MANAGEMENT OF TECHNICAL INFRASTRUCTURE DEVELOPMENT AT COMMUNES IN THE MAŁOPOLSKIE PROVINCE IN TERMS OF SOURCES OF FINANCING

Michał CHWASTEK[1], Elżbieta BADACH[2*], Jacek STROJNY[3]

[1] Uniwersytet Rolniczy w Krakowie, Katedra Statystyki i Polityki Społecznej;
michal.chwastek@student.urk.edu.pl
[2] Uniwersytet Rolniczy w Krakowie, Katedra Statystyki i Polityki Społecznej; rrbadach@cyfronet.pl,
ORCID: 0000-0002-5355-0810
[3] Uniwersytet Rolniczy w Krakowie, Katedra Statystyki i Polityki Społecznej; rrstrojny@cyfronet.pl,
ORCID: 0000-0003-4632-8645
* Correspondence author

Purpose: The purpose of the study was to identify the relation between the level of selected financial indicators and changes in ownership of selected elements of technical infrastructure at rural communes in the Małopolskie province.

Design/methodology/approach: The study was based on the data obtained from resources of Statistics Poland and the financial statements of local self-government institutions. Each of the 121 rural communes in the province was characterised with four indicators regarding their financial management. Subsequently, communes were classified using Ward's method into five groups with a uniform set of identified features. Next, each cluster was subject to detailed analysis in terms of changes in ownership of selected elements of technical infrastructure with a concurrent review of financing sources of such changes typical for a given group. Certain patterns of financial management focused on technical infrastructure improvement in a given commune were thus identified.

Findings: The study presents the status of selected network infrastructure as well as components and structure of income of rural communes in the Małopolskie province. On the one hand, communes with the highest population density have the largest economic potential, but on the other, they have significant requirements with regard to technical infrastructure. An important driver for technical infrastructure development are aid funds, including EU funds. Communes with a comparable potential may follow different strategies with regard to investment and financing of deficit. The status of infrastructure and financial standing of a commune are shaped in multi-annual process.

Research limitations/implications: The analysis was performed for the entire population. A more detailed approach would require information on the criteria for selection of the type and scope of investment projects. It would also be appropriate to analyse the financial and economic effectiveness of individual projects.

Practical implications: The contents of the analysis and conclusions will be useful for persons responsible for management at commune level. Identification of the impact of individual factors on the development of technical infrastructure will enable a more conscious and responsible

commune management. This material will surely be found useful by groups focused on local growth planning and management, including distribution of aid funds.

Social implications: The article will have a positive impact on local development, because it will contribute to more reasonable commune management. The awareness of the existing mechanism will also enhance the professionalism of local consultative groups, which represent the community during public consultations regarding planned actions of the local self-government authorities.

Originality/value: The diagnosis of the conditions for infrastructure development in terms of finances of communes is a valuable source of expertise for management personnel.

Keywords: Local development, technical infrastructure, income of communes.

Category of the paper: research paper.

1. Introduction

Technical infrastructure plays a vital role in stimulating social and economic development at the regional, county, and communal level. It is all the more important particularly in remote areas not only because of the development of the agricultural sector, but most of all due to establishment and support of other forms of business and enabling so-called multi-functional development of rural areas (Kocur-Bera, 2011, p. 21).

The Małopolskie province is a region showing significant diversity, not only in terms of landscape, but also economic conditions. The policy of sustainable development requires supporting the development of areas with a weaker economic standing. These include rural communes of the province. They cover a significant part of the province, i.e. 9879 km^2, which represents 65.4% of the total area of the province. According to Statistics Poland data from 2017, rural communes are inhabited by 1 218 260 people.

Those communes are highly polarised in terms of technical infrastructure development. One of the key drivers for its condition and growth is income. Rural communes are also characterised by significant differences in the level of income, in particular of its individual components and its structure. The purpose of the study was to identify the relation between the level of selected financial indicators and changes in ownership of selected elements of technical infrastructure at rural communes in the Małopolskie province.

The scope of tasks of a commune is defined mostly by the Act on Municipal Self-Governments. The implemented tasks require relevant sources of financing. The most important factors determining the scope and effectiveness of tasks pursued by a local self-government are financial conditions. (Sierak, 2011, p. 75). These are specified in the Act on Income of Local Self-Government Institutions. The key groups of income specified in the act are: own income, subsidies, special-purpose grants from the State budget. Income may be provided by non-refundable funds from foreign sources, funds from the budget of the European Union and other funds specified in other regulations (Act on Income of Local Self-Government Institutions,

2018). A particularly important type of income of a commune is own income. These include income from taxes collected by the commune, of which the most important are: agricultural tax, forest tax, vehicle tax, tax on civil law transactions, and tax in the form of a tax card, mining fees and interest in personal income tax and corporate income tax. Own income of communes is very diverse, which is mostly related to their economic potential. The key factor determining the level of income is the economic activity of residents (Hok, 2017, p. 116). It is closely related to the geographical location with respect to large urban centres and major communication routes.

2. Methodology

The study covered 121 rural communes in the are of the Małopolskie province. For each commune five variables were identified, four of which presented financial management at the communes: own income per capita, capital expenditure per capita, property income other than sale of property per capita, and real debt per capita registered as resident of the commune. The firth variable included in the analysis was the average population density, which in previous studies carried out by the authors was identified as a significant factor differentiating communes in their ownership of technical infrastructure. Economic indicators used in the analysis include selected own income of communes: property tax, vehicle tax, income from property, interest in personal income tax, interest in corporate income tax, external funds, including from EU funds, earmarked for the financing of investments in fixed assets. The analysis also drew on the data regarding the amounts of subsidies, debt and cumulative budget performance. The diagnostic variables were selected in line with the relevant recommendations, which specify that the variables should be: universal, measurable, available, of proper quality, interpretable and clear in terms of their interaction (Zeliaś, 2000). The analysis was carried out using Ward's method from the group of cluster analysis methods. The study is based on data sourced from the resources of the Local Data Bank of Statistics Poland and Rb-NDS, Rb-Z statements of self-government units and consolidated balance sheets of local government institutions, with data for 2017, while in the supplementary analyses and in the discussion of results 2010-2017 and 2019 data was used. The variables described above were the starting point for cluster analysis, which was designed to identify groups of communes with similar selected features. Subsequently, the analysis covered (within each of the selected uniform groups) the relation between the financial status of the communes and changes in ownership of technical infrastructure.

Table 1.
Shows key features of the variables used

Variables	Minimum	Maximum	Arithmetic average	Standard deviation	Coefficient of variation
Own income per capita	481,2545	2728,152	1003,98	366,14	0,36
Capital expenditure per capita	260,7338	1527,013	579,66	205,24	0,35
Property income other than sale of property per capita	57,56653	730,075	255,74	138,18	0,54
Real debt per capita	-1130,55	3355,051	662,68	604,81	0,91
Average population density	24	457	135,17	64,47	0,48

Source: own calculations.

The key concept of clustering is to separate objects to a certain number of subsets (whether pre-determined or not) in such a way that objects in the same subset are similar to each other and are dissimilar to those in other groups. Such clustering can tell a lot about the structure of the population (Stanisz, 2007, p. 114). It enables discovering certain regularities regarding the features of the analysed objects, makes it possible to reduce a large set of data to averages from individual groups and characterise those groups with descriptive statistics. Separation of objects into clusters may also be treated as a preliminary step to further multi-dimensional analyses.

In Ward's analysis used in this study, the variance analysis approach is used to estimate the distance between clusters, i.e. divisions are made along the minimum of within-cluster sum of squared variance (Grabiński, 1992). In this method, at each stage, from all possible combinations of cluster pairs such pair is selected, which, after the combination, results in a cluster with a minimum variance. This method is considered as the most effective, although it leads to creation of small clusters (Stanisz, 2007, p. 122).

The set of variables describing the clustered objects should not include strongly correlated variables which carry similar information, because this may distort the structure of clusters (Malina, Zeliaś. 1997). Table 2 presents the level of correlation of variables.

Table 2.
Pearson correlation coefficients for selected variables

Specification	Own income per capita	Capital expenditure per capita	Property income other than sale of property per capita	Real debt per capita	Average population density
Own income per capita	1	0,230112	0,003555	0,129021	0,44872
Capital expenditure per capita		1	0,775167	0,197216	-0,13323
Property income other than sale of property per capita			1	0,239358	-0,4009
Real debt per capita				1	-0,00604
Average population density					1

Source: own calculations.

Due to strong correlation of investment expenditures and property income per capita in the analysed communes, ultimately for the purpose of clustering only four variables were used, disregarding property income.

To bring variables with significant differences in amounts to one scale, they were unified in accordance with the following formula:

$$z_{ij} = \frac{x_{ij}}{\max_j x_{ij} - \min_j x_{ij}} \quad i = 1,...,5 \quad j = 1,...121 \tag{1}$$

Such restated variables served as a starting point for cluster analysis carried out using Statistica13.1 software.

3. Results and discussion

As a result of clustering, five clusters of communes with a similar set of analysed features were identified. Table 3 shows the number of communes in clusters and average values of the variables in individual clusters. The identified clusters were then subject to detailed analysis focused on the one hand on indicators showing the quality of financial management in individual commune groups, and on the other on the ownership of selected elements of technical infrastructure.

Table 3.
Average values of selected features in clusters

Cluster	Number of communes	Own income per capita	Capital expenditure per capita	Property income other than sale of property per capita	Real debt per capita	Average population density
1	53	962	514	210	893	146
2	42	802	520	241	229	112
3	12	1 133	871	429	461	66
4	10	1 813	694	215	694	280
5	4	1 277	916	602	2 697	84

Source: own calculations.

Table 4. presents the list of communes included in individual clusters. Strong infrastructure improves the living comfort of residents and encourages them to make investments and conduct economic activity within a well-equipped commune (Krakowiak-Bal, 2007, p. 107). Next to the power grid, the most important element is the water supply system. As can be seen in Table 5, the highest percentage of residents using water supply network is in communes from group 4. This group also has the longest network per 100 km^2. This indicator is at least two times higher for this group than for any other. In all groups, the percentage of residents connected to the water supply system is on average higher than 55%. In recent years, in most

groups the proportion of residents using water supply system grew by some 10 percentage points. The largest increase in the length of the system can be observed in group 5, with more than 31 km/100 km^2. This group, before system extension, had the lowest percentage of residents connected to the water supply system.

Table 4.
List of communes included in individual clusters

Cluster	Name of the commune		
1	Babice	Kłaj	Radgoszcz
	Biały Dunajec	Krościenko n. Dunajcem	Radziemice
	Biskupice	Laskowa	Ropa
	Bochnia	Limanowa	Rzezawa
	Brzeźnica	Lisia Góra	Skrzyszów
	Czarny Dunajec	Łącko	Spytkowice (1211132)
	Czernichów	Łużna	Spytkowice (1218062)
	Dębno	Michałowice	Stryszawa
	Dobra	Mucharz	Stryszów
	Drwinia	Nowy Targ	Szaflary
	Gdów	Osiek	Tomice
	Gnojnik	Pcim	Trzciana
	Gorlice	Pleśna	Tymbark
	Gródek n. Dunajcem	Podegrodzie	Wieprz
	Iwanowice	Polanka Wielka	Wierzchosławice
	Iwkowa	Poronin	Zawoja
	Kamionka Wielka	Raba Wyżna	Żegocina
	Klucze	Raciechowice	
2	Bolesław (1204012)	Korzenna	Niedźwiedź
	Budzów	Kozłów	Olesno
	Bystra-Sidzina	Lanckorona	Przeciszów
	Charsznica	Lipinki	Rytro
	Czorsztyn	Lipnica Murowana	Rzepiennik Strzyżewski
	Gręboszów	Lipnica Wielka	Słaboszów
	Gromnik	Lubień	Słopnice
	Grybów	Łabowa	Sułoszowa
	Igołomia-Wawrzeńczyce	Łososina Dolna	Szerzyny
	Jerzmanowice-Przeginia	Łukowica	Tokarnia
	Jordanów	Mędrzechów	Trzyciąż
	Kamienica	Moszczenica	Wietrzychowice
	Kocmyrzów-Luborzyca	Mszana Dolna	Wiśniowa
	Koniusza	Nawojowa	Zembrzyce
3	Bukowina Tatrzańska	Kościelisko	Pałecznica
	Gołcza	Książ Wielki	Racławice
	Jabłonka	Łapsze Niżne	Sękowa
	Koszyce	Ochotnica Dolna	Szczurowa
4	Bolesław (1212032)	Oświęcim	Zabierzów
	Chełmiec	Siepraw	Zielonki
	Liszki	Tarnów	
	Mogilany	Wielka Wieś	
5	Borzęcin	Łapanów	Jodłownik
	Uście Gorlickie		

Source: own elaboration.

Table 5.
Features of water supply infrastructure by group

Number of cluster	Percentage of residents connected to water supply system	Length of water supply system per 100 km^2	Increase in percentage of residents connected to water supply system in 2010-2017	Increase in length of water supply system per 100 km^2 in 2010-2017
	%	km	%	km
1	66,38	125,79	11,56	22,08
2	57,87	101,04	10,30	15,33
3	63,89	73,17	10,10	9,73
4	90,90	275,87	8,50	30,81
5	55,25	112,73	12,88	31,88

Source: own elaboration.

The sewer system is most developed in communes from group 4, significantly exceeding the indicators of the remaining groups. Its length per 100 km^2 is similar to the length of water supply system. In the remaining communes, with three to four times shorter length per 100 km^2, the percentage of residents using the sewer system is nearly two times lower. The group 5 data is interesting. With a very short length of the system per 100 km^2, the group shows a relatively high percentage of residents connected to the sewer system. This is most likely attributable to the nature of development in those communes. Compact development in part of the commune facilitates a very efficient layout of the sewer system.

Table 6.
Sewage infrastructure characteristics by group

Number of cluster	Percentage of residents connected to sewage system	Length of sewage system per 100 km^2	Increase in percentage of residents connected to sewage system in 2010-2017	Increase in length of sewage system per 100 km^2 in 2010-2017
	%	km	%	km
1	36,24	79,91	13,91	30,40
2	31,65	63,45	15,17	31,21
3	43,98	53,55	12,19	18,02
4	56,55	243,12	21,70	90,42
5	20,23	19,18	2,60	4,93

Source: own elaboration.

Table 7 presents data regarding the gas system. As in the previous cases, group 4 communes have the most developed gas network. Group 3 clearly stands out in that category, where on average the number of residents using the system is the lowest. In recent years, the increase in that group was also the lowest.

Table 7.
Gas infrastructure characteristics by group

Number of cluster	Percentage of residents connected to gas system	Length of gas system per 100 km^2	Increase in percentage of residents connected to gas system in 2010-2017	Increase in length of gas system per 100 km^2 in 2010-2017
	%	km	%	km
1	48,78	141,66	1,02	14,93
2	42,31	117,62	1,55	5,54
3	9,36	14,16	0,44	1,13
4	76,44	301,92	4,54	52,15
5	43,88	137,25	0,75	11,38

Source: own elaboration.

Further in this article an analysis of financial conditions in communes will be presented, in particular their own income, including tax income, and external financing, subsidies and sources of funds covering the budget deficit. To secure funds for the functioning of communes, irrespectively of their economic potential, they are subject to an income equalisation scheme (Kowalczyk et al., 2013, p. 475). Wealthy communes with high tax income are obliged to transfer funds to poorer communes. The funds are provided in the form of subsidies. The basis for calculation of amounts due is the average tax income of each commune, marked as Gg, while the average income in the country, marked as G, is used as a reference for the calculation of the amount of subsidies. Other indicators are less important in the calculation of part of the subsidies, the most significant of which is population density. Table 8 presents the amount of tax income of rural communes in the Małopolskie province in comparison to the average income in the country and the province.

Table 8.
G indicator for rural communes in Małopolskie province in 2019

Specification	G indicator* for 2019 PLN/capita	Number of communes in group
G indicator for country	1 790,33	2478
Average G for communes in Małopolskie province	1 162,98	182
Average G for rural communes in Małopolskie province	1 014,63	121
G indicator range		
Gg** > 150%G	2 807,02	1
100%Gg < G ≤ 150%Gg	2 196,49	5
92%Gg < G ≤ 100%Gg	1 738,62	2
75%Gg <G ≤ 92%Gg	1 533,69	5
40%Gg <G ≤ 75%Gg	985,18	85
Gg ≤ 40% G	608,78	22

Source: own calculation based on https://www.gov.pl/web/finanse/wskaźniki-dochodow-podatkowych-dla, 1.05.2019.

Data in Table 8 clearly shows significant differences in tax income of communes. Only six communes have Gg income of more than 100% of G, i.e. the national average. A vast majority, as many as 85 out of 121 communes, are communes whose tax income per capita falls within the range of 40-75% of G. The group of communes with the lowest income (Gg below 40%) is

quite numerous and includes 22 communes. The equalisation subsidy scheme is applied so that communes with very diverse economic potential could have access to similar funds per capita. Failure to implement such a measure would cause a very dangerous trend. Residents of less urbanised areas would move to wealthier communes with higher potential. Naturally, such situations do occur, but they are mitigated by the subsidy system and other mechanisms as part of local development policy. In reality, subsidies can also have an adverse effect – communes limit their efforts to increase own income, for example by not taking up growth-oriented initiatives, knowing that higher own income would reduce the subsidy. Table 9 presents tax income and subsidies received in groups under review.

Table 9.

Average tax income and subsidies in 2017 by group

Number of cluster	Own tax income	General subsidy, net of education portion	Total income and subsidies	Change in subsidies in 2017-2010
		[PLN/capita]		
1	891	511	1 401	32
2	688	691	1 379	71
3	864	635	1 499	40
4	1 771	82	1 853	-27
5	875	603	1 478	-67

Source: own elaboration.

Most communes, apart from several communes with the highest income of more than 100% of G, have similar income per capita, which results from, among other things, the operation of the subsidy scheme. Group 4 stands out from all the others. The group comprises 10 wealthy communes, i.e. five communes located around Kraków: Liszki, Wielka Wieś, Zabierzów, Zielonki, Siepraw. Next ones are located next to large cities: Chełmiec near Nowy Sącz, Oświęcim-rural commune, Tarnów-rural commune, Bolesław – Olkusz county, located next to Olkusz, which has mines within its limits. The issue of the amount of own income and subsidy scheme is not always understood properly by both decision-makers and publicists. There are numerous publications evaluating the quality of management at communes, where one of the basic criteria is the amount of tax income. This criterion is appropriate, but for comparing the potential of communes. However, it does not tell much about the quality of management. The subsidy scheme itself assumes that communes have different characteristics, and thus they present a different level of competitiveness. The quality of management should be measured in different categories. As can be seen based on calculations, with subsidies taken into account most communes have similar funds per capita, but they still show significant differences.

In the analysis of the average income within individual clusters, it can be noticed that group 4 significantly stands out from the others. These are communes neighbouring Kraków and other large cities. They had the highest income per capita already in 2010. Compared to other groups, the average income in these communes was nearly two times higher. In 2010-2017, income in all groups grew considerably. A comparable increase in income was recorded in group 4 and 5. The higher income in communes from group 5 is caused by

an increase in subsidy income, while in communes from group 4 it resulted from higher tax income. As can be seen, the largest item of income was tax income, accounting for 63-78% percent of the total. Many local self-governments seek to rise tax income, so that in the future they will not have to be too dependent on subsidies.

Table 10.
Average income in communes by group

Number of cluster	Own income in 2010	Own income in 2017	Change in own income in 2010-2017	Own tax income in 2017	share of tax income in own income [%]
	[PLN/capita]				%
1	703	1 162	459	891	76,63
2	621	926	305	688	74,34
3	852	1 228	376	864	70,38
4	1 465	2 261	796	1 771	78,34
5	700	1 377	677	875	63,53

Source: own elaboration.

Table 11 presents the amount of property tax, vehicle tax and income from property. Property tax is the most important and most efficient source of income generated locally (Czempas, 2009, p. 22). The property tax is the indicator of economic growth of a commune. It is mainly related to construction of buildings and economic activity. It must be noted that tax rates for buildings and land used in economic activity are many times higher than for property used for residential purposes.

Table 11.
Average income from property tax, vehicle tax and property income by group

Number of cluster	Property tax [PLN/capita]			Vehicle tax [PLN/capita]			Income from property [PLN/capita]		
	2010 r.	2017 r.	Change [%]	2010 r.	2017 r.	Change [%]	2010 r.	2017 r.	Change [%]
1	152	232	52,94	18	24	34,81	37	33	-11,80
2	98	155	58,79	21	30	42,76	27	34	26,25
3	156	290	86,57	16	23	41,97	58	57	-0,38
4	309	487	57,51	19	22	14,56	78	139	79,01
5	159	263	65,68	17	34	94,64	73	118	62,29

Source: own elaboration.

The amount of property tax income is closely related to population density and location of a commune. The highest population density of approximately 280 residents per km^2 is recorded in communes from group 4. Income from vehicle tax relates to ownership of trucks, trailers, semi-trailers and buses by entities registered in the communes. Very often, those entities operate within the commune, where they have their registered office. However, it is often the case that high income from vehicle tax results from the fact that the registered office of a transport company whose business consists in national and international shipping is located in a given commune. It is likely that the increase in income in communes from group 5 was caused by establishment of an entity or entities with a large number of vehicles used for the provision of transport services. In the area of vehicle tax, communes compete with each other by offering

attractive tax rates. Large transport companies with a large number of vehicles are willing to move their registered office to a commune with lower rates only to generate tax savings. Income from property mainly includes rental and lease income, and again group 4 shows the highest amount in that category. Compared to 2010, the amount doubled. Relatively high income from property is also generated by communes from group 5.

A very considerable item of tax income is interest in personal income tax and corporate income tax. Table 12 presents average income in individual groups. Group 4 again outperforms others significantly. This confirms the fact that this type of income is the most significant in municipalities and units neighbouring large cities (Sekuła, 2014, p. 243). As regards personal income tax, the difference is more than twofold, while in the case of corporate income tax the difference between groups is from 12 to 6-fold. A very important factor is the change of the amount of tax income: income from personal income tax doubled over eight years. Income from corporate income tax grew the fastest, i.e. by 115%, in group 4. In group 3 a 22% drop in average income from corporate income tax was recorded, but it still remained relatively high compared to other groups other than group 4.

Table 12.
Average income in analyzed communes from their interest in personal income tax and corporate income tax by group

Number of cluster	Interest in personal income tax [PLN/capita]			Interest in corporate income tax [PLN/capita]		
	2010 r.	2017 r.	Change [%]	2010 r.	2017 r.	Change [%]
1	269	543	102,09	4	7	63,52
2	195	411	110,89	2	4	76,55
3	177	379	113,65	10	8	-22,25
4	599	1 092	82,31	23	50	115,19
5	232	433	86,39	3	4	37,86

Source: own elaboration.

Property income mainly represent subsidies to investment projects and income from the sale of property and other less important income, e.g. from conversion of perpetual usufruct right. Income from property is a separate category and is not included in property income. Significant items in this category are funds from state programmes and co-financing from EU funds. Table 13 presents the structure of average property income. It is related to investment processes and capital expenditure. The high correlation of the two variables required one of them to be eliminated from the set of variables used for clustering. Data in the table shows that in recent years communes from group 5 incurred the highest capital expenditure per capita, followed by group 3. Communes from this group were also characterised by high income from subsidies, including under EU programmes. An obvious leader in terms of percentage of received support for investment projects was group 5. Support accounted for more than 65% of the total cost. The wealthiest communes received the lowest support per capita.

Table 13.
Amount of capital expenditure and co-financing of capital expenditure in groups

Number of cluster	Average capital expenditure in 2010-2017	Average property income, net of sale of property, in 2010-2017	Average income from EU funds earmarked for investment projects	Share of subsidies in capital expenditure	Share of EU subsidies in capital expenditure
	[PLN/capita]			%	
1	514	210	62	40,84	11,99
2	520	241	71	46,29	13,70
3	871	429	133	49,26	15,24
4	694	215	88	31,04	12,74
5	916	602	181	65,71	19,73

Source: own elaboration.

Most of the funds received as subsidies are awarded in competition procedures. Well-designed investment projects, aligned with objectives of programmes under which support is awarded, well-prepared design and application documents increase the changes for receiving aid. Depending on the programme, aid intensity is within the range 35-85%. The issue of submitting an application and acquiring subsidies to investment projects by communes is rather complex. Communes have different strategies in that respect, from very reluctant, where communes are virtually uninterested in applying for external funds, to very active communes. There are communes which almost always submit their application, many times creating projects that specifically meet the criteria of the call for applications. Unfortunately, communes focused on acquiring external funds not always take into account the priority of needs and the financial and economic justification of the pursued projects.

Communes' revenue mainly include proceeds from loans and bank borrowings. Loans are always advanced for a specific project, usually for environmental protection objectives. In recent years, funds were also awarded as part of loans for revitalisation projects. Loans bear low interest. The most significant source of loans to communes are Provincial Funds for Environmental Protection and Water Management and the National Fund for Environmental Protection and Water Management. Very often after a project is completed and once the achievement of the assumed objective is confirmed, part of the loan principal is cancelled. When planning expenses which are higher than income, to finance the deficit communes usually cover it with bank borrowings (Brzozowska, 2018). When a commune wants to take out a bank borrowing, it must carry out a public procedure. A commune's debt is generally subject to specific limits. (Dworakowska, 2016, p. 146). Just a few years ago, a simple rule was in effect, under which the amount of debt could not exceed 60% of income of the unit. As of 1 January 2014, each commune must meet an individually specified debt ratio. (Act on Public Finance, 2009, Art. 243.1). The current individual debt limits are not linked to expenses related to projects financed with EU and EFTA funds, as was previously the case. As a result of the changes, in practice local self-government units can incur new financing only for investment purposes (Kluza, 2019, pp. 37-38). Table 14 presents communes' debt per capita.

Table 14.

Debt of rural communes in Małopolskie province by group

Number of cluster	Debt per capita in 2010	Debt per capita in 2017	Difference in debt in 2010-2017	Change in debt	Cumulative budget performance per capita in 2017
		[PLN/capita]		%	[PLN/capita]
1	875,72	1 023,69	147,97	16,90	-839,03
2	591,12	410,62	-180,49	-30,53	-163,73
3	705,56	656,64	-48,92	-6,93	-440,22
4	829,31	963,84	134,53	16,22	-597,72
5	1 571,46	2 743,48	1 172,03	74,58	-2 200,90

Source: own elaboration.

The communes with the highest debt are communes from group 5. Their debt nearly doubled over the last two years. In 2017, it was more than PLN 2,743 per capita. This group is also characterised with the highest capital expenditure and the highest amount of external funds received. Nonetheless, the burden related to the need to cover the share of own funds, given the relatively low income, may result in the fact that communes from this group can find it difficult to meet their liabilities. Communes from group 2 invested in a sustainable manner, reduced their debt in the period of positive economic conditions without refraining from further investments. Communes from group 3 maintained debt at a relatively similar level, incurring significant capital expenditure and heavily relying on external financing. In group 4 debt increased. This is the group with the highest potential which accomplished the most projects. This results from a very high population density. The share of external funds in the financing of investment projects was the lowest in those communes. When referring to debt, note must be taken of the indicator of cumulative budget performance. This is an item of equity and liabilities of the consolidated balance sheet of a local self-government unit. The item is the sum of budget performance in previous years. As presented in Table 10, the cumulative budget performance is the highest in group 2, with the lowest indicator recorded in group 5. Another group of communes with a large cumulative deficit is group 1. A very interesting issue is that among all communes there is a very high polarisation of the cumulative budget performance. The worst performance is posted by the Raciechowice commune with PLN -3,216 per capita, while the best performance is seen in the Trzyciąż commune, at PLN 1,960 per capita.

4. Conclusions

Rural communes of the Małopolskie province show a diverse economic potential resulting from their location with respect to large cities and communication routes. Communes with a large economic potential have a high tax income per capita.

Despite large differences in tax income, communes have similar funds per capita at their disposal due to the operation of the subsidy scheme.

Communes follow different investment strategies. To implement their investments in fixed assets, most local governments rely on co-financing and bank borrowings.

Providing utility services to residents in heavily urbanised communes requires significant capital expenditure resulting from the need build systems with a high density.

The cumulative budget performance and debt are not related to the economic potential of communes but to their management strategy.

The status of infrastructure and financial standing of a commune are shaped in multi-annual process.

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