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ORIGINAL PAPER

CAPITAL STRUCTURE AND PROFITABILITY OF MUNICIPAL COMPANIES IN OLSZTYN

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Abstract

Municipal companies try to combine the implementation of social goals and municipal tasks in the public utility field with the owner's commercial goals related to increasing value or maximising financial results. They also use debt capital obtained from the financial market in their activities. The research aims to assess the capital structure in Olsztyn's municipal companies between 2017 and 2022 and the impact of the adopted capital structure on the profitability of these entities. The subjects of the research were seven municipal-owned companies operating in Olsztyn. The study used economic analysis methods, i.e. comparative analysis, ratio analysis and the Du Pont model according to Hawawini's proposal. The research shows that these companies generate losses and are primarily profitable in general activities, but their profitability is low. They use debt in their capital structure, often to a significant extent, but employ secure financing strategies. The observed changes in profitability were most often due to changes in operating margins from sales rather than changes in capital structure.

STRUKTURA KAPITAŁU A RENTOWNOŚĆ SPÓŁEK KOMUNALNYCH OLSZTYNA

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Słowa kluczowe: spółka komunalna, dług, struktura kapitału.

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Abstrakt

Spółki komunalne starają się łączyć realizację celów społecznych i zadań gminy z zakresu użyteczności publicznej z celami komercyjnymi właściciela związanymi ze wzrostem wartości lub maksymalizacją wyników finansowych. W swojej działalności wykorzystują także kapitały obce pozyskane z rynku finansowego. Celem badań jest ocena struktury kapitału w spółkach komunalnych Olsztyna w latach 2017-2022 oraz wpływu przyjętej struktury kapitału na rentowność tych podmiotów. Podmiotami badań było siedem spółek komunalnych funkcjonujących na terenie Olsztyna. W badaniach wykorzystano metody analizy ekonomicznej, tj. analizę porównawczą, wskaźnikową analizę finansową oraz model Du Pont według propozycji Hawawiniego. Wyniki badań wskazują, że spółki te w większości są rentowne, ale ich rentowność jest niska, a ze sprzedaży generują straty. W strukturze kapitału wykorzystują dług, często w znacznym zakresie, ale stosują bezpieczne strategie finansowania. Obserwowane zmiany rentowności najczęściej wynikały ze zmian marży operacyjnej ze sprzedaży, a nie zmiany struktury kapitału.

Introduction

The main task of a municipality is to meet the needs of the inhabitants of an area. Municipalities organise the provision of various types of public services to residents. Under the current legal conditions, municipal authorities do not have to provide theseservices. Private entities and non-profit organisations can also participate in public service delivery processes. This is intended to increase the efficiency of public service provision. Various organisational and legal forms can be used in this process, such as budgetary units, local government budgetary establishments, limited liability companies or joint-stock companies with municipal participation. Municipal companies fulfil the objectives and tasks of the municipality, but as companies, they should pursue commercial goals related to increasing value or maximising financial results. The usage of debt capital is a significant problem in these entities' functioning. The choice of both the organisational form and the sources of financing should be made in such a way as to secure the continuity of the implementation of the municipality's tasks. This approach, therefore, favours the use of equity capital.

The research aims to assess the capital structure in Olsztyn's municipal companies between 2017 and 2022 and the impact of the adopted capital structure on the profitability of these entities. Despite the epidemiological threat in 2020--2022 present during the research period, most public services must be provided to residents at a similar level. The choice of municipal companies from Olsztyn is deliberate. Olsztyn is a provincial city and can be regarded as a regional growth or development centre. Moreover, in local cities, most public utility tasks are carried out in the form of commercial companies rather than organisational units of the public finance sector. On the other hand, the municipality is located in a peripheral region with underdeveloped industry, a declining population and a relatively small centre (approx. 175,000 inhabitants).

Literature Review

Municipal companies are not separate organisational and legal forms regulated by law. They are commercial law companies established to carry out selected tasks of the municipality. They operate based on the general provisions of the Commercial Companies Code (Ustawa Kodeks spółek..., 2000). Certain restrictions apply to the possibility of their creation by local authorities of different levels and from the specificity of their activity. These specificities arise from the performance of public utility activities. These tasks are defined in Article 9 of the Act of 8 March 1990 on municipal self-government. Public utility tasks are the municipality's tasks, aiming to satisfy the population's collective needs on an ongoing and uninterrupted basis by providing generally availableservices (Ustawa o samorządzie gminnym, 1990). Municipal companies are engaged in activities aimed at satisfying the needs of the population and local entrepreneurs in, among other things, water supply and sewage disposal, municipal waste, communications, municipal construction, and thermal energy. They pursue economic and social objectives, creatinga contradiction (Klimek, 2017; Dziedzic, 2020). K. Byjoch and D. Klimek (2015) consider the most critical features of municipal companies their monopolistic position inthe local market, non-market way of pricing, low price elasticity, spatial limitation of activities, continuity of provision of municipal services, high capital intensity of assets, firm social and political influence of the environment on the company and vice versa.

In addition, the Act on Municipal Management of 20 December 1996 defined the principlesand forms of municipal management of local government units (Ustawa o gospodarce..., 1996).It indicates these tasks may be done through a local government budgetary establishment or a commercial law company. According to the Public Finance Act (2009), the first of these forms is included in the public finance sector, while the second belongs to the private finance sector, even when the local government unit is the sole owner of such a company. Municipal management is not for profit, but the activities of a capital company are. As a result, municipal companies should be established where a sustainable surplus of revenues from the activity over the costs of its implementation can be obtained. The absence of such a surplus indicates the need to subsidise such an entity. This will be easier when the activity is carried out in one of the organisational forms of the public finance sector, i.e. a budgetary unit or a local government budgetary establishment. However, the revenues are fees for municipal services paid by residents, so making money on such an activity becomes problematic.

Municipally owned corporations (MOCs) in other countries are autonomous organisations owned by municipalities and used to produce or provide local public services outside the local authority (Voorn *et al.*, 2017; Tavares & Camoes, 2007). Research has focused mainly on the effectiveness of the provision of services by these organisations and their direct provision by local authorities.

Also, in the West, these entities are given broad autonomy in their tasks, including the right to generate profits or go bankrupt. On the other hand, Thailand also has community enterprises (CEs) to fight poverty caused by economic crises (Somwethee *et al.*, 2023).

A significant problem highlighted in the practice of the operation of municipal companies in Poland is the issue of the owners' influence on the decisions made by the company's management. There are two views here. The first one, strictly based on the provisions of the Commercial Companies Code, indicates that the owner, i.e. the governing body of a local government unit, cannot interfere in the company's direct management. The second view suggests that the specifics of the company's operation and responsibility for the municipal property entrusted to it, as well as the need to ensure continuity of service provision, justify the day-to-day interference of the managing body of the local government unit. The application of the second model is more widespread in practice (Dolewka, 2022).

One factor that influences companies' financial situation is the capital structure. It results from managerial decisions resulting from the business's profile, size, availability of capital and cost and the assumed level of risk accepted by the owners. Capital structure is understood in different ways in the literature. Capital is taken to be fixed capital, equity plus interest-bearing debt capital, or the sum of the company's liabilities. Each solution has advantages and disadvantages (Miarecka, 2021). This study equates the capital structure with the structure of the company's liabilities (Duliniec, 2015). Capital structure depends on various factors (Jaworski *et al.*, 2019; Öztekin, 2015). Research on capital structure in CEE markets shows that this structure differs from developed countries, and managers prefer equity over debt (Delacoure, 2007). Czerwonka and Jaworski (2022) presented similar results for Poland and Portugal. Also, Zawadzka and Szmidt (2022) point to a Poland-specific preference for short-term debt over long-term debt in their study. Existing theories of capital structure indicate that there is an optimal capital structure to increase the value of a company or minimise the cost of raising capital. As a result, the use of debt is profitable for the company under certain conditions. The strongest correlations have been observed in studies for listed companies (Szomko, 2020; Prędkiewicz & Prędkiewicz, 2015; Mazur, 2007). In general, however, no single universally accepted capital structure theory exists.

Research on the financing of municipal companies is undertaken relatively infrequently. The analyses usually concern the assessment of financial condition, and the topic of capital structure in them is generally not the main focus (Yakymova & Kuz, 2019; Stoilova, 2022; Kowalewski & Zamielska, 2020). With limited funds in local government budgets, the need to create, modernise and repair public infrastructure causes pressure to transfer some of these tasks and debt from the budget to municipal companies. This reduces the financial transparency of the financial management carried out by local authorities (RIO, 2021; Jastrzębska, 2017). The threat to economic security is multifaceted (Nita *et al.*, 2020). However, municipal companies take on a particular significance arising from the specificity of the functioning of these entities. The cessation of the provision of municipal services to residents, even if only temporarily, results in significant social consequences for residents.

Research Methodology

All seven municipal entities operating in Olsztyn are subjected to the study, i.e., Miejskie Przedsiębiorstwo Energetyki Cieplnej Sp. z o.o. (MPEC), Przedsiębiorstwo Wodociągów i Kanalizacji Sp. z o.o. (PWiK), Miejskie Przedsiębiorstwo Komunikacyjne Sp. z o.o. in Olsztyn (MPK), Zakład Gospodarki Odpadami Komunalnymi Sp. z o.o. (ZGOK), Olsztyńskie Towarzystwo Budownictwa Społecznego Sp. z o.o. (OTBS), Zakład Budynków Komunalnych I Sp. z o.o. (ZBK1), Zakład Budynków Komunalnych II Sp. z o.o. (ZBK2). The sources of information are the financial statements and management reports of the surveyed companies obtained from the National Court Register database.

Due to the specific nature of the functioning of municipal companies, the following hypotheses are formulated in the research:

H1: Olsztyn's municipal companies use safety strategies to finance their operations.

H2: Changing the capital structure is not a fundamental factor in improving the return on equity of Olsztyn's municipal companies.

The research used the literature, documentary, and economic analysis methods, i.e., the comparative analysis method in time and space and the ratio financial analysis method, using debt and profitability assessment indicators described by Sierpińska and Jachna (2011). Interest-bearing debt in a company's financing structure can work either to the advantage or disadvantage of the entity (Łach, 2020). Therefore, the leverage effect achieved by the company was investigated according to the formula specified by Janik and Paździor (2011). The Du Pont diagram is a tool for analysing the factors shaping the profitability of equity. The basic model assumes that the profitability of equity capital employed is directly influenced by asset productivity, return on sales and capital structure. This study uses the extended, five-element model proposed by Hawawini and Viallet (2007), which additionally considers the impact of the tax shield and finance costs on company performance. The following formula describes it:

$$\mathrm{ROE} = \mathrm{OPM} \cdot \mathrm{TAT} \cdot \mathrm{FCR} \cdot \mathrm{FLM} \cdot \mathrm{TR} \qquad (1)$$

where:

ROE – return on equity = net profit (EAT) / equity (E),

OPM – operating profit margin = earnings before interest and taxes (EBIT) / sales (S),

TAT – total assets turnover = sales (S) / total assets (TA),
FCR – financial cost burden ratio = earnings before taxes (EBT) / earnings before interest and taxes (EBIT),
FLM – financial leverage multiplayer = total assets (TA) / equity (E),
TR – tax burden ratio = net profit (EAT) / earnings before taxes (EBT).

The indicators of the model are calculated according to the methodology proposed by Sibilski (2013), adapting the data to the standards of Polish accounting. Sub-ratios' impact on overall changes in return on equity is determined using the successive substitution method (Sierpińska & Jachna, 2011).

Results and Discussion

The entities surveyed are diverse in terms of both the type of activity and the value of assetsand revenue generated. Basic information on the revenues and assets of the entities surveyed ispresented in Table 1.

Table 1

Revenues and assets of Olsztyn's municipal companies from 2017 to 2022

Items	2017	2018	2019	2020	2021	2022	Rate of change 2022/2017 [%]	Coefficient of variation [%]
Sales revenue [PLN million]								
MPEC	111.3	114.0	117.5	125.4	164.2	222.8	100.1	30.8
PWiK	83.4	86.1	90.6	93.5	97.8	107.4	28.7	9.3
MPK	72.9	78.1	82.0	80.0	77.8	79.7	9.4	3.9
ZGOK	41.6	48.3	63.4	74.2	100.6	98.8	137.4	35.0
OTBS	7.5	7.6	7.8	8.2	8.6	9.3	24.2	8.5
ZBK1	1.1	1.1	1.1	1.1	1.6	2.0	81.7	27.4
ZBK2	1.3	1.3	1.3	1.4	1.4	1.6	24.6	8.3
Total assets [PLN million]								
MPEC	152.4	204.8	245.6	256.0	292.0	369.9	142.7	29.4
PWiK	323.9	320.3	328.6	357.6	366.9	365.6	12.9	6.3
MPK	62.5	49.7	40.1	50.0	43.8	60.9	-2.6	17.6
ZGOK	182.5	169.9	167.2	178.5	179.5	200.1	9.6	6.5
OTBS	109.0	108.5	107.5	106.7	105.8	106.4	-2.4	1.2
ZBK1	1.4	1.5	1.5	1.4	1.5	1.0	-27.8	13.0
ZBK2	0.5	0.4	0.5	0.4	0.5	0.5	2.0	2.9

Source: own compilation based on data from the National Court Register (2023).

The most significant turnover is generated by companies involved in the supply of heat, water and sewage disposal, waste management and public transport organisation in Olsztyn. The minor revenues are generated by companies operating in the field of housing management, with the activity of the so-called ZBKs limited only to the administration of housing communities, both with the participation of the municipality and entirely private communities. For this reason, their assets and revenues are small compared to the other companies. MPEC and PWiK have the most significant assets, followed by ZGOK and OTBS, which carried out social housing tasks. The most considerable variability and growth in revenues characterises MPEC and ZGOK. They have achieved these primarily due to increased municipal service charges. To a lesser extent, these increases are influenced by ongoing investments, as building a combined heat and power plant with a thermal waste processing facility still needs to be completed in the period under review (commissioning is planned for 2024). The expansion of the water and sewerage networks is progressing gradually, and the public transport network is being modernised. Despite the significant housing shortage in the local market, no new social housing investments are being made. It should be emphasised here that a large part of the investment in public infrastructure is carried out directly by the municipality and not by municipal companies, and the local government remains the owner of this infrastructure. In contrast, municipal companies have the right to this use.

The companies surveyed are characterised by very high variability in financial performance, both over time and within the group surveyed (Tab. 2). The realised sales generally result in sales losses. The only company to profit from sales throughout the period is OTBS, while the only company to generate losses on sales is PWiK. It should be pointed out here that the constant generation of sales losses calls into question the sense of the ownership transformation carried out in the area by the municipality. As mentioned earlier, the essence of establishing a commercial law company in the area of public utility is the generation by a given entity of a revenue stream that allows to cover the costs of the company's operations. Since the activity of some of the surveyed companies is permanently unprofitable and requires continuous subsidies from local authorities, it should remain within the organisational forms of the public finance sector as a local government budgetary establishment or budgetary unit.

The analysis of the net financial results shows that the municipal company of Olsztyn is mostly profitable in its total activities. Net profits characterise MPEC, OTBS, and ZBK2 between 2017 and 2022, while ZGOK has net losses only in 2018. Such results are possible because the most significant entities, such as MPEC, PWiK, and ZGOK, receive subsidies to cover operating costs. On the other hand, OTBS, which generates profit on sales, does not receive such subsidies. These subsidies are of an investment nature from domestic and foreign funds and for the companies' day-to-day operations. The provision of operating subsidies is a troublesome matter, as providing additional

Table 2

Selected financial results of Olsztyn's municipal companies from 2017 to 2022

Items	2017	2018	2019	2020	2021	2022	Average	Coefficient of variation [%]
Profit/loss on sales [thousand PLN]								
MPEC	3,063.9	1,352.2	-2,486.7	-3,784.3	-9,074.3	8219.2	-451.7	1,329.9
PWiK	-1,860.4	-1,623.4	-198.4	-2,494.4	-852.2	-10,657.4	-2,947.7	131.0
MPK	-2,418.0	-499.0	3,182.4	3,326.4	232.5	-4,382.7	-93.1	3,276.8
ZGOK	-1,139.3	-5,381.7	-2,950.9	-9,970.4	10,912.7	8,995.4	77.6	10,597.5
OTBS	1,956.6	1,647.6	1,631.9	1,674.1	1,539.5	2,124.1	1,762.3	12.8
ZBK1	-7.0	10.2	-0.2	-53.5	-137.2	-24.4	-35.3	154.7
ZBK2	12.5	2.1	-8.3	17.3	-20.2	-6.7	-0.6	2,531.1
Net profit/loss [thousands PLN]								
MPEC	4,130.1	3,020.9	6,907.2	11,626.1	1,897.8	2,681.0	5,043.8	72.7
PWiK	557.1	178.1	249.6	-99.6	622.4	-9,645.6	-1,356.3	300.0
MPK	-2,928.1	-809.3	2,428.3	3,082.7	43.1	-5,704.2	-647.9	510.2
ZGOK	4,312.6	-2,441.9	1,035.4	-6,066.0	9,083.9	10,599.4	2,753.9	236.3
OTBS	1,342.8	1,014.4	1,042.2	1,373.4	1,333.5	1,701.0	1,301.2	19.4
ZBK1	2.9	6.8	3.5	19.9	-29.6	-282.8	-46.6	251.1
ZBK2	0.8	1.3	1.0	0.7	2.0	1.6	1.2	40.6

Source: own compilation based on data from the National Court Register (2023).

non-refundable support to them violates the principles of free competition. Therefore, these procedures are subject to special supervision. As indicated by the Supreme Chamber of Control report, the most frequently used form of subsidy is a form of support for companies implementing public utility services based on task entrustment agreements and in-house contracts (NIK, 2021).

Capital structure ratios (share of equity, sustainability of the financing structure) and capital and wealth structure ratios (gold and silver financing rule) were used to verify the first research hypothesis. Based on the data in Table 3, it can be concluded that the highest share of equity is found in companies related to housing administration (ZBK2, ZBK1, OTBS) - over 70%, while the lowest is in ZGOK - 13% on average. An analysis of the use of equity in the capital structure of the surveyed companies shows that the balance between equity and debt capital was generally maintained in the surveyed group. Until 2020, a slight (1-2%) predominance of foreign capital was observed, while between 2021 and 2022, the share of equity capital increased to 55%. The variation within the study group is high (the coefficient of variation is around 50%). The level of equity in almost all companies (except ZBK2) is insufficient to finance fixed assets, so the golden rule of balancing is not met.

Table 3

Capital structure of Olsztyn's municipal companies 2017-2022

Items	2017	2018	2019	2020	2021	2022	Average	Coefficient of variation [%]
Share of equity = equity / total assets [%]								
MPEC	49.2	36.8	33.8	37.0	33.1	27.2	36.2	20.2
PWiK	53.9	56.0	54.7	50.2	49.1	46.7	51.8	7.0
MPK	19.8	23.3	34.9	34.2	39.2	63.0	35.7	42.7
ZGOK	12.8	9.6	10.4	10.7	15.7	19.4	13.1	28.9
OTBS	58.7	59.9	61.4	63.1	65.0	66.2	62.4	4.7
ZBK1	64.4	62.5	63.8	66.1	74.8	83.5	69.2	11.9
ZBK2	82.8	86.7	81.1	84.7	80.4	79.7	82.6	3.3
Sustainability of the capital structure = (equity + long-term debt) / total assets [%]								
MPEC	79.0	73.9	70.4	80.0	80.0	68.0	75.2	7.0
PWiK	91.7	92.5	92.1	92.4	92.3	91.4	92.1	0.5
MPK	59.5	56.1	53.3	65.3	66.0	76.6	62.8	13.4
ZGOK	89.7	88.6	87.8	81.1	86.0	82.9	86.0	4.0
OTBS	98.1	97.1	97.2	97.3	97.5	97.8	97.5	0.4
ZBK1	64.4	62.5	70.5	70.6	76.8	83.5	71.4	10.9
ZBK2	82.8	86.7	82.5	85.3	81.0	79.7	83.0	3.1

Source: own compilation based on data from the National Court Register (2023).

Subsidised equity is one of the forms of financial support used for the operations of municipal companies, allowing, among other things, the covering of emerging losses. However, the share capital in the analysed companies is characterised by low volatility. In MPEC, the primary share capital was increased twice - in 2020 and 2021, each time by approximately 9%. In PWiK, the primary capital only increased in 2018 by about 3%. At MPK, the primary capital increased in 2022 by as much as 444%. At ZGOK, the primary capital increased in 2020 by around 35%, but earlier in 2018, it was reduced by about 17%. At ZBK1, the increase only occurred in 2021 by approximately 26%. In OTBS and ZBK2, no changes were made to the primary capital.

An analysis of the use of fixed capital in the capital structure of the surveyed companies indicates that among the municipal companies of Olsztyn, the sustainability of the financing structure is high, approximately 81%. In comparison, its variability is low (about 15%). Also, the variation of the studied group in individual years does not exceed 20%. The highest average share of fixed capital is observed in OTBS and PWiK (over 90%) and the lowest in MPK (about 63%). The level of fixed capital in almost all companies (except ZBK1 and MPK) is at a level similar to or higher than the value of fixed assets, so the silver balance rule is met.

An examination of the return on equity (Tab. 4) confirms that the activities of these companies are not particularly profitable for the owners, which is precisely the nature of municipal companies. The average profitability across the entire study group from 2017 to 2022 is positive but only 0.93%. This is well below the risk-free rate and, therefore, the yield on government bonds. The highest performance of the companies is in 2021 (on average around 4.96%) and 2019. (on average, around 4.85%). The lowest performance occurred in 2022 (due to high deficits of ZBK1, MPK and PWiK) and 2018 (lack of profitability of ZGOK). ZGOK (6.22%) and MPEC (5.79%) have the highest average rate of return despite the high fluctuations observed. The worst rates of return are generated by ZBK1 (average -5.29%) due to losses generated in the last two years. In general, equity returns are characterised by high volatility. The only stable company in terms of performance is OTBS.

Table 4

Return on equity of Olsztyn's municipal companies from 2017 to 2022

Items	2017	2018	2019	2020	2021	2022	Average	Coefficient of variation [%]
Return on equity (ROE) = earnings after taxes / equity [%]								
MPEC	5.51	4.01	8.32	12.28	1.97	2.67	5.79	67.4
PWiK	0.32	0.10	0.14	-0.06	0.35	-5.65	-0.80	297.3
MPK	-23.61	-6.98	17.32	18.02	0.25	-14.88	-1.65	1,029.9
ZGOK	18.47	-14.91	5.96	-31.82	32.26	27.35	6.22	404.8
OTBS	2.10	1.56	1.58	2.04	1.94	2.42	1.94	16.9
ZBK1	0.32	0.73	0.37	2.08	-2.57	-32.64	-5.29	255.1
ZBK2	0.20	0.35	0.26	0.18	0.53	0.42	0.33	41.0
Financial leverage effect = return on equity – operating asset margin [%]								
MPEC	1.76	1.72	4.45	6.12	0.76	-0.06	2.46	95.6
PWiK	0.01	-0.53	-0.40	-0.37	-0.34	-3.99	-0.94	160.7
MPK	-20.45	-7.14	8.60	10.11	-1.17	-6.84	-2.81	403.8
ZGOK	15.89	-13.81	4.43	-28.40	26.44	20.56	4.19	510.9
OTBS	0.39	0.19	0.16	0.54	0.56	0.54	0.40	46.3
ZBK1	0.06	0.15	0.11	0.54	-0.70	-5.40	-0.87	258.1
ZBK2	-0.34	0.02	0.17	-0.23	0.10	0.08	-0.03	630.3

Source: own compilation based on data from the National Court Register (2023).

As noted earlier, the entities make extensive use of debt capital. Consequently, whether debt is profitable for the companies is examined. For this purpose, the leverage effect is determined. The results show that this effect is positive but that debt increased the return on equity by only around 0.34 percentage points. In no year is it the case that all companies have a positive effect. The closest to this state is in 2019. In the other years, as a rule, two of the seven entities surveyed had a negative impact. Only OTBS has a positive leverage effect in all the years studied. On average, however, it is in ZGOK that the use of debt has the best impact (4.19%); in MPK, the effect is the worst (-2.81%).

To verify the second research hypothesis, the analysis results of the five-element Du Pont model are used with the deterministic methods of economic analysis, which is the method of successive substitutions. According to this model, five essential factors determining changes in return on equity (ROE) have been identified. These are equity multiplier (illustrates capital structure), asset turnover (illustrates liquidity in the company), operating return on sales (illustrates profitability of the company), interest on third-party capital (illustrates financial risk), and income tax (illustrates tax risk).

Table 5

Impact of the factors identified in the DuPont model on the change in the return on equity of Olsztyn's municipal companies from 2017 to 2022 (in percentage points)

Items	2018	2019	2020	2021	2022
1	2	3	4	5	6
MPEC					
Impact of changes in the equity multiplier (TA/E)	1.85	0.36	-0.71	1.45	0.43
Impact of changes in asset turnover (S/TA)	-1.68	-0.26	0.43	0.55	0.12
Impact of changes in operating profitability of sales (EBIT/S)	-1.25	3.26	3.99	-11.74	2.87
Impact of changes in interest on borrowed capital (EBT/EBIT)	-0.14	-0.12	0.57	-0.54	-3.01
Impact of income tax changes (EAT/EBT)	-0.28	1.08	-0.31	-0.04	0.29
Change in return on equity (ROE)	-1.50	4.31	3.96	-10.31	0.70
PWiK					
Impact of changes in the equity multiplier (TA/E)	-0.01	0.00	0.01	0.00	0.02
Impact of changes in asset turnover (S/TA)	0.01	0.00	-0.01	0.00	0.04
Impact of changes in operating profitability of sales (EBIT/S)	0.02	-0.01	-0.04	-0.03	-1.55
Impact of changes in interest on borrowed capital (EBT/EBIT)	-0.10	0.00	-0.09	-0.52	-3.41
Impact of income tax changes (EAT/EBT)	-0.14	0.04	-0.07	0.95	-1.09
Change in return on equity (ROE)	-0.22	0.04	-0.19	0.40	-6.00
MPK					
Impact of changes in the equity multiplier (TA/E)	3.53	2.32	0.35	-2.26	-0.10
Impact of changes in asset turnover (S/TA)	-6.69	-1.47	-3.91	1.87	-0.04
Impact of changes in operating profitability of sales (EBIT/S)	27.06	-851.7	2.28	-14.75	-0.98
Impact of changes in interest on borrowed capital (EBT/EBIT)	-7.28	878.85	1.26	-2.47	-7.13
Impact of income tax changes (EAT/EBT)	0.00	-3.69	0.73	-0.15	-6.88
Change in return on equity (ROE)	16.63	24.30	0.70	-17.77	-15.13

cont. Table 5

1	2	3	4	5	6
ZGOK					
Impact of changes in the equity multiplier (TA/E)	6.05	1.08	-0.17	10.15	-6.14
Impact of changes in asset turnover (S/TA)	1.09	-4.60	0.43	-6.88	-2.87
Impact of changes in operating profitability of sales (EBIT/S)	-35.59	37.58	-19.36	65.32	4.98
Impact of changes in interest on borrowed capital (EBT/EBIT)	-7.11	-9.68	-7.66	-4.77	-0.25
Impact of income tax changes (EAT/EBT)	2.17	-3.50	-11.03	0.26	-0.63
Change in return on equity (ROE)	-33.39	20.88	-37.78	64.08	-4.91
OTBS					
Impact of changes in the equity multiplier (TA/E)	-0.04	-0.04	-0.04	-0.06	-0.04
Impact of changes in asset turnover (S/TA)	0.02	0.06	0.09	0.10	0.15
Impact of changes in operating profitability of sales (EBIT/S)	-0.38	-0.04	-0.08	-0.31	0.94
Impact of changes in interest on borrowed capital (EBT/EBIT)	-0.10	0.05	0.43	0.07	-0.44
Impact of income tax changes (EAT/EBT)	-0.04	-0.01	0.06	0.10	-0.13
Change in return on equity (ROE)	-0.54	0.02	0.46	-0.10	0.47
ZBK1					
Impact of changes in the equity multiplier (TA/E)	0.01	-0.02	-0.01	-0.24	0.27
Impact of changes in asset turnover (S/TA)	0.00	0.00	0.03	1.56	-0.65
Impact of changes in operating profitability of sales (EBIT/S)	0.42	-0.39	1.73	-5.63	-30.68
Impact of changes in interest on borrowed capital (EBT/EBIT)	0.00	0.00	0.00	0.00	0.00
Impact of income tax changes (EAT/EBT)	-0.02	0.05	-0.04	-0.34	1.00
Change in return on equity (ROE)	0.41	-0.36	1.71	-4.65	-30.06
ZBK2					
Impact of changes in the equity multiplier (TA/E)	-0.01	0.02	-0.01	0.01	0.00
Impact of changes in asset turnover (S/TA)	0.01	-0.01	0.02	0.00	0.05
Impact of changes in operating profitability of sales (EBIT/S)	-0.08	-0.19	0.36	-0.04	-0.17
Impact of changes in interest on borrowed capital (EBT/EBIT)	0.00	0.00	0.00	0.00	0.00
Impact of income tax changes (EAT/EBT)	0.22	0.10	-0.45	0.38	0.00
Change in return on equity (ROE)	0.15	-0.09	-0.08	0.35	-0.11

Source: own compilation.

Analysis of the data in Table 5 shows that various factors shape changes in the profitability of equity. In MPEC, the most critical factor influencing changes in the company's overall profitability is the margin on sales. In 2019-2021, it is the most important factor; in 2022, it is one of two critical factors; and in 2018, it is in third place. In 2022, interest on debt has the most significant impact on ROE. Only in 2017, the primary factor determining changes in the profitability of equity capital is changes in the capital structure. The increase in the equity multiplier observed this year is equivalent to a decrease in the proportion of equity in the capital structure of 12.4 percentage points. It induces an increase in the return on equity of around 1.85%. These changes limit the profitability observed in the year caused by other factors (a decrease in asset turnover and sales margins).

In PWiK in 2018-2019 and 2021, the most significant impact on the return on equity is changes in the amount of income tax paid. This tax is subject to high fluctuation, which, with the company's low profitability, caused significant changes. The second major factor is changes in the interest paid on debt. They are the most critical factor in 2020 and 2022. In 2019 and 2022, the impact of the operating margin on sales is also essential. At MPK, the most important determinant of changes in return on equity is the operating margin on sales (2018 and 2021), followed by debt costs (2019 and 2022) and asset turnover (2020). Also, at ZGOK, the primary determinant of changes in the company's profitability is the change in the margin on sales. It is only in 2022 that the significant impact of the change in capital structure becomes apparent. An increase in equity share by 3.68 percentage points, with its low share at 19%, triggers a decrease in ROE of 6.14%.

In OTBS, on three occasions (in 2018, 2021, and 2022), the operating margin on sales has been the biggest driver of ROE changes. In 2019, changes in liquidity were the main driver of change, and in 2020, changes in the cost of debt. Changes in capital structure are, in 2019, the second driver of change in ROE. Profitability then changed slightly, which is why the 1.72 percentage point increase in the proportion of equity has such an enormous impact. In ZBK1, significant changes in the return on equity are only caused by changes in the operating return on sales. In ZBK2, a similar situation was observed, but the changes in the amount of income tax paid are equally important factors.

Conclusions

Decisions on the choice of appropriate financing play a vital role in the management of any business entity. The long-term objective of corporate financial management is to maximise the owners' wealth. In practice, this is determined by the level of profitability generated by the enterprise. The activities of municipal companies are not profit-oriented due to the implementation of public utility tasks, which is also confirmed by the survey of municipal companies in Olsztyn. This does not exempt managers from the obligation to manage the capital structure effectively.

The study results indicate that municipal companies implement safety financing strategies, and thus, the first research hypothesis was confirmed. Equity alone is primarily insufficient to finance fixed assets. Its share at 50 per cent and in some companies even below 30 per cent (i.e. safe levels from the point of view of banks' assessment of creditworthiness) is lower than should be expected given the specific nature of the entities' activities. However, financial security is ensured by a sufficiently high proportion of long-term debt capital. As a result, the total level of fixed capital ensured high sustainability of the financing structure. Its level was close to the fixed asset value in the entities studied.

The second research hypothesis is also confirmed. An analysis of the causes of changes in profitability reveals that the main factors for improving or worsening return on equity are changes in the operating margin on sales, the amount of the cost of capital and tax risks. Changes caused by capital structure or asset turnover are incidental. As a result, it can be concluded that in the municipal companies studied, debt and capital structure are not used to shape the profitability of equity. This phenomenon can be regarded as characteristic of commercial law companies carrying out public utility tasks. Summarising the research results, it can be stated that the authorities of Olsztyn's municipal companies manage the capital structure correctly.

Translated by Author

References

Byjoch, K., & Klimek, D. (2015). *Spółka komunalna. Aspekty prawne, ekonomiczne i społeczne.* Toruń: Wydawnictwo Adam Marszałek.

Czerwonka, L., & Jaworski, J. (2022). Capital Structure and its Determinants in Companies Originating from two Opposite Sides of the European Union: Poland and Portugal. *Economics and Business Review*, *8*(22), 1, 24-49. http://dx.doi.org/10.18559/ebr.2022.1.3.

Delacoure, N. (2007). The Determinants of Capital Structure in Transitional Economies. *International Review of Economics & Finance*, *16*(3), 400-415. http://dx.doi.org/10.1016/j.iref.2005.03.005.

Dolewka, Z. (2022). Spółki komunalne w samorządzie terytorialnym. *Analiza Celowa*, *19*. Centrum Ekspertyzy Lokalnej. Fundacja Rozwoju Demokracji Lokalnej im. Jerzego Regulskiego. Retrieved from https://frdl.org.pl/static/upload/store/frdl/ANALIZY_CELOWE/SPOLKI_KOMUNALNE_W_SAMORZADZIE_TERYTORIALNYM.pdf (15.12.2023).

Duliniec, A. (2015). Wybór źródeł finansowania a optymalna struktura kapitału w przedsiębiorstwie. *Finanse, Rynki Finansowe, Ubezpieczenia*, *2*(74), 73–82. https://doi.org/10.18276/frfu.2015.74/2-06.

Dziedzic, M. (2020). Status prawny komunalnych spółek prawa handlowego. *Kwartalnik Prawno-Finansowy*, *4*, 36-53. https://doi.org/10.34616/145072.

Finansowanie i wspieranie działalności spółek z udziałem jednostek samorządu terytorialnego w województwie dolnośląskim. Informacja o wynikach kontroli. (2021). Wrocław: Najwyższa Izba Kontroli. Retrieved from https://www.nik.gov.pl/plik/id,25338,vp,28094.pdf (10.12.2023).

Hawawini, G. & Viallet, C. (2007). *Finanse menedżerskie*. Warszawa: Polskie Wydawnictwo Ekonomiczne.

Janik, W., & Paździor, A. (2011). *Zarządzanie finansowe w przedsiębiorstwie*. Lublin: Politechnika Lubelska.

Jastrzębska, M. (2017). Dług ukryty jednostek samorządu terytorialnego – przyczyny, skutki, przeciwdziałanie. *Annales Universitatis Mariae Curie-Skłodowska. Sectio H. Oeconomia*, *51*(4), 125–132. https://doi.org/10.17951/h.2017.51.4.125.

Jaworski, J., Czerwonka, L., & Mądra-Sawicka, M. (2019). Determinants of Capital Structure: Evidence from Polish Food Manufacturing Industry. *German Journal of Agricultural Economics*, *68*(1), 45-56. https://doi.org/10.22004/ag.econ.319807.

Klimek, D. (2017). Spółka komunalna – ekonomiczne i społeczne aspekty zarządzania. *Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach*, *332*, 32-41.

Kowalewski, M., & Zamielska, M. (2020). Application of Budgeting in Selected Municipal Companies in the Warmińsko-Mazurskie Voivodeship. *Olsztyn Economic Journal*, *15*(4), 339–350. http://dx.doi.org/10.31648/oej.6857.

Łach, K. (2020). Efekt dźwigni finansowej a struktura źródeł finansowania przedsiębiorstw w Polsce w latach 2005-2018. *Polityki Europejskie, Finanse i Marketing*, *23*(72), 82-94. http://dx.doi.org/10.22630/PEFIM.2020.23.72.7.

Mazur, K. (2007). The Determinants of Capital Structure Choice: Evidence from Polish Companies. *International Advances in Economic Research*, *13*, 495-514. http://dx.doi.org/10.1007/s11294-007-9114-y.

Miarecka, A. (2021). Analiza wybranych czynników kształtowania struktury finansowania przedsiębiorstw w Polsce w latach 2015-2019. *Współczesne Problemy Zarządzania*, *9*, 1(18), 43-52. https://doi.org/10.52934/wpz.130.

Nita, B., Kaczmarczyk, A., & Oleksyk, P. (2020). *Zagrożenia utraty bezpieczeństwa finansowego przedsiębiorstw*. Wrocław: Wydawnictwo Uniwersytetu Ekonomicznego we Wrocławiu.

Öztekin, Ö. (2015). Capital Structure Decisions Around the World: Which Factors are Reliably Important? *The Journal of Financial and Quantitative Analysis*, *50*, 301–323. http://dx.doi.org/10.1017/S0022109014000660.

Prędkiewicz, K., & Prędkiewicz, P. (2015). Chosen Determinants of Capital Structure in Small and Medium-Sized Enterprises – Evidence from Poland. *Finanse, Rynki Finansowe, Ubezpieczenia*, *74*(2), 331-340. https://doi.org/10.18276/frfu.2015.74/2-29.

Sibilski, W. (2013). Zmodyfikowane modele DuPont do analizy rentowności polskich przedsiębiorstw. *Finanse, Rynki Finansowe, Ubezpieczenia*, *64*(1), 257-268.

Sierpińska, M., & Jachna, T. (2011). *Ocena przedsiębiorstwa według standardów światowych*. Warszawa: Wydawnictwo Naukowe PWN.

Somwethee, P., Aujirapongpana, S., & Ru-Zhuea, J. (2023). The Influence of Entrepreneurial Capability and Innovation Capability on Sustainable Organisation Performance: Evidence of Community Enterprise in Thailand. *Journal of Open Innovation: Technology, Market, and Complexity*, *9*, 1-12. https://doi.org/10.1016/j.joitmc.2023.100082.

Sprawozdanie z działalności regionalnych izb obrachunkowych i wykonania budżetu przez jednostki samorządu terytorialnego w 2020 roku. (2021). Warszawa: Krajowa Rada Regionalnych Izb Obrachunkowych. Retrieved from https://rio.gov.pl/130/sprawozdanie-krrio-za-2020-rok.html (15.12.2023).

Stobieniecka, W., & Białek-Jaworska, A. (2020). Do Local Governments Use Municipal Companies for Off-Balance-Sheet Financing? *Central European Economic Journal*, *7*(54), 242-257. http://dx.doi.org/10.2478/ceej-2020-0014.

Stoilova, D. (2022). Analysis of the Financial Management of Municipal Enterprises in Blagoevgrad with Z-Score Model. *Economics & Law*, *IV*(I), 1-14. http://dx.doi.org/10.37708/el.swu.v4i1.1.

Szomko, N. (2020). Factors Associated with the Capital Structure of Polish Companies in the Long and Short Term. *Gospodarka Narodowa*, *1*(301), 55–74. http://dx.doi.org/10.33119/GN/116717.

Tavares, A. & Camões, P. (2007). Local Service Delivery Choices in Portugal: A Political Transaction Costs Network. *Local Government Studies*, *33*(4), 535–553. http://dx.doi.org/10.1080/03003930701417544.

Ustawa z dnia 15 września 2000 r. Kodeks spółek handlowych. Dz.U. z 2022 r., poz. 1467 ze zm.

Ustawa z dnia 20 grudnia 1996 r. o gospodarce komunalnej. Dz.U. z 2021 r., poz. 679 ze zm.

Ustawa z dnia 27 sierpnia 2009 r. o finansach publicznych. Dz.U. z 2021 r., poz. 305 ze zm.

Ustawa z dnia 8 marca 1990 r. o samorządzie gminnym. Dz.U. z 2022 r., poz. 559 ze zm.

Voorn, B., Van Genugten, M., & Van Thiel, S. (2017). The Efficiency and Effectiveness of Municipally Owned Corporations: A Systematic Review. *Local Government Studies*, *43*(5), 820–841. http://dx.doi.org/10.1080/03003930.2017.1319360.

Yakymova, L., & Kuz, V. (2019). The Use of Discriminant Analysis in the Assessment of Municipal Company's Financial Health. *Economics and Sociology*, *12*(2), 64-78. http://dx.doi.org/10.14254/2071-789X.2019/12-2/4.

Zawadzka, A., & Szmidt, K. 2022. Structure of Assets and Liabilities of Non-Financial Corporations by Selected NACE Sections. *Olsztyn Economic Journal*, *17*(2), 191–211. http://dx.doi.org/10.31648/oej.8997.