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FINANCIAL ECONOMY OF COMMUNES WITH A LARGE FOREST AREA – EXAMPLE OF RURAL COMMUNES OF THE PODLASKIE VOIVODESHIP

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ABSTRACT: The financial situation of rural municipalities in the Podlaskie voivodeship, which has large forest areas, was discussed. The problem that was undertaken was addressed based on mass statistical data from the Central Statistical Office (GUS), and analysis covers the years 2016-2019. The financial economy was assessed based on budget, per capita and debt liability indicators. Correlation analysis was conducted to determine relationships between indicators. Both incomes and expenses per capita are lower than the average for Polish rural communes. Significant differences in the values of other indicators are present between groups, which arises from, among other things, the policy conducted by local authorities—income from forestry tax supplements other income from natural persons' property taxation. The share of income from forestry tax is similar to the percentage of income from agricultural tax and even higher in certain municipalities.

KEYWORDS: budget indicators, forest tax, local budget, rural commune

Introduction

Under conditions of dynamic changes in the external environment, the local authority has special responsibility for the financial situation of a local government unit. Assessment of the financial economy, using the tools appropriate for such assessment, provides information on the current situation and allows for identifying developmental capabilities. The condition of a municipality's financial economy depends, above all, on its internal resources, which determine its income. Municipalities vary in the natural resources they hold and in commercial activity, which ultimately affects generating income. Income from taxes and fees are an essential source of a municipality's income. They are determined by legislation but are at the complete disposal of territorial self-government. This group of taxes includes the property tax. The relevant legislative acts regulate taxation on property components (real estate). The most important among them are: Act on agricultural tax (1984), Act on forestry tax (2002) and Act on local taxes and fees (1991).

Qualifying land as agricultural or forestry land in the land and buildings registry is the basis for taxation, and this tax revenue is an essential source of rural municipalities' income. The number of municipalities in Poland is currently 2477, and of these, 1523 are rural municipalities. They vary in terms of the forest area. Cities of the Lubuskie voivodeship are characterised by the most significant forest coverage (51.7%), and the national average of the forested surface area is 30.9% (CSO, 2020).

The topic of forestry tax is present in the subject literature (Potocki, 2016; Milewska, 2017; Dziuba & Życzkowska, 2021); however, not much attention is dedicated to the financial situation of municipalities disposing of this tax. It seems that the topic is significant, particularly in cities with rich forestry resources. In such a case, the economic potential of commercial activity in municipalities is largely determined by natural conditions. Assessment of the financial economy of rural cities in the Podlaskie voivodeship, where 31.8% of the area is forested, with differentiation from 15% to 88% depending on the municipality (Statistical Office in Bialystok, 2020), was adopted as the goal of research. There are four national parks on the grounds of the voivodeship, including the oldest in Poland, Białowieża National Park, which figures on the UNESCO Global Heritage List.

Forest tax in the commune finance

A municipality's financial autonomy is strictly associated with its right to receive its income and expend it freely. These rights constitute a necessary condition, although insufficient by itself, about autonomy in financial man-

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agement. Municipalities have limited tax authority. They can shape some aspects of taxes within the statutory scope afforded them. The factor deciding the degree of autonomy is an adaptation of the municipality's income to the expenses arising from the performance of its statutory tasks. The realisation of these tasks has a significant impact on the financial economy due to the nature of public services. The research results indicate no significant difference in the tax policy of rural municipalities in terms of the structure of taxes and instruments applied compared to the policies of other types of cities (Dziuba, 2019). Local authorities' activity in using tax policy stimulates the municipality's economic growth, which in consequence increases tax revenue, thereby enhancing the self-government's financial autonomy (Dziuba, 2016). Tax revenue is the most significant revenue stream in the municipality's income structure.

The forestry tax is a typical local tax. Forestry tax applies to the forests specified in the relevant act, except forests occupied for the performance of the non-forestry commercial activity. Since the introduction of the forestry tax (independently of changes in the law), it has been associated with a responsibility for the ownership or management of forests (Pater, 2018). Forestry tax is also employed in forest management policy. Many forest management instruments in the USA are associated with reducing the tax burden in exchange for caretaking and maintaining the forest in its natural condition (Schram et al., 2021).

The tax instrument of forest management for protecting habitat biodiversity is also applied in Japan. A forest-environmental tax has been introduced in many municipalities to protect forests and their environmental functions (Okada et al., 2007; Nakauyama et al., 2019). Research by Wakiyama et al. (2021) is a foundation for the formulation of financing schemes encompassing taxes and other donations by taxpayers to support sustainable services of the forest ecosystem. The environmental aspect of the forestry tax and other forest taxes is also raised in studies by other authors (Daigheault et al., 2020). All US states offer preferential taxation of forest real estate to support ecosystem services (Frey et al., 2019).

Forestry tax is the subject of discussion in a municipality's finances. On the one hand, it emphasises the need to link forestry tax to the rational use of forestry resources. On the other, the impact of tax policy concerning forests on local budgets (Lazhentsev et al., 2020). By applying the appropriate financial instruments, the administrator can influence the self-governing unit's financial situation (Filipiak, 2009). In general, tax policy has a minor influence on the significance of forestry tax in a municipality's structure of finances (Dziuba & Życzkowska, 2021). The results of other studies indicate that local tax policy is not always an effective tool for generating economic

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growth (Korolewska, 2014). The share of forestry tax in a municipality's total income is small, but it is of greater significance in the structure of its income.

Methodology

The undertaken problem was addressed based on mass statistical data from the Local Data Bank (Statistics Poland, 2021). The study covered 78 rural municipalities of the Podlaskie voivodeship. The research process covered two stages. In the first stage, the share of forestry tax in the income structure was calculated for all municipalities. Next (based on quartiles), four groups of municipalities with a varied share of forestry tax in municipality income were identified:

- group I – up to 0.421% (19 municipalities),
- group II – from 0.421% to 0.643% (19 municipalities),
- group III – from 0.643% to 1.343% (21 municipalities)
- and group IV – above 1.343% share of forestry tax in total income (19 municipalities).

In the second research stage, only municipalities with the highest percentage of forestry tax in the budget were considered (group IV). Next, these municipalities were divided into two subgroups, A and B. The division into two subgroups seems justified, as the share of forestry tax in income varies between municipalities (V = 59.02). Until now, research concerning the financial situation of municipalities included municipalities in which income from the forestry tax made up at least 4% of total income (accepted arbitrarily) (Milewska, 2017). Subgroups were distinguished based on the median value (2.57) in this research. 10 of the following municipalities were classified into subgroup A: Janów, Grodzisk, Zambrów, Dziadkowice, Narew, Zbójna, Nurzec-Stacja, Mielnik, Milejczyce, Sztabin.The share of forestry tax in the income of these municipalities ranged from 1.37% to 2.57%. municipalities were classified into subgroup B, where the share of forestry tax in total income ranged from 3.78 to 7.77%, and they are: Szudziałowo, Hajnówka, Nowinka, Dubicze Cerkiewne, Gródek, Narewka, Białowieża, Giby, Płaska. An assessment of the financial economy was conducted for both subgroups. Financial management is comprehensive, so the analysis was limited to selected aspects of economic evaluation, including budget indicators, per capita indicators and debt liability indicators. Evaluation of the financial economy was conducted concerning the years 2016-2019.

Results were compared to rural municipalities in the Podlaskie voivodeship or nationwide, depending on data availability.

Assessments were conducted based on the following indicators:

- budget indicators: share of current revenues in total income (%), the share of own income in total income (%), the share of operational surplus

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in total income (%), the share of capital expenditure in total expenses (%), self-financing indicator (operational surplus + capital gains/ total costs expressed as a %;
- per capita indicators: transfers per capita (PLN), operating surplus per capita (PLN);
- debt liability indicators: share of total liabilities in total income (%), encumbrance of total revenue with debt service expenses (%), the share of mature liabilities in total liabilities (%).

Correlation analysis was conducted to determine relationships between indicators. The matrix of correlation coefficients is given in Tables 3 and 4. Analysis of the financial situation of territorial self-government units differs from an enterprise's analysis, mainly due to the nature of the tasks with which self-government is entrusted. Territorial self-government units are appointed to satisfy the needs of the local community hence they are not profit-oriented. Differences also arise from different sources of financing and different approaches to the principles of financial management (Dylewski et al., 2004).

Results

A municipality's financial autonomy is strictly associated with its right to receive its income and expend it freely. The data given in Tables 1 and 2 indicates the high variation of the studied municipalities regarding their financial situation. The share of own income in total income (WB_2) speaks to financial autonomy. In group A, the average percentage of own income amounted to 34.91% with a range of variation from 20.2% to 75.9%, and in group B, this was 41.03%, with a range of variation from 24.5% to 65.7%. Indicator WB_2 was 33.67% on average during this period for rural municipalities of the Podlaskie voivodeship (Statistical Office in Bialystok, 2000). This indicates that the financial autonomy determined by this indicator is similar to the voivodeship's cities in the case of municipalities from group A. For group B, it is higher (by approx. 7.3%). Significant differences in the values of other indicators are present between groups.

Higher-income and a higher share of it in total income demonstrate greater autonomy of the self-government unit and independence from transfers from the state budget. Own income decides the number of funds allocated to local development. In the studied municipalities, the share of own income in total income (WB_2) was positively correlated with the operational surplus to total income (WB_3) and per capita ratios (WL_2), as well as with the capital expenditures to total expenses ratio (WB_4). A positive correlation was found between the mentioned indicators in group A: r = 0.4332, r = 0.3865, r = 0.6453 (Table 3) and group B: r = 0.5911, r = 0.5408, r = 6375 (Table 4).

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It is also worth paying attention to current income (WB_1), which makes up, on average, over 90%, where the range of variability is very high (0.7-100%).

Table 1. Descriptive statistics of budget indicators for debt liabilities and per capita – group A

Indicator*	Average	Median	Minimun	Maximum	Lower quartile	Upper quartile	Coefficient of variation V
WB1	91.97	95.10	0.70	100.00	90.65	99.05	17.08
WB2	34.91	29.80	20.20	75.90	26.60	41.20	37.64
WB3	9.70	8.55	1.40	25.30	6.00	12.40	55.53
WB4	15.07	12.25	2.10	43.50	9.20	20.50	61.19
WB7	128.81	109.20	28.60	474.40	82.80	149.10	62.84
WZ1	23.19	24.95	0.00	50.50	11.40	32.40	59.27
WZ3	4.68	3.40	0.00	36.90	2.25	4.75	122.92
WZ5	16.13	9.45	0.00	133.80	6.40	17.10	139.05
WL1	2818.97	2735.34	1687.19	4127.92	2458.86	3213.55	20.76
WL2	475.51	394.12	73.81	1357.92	258.74	541.12	66.73

*WB1-share of current income in total income (%); WB2 – share of own income in total income (%); WB3 – share of the operating surplus in total income (%); WB4 – share of property expenditure in total expenditure (%); WB7 – self-financing ratio (operating surplus + property income / total cost) (%); WZ1 – share of total liabilities in total income (%); WZ3 – burdening total revenues with debt servicing expenses (%); WZ5 – burdening own gains with debt servicing expenses (%); WL1 – current transfers per capita (PLN); WL2 – operating surplus per capita (PLN)

Source: author's work based on (Ministerstwo Finansów, 2020).

Table 2. Descriptive statistics of budget indicators for debt liabilities and per capita – group B

Indicator*	Average	Median	Minimun	Maximum	Lower quartile	Upper quartile	Coefficient of variation V
WB1	90.92	95.70	8.70	100.00	88.00	99.25	17.38
WB2	41.03	38.65	24.50	65.70	32.85	47.65	29.17
WB3	7.71	7.35	-2.60	21.60	4.10	9.95	68.70
WB4	13.24	12.10	2.20	31.70	6.70	16.55	59.74
WB7	125.61	96.45	-0.90	394.50	69.85	159.50	70.71
WZ1	34.79	33.20	8.30	76.00	25.85	41.60	42.79
WZ3	4.14	4.15	0.00	8.50	3.40	4.95	42.45
WZ5	11.01	9.00	0.00	24.40	7.15	15.50	53.33
WL1	2456.21	2503.94	1819.54	3046.82	2177.92	2702.22	13.08
WL2	356.84	315.92	-121.85	1247.00	191.67	411.38	72.94

* as in table 1

Source: author's work based on (Ministerstwo Finansów, 2020).

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According to the act on public finance, current income should cover current expenses. In the studied municipalities, this principle was fulfilled, as shown by the positive result between these two values, called the operational surplus. Only in Szudziałowo municipality did a current deficit (WB_3 = -2.6) occur in 2019. Operating surplus reflects the degree of a given unit's financial autonomy and investment capacities. Operating surplus is frequently referred to as the most synthetic indicator of a municipality's financial situation. It informs how many funds remain available after expenses related to current operations are covered. The presence of an operational surplus increases capabilities when it comes to implementing investment projects serving the municipality's development. In assessing a self-government unit's financial situation, the share of operating surplus in total income is significant. This indicator reflects the degree of a given unit's financial autonomy and investment capacities. The average value of the WB_3 index in the analysed communes was 7.71%, which was less than in other rural communes of the Podlaskie Voivodeship (9.97%).

Capabilities of executing investments would have to be analysed through the lens of another indicator, namely the self-financing indicator (WB_7), as the construction of this indicator accounts for capital gains in addition to the operational surplus (Ministerstwo Finansów, 2020). A significant positive dependency was determined between the self-financing indicator and operational overload per capita (r = 0.6056 and r = 0.3882). A negative correlation was found between the self-financing hand and the share of capital expenditures in total expenses (r = -0.5346 and r = -0.4599). The data presented shows that the calculated indicators have an informational (theoretical) value, and self-governments decide on the actual purpose of funds – many factors condition investment.

Only a few municipalities possess capabilities of financing development with their equity, and in most cases, development projects require external funding. The share of capital expenditures in total expenses (WB_4) indicates that municipalities mainly finance tasks related to current operations and leave few resources for the execution of investments. This indicator was lower than in other rural communes of the Podlaskie voivodship (18.52%) in the analysed communes. On the national scale, the share of investment expenditures from 2016-2019 amounted to 15% in rural municipalities (Ministerstwo Finansów, 2020). This indicator was higher in only 8 of the studied municipalities during this time. In municipalities of group B, a negative correlation also occurred between capital expenditures and the encumbrance of own income with debt service (r = -0.3968). The average share of total liabilities amounted to 34.79% (group A – 23.19%) with a range of variation of 8.30-76%. Municipalities with the highest income and highest share of capital expenditures in total expenses were the most indebted. One could

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suppose that, in this case, investment processes were more advanced than in other municipalities where indebtedness was substantially lower.

Table 3. Matrix of correlation coefficients between the studied indicators – group A

Indicator	WB1	WB2	WB3	WB4	WB7	WZ1	WZ3	WZ5	WL1	WL2
WB1	1.0000									
WB2	-0.0940	1.0000								
WB3	0.0352	0.4332**	1.0000							
WB4	-0.0740	0.3865*	0.5093**	1.0000						
WB7	0.0847	-0.2123	0.0387	-0.5346**	1.0000					
WZ1	0.1119	0.0029	0.1474	0.2321	-0.0872	1.0000				
WZ3	-0.6575	-0.1687	0.06493	0.0884	0.1152	0.2265	1.0000			
WZ5	-0.0501	-0.3334*	-0.0305	0.0308	0.1525	0.2359	0.9761***	1.0000		
WL1	-0.0334	-0.4575**	-0.2352	-0.1724	0.3571*	0.2170	0.2873	0.3719*	1.000	
WL2	-0.0117	0.6453**	0.8896***	0.6056**	0.0304	0.2405	0.1048	-0.0139	-0.2379	1.000

correlation coefficients are significant p<0,05; * low dependence, ** moderate dependence, *** high dependence
Source: author's work based on (Ministerstwo Finansów, 2020).

Table 4. Matrix of correlation coefficients between the studied indicators – group B

Indicator	WB1	WB2	WB3	WB4	WB7	WZ1	WZ3	WZ5	WL1	WL2
WB1	1.0000									
WB2	0.0067	1.0000								
WB3	0.1718	0.5911**	1.0000							
WB4	-0.3001	0.5408**	0.3078*	1.0000						
WB7	0.1290	0.1202	0.2206	-04599**	1.0000					
WZ1	0.2059	-0.2107	0.2451	-0.1773	0.6998	1.0000				
WZ3	-0.0419	-0.0138	0.0027	-0.1590	0.1405	-0.0279	1.0000			
WZ5	-0.0487	-0.5566**	-0.2961	-0.3968*	0.0386	0.0403	0.8244***	1.0000		
WL1	0.0363	-0.3045	-0.5145**	-0.1454	0.0515	0.3169	-0.2658	-0.1291	1.0000	
WL2	0.1051	0.6375**	0.8996***	0.3882*	0.2656	0.0285	0.0228	-0.2956	-0.5198**	1.0000

correlation coefficients are significant p<0,05; * low dependence, ** moderate dependence, *** high dependence
Source: author's work based on (Ministerstwo Finansów, 2020).

Analysing the financial situation of the studied municipalities, it is worth noting their position on the background of rural municipalities in the country. Indicators informing of municipalities' financial autonomy are exciting.

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From this point of view, it should be noted that indicator WB_2 was at a similar level in group A. In contrast, in group B, it was 10% higher, while the self-financing indicator (WB_7) in both groups was half that of rural municipalities nationwide (Ministerstwo Finansów, 2020).

Relating to the issue of forestry tax, it is worth noting the role of this tax in own income. While the share of forestry tax in a municipality's total income is small, it is of greater significance in the structure of its income (Zaborek & Czarnecki, 2018). The share of forestry tax in the total income of the studied municipalities ranged from 1.37% to 7.77%, and the percentage in own income was 2.53-19.79%. Of course, this all depends on the level of income from other sources, and relative values do not fully explain the role of this tax in income. Nevertheless, it is worthy of attention that, in the case of many municipalities, the share of income from forestry tax is similar to the percentage of income from agricultural tax and even higher in certain municipalities (tab. 5). In municipalities with an agricultural-forestry profile, both types of taxes are a substantial source of own income. On the national scale, the share of the forestry tax in the structure of municipalities' income (excluding cities under powiat rights) amounted to 0.58% during the years 2016-2019, and in the case of municipalities in the Podlaskie voivodeship, 1.64% (Statistics Poland, 2020). This value was much higher in the studied municipalities.

Table 5. Share of forestry tax and agricultural tax in the income of the studied communes

Commune	The share of forest tax in total income (%)	The share of forest tax in own income (%)	The share of agricultural tax in own income (%)
Group A			
Dziadkowice	1.46	5.33	18.73
Grodzisk	1.41	4,89	25.28
Janów	1.37	4.67	12.60
Mielnik	1.96	2.53	0.51
Milejczyce	2.45	7.90	10.35
Narew	1.57	3.10	5.65
Nurzec-Stacja	1.90	7.17	6.45
Sztabin	2.57	10.19	8.84
Zambrów	1.43	2.75	5.75
Zbójna	1.58	7.35	0.93
Group B			
Białowieża	5.17	7.89	4.38
Dubicze Cerkiewne	3.82	7.27	6.08

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Commune	The share of forest tax in total income (%)	The share of forest tax in own income (%)	The share of agricultural tax in own income (%)
Giby	6.63	15.30	2.98
Gródek	4.06	9.03	3.02
Hajnówka	3.78	7.32	9.25
Narewka	4.48	6.63	1.66
Nowinka	3.79	10.82	4,97
Płaska	7.77	19.79	0.59
Szudziałowo	3.78	6.94	10.98

Source: author's work based on (Poland, 2020).

Conclusions

The financial situation of the studied municipalities indicates their varied economic potential. It is the result of natural, economic and social conditions. Both incomes and expenses per capita are lower than the average for Polish rural municipalities. There are also significant differences between the values of other indicators, which arises from, among other things, the policy conducted by local authorities. Income from forestry tax supplements other income from natural persons' property (agricultural tax, real estate tax). The value of forestry tax and its share in the structure of total income is determined by a municipality's forestation level. The municipality council has a voice on this issue, as it has tax authority and may apply reduced tax rates.

In most municipalities, forestry tax is of no greater significance in local budgets however there are municipalities for which this is a non-trivial source of income. Therefore, it is worth paying attention to this source of own income, particularly in highly forested municipalities.

This article is meant to stimulate discussion about forests not only through the lens of their economic and environmental functions but also in the context of local budgets. The perception of forests as a common good is changing, e.g. a forestry-environmental tax has been introduced in Japan to protect the forest environment. Society has started to consider the forest as common property and recognises its responsibility for its use, with full awareness of the need to incur costs. In the opinion of Bush and Mukherjee (2018), forests and the costs associated with them should be treated as an investment in future income to the budget. And forests should be viewed from this perspective.

In this context, one could ask whether similar solutions could be implemented in Poland? A broad social discussion should precede the answer to

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this question. Above all, one should take a look at current divisions of competencies. Forest tax is a municipality's income intended for allocation for the performance of public tasks assigned to the municipality by law. However, the institution called "State Forests" is responsible for managing forests and the forest economy, including the preservation of natural and cultural assets. It does not seem that anything is likely to change in this regard. Perhaps the starting point in this situation should be a discussion about public participation in financing the most valuable natural resources, which forests undoubtedly are, and how this would affect the budgets of municipalities.

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