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### The Assessment of Financial Risks of Municipally Owned Public Utility Companies in Hungary Between 2009 and 2018

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#### ABSTRACT

*The aim of this study is to assess the financial risks, as interpreted by us, of Hungarian corporations fully owned by municipalities across a national dimension after the global economic crisis broken out in 2008. In this study, financial risk was measured by profitability, liquidity and the equity ratio. We were seeking an answer to the question as to how more stringent state controls had influenced the companies' ability to provide public services and their financial situation behind in a more robust public financial regulatory and control environment created in Hungary after 2010, that is, how the going concern principle of accounting had been implemented. Indirectly, we were also seeking an answer to the question as to how operational risks had been affected by the "breaking" effect on net income exerted by the administrative price regulation (reduction of utility costs on the consumers' side) imposed on the services of public utility companies in 2013 (as part of the public finance reform introduced in 2010), that is, whether a more robust regulatory environment of public finances compelled the promotion of corporate efficiency. With the complex (and inter-related) methodology of the assessments carried out, we could establish that financial risks improved, but we propose even stricter controls due the economic shock caused by the COVID-19 pandemic. Our research results present a comprehensive situational picture of municipally owned companies providing public services in an emerging market economy, which can be compared with the data of other countries as well.*

## INTRODUCTION

Municipally owned corporations providing public services have a major role in numerous countries of the world, including Hungary. In several Western European countries, municipally owned or state-owned corporations taking part in performing public duties are prominent. After the crisis of 2008, the process of re-municipalisation has been increasingly unfolding, the main point of which is that public duties performed earlier by market organisations are taken over, or taken back, by municipalities. Its effects were analysed by PSIRU (2012), concluding that between 2000 and 2014 the performance of duties by municipally owned corporations increased in Western European countries, in particular in France. After the regime change, the Hungarian public finance system was unable to adequately respond to challenges, which was even further aggravated by the crisis deepening in 2008. A significant degree of indebtedness ensued in both the central budget and the municipal subsystem. As a result, several rules-based fiscal restrictive measures were introduced (Domokos et al. 2016). While in Ukraine the municipalities' performance of duties points towards decentralisation (Kuzkin, 2018), in Hungary the recentralisation of social assistance systems can be observed. In both Croatia and Hungary, the institution of the fiscal council has been established (Zigman and Jergovic, 2017), which represents a kind of brake in case of any overspending in public finances.

### 1. THE REGULATORY ENVIRONMENT OF HUNGARIAN MUNICIPALLY OWNED CORPORATIONS

The Hungarian municipal economy has a dual structure, since duties are performed through both budgetary units and (mostly) corporations owned by them. Consequently, financial risks need to be assessed separately. This study focusses on the corporate sector fully owned by municipalities. The financial situation of municipally owned corporations has been in the focus of research on public finances since 2005, and this area has been also present in the system of rules of public finance since 2011. The financial situation of the corporations examined affects the financial standing of the municipalities that own them, the living conditions of the population residing in the territory of the municipality, and it even influences the activities of private undertakings operating locally. Although there is also a reverse connection, according to which the standard of business management of municipalities and the quality of their ownership are the key to the operation of their companies. In the theoretical part of the study, the regulatory environment, the financial risks and the principle of going concern are presented. In the empirical research part, financial risks being present at municipally owned corporations are assessed within the framework of a panel sample survey.

The dual structure mentioned in the Introduction is the consequence of the regime change, as – pursuant to the Act on Municipal Assets – municipalities have become owners of assets located in their administrative territories specified by the Act, including the assets of public utilities. Corporations being in the focus of analysis (with the exception of newly established ones) were owned or their assets were managed by either the state or the council in the socialist planned economic system. If the latter one was the case, councils had asset management rights. It was an important change that in 1991, the asset management right became a right of ownership. At present, the operation of companies is stipulated by Act V of 2013 on the Civil Code, Act C of 2000 on Accounting, and Act CXCVI of 2011 on National Assets. This latter act specifies activities that can be undertaken exclusively through corporations fully owned by municipalities. Act LXVI of 2011 on the State Audit Office, entering into force in 2012 – and even before its entry into force, the act pertaining to the State Audit Office amended in 2011 – extended the State Audit Office's powers of control over municipally owned corporations. It should be stressed, however, that before 2011 the main supervisory body of the National Assembly, the State Audit Office had had no powers of control over municipally owned corporations, which had had an adverse effect on the quality of the standard of their business management. However, since 2014, several inspections and since 2016, several research results have been published by the State Audit Office. Moldovan researchers also came to a similar conclusion in respect of their own country, proposing a tight cost management system, complying with international standards, to companies; see Stratan – Manole (2018).

Further rules are set out in Hungarian sectoral laws, with special regard to Act CLXXXV of 2012 on Waste, Act CCIX of 2011 on Water Utility Supply, the act on the provision of district heating, and legislation related to centrally regulated prices (“utility cost reduction”). The Stability Act (Act CXCIV of 2011) has bound the borrowing of the municipalities to the permission of the central government, and simultaneously, has also restricted the borrowing of corporations fully owned by municipalities. The regulation has been demonstrating a continuous change; it was slightly eased in 2019. In addition to binding legislation, companies endogenously seek to develop their internal controls and controlling systems; this practice characterises both state- and municipally owned corporations (Boros 2019). The more stringent regulation and control practices entering into force within the framework of Hungary’s public finance reform after 2010 promote the application of the accounting principle of going concern, directly and indirectly at municipally owned public utility companies as well.

## 2. THE PRINCIPLE OF GOING CONCERN

On the basis of Subsection 1 of Section 15 of the operative Act on Accounting, the principle of going concern (or the Going Concern Assumption – GCA) states that drawing up the financial report and the accounting records shall be based on the assumption of the economic entity’s capacity to sustain operations in the foreseeable future and on its ability to continue its activity, and the termination of or a considerable reduction, for any reason, in the operation is not expected. Thus, this is the most important principle, which is presumed as the basis for drawing up the financial report and the evaluation of assets (Zéman and Lentner, 2018). It is important to be aware of the fact that the Hungarian regulation deducts the other accounting principles from the “likeliness” of going concern, that is, the ‘true and fair view’ principle, the principle of completeness, continuity, consistency, and other accounting principles can be interpreted in an economic organisation capable of operation, of maintaining its activities (Spicas et al., 2018; Hasik, 2018). In Hungary, it is possible to fulfil accounting and reporting obligations either in line with the Hungarian Accounting Standards or based on the International Financial Reporting Standards (IFRS). Based on IFRS, the principle of going concern is an underlying, that is, fundamental assumption for continuing as a going concern, and further framework principles regard it as a fundamental principle.

International Standard on Auditing 570 concludes that as for evaluation principles, the liquidation aspect comes to the fore if the going concern assumption proves to be inappropriate. In our interpretation it means that long-term liabilities may mature within a year – depending on the deterioration of the situation – within a short period of time, as the beneficiaries of the long-term liabilities imputable to the corporation want to have access to their assets as soon as possible. For example, their long-term loans are converted into short-term, immediately payable ones, which means that discharging corporate liabilities shall enjoy priority (at the debtor). The effects of the differences between accounting standards on the principle of going concern was studied by Hospodka (2018), and Valliskova and– Dvorakova (2017). In their view, the coordination of standards (e.g. USGAAP and IFRS, and international standards) promotes compliance with the fundamental principle, and its appropriate and reasonable application.

Lentner (2020) established that the fiscal, public finance environment and regulatory system also affect the operation of municipally owned corporations significantly. Their closure or transformation is predominantly the result of political decisions, which poses a further risk to the continuity of their operation, either through the indirect effects of central governance or directly from local government bodies. Generally, the implementation of the GCA is examined with bankruptcy forecasting models. Molnár-Hegedűs (2018) examined bankruptcy risk at Hungarian municipally owned corporations with the help of bankruptcy forecasting models. In the study cited herein they concluded that the models referred to in literature have only limited ability to assess the bankruptcy risk of municipally owned corporations. Feng and Neely (2017) showed that the implementation of the GCA is promoted by the regulated nature of the activities of government bodies, also including municipally owned corporations. This statement is confirmed by Krasnokutskaja et al. (2019), as corporate transparency positively affects the profit dynamics of corporations. The risks detectable in the operation of an undertaking determine the implementation of the principle of going concern to a significant extent. Departing from standard practice, in our research capital-related risks are rated among financial risks instead of the risks of financial standing, as its state is identified as a consequence (cf. loss-making operation and illiquidity and insolvency) and not a cause.

The reduction of risks may be affected also by banking (lenders') control in addition to public finance control, which may be one of the factors preventing municipally owned corporations from indebtedness (Sági, 2015; Chodnicka-Jaworska and Jaworski, 2017).

In the opinion of Kausar and his co-authors (2017), in the case of companies that are at risk of bankruptcy the forecasting role of auditing is vital. They concluded that in relation to the "principle of going concern", audit reporting compensated for the lack of accounting conservatism in the balance sheet, which derived from the fact that the book values were higher than the future liquidation values of assets. Bava and his co-authors (2018) identified within the framework of a survey which indicators used to assess whether an entity may not be able to continue as a going concern were regarded by Italian auditors and Italian accounting and finance academics as being the most appropriate. The authors considered the indicators applied in our study to be important. Marshall and his co-authors (2014) examined the effects of the global financial crisis on the "going concern" reports issued by auditors. The research examined auditors' reports issued for financially stressed clients (that subsequently entered into bankruptcy) during the period from 2004 to 2010. The authors found that the propensity of auditors to issue a going-concern modified opinion increased after the onset of the crisis, adequately anticipating the subsequent closure of companies.

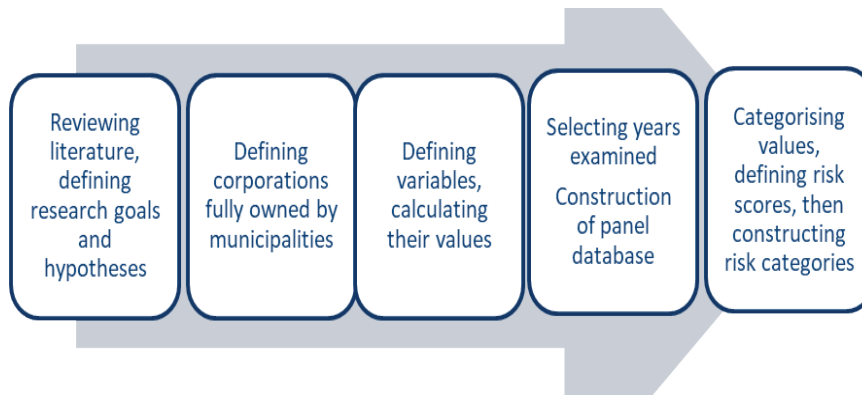
### 3. MATERIALS AND METHODOLOGY

The aim of this study is to assess the financial risks of companies fully owned by municipalities on a national level. Furthermore, we examine the financial risks of corporations by settlement types, by business law types, and by specialised tasks as broken down in the Hungarian Standard Sectoral Classification of Economic Activities (TEÁOR). The Bureau van Dijk Amadeus database, where the annual reports of companies are available, is the source of our research. This is a so-called panel sample survey, during which identical companies are examined on a multi-annual basis. Our analysis has a national dimension. The 52 corporations under examination were selected from 261 corporations. They are the ones that operated in a legally continuous manner in each year examined and constituted public utility companies under Hungarian legislation. Consequently, the sample accounts for 20 per cent of the population. Eight per cent of the companies involved in the examination were registered in Budapest, while the rest distributed proportionally among the 19 Hungarian counties. We consider the sample size and the data derived from them to be adequate for drawing conclusions across a national dimension.

The first testable hypothesis of the research is that the public financial regulatory environment, that is tightened controls and regulation, has a positive impact on the business management of municipally owned corporations, which manifests itself in categories describing financial risks. Thus, we assume an improvement in the risk classification of the companies examined, that is, a decrease in the share of financially risky companies in the years examined. We supported this finding with descriptive statistical tests. The second hypothesis of the study is that the introduction of administrative price regulation (utility cost reduction) did not substantially impair the financial stability of corporations. In addition to calculated data series (as proof by contradiction) we compared public transport, not concerned by the price regulation, to the value of sectors concerned by the regulation (the provision of district heating, water utility supply, wastewater treatment and waste management). The statistical method applied was the analysis of variance.

The third hypothesis of our research is that there is a connection between financial risks of corporations and the settlement type of the municipalities that own them. We assume that in villages with smaller financial capacities corporate financial risks are greater, while they are smaller in towns, cities of county rank and the capital. The reason for this assumption is that in larger settlements corporations have a higher asset value, and the income situation of the population is also more favourable, and most importantly, public services for a larger population number can be provided safely by larger corporations operating in a stable manner. A kind of reasonable (logically deducible) requirement also underlies our assumption, that is, as the sizes of the settlements and the asset values of the corporations providing public services within their territories, and even the size of the population served increase, greater at-

tention is paid to larger public utility companies, since the quality of public services have social and even political implications. This conclusion was tested by the analysis of variance.



**Figure 1.** Logical process of the analysis

Sources: Own research, 2020

Figure 1 shows the research process. As the first step, we defined the goal and the hypothesis of the research, based on specialised literature. Then we put the data of municipally owned corporations into a database, with our initial filter being (permanent) 100 per cent share of the municipality. For being included in the examination, it was also an exclusive criterion for companies to have an annual report submitted in each year examined and have other legal parameters unchanged, for example no fusions or change of ownership should have taken place. When scaling financial risks, we observed international standards and specialised literature. We selected three main areas of risks based on the indicators calculated from annual reports: the equity ratio, liquidity, and profitability (Subramanyam– Wild, 2009; World Bank, 1996). In relation to indicators, we examined three indicators below:

- The amount of leverage, or in other words, the equity ratio, which indicates the relative proportion of equity used to finance a company's total assets;
- ROA, that is, return on assets, which compares a company's pre-tax profit to its total assets, thus it is an indicator of profitability relative to total assets, and therefore, the efficiency of management;
- Cash liquidity, which shows the extent to which cash assets cover the short-term obligations of an undertaking. Liquidity can be measured with several indicators, the ratio that we apply is the most rigorous one, as it does not consider current assets other than liquid assets. At this point, we agreed with the findings of Györfi (2007), Zéman (2017), Kirkham (2012) and Gallinger and Healey (1991), according to which this was the most important indicator of liquidity both in budgetary management and at extra-budgetary performers of duties.

We selected four years within the interval examined: 2009 because of the crisis; the regulations presented in the section on the public financial regulatory environment came into force in 2012; in 2015, the past three years provided an adequate amount of experiences for the evaluation of the changes in the regulatory environment, including the administrative price regulation introduced in 2013; and 2018 was the last completed business year that provided up-to-date information when the manuscript was being prepared. The categorisation of corporate performance that we applied by using a scale from -5 to +5 is summarised in Table 1. By adding up the scores given, we obtained risk scores, which were then put into four categories. Risk categories were calculated from the sum of the scores of the three indicators (Table 1).

**Table 1.** Defining the categories of corporate financial performance and allocating scores

<i>Equity ratio</i>		<i>ROA</i>		<i>Cash liquidity</i>	
up to -0.5	-5	below -0.5	-5	0,00 – 0.149	-5
-0.49 – -0.4	-4	-0.49 – -0.4	-4	0.15 – 0.199	-4
-0.39 – -0.3	-3	-0.39 – -0.3	-3	0.2 – 0.239	-3
-0.29 – -0.2	-2	-0.29 – -0.2	-2	0.24 – 0.279	-2
-0.1 – -0.01	-1	-0.19 – -0.01	-1	0.28 – 0.329	-1
0-0.1	1	0 – 0.025	1	0.33 – 0.49	1
0.11 – 0.2	2	0.026 – 0.1	2	0.5 – 1	2
0.21 – 0.3	3	0.11 – 0.2	3	1.01 – 2	3
0.31 – 0.5	4	0.21 – 0.5	4	2.01 – 4.99	4
0.5 – 1	5	above 0.5	5	above 5	5
<i>RISK SCORE</i>		<i>CATEGORIES AND THEIR COLOUR CODES</i>			<i>CODE</i>
-15 – 0		High-risk corporation			Group 1
1 – 6		Risky corporation			Group 2
7 – 10		Acceptably functioning corporation			Group 3
11 – 15		Well-functioning corporation			Group 4

Source: Own research, 2020

The distribution of the panel data examined is shown in two different ways, i.e. as sectoral distribution and by the legal status of the municipalities as owners under public law in Table 2, where public utility companies engaged in waste management and district heating services represent the largest share. In addition to these sectors, the share of water utility companies is also high.

**Table 2.** Distribution of the sample (n=52)

<i>NACE Rev. Code</i>			
	<i>Frequency</i>	<i>Per cent</i>	<i>Cumulative Per cent</i>
Public transport	5	9.6	9.6
Waste management	19	36.5	46.2
District heating services	15	28.8	75.0
Wastewater treatment	4	7.7	82.7
Water utility supply	9	17.3	100.0
Total	52	100.0	
<i>Type of settlement</i>			
Budapest	4	7.7	7.7
City of county rank	21	40.4	48.1
Town, district seat	19	36.5	84.6
Village	8	15.4	100.0
Total	52	100.0	

Source: Own research, 2020.

In the distribution by settlements, cities of county rank within the meaning of Hungarian public law are dominant. These cities are settlements with populations between 33,000 and 200,000, there are 23 of them in Hungary, they are considered to be medium-sized centres, and the majority of them are county seats. Towns are also dominant in the sample, which are typically settlements with populations between 2,000 and 30,000 and have regional administrative roles. Villages are settlements that are usually smaller than towns, with populations between 3,000 and 5,000 people, where the needs of the population justify the local provision of certain public services. Obviously, only those villages were included in the examination which operated public utility companies continuously during the period of time examined. Budapest is the capital of Hungary; 1.5 million of the country's population of 10 million live here and almost further one million people come here on a weekly basis to work or run errands. Consequently, the public utilities listed are typically provided by larger public service providers, which can explain a low share of the capital in the test sample.

## 4. RESULTS

Table 3 shows the changes of the three indicators examined in the four years examined by using descriptive statistics.

The darker (darkening) colours indicate favourable values, while lighter colours represent unfavourable values of indicators. The equity ratio is in the favourable range at 50 per cent, that is the median, of the corporations examined in 2018 and 2015; however, it is at 40 per cent of the sample in the previous years. The fact that the equity ratios of public utility companies had improved by 2018 can be regarded as a positive development, since 60 per cent of them are in the favourable range of the indicator, while in 2009 and 2012, the share of companies with favourable values was only 40 per cent. At the ROA indicator, operational profitability is a “watershed”, which can be observed at 60 percent of companies, with the exception of 2015, as 40 per cent of the corporations in the sample were loss-making on the basis of distribution. The indicator measuring liquidity landed in the acceptable range at 60 per cent of the companies examined. On the basis of the data analysis, we can conclude that the capital position of undertakings had improved in the time series examined, which can be mainly contributable to the high values of profitability, which is stable in the period examined, allowing for adequate creation of capital at public utility companies. An improvement of the capital position in 2015 can be observed despite the fact that the share of companies with good profitability figures had slightly decreased.

**Table 3.** Descriptive statistics, distribution (n=52)

		Eq. ratio 2018	Eq. ratio 2015	Eq. ratio 2012	Eq. ratio 2009	ROA 2018	ROA 2015	ROA 2012	ROA 2009	CL ratio 2018	CL ratio 2015	CL ratio 2012	CL ratio 2009
<b>Minimum</b>		15. 36%	-48. 12%	12. 41%	11. 19%	-94. 18%	-196. 19%	- 5769. 34%	-319. 44%	0.11	0.13	0.13	0.12
<b>Maximum</b>		99. %	94. 14%	99. 69%	99. 36%	227. 89%	454. 17%	125.6 6%	95. 34%	8.84	2.35	4.88	49.32
<b>Variables and years</b>		Equity ratio				ROA (Return on Assets)				CL ratio (Cash liquidity)			
		2018	2015	2012	2009	2018	2015	2012	2009	2018	2015	2012	2009
<b>Percentiles and quartiles</b>	10	32. 16%	18. 60%	20. 07%	17. 44%	-47. 53%	-77. 98%	-84. 31%	-66. 17%	0.15	0.17	0.17	0.17
	20	37. 55%	31. 89%	27. 59%	23. 06%	-18. 69%	-54. 83%	-40. 10%	-30. 60%	0.23	0.21	0.22	0.21
	25	38. 70%	33. 95%	30. 53%	24. 16%	-14. 96%	-38. 40%	-18. 95%	-22. 48%	0.26	0.23	0.26	0.23
	30	41. 71%	35. 11%	34. 60%	28. 13%	-12. 07%	-26. 81%	-15. 99%	-17. 31%	0.27	0.26	0.29	0.27
	40	51. 66%	46. 85%	40. 02%	37. 56%	12. 34%	-18. 33%	13. 21%	11. 93%	0.37	0.39	0.37	0.36
	50	58. 26%	55. 32%	45. 77%	47. 21%	15. 71%	15. 15%	23. 69%	16. 77%	0.47	0.49	0.46	0.40
	60	65. 41%	58. 60%	55. 02%	56. 56%	26. 54%	27. 93%	36. 21%	25. 42%	0.57	0.61	0.62	0.56
	70	71. 32%	63. 01%	65. 58%	64. 45%	34. 80%	37. 81%	45. 74%	40. 55%	0.74	0.79	0.79	0.78
	75	73. 07%	71. 15%	70. 27%	71. 63%	39. 29%	46. 57%	48. 67%	54. 11%	0.84	0.86	0.86	0.88
	80	75. 50%	76. 35%	76. 68%	76. 12%	45. 08%	59. 55%	54. 07%	63. 62%	1.09	0.98	0.92	0.97
90	86. 22%	84. 02%	84. 79%	89. 29%	62. 20%	96. 12%	66. 98%	86. 37%	1.85	1.51	1.70	1.93	

Source: Own research, 2020

The liquidity position of the corporations examined could be regarded as stable in each year examined, thus, on the basis of our examinations, this indicator provides the foundation for the operation of public utility companies. On the basis of our analysis we drew the conclusion that in the time series examined, the liquidity position and its improvements had had a favourable impact on profitability, which had eventually manifested itself in improving equity ratios.

Colour codes indicate the degree of financial risks. The share of high-risk companies accounts for 20 per cent of the sample in 2012, and 25 per cent in 2015. In 2018, the share of companies belong-

ing to the worst risk category decreased, to 10 per cent. The share of risky companies is high in 2009 and 2018, which can be described as positive, since it results from a drop in the share of the worst category. The share of companies with acceptable functioning was the highest in 2012, while the share of companies belonging to the best category was 20 per cent in 2009 and 2012, and 25 per cent in the last two years examined.

**Table 4.** Distribution of risk score (n=52)

		<i>Risk score 2009</i>	<i>Risk score 2012</i>	<i>Risk score 2015</i>	<i>Risk score 2018</i>
N	<i>Valid</i>	52	52	52	52
	<i>Missing</i>	0	0	0	0
Minimum		-7	-6	-7	-4
Maximum		15	14	13	14
Percentiles	10	-3	-2	-4	-2
	20	1	0	-1	2
	25	1	1	-1	2
	30	2	1	1	3
	40	4	4	3	5
	50	5	8	8	8
	60	7	9	8	9
	70	8	10	10	10
	75	9	10	11	11
	80	11	11	11	11
90	12	11	12	11	

Source: Own research, 2020

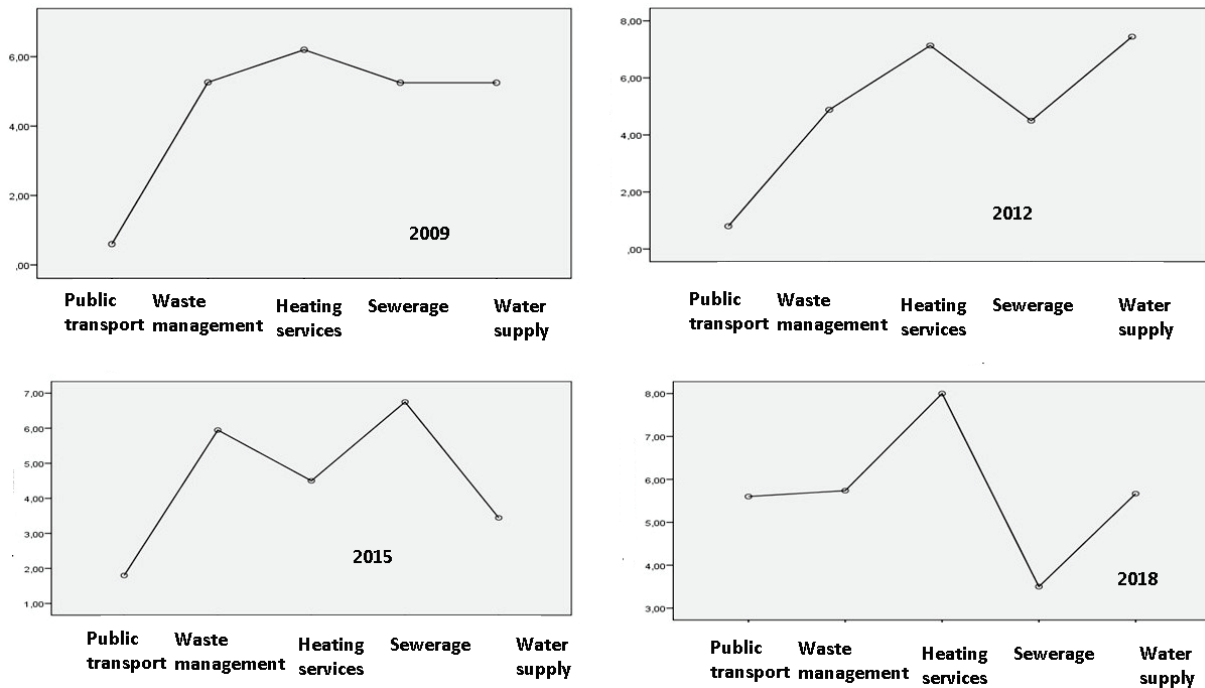
**Table 5.** Analysis of variance in risk score and industry classification

<i>Levene test</i>	<i>Levene Statistic</i>	<i>Sig.</i>
Risk score 2009	1.282	0.291
Risk score 2012	1.462	0.230
Risk score 2015	1.047	0.393
Risk score 2018	0.591	0.671
<b>ANOVA</b>	<b>F</b>	<b>Sig.</b>
Risk score 2009	3.0456	0.0400
Risk score 2012	3.7895	0.0158
Risk score 2015	2.9870	0.0487
Risk score 2018	2.9456	0.0480

Source: Own research, 2020

Levene's test is an assumption for the analysis of variance, and its value above 0.05 meets the requirement of homogeneity of variance, and this assumption is satisfied every year. The result of the ANOVA table is significant if it is below 0.05, that is, 5 per cent. It is satisfied in each year examined, the empirical value of the F-test exceeds the critical value, and as a result, variances are different (Table 5), which is also illustrated in Figure 2.





**Figure 2.** Means plot of sectors examined

Source: Own research, 2020

The analysis found that between 2009 and 2015 the risk classification of corporations engaged in public transport significantly deviates in a negative direction from the values of sectors concerned by the state price regulation on the basis of the results of the means plot (Figure 2). That is, the public transport sector, upon which no administrative price regulation (utility cost reduction) was imposed, is nevertheless problematic, even despite a more robust public financial regulatory and control environment. Thus, companies' apologetic arguments that administrative price regulation (reductions of household charges) had an expressly negative impact on public utility companies is irrelevant.

**Table 6.** Analysis of the variance between the municipal corporate status and the risk score

<i>Levene's test</i>	<i>Levene Statistic</i>	<i>Sig.</i>
Risk score 2009	0.023	0.995
Risk score 2012	1.741	0.172
Risk score 2015	7.323	0.000
Risk score 2018	0.904	0.446
ANOVA	F	Sig.
Risk score 2009	3.693	0.018
Risk score 2012	3.930	0.014
Risk score 2015	0.510	0.677
Risk score 2018	2.586	0.064

Source: Own research, 2020

As a result of the Levene statistic we can conclude that in 2015 the fundamental assumption for the analysis of variance was not satisfied, and the value of the F-test does not demonstrate a significant difference, either. In the other years examined the assumption for the analysis of variance is satisfied, the empirical value of the F-test exceeds the critical value, revealing a significant difference. These years are marked by the colour blue in Table 6. Next step was that, we examined the standard deviation and the average of the risk scores of the settlement status and the companies operating in their territory.

**Table 7.** The average and standard deviation of the risk scores of the companies are related to the status of the settlement

Settlement type		Risk score 2009	Risk score 2012	Risk score 2018
Budapest	Mean	1.25	1.50	4.00
	N	4	4	4
	Std. Deviation	6.24	7.00	4.83
City of county rank	Mean	7.29	7.95	7.52
	N	21	21	21
	Std. Deviation	4.80	4.22	4.11
Town, district seat	Mean	4.95	5.56	6.74
	N	19	19	19
	Std. Deviation	5.02	5.03	4.33
Village	Mean	1.00	1.75	2.50
	N	8	8	8
	Std. Deviation	4.97	5.85	6.70
Total	Mean	5.08	5.58	6.19
	N	52	52	52
	Std. Deviation	5.40	5.44	4.91

Source: Own research. 2020

The Scheffé Test concluded that the risk scores of companies operating in Budapest and villages are significantly below the scores of the other two settlement categories (town, city of county rank) in 2009 and 2012. In 2018, only the scores of villages deviate negatively from the scores of other settlement categories, as Budapest-based companies demonstrated significant improvement. The analysis revealed that the number of companies running financial risks is the highest in villages (Table 7). It is contributable to the fact that management discipline and solvent demand, the income position of the population, are weaker in these villages.

## CONCLUSIONS

The general starting point of this study is that in the transition developing after a tight regulation of a socialist, planned economic system to a market economy, state regulation and control became relaxed at local governments, gaining greater economic independence, and their public utility companies as well, which led to a deterioration of the standard of management. After 2010, during the Hungarian public finance reform, which resulted in an active participation of the state and tightening regulation and control, management discipline and efficiency improved substantially also at public utility companies; this study is a justification of that.

Of the three indicators, capital position demonstrated the greatest improvement in the period examined, since an increasing share of companies has favourable values of this indicator expected by the risk assessment. Liquidity and profitability were favourable at 60 per cent of the companies examined in the period concerned.

On the basis of the distribution of risk scores, it can be concluded that a positive process has been unfolding since 2015, as a result of a more robust regulatory and control environment, which has even compensated for a more moderate income of corporations concerned by the administrative price regulation (service charge reductions), as the share of companies whose operations counted as risky has decreased in the sample. Naturally, this is recognised as a favourable development, as all three indicators of the given corporation are in the favourable range, which promotes the improvement of the standards of public services and the implementation of the principle of going concern.

The improvement may stem from several factors, which, on the one hand, lie in the regulatory environment. In 2016, the debt rule was extended (restriction of borrowing, making it subject to permission) over municipally owned corporations as well. As a result of the legal authorisation entering into force in 2011, the State Audit Office could even take extensive control over municipally owned corporations. Thus, the active impact of the regulatory environment can be assumed as an explanation for the im-

provement, which supports our first hypothesis. Government decree No. 339/2019 (XII. 23) on internal audit and proprietor's audit, introduced in 2019, which falls outside the time horizon of this study, may lead to a further improvement of management discipline and efficiency. However, it should be noted that the change in the regulatory environment did not exert its impact directly immediately, therefore it was necessary to continuously monitor the regulatory environment and make necessary interventions. One example is the adoption of the corporate debt rule and the resulting improving risk scores, which are observable from 2015. It is an important message that a well-designed regulatory environment and reasonable changes in it, a more robust public financial control are able to produce a beneficial effect on the financial risks of municipally owned corporations, which requires a continuous control activity. The obviously more favourable risk classifications from 2015 to 2018 justify that after the full implementation of a tighter management and control practice the corporations' standard of management improved, and it even considerably compensated for the adverse effects of a decreasing net income generated by public utility companies as a result of the administrative price regulation on financial indicators, although compensating measures were also taken from central budgetary sources in some sectors (district heating services).

Another possible explanation for all corporations is of a macroeconomic nature, since the continuous opportunity for economic and wage growth had opened up after the fiscal consolidation taken place by 2013, which improved the financial position of the population and the companies, which is also confirmed by the data of the national accounts of the Central Bank of Hungary. Thus, a more stable macroeconomic environment has a positive effect on the financial position of the population and corporations, which, due to an increase in stable solvent demand, can downstream a positive impact on the liquidity of corporations and therefore, their profitability, which ultimately has a positive effect on their capital structure.

During the period examined (2009-2018), bad debts in the debt portfolios of corporations decreased considerably, by 22 per cent, while net average wages increased by some 45.8 per cent between 2014 and 2018. Thus, the increase in wages had a positive impact on the position of public utility companies through the expansion of consumers' liquidity, and this affected the other two aspects of operation, profitability and the equity ratio, in the way described above.

From that, it can be concluded that the liquidity position is primary, especially (also) in the current critical situation (in early 2020). Since the data strongly correlate with the changes in GDP (suffice to think of the decline in GDP in both 2009 and 2012, but there was an increase of 3.8 per cent in 2015 and as high as 5.1 per cent in 2018), therefore in the current economic situation caused by the coronavirus epidemic a serious deterioration of the financial positions of municipally owned corporations can be projected. The solvent demand (income) of the users of public utility services is going to decrease significantly, and even the possibility of introducing a moratorium on paying arrears on public utility bills of households cannot be ruled out.

Our second hypothesis has been also confirmed, as financial risks were higher in the public utility sector not concerned by the administrative price regulation between 2009 and 2015 (public transport) than in sectors concerned by the price regulation. Thus, the decrease in net income, triggered by the administrative price regulation (utility cost reductions) did not cause a considerable increase in the degree of financial risks in the sectors concerned.

Examining the legal status of settlements, the degree of risk was the highest at corporations of villages, which stems from a narrower profile of duties, lower level of independency in terms of revenues, and lower incomes of the local population. The analysis of background variables revealed that revenues and earnings after tax were the lowest, while the share of other incomes, where the owner's subsidies are accounted for, are the highest at corporations operating at settlements of this type, therefore the weakening liquidity of municipalities, who are the owners of these corporations, (even as a result of the crisis of 2020) may cause serious problems at these corporations. The best situation has developed at corporations operating in cities of county rank. Based on the analysis, we accepted our third hypothesis.

The new and novel scientific results of the study are:

- Public finance reforms being effective since 2011, more robust regulation and control practices had a positive impact on management discipline and the performance indicators of public utility companies; in particular, the regulation asserted a marked influence after 2015;
- The administrative price regulation caused a slight drop in net incomes of public utility companies, but their financial performance indicators did not deteriorate parallelly;
- The unfavourable financial situation of public transport companies points towards still existing (inherited) anomalies of their management, which is not a result of the administrative price regulation, since it has not been introduced in this sector;
- The corporations owned by villages run the highest financial risks, where we recommend the implementation of tighter public finance controls.

The analysis highlighted that ensuring liquidity is of primary importance also for municipally owned corporations. Our research has confirmed that liquidity dominates the other two factors, i.e. profitability and the equity ratio. The explanation for this is that incomes and capital positions of corporations are stable if liquidity is adequate. Permanently higher liquidity results in profitable operations, which increases equity in the form of profits, stabilising the funding structure.

As a proposal, we suggest (in agreement with Feng and Neely's study) that the prescription of an adequate level of liquidity and the obligation to continuously maintain it may be an area to be regulated in relation to public utility and public service companies, with which the sustainability and quality of public services may be further improved. A solution might be the separation of rules pertaining to companies performing duties on a mandatory or a voluntary basis, as it is the case in the municipalities' budgets. We stress that the impact of the economic crisis caused by the COVID-19 pandemic may be further moderated by the continuous review of regulations and further strengthening of the control environment, especially in the case of municipally owned corporations providing public services, for which our study may provide the professional background.

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