use of the investment potential decreased dramatically.

Research and limitations/implications: The research results can be used for further exploration in the field of managing investment activities and the financial potential of local governments.

Practical and social implications: The research results can help increase the awareness of the local community about the process of managing investment activities and the financial potential of municipal governments.

Originality/value: The article contributes to expanding the research topic in the field of managing the investment and development potential of municipal governments in crisis conditions, based on single- and multi-criteria analysis methods.

Keywords: financial and development potential, investment activities, local governments.

Category of the paper: Empirical research paper.

1. Introduction

Financial management in local government units mainly involves taking both strategic and development activities. An integral element is access to reliable information, as management cannot be intuitive. To implement the assigned tasks and rationally manage financial resources, ratio analysis becomes important. In times of crisis, the role of efficient decision-making increases, especially in the use of investment and development potential, self-financing opportunities, and obtaining debt capital. Due to uncertainty and major environmental perturbations, local governments should use appropriate tools and techniques to improve the budgeting process for public tasks.

The financial management of territorial division entities is considered a rather complex process, as it not only involves decision-making and several actions by the legislative and executive bodies but is also a process aimed at maximizing economic and social results to meet planned goals, both strategic and current. Kornberger-Sokołowska (2012) stresses that the level of income and the allocation of money are primarily based on the qualitative and quantitative needs of the local community. Drywa et al. (2014) indicate that funds are the basis for the performance of tasks by municipalities. Their amount also depends on the municipality's economic, social, and political development. Lewis and Oosterman (2011) argue that the implementation of investment projects by local government units (LGUs) affects the strengthening of their investment activity, which is important for any country, as it positively affects its development.

The COVID-19 pandemic has forced LGUs to use creative and untested economic development strategies (Johnson et al., 2022). Afonso (2021) stressed the importance of understanding how government agencies were responding to the challenges of the COVID-19 pandemic and how municipalities used their economic development tools to combat the crisis. The pandemic period, as Malinowska-Misiąg (2022) concluded, was a time of intensifying unfavourable systemic trends in the finance of Polish LGUs. For another year in a row, the financial independence of local government units has decreased, and the pool of funds with the status of own revenues has increased, which, unfortunately, is related to specific expenses. Ofiarska (2021, p. 139) note that the effects of the COVID-19 pandemic in the form of a reduction in LGU's own revenues and the related reduction in their expenditure, including capital expenditure, were the decisive factor for the introduction of extraordinary and temporary mechanisms to minimise this negative phenomenon from 2020. One such solution is the Government Fund for Local Investment, separated from the state-dedicated fund - the COVID-19 Counteracting Fund. Szolno-Koguc (2022, p. 547) notes that the creation of the COVID-19 Counteracting Fund resulted in the exclusion of some finances of a public nature from the general pool, intended primarily for tasks related to health care during the COVID-19 pandemic.

Therefore, the goal of the research undertaken in this article is to present a theoretical and practical approach to the management of investment activities and development potential of local government units based on the indicator analysis of budget implementation reports and the TOPSIS multi-criteria method of municipalities in the Silesian and Greater Poland Voivodeships in the conditions of the crisis caused by the pandemic. COVID-19. The period covered by the research covers the years 2019-2021.

2. Literature review

The pandemic and the ensuing recession caused a huge burden on state and local government budgets (Tracy et al., 2020). Responses to COVID-19 in various countries only exacerbated existing socioeconomic inequalities and, as expected, not all federal, state, or local responses had a positive effect on all segments of society (Li et al., 2022). With the challenges of the pandemic, governments around the world established various mechanisms to facilitate responses to the pandemic and ensure state functioning (Patrzalek, Gałeczka, 2022). At the same time, most EU countries saw a change in the structure of local government spending by increasing the share of spending on health care, social protection, and economic affairs. Franek (2022, p. 55) conducted research that indicated that local government finances in EU countries did not suffer significant effects of the pandemic, but this was mainly because the main source of funding for additional tasks and covering shortfalls in tax revenues were transfers from the government sector. Auerbach et al. (2021) indicated that the pandemic temporarily contributed to budget deficits, but had little impact on long-term budget forecasts. For state and local governments, the unusual nature of the recession was emphasized: focusing on job losses among low-wage workers, and the unprecedented growth and expansion of unemployment insurance benefits and business loans. Among other researchers, Grand and Loualiche (2020) found that local governments were facing large revenue losses and increased expenses due to the COVID-19 crisis. They also documented the causal relationships between the fiscal pressures caused by COVID-19 and layoffs of state and local government employees.

Malinowska-Misiąg (2022) concludes that the financial situation of individual LGUs varied greatly in the first year of the pandemic, which turned out to be better for LGUs than initially expected. The negative effects of the pandemic were particularly noticeable in urban municipalities and towns with powiat status, and least pronounced in rural municipalities. Mackiewicz et al. (2022) assessed the economic impact of the pandemic from the standpoint of the local finances of LGUs in the Mazovia region of Poland and provided evidence that the characteristics of urban and rural LGUs affect not only their resilience to the pandemic but also influence their strategies and actions performed in response to the crisis. The lockdown and reduced economic activity have had an impact on local government budget revenues. Chernick

et al. (2020) predicted large variations between cities, depending on differences in income structure and fiscal health due to the recession. According to the authors, the hardest-hit cities faced revenue losses of 15% or more at the beginning of the pandemic. The comparison of revenue pressures with cost pressures caused by the coronavirus conducted by these authors revealed that many cities would experience large revenue shortfalls and high additional costs in the coming years. Furthermore, Kańduła and Przybylska (2021) conducted a study showing that the initial response of Polish municipalities to the pandemic crisis varied by administrative type, amount of current per capita income, and population. However, correlations between applied income and expenditure instruments and the above factors were rather weak.

Patrzalek et al. (2022) examined how the pandemic affected the finances of LGUs in 2020-2021. Their scientific investigations also focused on indicating whether it was possible to distinguish the types of units where the impact was greater or lesser, and whether and how pandemic-related regulations affected the fiscal relationship between the state and local governments. Their research confirmed that the economic impact of the COVID-19 crisis varies from region to region and that financial solutions dedicated to LGUs and making local government fiscal rules more flexible helped maintain the potential of the local economic base.

The analysis of the literature on the subject based on the triangulation method allowed us to outline the following research questions:

- Has the COVID-19 pandemic affected the investment and development potential of urban, urban-rural, and rural municipalities in the Silesian and Greater Poland Voivodeships?
- Did municipalities accumulate financial resources and limit the use of debt capital during the crisis?
- Which municipalities in the Silesian and Greater Poland Voivodeships ranked best in terms of the TOPSIS synthetic measure?
- How did the COVID-19 pandemic affect the classification of municipalities in the Silesian and Greater Poland Voivodeships in terms of financial development potential in 2019-2021?

3. Methods

The assessment of the financial condition, investment, and development activities of local governments is most often carried out concerning traditional tools and methods based on financial analysis. The Ministry of Finance in Poland monitors three groups of indicators: budget (WB1-WB11), per capita (L1-L5), and liabilities according to debt titles (WZ1-WZ7), which together with the calculation formulas are presented in the table. 1. based on the presented indicators, it is possible to assess, statically and dynamically, inter alia, investment

activity, investment and development potential, use of investment potential, and sources of financing, including the self-financing possibilities of local governments.

Table 1.

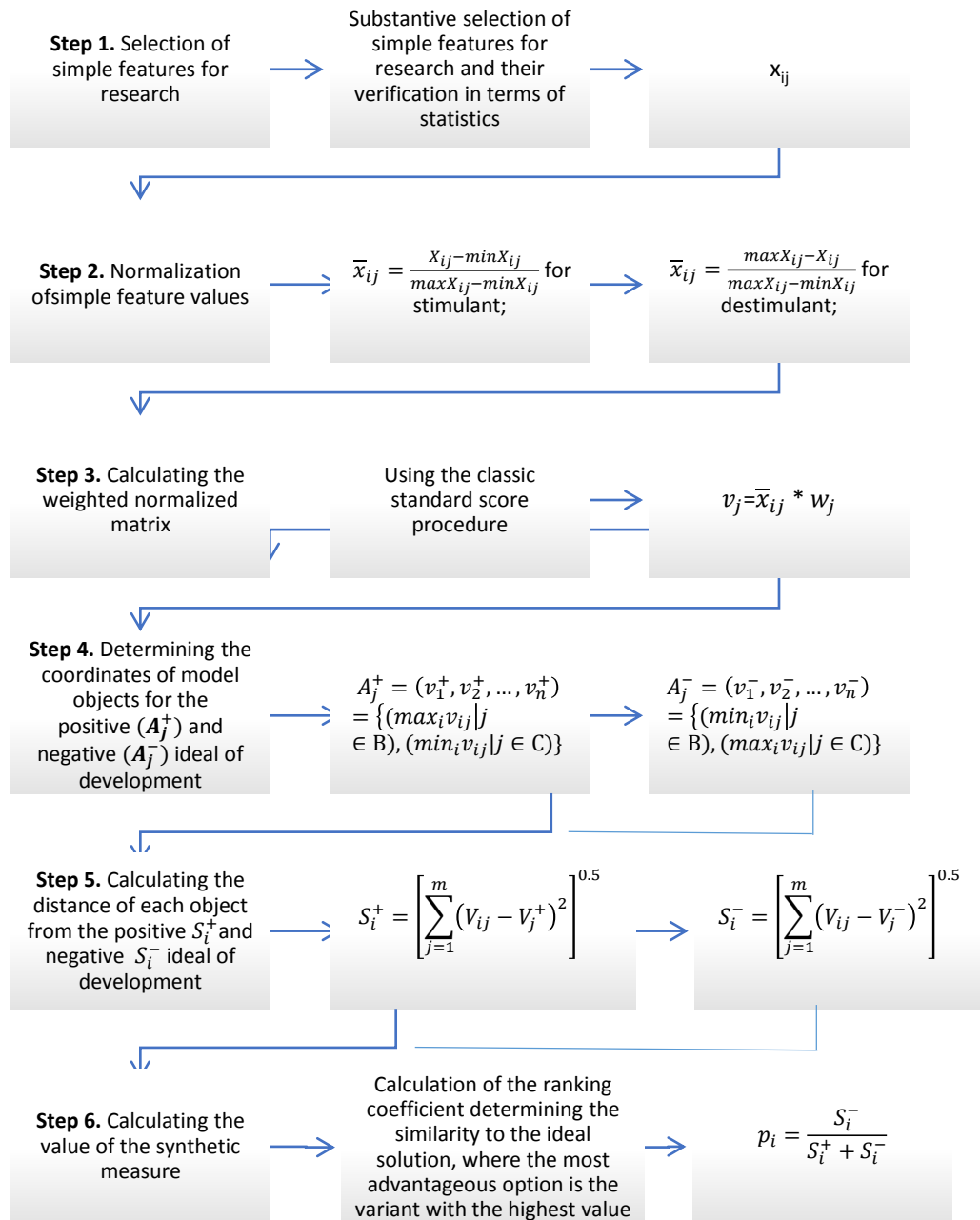
Indicators for monitoring the financial condition of local governments in Poland

Indicators name	Calculation formula
Share of current income in total income	$WB1 = Db/Do$
Share of current transfers in current income	$WB2 = Tb/Db$
Share of operating surplus in current income	$WB3 = No/Db$
Share of capital expenditure in total expenditure	$WB4 = Wm/Wo$
The burden of current expenditures on wages and salary derivatives	$WB5 = Ww/Wb$
Share of operating surplus and income from the sale of assets in total income	$WB6 = (No + Sm)/Do$
Share of operating surplus and property income in capital expenditure (Self-financing ratio)	$WB7 = (No + Dm)/Wm$
Development potential for property expenditures and capital repayments	$WB9 = (Pbzwr + (Do - Wb))/Wm + Rs$
Investment potential for property expenditures	$WB10 = (Pbzwr + (Do - Wb - Rs))/Wm$
Utilization of investment potential	$WB11 = Wm/(Pbzwr + (Do - Wb - Rs))$
Current transfers per capita	$WL1 = Tb/L$
Operating surplus per capita	$WL2 = No/L$
Total liabilities per capita	$WL3 = Zo/L$
Development potential per capita	$WL4 = (Pbzwr + (Do - Wb))/L$
Investment potential per capita	$WL5 = (Pbzwr + (Do - Wb - Rs))/L$
Share of total liabilities in total income	$WZ1 = Wo/L$
The burden of total income on debt service	$WZ3 = Wm/L$
The burden of current income on debt service	$WZ5 = (Rs + O)/(Db - Dbd)$

* Designations in formulas: *L* - number of residents of local government units; *Db* - current income; *Dm* - property income; *Sm* - income from the sale of property; *Tb* - current transfers - income from general subsidies and subsidies and funds allocated for current purposes; *Wo* - total expenses; *Wm* - capital expenditure; *Wb* - current expenses; *Ww* - expenditure on remuneration and remuneration derivatives, excluding remuneration financed or co-financed by EU funds; *Zo* - Total liabilities according to debt titles; *O* - debt servicing expenses, including interest on credits and loans; *Rs* - repayment of capital instalments on loans and credits taken out; *No* - operating surplus; *Pbzwr* - budget revenues excluding credits, loans, securities issues; *Dbd* - current income from subsidies and funds allocated for current purposes.

Source: Own elaboration based on: Wskaźniki do oceny sytuacji finansowej jednostek samorządu terytorialnego w latach 2019-2021. Retrieved from: <https://www.gov.pl/web/finanse/wskazniki-do-oceny-sytuacji-finansowej-jst-w-latach-2019---2021>, 7.09.2023.

To assess the investment activity and development potential of 370 municipalities (excluding cities with powiat status) located in two bordering voivodeships: Silesia (148 municipalities) and Greater Poland (222 municipalities), univariate and multivariate analyses were carried out using the TOPSIS method in 2019–2021 (period of the COVID-19 pandemic), to obtain the value of a synthetic measure of the level of investment activity and development potential of the surveyed entities. The designated classes of financial development potential were the basis for a comparative analysis of the assessed municipalities. Fig. 1 shows the stages of the TOPSIS method along with the description and individual formulas, and Fig. 2 shows the ranking of the classes of the calculated synthetic measure.



Where: x_{ij} – the value of the j -th trait in the i -th object (municipalities); v_j – indicator value in the weighted normalized matrix; w – indicator weight; V – coefficient of variation of a single indicator; \bar{x}_{ij} – normalised values of the j -th trait in the i -th object; A_j^+ – the positive ideal value; A_j^- – the negative ideal value; S_i^+ – euclidean distance from the ideal value; S_i^- – euclidean distance from the anti-ideal value.

Figure 1. Stages of determining the TOPSIS synthetic value.

Source: Own elaboration based on Wysocki (2020), Kozera, Wysocki (2016), Kacprzak (2018), Behzadian et al. (2012), Pietrzak (2016), Azizi (2017), Wołoszyn et al. (2021).

According to research conducted by Głowicka-Wołoszyn et al. (2018), based on the calculated TOPSIS synthetic indicator, four typological classes can be selected to define the financial development potential of municipal governments, based on the mean (\bar{p}_i) and standard deviation (s_{pi}) of the synthetic indicator (p_i). The grading formulas for individual classes are presented in Table 2. The best result is shown in class 4, and the weakest in class 1.

Table 2.*Typological classes of measures of the synthetic TOPSIS method*

Class I (high)	Class II (medium-high)	Class III (medium-low)	Class IV (low)
$p_i \geq \bar{p}_i + s_{pi}$	$\bar{p}_i - s_{pi} \leq p_i < \bar{p}_i$	$\bar{p}_i - s_{pi} \leq p_i < \bar{p}_i$	$p_i < \bar{p}_i - s_{pi}$

Source: Own elaboration based on Głowicka-Wołoszyn et al. (2018); Wołoszyn, Wysocki (2016).

The TOPSIS method (Technique for Order Performance by Similarity to Ideal Solution) is one of the most frequently used multi-criteria decision-making methods (Çelikkilek, Tüysüz, 2020). Among others, Pandey et al. (2023) made an effort to review various studies that have used the TOPSIS method or developed extensions to it. The authors performed an extensive review of the subject literature: articles published by Elsevier, Springer, Wiley, Taylor and Francis, and others from 1981 to the first quarter of 2023, relating to various types of TOPSIS methods, their extensions and applications, as well as the latest trends in various research fields. Based on their findings, they observed that the number of articles using the TOPSIS method and its extensions has increased exponentially in recent years. The popularity of this method in the research conducted influenced the decision to use it in this study, although it was decided to choose the classic TOPSIS approach.

4. Results

The research was conducted for 370 municipalities ($n = 370$) from the Silesian and Greater Poland Voivodeships in 2019-2021. These are regions with a large number of inhabitants and a high degree of industrialization. The main goal of the research undertaken is to assess the investment and financial potential of the surveyed entities in the conditions of the crisis caused by the COVID-19 pandemic. Due to its implementation, the financial indicators monitored by the Ministry of Finance in Poland for 45 urban municipalities (excluding cities with powiat status), 118 urban-rural municipalities, and 207 rural communes were first assessed. In total, 370 municipalities were subjected to the study including 15 urban municipalities in the Greater Poland Voivodeship, 30 in the Silesian Voivodeship; and 96 urban-rural municipalities in the Greater Poland Voivodeship and 22 in the Silesian Voivodeship, as well as 111 rural municipalities in the Greater Poland Voivodeship and 96 in Silesian Voivodeship. The results of the examined indicators are presented in Tables 3 and 4.

Table 3.

Budget, per capita, and liabilities indicators of municipal governments in the Greater Poland Voivodeship in 2019-2021

Indicator name	Rural municipalities			Urban-rural municipalities			Urban municipalities		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
WB1 [%]	93.0	91.0	90.9	94.2	92.4	92.1	92.2	93.3	94.6
WB2 [%]	61.9	63.0	61.5	58.7	60.7	59.6	49.2	51.6	51.3
WB3 [%]	10.2	10.1	12.3	9.3	9.0	10.9	7.2	5.7	11.0
WB4 [%]	15.6	14.0	14.2	13.3	13.0	12.6	13.6	9.8	10.8
WB5 [%]	36.7	35.7	36.8	36.0	34.9	35.7	37.2	36.0	37.2
WB6 [%]	9.9	9.8	12.0	9.7	9.1	11.4	8.1	6.9	11.6
WB7 [%]	134.6	177.0	177.9	124.1	145.9	176.0	145.0	139.4	182.7
WB9 [%]	131.4	180.4	218.1	123.9	152.0	199.2	140.3	164.0	203.7
WB10 [%]	148.1	210.5	248.6	130.7	169.0	229.1	162.3	187.0	244.4
WB11 [%]	99.9	64.9	46.7	98.7	73.5	54.1	90.4	67.3	49.6
WL1 [zlotys/per capita]	3,080.7	3,409.5	3,607.9	2,830.1	3,167.9	3,352.6	2,306.3	2,615.6	2,922.8
WL2 [zlotys/per capita]	529.5	574.2	767.8	460.2	478.7	626.9	339.9	289.1	635.7
WL3 [zlotys/per capita]	1,075.0	1,105.9	1,056.0	1,197.8	1,229.2	1,207.9	988.4	1,067.2	1,027.7
WL4 [zlotys/per capita]	1,262.7	1,587.6	2,144.0	1,018.1	1,269.4	1,682.4	939.7	973.8	1,502.6
WL5 [zlotys/per capita]	1,044.4	1,389.4	1,954.7	824.0	1,084.5	1,506.1	803.2	828.5	1,323.8
WZ1 [%]	19.5	17.8	15.7	23.3	21.5	19.8	19.4	19.4	17.3
WZ2 [%]	4.5	3.6	3.1	4.4	3.7	3.2	3.1	3.0	3.2
WZ5 [%]	7.5	6.4	5.2	7.1	6.4	5.3	4.8	4.8	4.9

Source: Own elaboration.

Urban and urban-rural municipalities in the Greater Poland Voivodeship were characterized by a decreasing share of current income in total income (WB1) in the years 2019-2021, and the opposite trend was observed in urban municipalities (an increase from 92.2-94.6%). In the case of municipalities in the Silesian Voivodeship, a progression of property income is visible, current income decreased except for urban municipalities in 2021. The increase in current transfers is especially visible in 2020, which was characterized by an escalation of the COVID-19 pandemic and clear support from government funds under the Road Fund Local Government Funds (FDS) (currently Government Road Development Fund - RFRD). The fund is an instrument to support the implementation of tasks on roads managed by local government units. It aims to accelerate the creation of modern and safe road infrastructure at the local level, constituting an important element of the proper functioning and development of the economy and contributing to improving the standard of living of citizens. In 2019, 6 billion zlotys was allocated for the construction of local roads from the FDS, while in 2020 it was 3.2 billion zlotys. The limit for co-financing tasks carried out by local governments of the Greater Poland Voivodeship was 376.9 billion zlotys in 2019, and 228.7 billion zlotys in 2021; while local

government units from the Silesian Voivodeship in 2019 (234.4 billion zlotys), and in 2021 (140.6 billion zlotys). It can therefore be concluded that greater co-financing for current tasks in the field of road infrastructure went to the LGUs of the Greater Poland Voivodeship. This thesis is also confirmed by the higher level of WB1 and WB2 indicators. Taking into account the situation related to the COVID-19 epidemic and the need to take action to protect the road transport sector, financial support provided under the FDS was one of the important elements of combating the effects of the economic crisis and stimulating economic activity.

Table 4.

Budget, per capita, and liabilities indicators of municipal governments in the Silesian Voivodeship in 2019-2021

Indicator name	Rural municipalities			Urban-rural municipalities			Urban municipalities		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
WB1 [%]	91.3	88.9	88.3	91.7	89.4	87.8	92.0	88.6	90.6
WB2 [%]	56.3	57.9	57.2	54.4	56.6	56.0	42.7	46.4	45.8
WB3 [%]	10.5	9.5	11.7	8.1	7.8	10.5	7.7	4.7	9.5
WB4 [%]	17.3	14.5	14.4	16.1	14.1	14.9	16.1	13.7	13.4
WB5 [%]	40.0	38.1	39.0	38.6	36.7	37.6	38.9	37.5	38.6
WB6 [%]	10.2	9.1	11.1	8.4	7.7	10.4	9.0	6.0	11.0
WB7 [%]	142.6	178.3	226.8	108.9	143.8	184.2	103.0	128.3	157.6
WB9 [%]	147.5	212.4	269.4	121.1	149.7	204.0	121.4	157.5	211.5
WB10 [%]	160.9	238.9	322.9	126.6	159.3	237.3	127.6	168.0	235.2
WB11 [%]	86.4	147.4	-5.1	96.8	74.9	48.5	91.6	75.6	51.7
WL1 [PLN/per capita]	2,646.6	2,970.9	3,223.7	2,404.6	2,742.1	3,005.4	1,971.1	2,281.4	2,546.0
WL2 [PLN/per capita]	509.6	492.4	670.0	362.3	377.8	571.9	367.5	231.3	533.3
WL3 [PLN/per capita]	996.0	1,040.8	1,009.0	965.9	1,026.6	976.1	1,043.8	1,116.6	1,144.2
WL4 [PLN/per capita]	1,422.7	1,694.5	2,375.2	1,067.7	1,275.3	1,935.7	1,163.7	1,312.4	1,777.5
WL5 [PLN/per capita]	1,259.3	1,549.7	2,196.9	893.1	1,119.2	1,780.3	1,011.0	1,166.7	1,652.2
WZ1 [%]	19.3	17.8	15.4	20.3	19.1	15.8	20.7	19.9	18.3
WZ2 [%]	3.7	2.9	3.1	4.1	3.3	2.8	3.5	3.0	2.3
WZ5 [%]	5.9	4.9	5.0	6.5	5.5	4.5	5.1	4.9	3.6

Source: Own elaboration.

The outbreak of the COVID-19 pandemic also affected the level of operating surplus, with the surveyed municipalities recording the lowest share in total income (WB3) in 2020. It should also be emphasized that the lowest level of the examined measure in 2020 was recorded in urban communes (in the Silesian Voivodeship, 4.7%, and in the Greater Poland Voivodeship, 5.7%, respectively). Fig. 2 illustrates the share of capital expenditure in total expenditure (WB4). The list of communes in the studied voivodeships was compared to the value of

communes in total in Poland. It can be concluded that municipalities in Poland during the outbreak of the COVID-19 pandemic recorded a slowdown in investment activity on average from 15.9% in 2019 to 14.1% in 2020. The highest value of the examined measure was recorded in the municipalities of the province of Silesia, although in their case the indicator decreased from 16.5% to approximately 14% in 2020-2021. In turn, the investment activity of municipalities in Greater Poland was characterized by a regression from 14.2% in 2019 to over 12% in 2020-2021. This confirms the thesis that the investment activity of the surveyed municipalities slowed down during the COVID-19 pandemic.

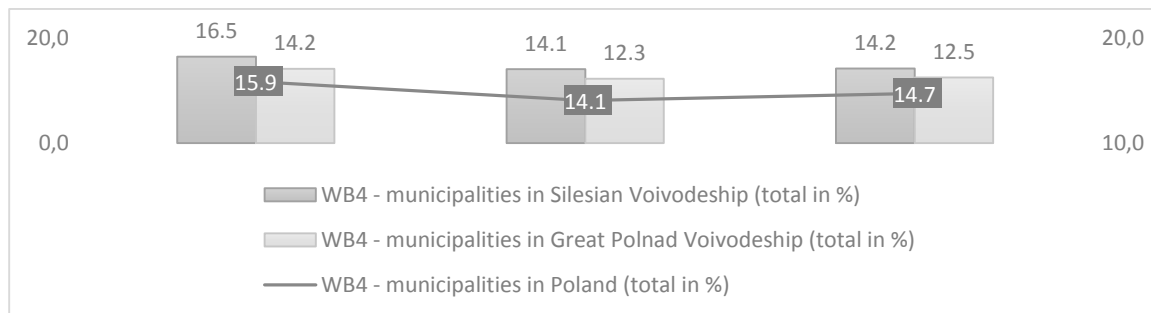


Figure 2. Share of capital expenditure in total expenditure of municipalities in Poland in 2019-2021.

Source: Own elaboration.

The slowdown in investment activity and a very cautious investment policy increased the level of self-financing of the examined communes (Fig. 3), which did not differ significantly from the average value for all communes in Poland. The years 2019-2021 were also characterized by a regression of debt ratios according to debt titles (WZ1, WZ2, and WZ5), although the communes of the Silesia and Greater Poland Voivodeship generated much lower values compared to municipalities in Poland in general.

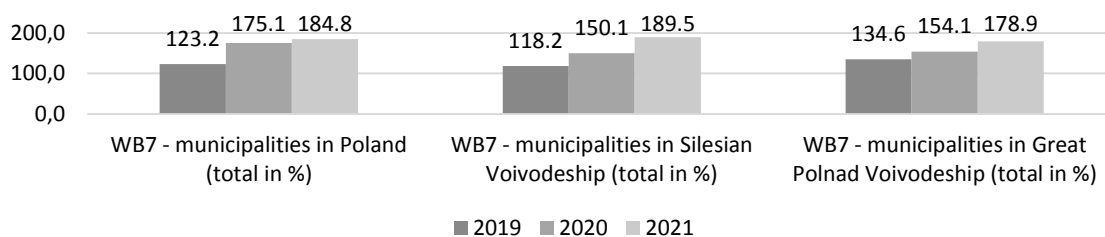


Figure 3. Share of operating surplus and property income in capital expenditure (self-financing ratio) of municipalities in Poland in 2019-2021.

Source: Own elaboration.

Figure 4 compares the development potential in terms of capital expenditure and capital repayments of the surveyed municipalities in 2019-2021. It can be noticed that the WB9 indicator is characterized by a large progression, for municipalities in general it is an increase of 75.1%, for municipalities in the Silesian Voivodeship by 98.3%, and in the Greater Poland Voivodeship by 88.2%.

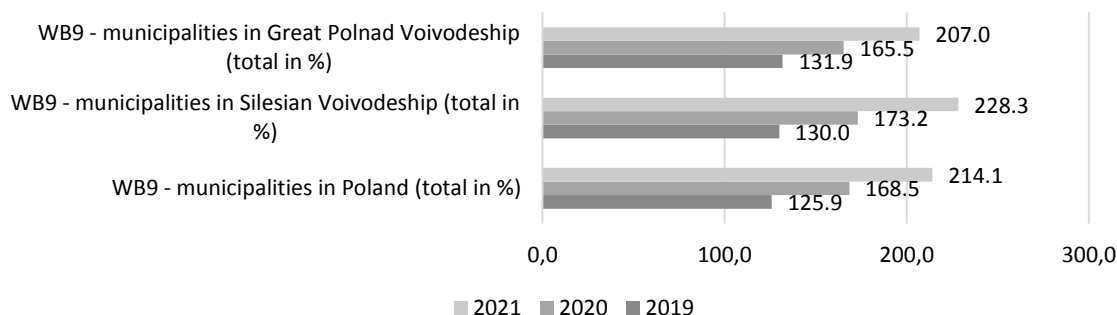


Figure 4. Development potential about property expenditures and capital repayments of municipalities in Poland in 2019-2021.

Source: Own elaboration.

A similar escalation can be seen in the case of the next measure WB10. Investment potential in property expenditures of municipalities in Poland increased from 132.1% to 250.3% in 2019-2021. The highest value of the indicator in 2021 was recorded by the communes of the Silesian Voivodeship 265.1%, while about the total number of communes in Poland, communes of the Voivodeship Greater Poland Voivodeship with an investment potential of 240.7%. Such high values of indicators confirm great possibilities in the field of active investment policy, unfortunately, another indicator WB11 proves that the use of this potential was relatively low during the COVID-19 pandemic.

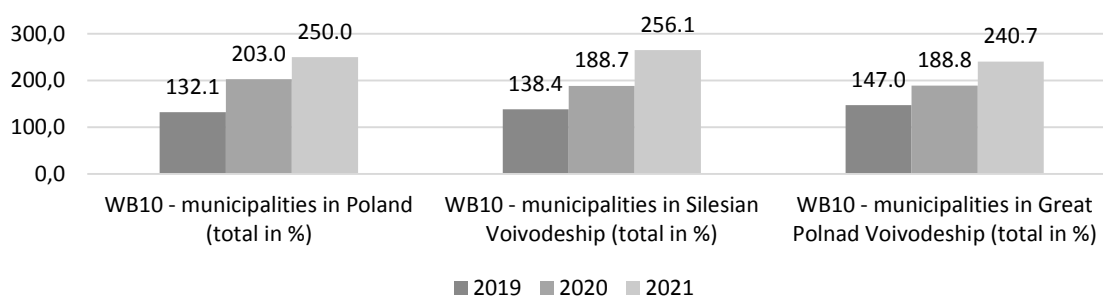


Figure 5. Investment potential about property expenditures of municipalities in Poland in 2019-2021.

Source: Own elaboration.

Municipalities in total in Poland reached the ceiling of 96.3% of the use of investment potential in 2019, and in the following years there was a significant decline, first to 72.3% in 2020, and then 49.4% in 2021. This proves the thesis about half the capacity to pursue an active investment policy in times of crisis. Interestingly, the communes of the province in 2020, Greater Poland Voivodeship had 99.3% of the opportunities to use the investment potential, but in 2021 only 31.7%. Municipalities of the province of Silesia were characterized by a slightly lower level of the examined measure compared to municipalities in Poland in general.

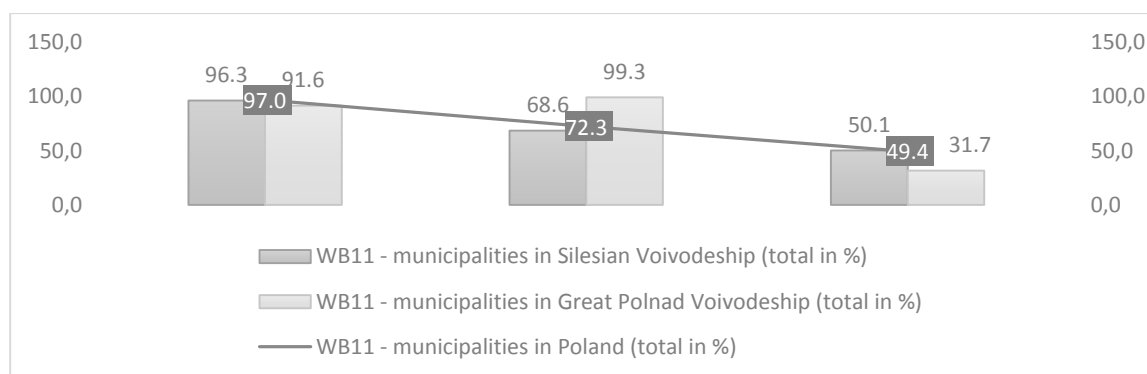


Figure 6. Utilization of investment potential by municipalities in Poland in 2019-2021.

Source: Own elaboration.

The analysis of budget indicators and liabilities allows for a general assessment of the management of the investment and development potential of the examined municipalities. To determine development classes and classify individual municipalities into them, research was carried out using the TOPSIS linear ordering measure. Table 5 presents the highest values of the synthetic indicator and the names of municipalities that achieved its highest level.

Table 5.

A synthetic measure of the financial development potential of municipalities with 1st position in voivodeship based on the TOPSIS method in 2019-2021

Type of local government unit and location in the voivodeship		Pi – municipalities with 1st position			Ranking – municipalities with 1st position		
		2019	2020	2021	2019	2020	2021
Silesian Voivodeship	rural municipalities	0.5818	0.7466	0.9904	Ornontowice	Brenna	Milówka
	urban-rural municipalities	0.6450	0.6537	0.5551	Sośnicowice	Kuźnia Raciborska	Sośnicowice
	urban municipalities	0.8095	0.6160	0.7460	Knurów		
Greater Poland Voivodeship	rural municipalities	0.6233	0.6294	0.7357	Baranów		
	urban-rural municipalities	0.6606	0.6572	0.6800	Sieraków	Stęszew	
	urban municipalities	0.6570	0.6809	0.6641	Chodzież		Obrzycko

Source: Own elaboration.

Based on the data presented in Table 5, it can be concluded that, firstly, in the Silesian Voivodeship during the entire period under study, the leader in terms of financial possibilities and development was the urban commune of Knurów, and in the Silesian Voivodeship the rural commune of Baranów was the leader. However, it should be noted that the escalation of the COVID-19 pandemic resulted in much lower values of the synthetic measure than in the first year of the analysis. The rural communes of Ornontowice (2019), Brenna (2020), Milówka (2021) also recorded high scores; urban-rural Sośnicowice (2019, 2021), Kuźnica Raciborska (2020), Sieraków (2019), Stęszew (2020-2021), as well as urban Chodzież (2019-2020) and Obrzycko (2021). Table 7 presents average values for positive and negative ideal and synthetic measures (P_i) of the financial development potential of LGUs based on the TOPSIS method in

2019-2021. A very low average value of the synthetic indicator was recorded by the surveyed communes in 2020, in particular rural communes in Silesia ($P_i = 0.189$), although in 2021 this is the highest level among the presented results ($P_i = 0.963$). Although the COVID-19 pandemic has had a huge impact on the investment activities of local governments in Territories, in the case of municipalities in the Silesian and Greater Poland Voivodeships, a significant improvement in the synthetic measure of the financial development potential of the assessed units in 2021 is visible.

Table 7.

The positive (S_i^+) and negative (S_i^-) ideal and synthetic measure (P_i) of the financial development potential of LGUs based on the TOPSIS method in 2019-2021 - average value

Type of local government unit and location in the voivodeship		positive S_i^+ ideal			negative S_i^- ideal			Pi		
		2019	2020	2021	2019	2020	2021	2019	2020	2021
Silesian Voivodeship	rural municipalities	0.184	0.425	0.041	0.143	0.100	1.078	0.435	0.189	0.963
	urban-rural municipalities	0.158	0.148	0.174	0.152	0.164	0.138	0.489	0.525	0.440
	urban municipalities	0.171	0.180	0.166	0.135	0.116	0.132	0.441	0.389	0.442
Greater Poland Voivodeship	rural municipalities	0.175	0.169	0.131	0.131	0.136	0.191	0.427	0.444	0.592
	urban-rural municipalities	0.152	0.154	0.142	0.138	0.136	0.162	0.473	0.469	0.533
	urban municipalities	0.197	0.182	0.160	0.106	0.113	0.144	0.345	0.380	0.472

Source: Own elaboration.

The synthetic value of the financial development potential of municipalities in the Silesian and Greater Poland Voivodeship based on the TOPSIS method allowed us to further classify the assessed units into four classes, as shown in the data in Table 8.

Table 8.

Class of the financial development potential of municipalities in the Silesian and Greater Poland Voivodeship based on the TOPSIS method in 2019-2021

Specification		number of municipalities in the Silesian Voivodeship			number of municipalities in the Greater Poland Voivodeship		
		rural municipalities	urban municipalities	urban-rural municipalities	rural municipalities	urban municipalities	urban-rural municipalities
class 1	2019	18	4	4	17	18	2
	2020	1	3	4	17	17	2
	2021	0	4	3	14	19	3
class 2	2019	32	10	7	40	22	4
	2020	38	9	10	33	28	4
	2021	95	8	13	44	38	3
class 3	2019	30	2	15	35	37	7
	2020	56	6	12	47	36	8
	2021	0	6	9	46	27	7
class 4	2019	16	6	4	19	19	2
	2020	1	4	4	14	15	1
	2021	1	4	5	7	12	2

Source: Own elaboration.

In the case of rural communes in the province of Silesia, the largest number of them (32 communes) in 2019 is concentrated in class 2, and 30 communes in class 3, although 16 are characterized by the highest, fourth class of financial development potential. In 2020, only one commune was qualified for class four, 56 communes for class two, and 38 communes for class three. In turn, in 2021, no rural commune was classified in class three, and as many as 95 were in class two. The situation is different in the Wielkopolskie Voivodeship, the largest number of communes are classified two and three. It should also be noted that of the 19 rural communes from class four recorded in 2019, there were only 7 of them in 2021. A similar trend characterizes urban communes in the years examined.

5. Discussion

Evaluating investment activity and development potential, especially under conditions of a pandemic crisis, is a complex phenomenon, determined by the choice of appropriate measures and techniques of ratio analysis. Multi-criteria analysis is one of the most widely used in the management process by both public and commercial entities (Çelikkilek, Tüysüz, 2020). The aim of the research undertaken by Kozera et al. (2017) among others, was to conduct a comparative analysis of the results obtained by serial ordering of objects and identification of their development types using the TOPSIS method in two approaches: classical and positional. The proposed approaches are presented using the example of the construction of a synthetic measure and the identification of types of financial self-sufficiency in rural municipalities in the Greater Poland region in 2013. Research using the TOPSIS technique as a tool for a comprehensive evaluation of local governments in Slovakia was conducted by Vavrek and Pukała (2019), who used eight criteria and calculated their weights based on Fuller's triangle method and 25 experts. The authors noted that the use of this method is contingent on the choice of specific indicators and their proper monitoring. In their study, Malinowski and Smoluk-Sikorska (2020) also used the TOPSIS approach to measure the standard of living of residents and the financial capabilities of 380 poviats. Furthermore, Łuczak and Just (2020) proposed a new methodological approach to the construction of a synthetic measure in the assessment of complex economic phenomena of local government units. Their study aimed to demonstrate the application potential of the positional MEF-TOPSIS method. The approach proposed by the authors is used to assess the financial self-sufficiency of Polish municipalities in 2016. The paper also compares the results of applications of the positional MEF-TOPSIS method and the classical and positional TOPSIS methods.

The TOPSIS method was also used in the investigations presented in this paper to determine a synthetic measure in municipalities from two different macro-regions. Kozera et al. (2021) studied local investment projects of rural municipalities and their expansion due to, among other

things, obtaining EU funding in 2007-2018, and their research showed that the most pro-investment municipalities are those in the southern and eastern macro-regions, while those that invest the least are located in the northwestern and northern macroregions. In the present study, municipalities from the Silesian Voivodeship (southern macroregion) and the Greater Poland Voivodeship (northwestern macroregion) were selected. The research included univariate and multivariate analyses using the TOPSIS method to obtain synthetic values for a measure of the level of financial development potential and investment activity of municipalities of three types: rural, urban-rural, and urban. The authors' research showed that the apparent slowdown in investment activity came in 2020, which in Poland saw the spread of the COVID-19 pandemic and its effects on economic activity and development. This is illustrated, among other things, by the WB4 index, which was much higher for municipalities in Silesia than those in Greater Poland. In contrast, the units from the Northwest macroregion were characterized by slightly lower investment potential (WB10), similar development potential (WB9), and level of self-financing (WB7), despite government support for infrastructure investment.

As emphasized by Malinowska-Misiąg (2022), this support was intended to counteract the socio-economic impact of COVID-19 but the distribution of funds indicates that this was not a priority in making the allocation. The most funds (3.1 billion zlotys) went to rural municipalities, while urban-rural municipalities, towns with powiat status, and powiats received support at a comparable level (1.9-2.0 billion zlotys). The distribution of funds has aroused a lot of emotion and controversy, as evidenced both by numerous media reports and the huge number of parliamentary interpellations and questions. These issues were also the subject of many expert reports, which indicated that the distribution of funds was not based on substantive but political criteria (Malinowska-Misiąg, 2022, p. 59). Similar conclusions were presented by such authors as Rudka and Kocemba (2021); Flis and Swianiewicz (2021a; 2021b); Sześciło et al. (2021).

Based on the WB11 index, it can be concluded that the municipalities of Greater Poland voivodeship in 2020 used the investment potential in more than 99% (68.6% in the Silesian Voivodeship), with this percentage declining in 2021 to only 31.7% (50.1% in Silesia). The average value of the synthetic index (P_i) decreased significantly in the municipalities of both Silesia and Greater Poland. The pandemic had an impact on the classification of the financial development potential of the LGUs studied, with most municipalities reaching the range defined for classes 2 or 3. Unfortunately, few units were characterized by very high financial and investment potential (class 4).

6. Conclusion

The comparisons and classification of communes into individual classes presented in this article using the classic TOPSIS approach prove that the financial development potential of communes in the studied Silesian and Greater Poland voivodeships is medium-low and medium-high. The research also confirms the thesis about the impact of the COVID-19 pandemic on the slowdown in the investment activity of municipalities, the weakening of their financial condition in 2020, and especially the lower use of the investment potential. The communes pursued a cautious investment policy, relying on transfer funds intended primarily for road infrastructure, engaging less foreign capital, and accumulating high financial surpluses.

To conclude, based on the research conducted, it can be indicated:

- The research showed that the apparent slowdown in investment activity of municipalities came in 2020, which in Poland saw the spread of the COVID-19 pandemic and its effects on economic activity and development.
- The municipalities recorded an average slowdown in investment activity from 15.9% in 2019 to 14.1% in 2020 (the highest value of the examined measure was recorded in the municipalities of Silesia).
- The outbreak of the COVID-19 pandemic affected the level of operating surplus (the lowest level of the examined measure WB3 in 2020 was recorded in urban communes, in the Silesian Voivodeship, 4.7%, and in the Greater Poland Voivodeship, 5.7%, respectively).
- Investment potential in property expenditures of municipalities in Poland increased from 132.1% to 250.3% in 2019-2021. The highest value of the indicator in 2021 was recorded by the communes of the Silesian Voivodeship (265.1%).
- High values of indicators confirm great possibilities in the field of active investment policy and prove that the use of this potential was relatively low during the COVID-19 pandemic.
- The average value of the synthetic index (Pi) (TOPSIS method) decreased significantly in the municipalities of both Silesia and Greater Poland. Few units were characterized by very high financial and investment potential (class 4).
- The pandemic COVID-19 had an impact on the classification of the financial development potential of the municipalities studied, with most of them reaching the range defined for classes 2 or 3.

Further research in this area should include a multi-criteria analysis of the entire population of communes in Poland, along with the correlation of the examined indicators and the assessment of the strength of their dependence. On this basis, the TOPSIS synthetic indicator and its classification classes can be visualized on cartograms, enabling monitoring of the

financial development and investment potential of local government units, which should have a positive impact on their management process, but also due to the large information value of the measure, especially from an important point of view. the perspective of residents, but also business entities.

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