



# Management of local finances in crisis conditions on the example of voivodeship governments in 2019-2021

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## Abstract

The management of local finances is an intricate process consisting of decisions made by authorized bodies, which, as a result, after taking into account the established goals, both current and strategic, should result in the maximization of socio-economic effects. Indicator analysis is considered one of the important instruments of local government financial management. In the article, based on the data published by the Ministry of Finance, the National Council of Regional Chambers of Accounts and the Central Statistical Office, the financial management of the provincial cross-section of Poland in 2019-2021 was reviewed. The idea of the study was to assess the management of local finances during the crisis caused by the COVID-19 pandemic in synthetic terms, based on the TOPSIS multi-criteria linear ordering method and benchmarking, and to try to identify the factors determining this process. The research was carried out by means of financial analysis of 21 indicators, which were compiled for 16 local government provinces in Poland. The results of the research made it possible to determine the classes of financial condition of the analyzed units. The COVID-19 pandemic caused that in 2020, none of the studied local government provinces ranked in the first class characterizing a very high level of financial condition according to the TOPSIS method, although as many as 9 units were assigned to the second class characterizing a high level of financial condition. Local government provinces in 2019-2021 were characterized by very high development and investment potential, as well as the self-financing rate, they accumulated budget surpluses at the expense of an apparent slowdown in investment activity.

*Keywords: management; local finances; voivodeship; TOPSIS; benchmarking*

*JEL classification: G32*

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## 1. Introduction

The turn of 2019/2020 was marked by a crisis disrupting the functioning of the entire world. The SARS-COV-2 virus has significantly affected the operation of the economy on a global scale, individual countries, and has also changed the way individual citizens function, prompting the need for immediate changes. Prevention of the spread of the

COVID-19 pandemic itself took various forms manifested, among others, in complete or partial lockdowns that affected the operation of various economic entities (Strojny, et al. 2022; Brinca et al. 2021). Both the private and public sectors were involved in limiting the impact of the pandemic. The restrictions put in place, contributed to negative economic changes, manifested, among other things, as parallel disruptions in aspects of demand and supply (Chudnik et al. 2020). In the public sector, changes were evident in the areas of policy and public management. The COVID-19 pandemic had an increased impact on local governments in terms of OECD governance (OECD, 2020a), but its impact on individual entities was heterogeneous. As noted by some authors (Ascani et al., 2020; ICAEW, 2020), the destimulants contributing to the spread of the virus were both the economic base and the territorial economic domain. The COVID-19 pandemic forced local governments, among other things, to deviate from the planned spending pattern of their public resources, which implied certain financial consequences (Grata & Jaroszyk, 2022). Local governments were forced to reorient their planned budgets, allocations, and incur additional expenditures on expenses related to preventing the effects of the pandemic (Rusadze, et al. 2020; Tyniewicki & Kozieł 2021). In the public sector, as Dougherty & Biase (2021) note, public administration units have had to deal with the so-called "scissor effect" manifested as a loss of revenue and an increase in spending.

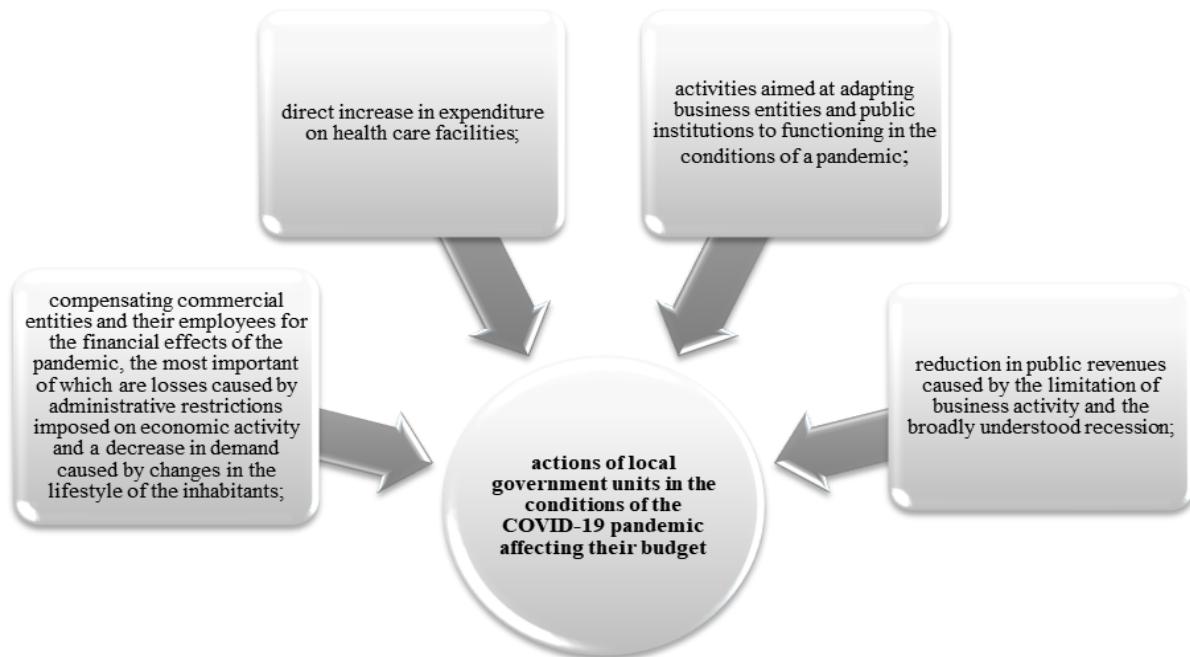
This article aims to assess the process of managing the finances of local government units on the example of self-government voivodeships in Poland during the COVID-19 pandemic. In addition, the considerations attempt to select the province with the best and worst financial condition based on the benchmarking method and ranking of the synthetic index calculated on the basis of the TOPSIS linear ordering method.

## 2. Literature review

The specific way of financial management during the pandemic was reflected in the budget of the LGU, the state of which determines the functioning of the entire entity, determining, at the same time, its development. Pandemic restrictions, as a result of the reorganization of the activities of various entities of the national economy, and also consequently the recession caused a depletion of revenues at both the central and local government levels, which directly correlate with the scale of investment activities, in parallel forcing LGU to increase spending and implement activities focused on countering the COVID-19 pandemic. Local government units took actions that addressed the aspects illustrated in Figure 1.

The finances of local government units are the basis for the implementation of public tasks and determine the factors of economic development. In the management of a local government unit, the issue of financial condition plays a key role. Its level determines the activity of the local government in terms of continuity of performance of the tasks assigned to it, and at the same time determines the level of its local development (Sekuła, 2017). Financial condition can be considered through the prism of a number of variables, among others, as: the ability in the issue of increasing assets, or the implementation of tasks and the ability to balance the budget (Dziekański 2019). The financial condition as a determinant of the realization of the set goals of local governments is considered a complex phenomenon, which is important both from the point of view of profits for

citizens and the public finance system as a whole. It is shaped, among other things, by the level of income or the amount of property expenditures (Skica et al. 2020).



**Figure 1. Activities of local government units focusing on counteracting the effects caused by the COVID-19 pandemic**

Source: own elaboration based on: (Misiąg 2020; Ociepa-Kicińska et al., 2022).

As Cabaleiro et al. (2012) and Halkos & Salamouris (2004) note, due to the complex nature of financial condition, single measures describing the financial condition in individual local governments are considered suboptimal. Therefore, the financial condition of a local government should be considered in parallel through various measures. A multi-criteria approach is considered the optimal solution. As Pramanik et al. (2021) point out, multi-criteria methods have found application in many areas of the economy. They are also used in assessing the financial condition (Hedija & Kuncová 2018; Marqués et al. 2020; Türegün 2022; Vavrek 2022). In this regard, they are also used in local government units to assess their financial condition (Bieniasz et al. 2013; Standar 2017; Dziekański 2019; Pawlik, Dziekański 2021; Galiński, 2022; Malinowski, M. 2022; Kotlińska et al. 2022). Due to the popularity of multi-criteria methods, it is worth making an attempt to assess the financial condition of local government units affected by the COVID-19 pandemic. The scientific achievements of the last three years indicate that the topic of the COVID-19 pandemic was very popular. Attempts to determine the impact of the COVID-19 pandemic on socio-economic life include both international and national literature. In this regard, research in the international arena has focused, among other things, on the initial period of the pandemic, where McKibbin & Fernando (2020), on the macroeconomic side, analyzed the development of the COVID-19 pandemic and its possible effects using the DSGE/CGE model. The researchers also attempted to estimate the pandemic on production and the supply chain in selected countries Bonadio et al. (2020). Other authors have attempted to determine estimated GDP changes in individual countries, while pointing out that due to the process of globalization, all countries are economically exposed to the consequences of the pandemic to a greater or lesser extent. The consequences of the first wave of the

pandemic on public administration were analyzed by Hegel & Schnabel (2021), among others, discussing centralized and decentralized actions by the federal countries of the European Union. They also discussed the response of the Visegrad Group countries to the situation and how they adapted administrative law to the circumstances (Horvat et al. 2021). The Slovak budget from the perspective of tax revenues during the COVID-19 pandemic was discussed by Černěnko et al. (2021), indicating that the actual state was better than assumed. A similar conclusion is given by Szarowska (2021), who analyzes selected regional budgets of the Silesian-Moravian area by comparing pre-pandemic data with the first pandemic year, while presenting basic measures of financial management (Çelikyay & Bayraktar 2022).

At the national level, studies of public finances considered through the prism of the crisis caused by the COVID-19 pandemic touched, among other things, on fiscal federalism (Poniatowicz 2022), the socio-economic sphere in Poland (Kańduła, Przybylska, 2022), or communication policy (Kańduła & Przybylska 2022). A large part of considerations also focused on the analysis of changes within the income and expenditures, or the debt of LGU (Bober et al. 2020; Swianiewicz et al. 2020; Podgorzanska 2021; Klimek 2022; Misiąg 2022; Patrzalek, Gałeczka 2022; Ociepa-Kicińska et al. 2022). The multitude of studies related to the COVID-19 pandemic and its consequences shows the complexity of this phenomenon.

Due to the small amount of research showing how individual local governments at the voivodeship level dealt with the crisis caused by the COVID-19 pandemic, the following research questions were posed:

- Has the COVID-19 pandemic affected the financial situation of local government voivodeships in Poland?
- Which self-government voivodeships in Poland were in the best financial condition in 2019-2021?

The research was carried out using a multi-criteria analysis. The analysis was aimed at determining the financial situation of voivodeship self-governments. In addition, due to the existing research gap regarding the use of multi-criteria analysis, it was considered reasonable to determine the financial condition based on one of the linear ordering methods, i.e. the TOPSIS method, and on its basis to indicate the voivodeship that is a model or an anti-model in terms of financial condition.

### 3. Literature review

The research carried out was aimed at assessing the financial management of local government units using the example of local government provinces during the COVID-19 pandemic (in Poland, local government includes three basic levels of territorial division - commune, county and voivodeship, with the first two being responsible for the implementation of local tasks and the third for regional). The assessment of the financial condition of local governments is multidimensional, determined by the economic, legal and financial factors (Dziekański 2020). The study was carried out on the basis of secondary data published on the websites of the Ministry of Finance, Regional Chambers of Accounts and the Central Statistical Office in 2019-2021. In total, the analysis covered 16 provinces in Poland (n=16; 100%). In this study, 21 indicators for the synthetic evaluation of the budget management of local government units were evaluated (10 budget indicators, 8 indicators per capita and 3 indicators by debt titles - their division into stimulants and destimulants is presented in Table 1).

**Table 1: Stimulants and destimulants in the assessment of the financial condition of self-government voivodeships**

<i>Variable - Stimulants</i>	<i>Variable - Destimulants</i>
<ul style="list-style-type: none"> <li>• Share of operating surplus in current income;</li> <li>• Share of property expenditures in total expenditures;</li> <li>• Share of operating surplus and income from sale of assets in total income;</li> <li>• Share of operating surplus and property income in property expenditures (self-financing ratio);</li> <li>• Development potential in relation to property expenditures and capital repayments;</li> <li>• Investment potential in relation to property expenditures;</li> <li>• Utilization of investment potential;</li> <li>• Share of own income in total income;</li> <li>• Operating surplus per capita;</li> <li>• Development potential per capita;</li> <li>• Investment potential per capita;</li> <li>• Total income per capita;</li> <li>• Total expenditures per capita;</li> <li>• Property expenditures per capita;</li> </ul>	<ul style="list-style-type: none"> <li>• Share of current expenditures in total income;</li> <li>• Share of current transfers in current income;</li> <li>• Burden of current expenditures on wages and salary derivatives;</li> <li>• Current transfers per capita;</li> <li>• Total liabilities per capita;</li> <li>• Share of total liabilities in total income;</li> <li>• Burden of total income on debt service;</li> <li>• Burden of current income on debt service;</li> </ul>

Source: authors.

Financial analysis, the idea of which is to evaluate the efficiency of operation is sometimes seen as a key element of financial management in business entities. Financial analysis can be considered both through the prism of financial conditions or property conditions of business entities. A tool for synthetically determining the various dimensions of the functioning of business entities and showing the relationship between the components of financial statements is a ratio analysis. Benchmarking analysis and the TOPSIS linear ordering method were used to assess the financial situation. Benchmarking as a method supporting the process of financial management allows to select a leader - a voivodeship implementing best practices on the basis of selected budget indicators. On the other hand, thanks to the TOPSIS method, it was possible to collectively assess the surveyed measures broken down by individual voivodeships, as a result of which voivodeships were selected as a pattern and an anti-pattern (Panek 2009; Wysocki 2010). The TOPSIS method was created as a multi-criteria method, but later found application in a statistical analysis as a method of linear ordering of objects and assessment of complex socio-economic phenomena (Roszkowska & Wachowicz 2013, 2015). The TOPSIS method (Technique for Order Preference by Similarity to an Ideal Solution) enables the construction of a ranking of the examined entities as a result of the analysis of heterogeneous characteristics. The variables used to determine the value of the synthetic measure, for which the coefficient of variation was above 10% (divided into stimulants and destimulants), are presented in Table 1. 14 stimulant variables and 8 destimulant variables were determined. Due to the too low volatility coefficient, the indicator monitored by the Ministry of Finance was

excluded from the study: the share of matured liabilities in total liabilities. The stages of the TOPSIS method used in the research are shown in Figure 2.

**Figure 2. Stages of determining the TOPSIS synthetic value**

The classic TOPSIS method	
STEP 1. Calculation of the normalized matrix:	$\bar{X}_{ij} = \frac{X_{ij}}{\sqrt{\sum_{i=1}^n X_{ij}^2}}$
STEP 2. Calculation of the weighted normalized matrix:	$V_{ij} = \bar{X}_{ij} \times W_j$
STEP 3. Calculation the best ( $A_j^+$ ) and the worst ( $A_j^-$ ) ideal value:	$A_j^+ = (v_1^+, v_2^+, \dots, v_n^+) = \{(max_i v_{ij}   j \in B), (min_i v_{ij}   j \in C)\}$ $A_j^- = (v_1^-, v_2^-, \dots, v_n^-) = \{(min_i v_{ij}   j \in B), (max_i v_{ij}   j \in C)\}$
STEP 4. Calculation of the Euclidean distance from the ideal value:	$S_i^+ = \left[ \sum_{j=1}^m (V_{ij} - V_j^+)^2 \right]^{0.5}$
STEP 5. Calculation of the Euclidean distance from the anti-ideal value:	$S_i^- = \left[ \sum_{j=1}^m (V_{ij} - V_j^-)^2 \right]^{0.5}$
STEP 6. Calculation of the ranking coefficient determining the similarity to the ideal solution, where the most advantageous option is the variant with the highest value:	$P_i = \frac{S_i^-}{S_i^+ + S_i^-}$

Source: own elaboration based on: (Kacprzak 2018; Behzadian et al. 2012; Pietrzak 2016; Azizi 2017; Wołoszyn et al. 2021).

The stages of determining the TOPSIS synthetic value indicated in Figure 3 make it possible to define four typological classes of the financial condition of self-governing voivodeships based on the arithmetic mean and standard deviation calculated from the value of the synthetic feature (Wysocki, 2010).

<i>class I (high level)</i>	$p_i \geq \bar{p}_i + s_{pi}$
<i>class II (upper-intermediate level)</i>	$\bar{p}_i \leq p_i < \bar{p}_i + s_{pi}$
<i>class III (lower-intermediate level)</i>	$\bar{p}_i - s_{pi} \leq p_i < \bar{p}_i$
<i>class IV (low level)</i>	$p_i < \bar{p}_i - s_{pi}$

when:  $\bar{p}_i$  - arithmetic average;  $s_{pi}$  - standard deviation

**Figure 3. Classes of financial condition of local governments**

Source: own elaboration based on: (Wysocki 2010).

In the preparation of the ranking of local government voivodeships in Poland based on the TOPSIS method, 4 classes of financial condition were used (Wysocki 2010), in which individual units were ranked on the basis of arithmetic means and standard deviation of the synthetic index. The task of the prepared rankings was to compare the activities of local government voivodeships in the area of budget management based on the indicators adopted for the study in 2019-2021.

#### 4. Research Results

In this study, self-government voivodeships during the COVID-19 pandemic were subjected to a multi-criteria assessment. First, a financial analysis of the 21 surveyed indicators was carried out. Contrary to earlier expectations, the COVID-19 pandemic did not significantly affect the level of total income in the scale of local government voivodeships in Poland. Despite the general increase in total income in the discussed period, not all self-government voivodeships generated increased values in this respect. The decrease in total income in 2019-2020 concerned four voivodeships, while in 2020-2021 three. The largest decrease in total income was recorded in the Pomeranian Voivodeship by about 14.35% and in the Podlaskie Voivodeship by 17.15%. The level of income in self-governing voivodeships, especially in the last analyzed years, was determined by funds received from the EU as part of the final phase of the financial perspective for 2014-2020. In 2021, the share of EU revenues decreased by approximately 23.30%.

Budget revenues of the analyzed voivodeships are mainly current revenues in the structure of total revenues characterized by progression, which in the discussed period were in the range (80.42%-83.60%). In 2020, there is a decrease in the level of own income of local government voivodeships from 52.8% to 50.9% compared to 2019. In 2021, the financial independence ratio is at the level of 56.2% (increase by 5.3%). Property income was at an average level ranging from 16.64% to 19.58%. The highest share of property income in the total income was generated by the Subcarpathian Voivodeship, in 2019, oscillating around 49.25%, a high share of property income in the total income structure was also held by the Lublin Voivodeship - 33.63%. The smallest share of property income in the total income is characteristic for the Masovian Voivodeship - 6.63%. The highest rate of change in property income was recorded in 2020/2019 in the Silesian Voivodeship (+41.63%) and in 2021/2019 in the Łódź Voivodeship (+74.24%). On the other hand, the rate of change in the chain approach reaches its maximum values in the Masovian Voivodeship at 1170.40%. The largest change, taking into account the decrease in investment income, was visible in the Opolskie Voivodeship of about 73.43% in 2021/2019.

In 2021, subsidies and funds for investments accounted for the most significant share in the property income of voivodeships - 94.8%. Their share decreased from 95.9% in 2020 to 94.8% in 2021. Local government units received support from the Government Local Investment Fund during the COVID-19 pandemic. The aim of the program was to counteract the socio-economic effects of COVID-19, however, the distribution of funds indicates that this was not a priority when making the allocation. Most funds (PLN 3.1 billion) went to rural communes, urban-rural communes, cities with county rights and county received support at a comparable level (PLN 1.9-2.0 billion). The voivodeships did

not participate in the first tranche, they received from PLN 2 million (Lubusz Voivodeship) to PLN 120 million (Subcarpathian Voivodeship) under the first competition. Four voivodeships (Kuyavia-Pomeranian, Masovia, Greater Poland, West Pomerania) were omitted from the allocation of competition funds. Support from the RFIL could be used only for capital expenditure, while the estimated value of the investment financed or co-financed from these funds could not be lower than PLN 400,000. PLN (Malinowska-Misiąg 2022). Table 2 summarizes the best achievements for budget indicators of self-government voivodeships in individual years and their average value.

**Table 2: Budget indicators of self-government voivodeships in 2019-2021**

<i>Indicator name</i>	<b>Average value achieved (%)</b>			<b>Target indicator level (in %) - the best achievement</b>		
	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
<i>Share of current income in total income</i>	77,72	78,70	83,36	93,35 Masovia	95,50 Masovia	93,17 Opole
<i>Share of current transfers in current income</i>	45,89	49,88	44,54	10,05 Masovia	13,33 Masovia	12,97 Masovia
<i>Share of operating surplus in current income</i>	22,79	25,10	30,41	29,19 Masovia	35,30 Świętokrzyskie	37,71 Subcarpathian
<i>Share of capital expenditure in total expenditure</i>	38,92	36,96	35,76	63,72 Podlaskie	50,49 Podlaskie	46,43 West Pomerania
<i>Burden of current expenditures on wages and salary derivatives</i>	20,27	19,44	20,06	15,75 Masovia	14,78 Lesser Poland	15,61 Masovia
<i>Share of operating surplus and income from sale of assets in total income</i>	18,14	20,35	25,88	27,62 Masovia	28,30 Świętokrzyskie	32,20 Lower Silesian
<i>Self-financing ratio</i>	106,45	122,69	133,46	142,36 Silesian	189,36 Lower Silesian	170,62 Subcarpathian
<i>Development potential in relation to property expenditures and capital repayments</i>	113,67	128,76	159,42	145,87 Silesian	177,26 Opole	250,68 Subcarpathian
<i>Investment potential in relation to property expenditures</i>	115,81	132,45	167,03	159,37 Silesian	186,30 Opole	263,95 Opole
<i>Utilization of investment potential</i>	88,78	77,89	63,90	118,07 Lublin	95,89 Silesian	86,28 Warmian-Masurian

Source: own elaboration.



Budget indicators in the analyzed period showed different rates of change. Characteristic of the years 2019-2021 is the increase in current income in total income by 5.7% compared to the base year 2019, as well as the operating surplus (from 22.8% to 30.4%). Current transfers were characterized by escalation, which was influenced by subsidies from the state budget for operational tasks that required increasing due to the measures taken to counteract the crisis as a result of the COVID-19 pandemic. The increase in tasks in the operational part of the budget translated into a visible slowdown in investment activity in 2019-2020 from 38.9% to 35.8% of the share of capital expenditure in total expenditure. Self-government voivodeships were distinguished by high self-financing rates, development and investment potential, however, a downward trend can be observed in the case of using the investment potential.

**Table 3: Indicators per capita of self-government voivodeships in 2019-2021**

<i>Indicator name</i>	<b>Average value achieved (%)</b>			<b>Target indicator level (in %) - the best achievement</b>		
	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
<i>Current transfers per capita</i>	173,86	218,95	220,82	57,54 Masovia	82,66 Masovia	86,17 Masovia
<i>Operating surplus per capita</i>	88,27	110,19	150,94	167,13 Masovia	158,62 Świętokrzyskie	191,88 Subcarpathian
<i>Total liabilities per capita</i>	163,14	166,84	156,81	333,89 Lublin	328,86 Lublin	290,13 Lublin
<i>Development potential per capita</i>	251,24	279,01	337,87	548,61 Podlaskie	444,57 Podlaskie	505,41 Subcarpathian
<i>Investment potential per capita</i>	228,31	256,95	312,30	540,00 Podlaskie	437,44 Podlaskie	489,55 Subcarpathian
<i>Total income per capita</i>	502,80	560,60	599,40	749,80 Podlaskie	714,40 Podlaskie	728,00 Masovia
<i>Total expenditures per capita</i>	498,90	525,90	543,30	836,60 Podlaskie	731,80 Podlaskie	693,80 Masovia
<i>Property expenditures per capita</i>	203,70	197,30	196,10	533,00 Podlaskie	369,50 Podlaskie	305,90 West Pomerania

Source: own elaboration.

In 2019-2021, the arithmetic means of the surveyed indicators per hybrid were characterized by a constant progression, with the exception of the property expenditure per inhabitant, which decreased from PLN 203.7 per inhabitant to PLN 197.10 per inhabitant. The visible escalation of the operating surplus per capita (increase from PLN 88.27-150.94/capita) influenced the progression of both the development potential per capita (PLN 251.24-337.87/capita) and the investment potential per capita of local government voivodeships in Poland (PLN 238.31-312.30 per inhabitant). A downward trend can be observed in the case of total liabilities per capita from PLN 166.84/capita to PLN 156.81/capita. In 2019-2020, the leader in terms of income per capita, expenditure per capita, capital expenditure per capita, development and investment potential per capita was the Podlaskie Voivodeship. In 2021, the highest development and investment potential per capita was added to the Subcarpathian Voivodeship, while the highest total expenditures and per capita income were generated by the Masovian Voivodeship. The leader in 2021 in terms of capital expenditure per capita was the West Pomeranian

Voivodeship. In 2019-2021, the target level of current transfers per capita fell to the Masovian Voivodeship.

**Table 4: Ratios by debt titles of local government voivodeships in 2019-2021**

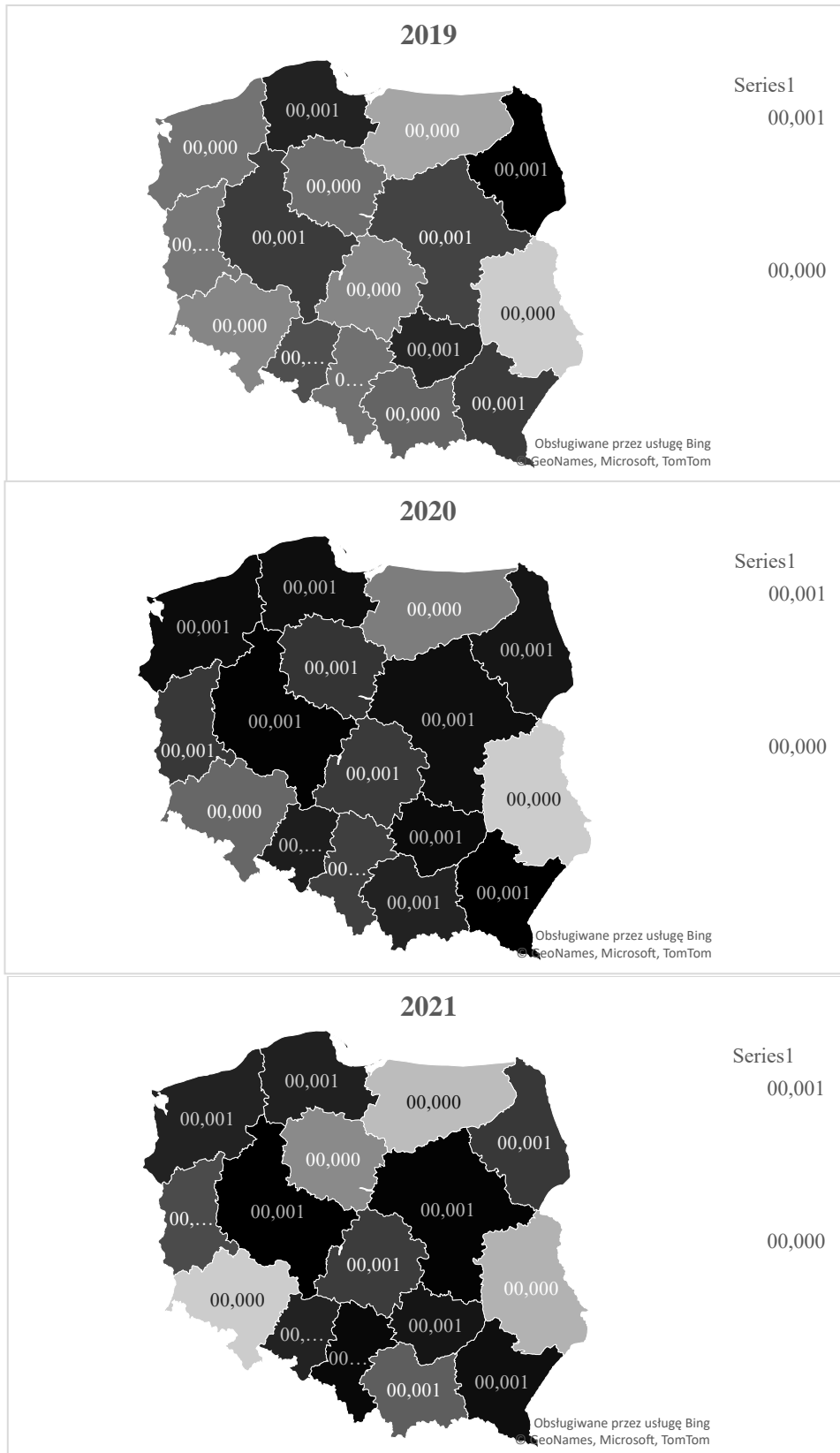
<i>Indicator name</i>	Average value achieved (%)			Target indicator level (in %) - the best achievement		
	2019	2020	2021	2019	2020	2021
<b>Share of total liabilities in total income</b>	31,41	30,18	25,95	17,95	12,67	9,73
				Opole	Opole	Opole
<b>Burden of total income on debt service</b>	5,50	4,64	4,59	1,51	1,50	1,69
				Podlaskie	Podlaskie	Podlaskie
<b>Burden of current income on debt service</b>	9,26	7,85	7,00	3,98	3,13	2,59
				Greater Poland	West Pomerania	Podlaskie

Source: own elaboration.

Debt ratios are summarized in Table 4. It should be noted that since 2016, a decrease in the debt level of local government voivodeships has been observed from 50.1% to 24.9% in 2021. The most indebted voivodeships in 2021 are Podlaskie and Lublin, and the least - Opole. The average share of total liabilities in the total income of self-government voivodeships was characterized by a regression from 31.41% to 25.95% in 2019-2021. The audited units did not show any problems with debt servicing either, because the debt servicing burden on total income decreased from 5.5% to 4.59%, while the debt servicing burden on current income decreased from 9.26% to 7%.

In 2021, for the first time, all self-government voivodeships ended the financial year with surpluses, due to the receipt of a subsidy from the state budget at the end of December 2021, supplementing the loss of income under the provisions of the Act on Local Government Income regarding the introduction of the "Polski Ład" program from 2022.

The differentiation of local government voivodeships in terms of financial condition in 2019-2021 as a result of the TOPSIS linear ordering measure, based on 21 indicators, allowed for the identification of patterns and anti-patterns in the rankings presented in Table 5. In 2019 and 2020, the last 16th place was held by the Lublin Voivodeship, and in 2021 by Lower Silesian Voivodeship. In turn, the model in terms of the best financial condition in each of the surveyed years was a different voivodeship - in 2019, Podlaskie, in 2020, Subcarpathian, and in 2021, Greater Poland.



**Figure 3. Synthetic TOPSIS value of self-government voivodeships in Poland in 2019-2021**

Source: own elaboration.

**Table 5: Ranking and classes of the financial condition of self-government voivodships in Poland - analysis of the synthetic TOPSIS measure**

Name of the local government unit	Pi1	Ranking 2019	Condition class	Pi2	Ranking 2020	Condition class	Pi3	Ranking 2021	Condition class
Lower Silesian	0,4076	13	3	0,4297	14	4	0,3162	16	4
Kuyavian-Pomeranian	0,4659	9	3	0,5970	10	3	0,4663	13	3
Lublin	0,2397	16	4	0,1033	16	4	0,3759	14	4
Lubusz	0,4425	12	3	0,5832	11	3	0,6066	11	3
Łódź	0,4069	14	3	0,5765	12	3	0,6406	10	2
Lesser Poland	0,4881	8	3	0,6546	9	2	0,5657	12	3
Masovia	0,5669	6	2	0,7196	5	2	0,7695	2	1
Opole	0,5378	7	2	0,6693	8	2	0,7010	7	2
Subcarpatian	0,5851	4	2	0,7641	1	2	0,7446	4	2
Podlaskie	0,7264	1	1	0,6976	7	2	0,6506	9	2
Pomerania	0,6442	2	1	0,7191	6	2	0,7045	6	2
Silesian	0,4560	10	3	0,5592	13	3	0,7587	3	2
Świętokrzyskie	0,6361	3	1	0,7326	3	2	0,7289	5	2
Warmian-Masurian	0,3338	15	4	0,3583	15	4	0,3518	15	4
Greater Poland	0,5846	5	2	0,7576	2	2	0,7769	1	1
West Pomerania	0,4513	11	3	0,7270	4	2	0,7005	8	2

Source: own elaboration.

The COVID-19 pandemic resulted in the fact that in 2020, none of the surveyed local government provinces ranked in the first class characterizing a high level of financial health according to the synthetic indicator calculated based on the TOPSIS multi-criteria linear ordering method. In 2020, 9 of the surveyed units were assigned to class 2 characterizing a medium level of financial condition. In 2020-2021, the same three voivodeships – Warmian-Masurian, Lublin and Lower Silesian - were placed in the fourth class - low level of financial condition according to TOPSIS. On the other hand, the benchmark in terms of the best financial condition in each of the years studied was a different province - Podlaskie in 2019, Subcarpatian in 2020 and Greater Poland in 2021.

## 5. Discussion

As Patrzalek & Gałeczka (2022) note, the first studies on the impact of the COVID-19 pandemic on the finances of local governments in Poland were published in the second half of 2020 (Bazyłak et al. 2020; Bober et al. 2020), as well as in 2021-2022 ( among others in the publications: Malinowska-Misiąg 2022; Swianiewicz et al. 2022), while the authors of these publications focused mainly on determining the scale and scope of changes in budget revenues and expenditures, the scale of debt and the financial result of the budget. Patrzalek & Gałeczka (2022) note that the loss in the income of local governments in Poland during the COVID-19 pandemic was estimated at nearly PLN 8-9 billion, and expenditure on counteracting the effects of the pandemic was defined as about

1-2% of current expenditure. Research was also conducted on the impact of the COVID-19 pandemic on local government finances in individual countries, including in the field of fiscal stability of local government units, analysis of the level of fiscal decentralization, income structure and its sensitivity to economic fluctuations, as well as the level of support from state authorities (Allain -Dupre et al. 2020; Chernick et al. 2021). In the face of the crisis, local governments should take action including finding new sources of financing or diversifying budget revenues and revenues (Shon & Kwak, 2019). Research on support from central authorities of local government authorities has shown that it did not reduce the effects of the pandemic related to losses in tax revenue (Mackiewicz et al. 2022; Ofiarska 2021). The COVID-19 crisis varies by region and government support. Bailey et al. (2020), emphasize that its impact on health and the economy is unevenly distributed geographically, sometimes even with greater differences within countries than between them. Interregional inequalities have been increasing in recent decades, with trends shifting from convergence to divergence (Bailey et al., 2020; Nocco 2005; Kemeny & Storper 2020; Ezcurra 2019; Rosés & Wolf 2019), and the pandemic could only exacerbate this problem. An analysis of the territorial economic impact of COVID-19 in EU regions (Conte et al, 2020) showed that both supply and demand shocks were felt symmetrically in all member states, but the reaction of these countries to the crisis was varied and asymmetric. As noted by McNeill & Asquith (2022), economies dependent on tourism or metropolitan economies were more exposed to the negative effects of the COVID-19 pandemic.

The purpose of this study was to assess the process of managing the finances of local government units on the example of self-governing voivodeships in Poland during the COVID-19 pandemic. This goal was achieved. 21 indicators were assessed, and using a synthetic indicator calculated on the basis of the TOPSIS method, it was confirmed that the COVID-19 pandemic resulted in a reduction in the financial condition classes of the surveyed entities. The conducted considerations and empirical research also made it possible to respond to the research questions posed: firstly, it was confirmed that the COVID-19 pandemic had an impact on the financial situation of local government voivodeships in Poland, especially the regression of the assessed measures was recorded in 2020, in which, as a result of temporary quarantine and isolation society and closing or limiting the activities of economic entities, the revenues to local government budgets and the necessary support of the central authorities were at risk; secondly, the self-government voivodeships in Poland with the best financial condition should be indicated as a model in 2019, Podlaskie, in 2020, Subcarpathian, and in 2021, Greater Poland. Local government voivodeships in 2019-2021 were characterized by a very high development and investment potential, as well as a self-financing ratio, they accumulated budget surpluses at the expense of the slowdown in investment activity visible in 2019-2020. Investments of local government voivodeships recorded the largest increase compared to the previous year of 2019 by 17.8%, in 2021 the growth rate was lower - it amounted to 6.5%. Compared to 2019, in 2020 investments decreased by 0.1%. In 2021, no voivodeship generated a budget deficit, during the COVID-19 pandemic these units used debt capital to a lesser extent. It can also be noticed that from 2016 to 2021 the share of liabilities in total income decreased almost twice (from 50.1% to 24.9%).

## 6. Conclusion

To sum up, considerations on the methods of assessing the financial condition of local government units are undertaken by many researchers (Rivenbark & Roenigk 2011; Cabaleiro-Casal, Buch-Gómez, & Vaamonde Liste 2012; Dziekański 2013,2014; Głowicka-Wołoszyn & Satoła 2018) and selection of appropriate indicators, as well as the area and type of territorial unit. The TOPSIS linear ordering method is often used in scientific research in multi-criteria evaluation (Shih, Shyur & Lee 2007). This method allows to organizing the research sample using an aggregated measure created on the basis of a prepared data matrix. Among others, Balcerzak (2020) assessed the quality of institutions in the European Union countries on the basis of entropy measures for objective weighting. On the other hand, at the local level, Dziekański (2013, 2020) uses a synthetic indicator in the process of evaluating the financial management of communes, and performed a multi-criteria analysis of the diversification of the financial situation of communes in the Świętokrzyskie Voivodeship in terms of their financial independence or countys (Dziekański 2014). An empirical assessment of the financial situation of communes in Spain was carried out by Bastida, Benito & Guillamón (2009), while communes in Poland were assessed by Bieniasz, Gołaś & Łuczak (2013). The use of the TOPSIS method also allowed for the determination of a synthetic indicator specifying the implementation of the sustainable development policy in Polish voivodeships in the years 2010-2014 (Roszkowska et al. 2017). The research conducted in this study in the field of multi-criteria analysis using the TOPSIS method of local government voivodeships in Poland shows that the COVID-19 pandemic affected the financial condition of the surveyed entities, especially 2020 brought a regression of budget indicators and caused that no voivodeships was ranked in the first best condition class and as many as 9 out of 16 in class 2. As a result of the research undertaken based on the benchmarking method and the ranking of the synthetic indicator calculated on the basis of the TOPSIS linear ordering method, it was possible to select the voivodeships with the best (in the individual years 2019-2021, respectively: Podlaskie, Greater Poland and Subcarpathian) and the worst financial condition (Warmian-Masurian, Lublin and Lower Silesian). The conducted pilot studies may be continued in further research periods, especially it seems reasonable to undertake research in a comparative system, before, during and after the COVID-19 pandemic. Such a research area would enable more detailed analyzes and correlations between individual indicators. An important factor for further research should also be the destabilization of economies as a result of the war in Ukraine and the escalation of inflation and their impact on the formation of financial condition classes not only in self-governing voivodeships, but also in other types of local government units in Poland and EU countries.

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