Analysis of the Asset Structure of Hungarian District Heat Suppliers, with Special Regard to the Fixed Assets, Based on the Companies' 2009-2017 Accounts

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SUMMARY

Nowadays in Hungary, district heating has 677,000 fee payers in 93 settlements, for the provision of which 89 companies are responsible. There are, however, differences in the ownership background, in the technical structure, in the activities carried out by the district heat producers and in the number of the consumers supplied. This paper examines the asset structure of the Hungarian district heat suppliers, with special regard to their fixed asset ratio. The research aims to explore whether the companies' activities have an effect on their asset structure on the one hand and whether there are any significant differences between some special characteristics (pipeline length, number of fee payers) of the district heat suppliers and the tangible asset ratio. Using the data derived from the accounts of the Hungarian district heat suppliers and from technical and economic data, information from nine years (2009-2017) were analyzed.

Keywords: District heat supply, District heat producers, account analysis, asset structure
Journal of Economic Literature (JEL) code: K32
DOI: http://dx.doi.org/10.18096/TMP.2019.02.07

INTRODUCTION

The bulk of the literature dealing with district heating examines the sector from its technical aspect. In this field, the research of Németh (2008) and Kádárné Horváth (2010), who examined the pricing of district heat suppliers, are outstanding. In their dissertations and the related research, they described in detail the regulatory environment and the theoretical and practical basics of the formation of pricing. As district heat suppliers are public service companies, the analytical research of Illés (2010) about the management of public service companies is essential regarding this field. One of the novelties of the current research is that there is no analysis in the literature that has examined the management and operation of heat supply companies in a comprehensive way with report analysis tools. The other novelty is that this research fills the gap that no summary study has been prepared whose data could be used as a benchmark for industry experts for the comparative analysis of the performance of their industry and their company. The aim of the paper is to reveal any operational specificities that significantly influence the asset structure and to reveal whether there are any technical or economical characteristics that have an important effect on the asset structure.

LITERATURE REVIEW

I begin the theoretical review with describing the most important technical characteristics of the district heat sector in two steps. I examine the Hungarian companies dealing with heat supply and reveal their characteristics, since this provides the opportunity to define qualitative criteria necessary for subsequent variance analysis (Domán et al., 2009). The tools to characterize wealth position used in the empirical analysis are also described in the literature review.

CHARACTERISTICS OF HUNGARIAN DISTRICT HEAT SUPPLIERS

Although the beginning of district heating in Hungary dates back to 1899, when the district heating system responsible for supplying the Parliament was put into operation, the real beginning of district heating can be traced back to the 1950s, when residential communal district heating began. Later, in the 1960s, it was the state housing program that led to its spread (Cselédes, 2009). At the time of the establishment of Hungarian district heating, the role of industrial district heating was dominant (Lázár and Orbán 2011). Then, between 1960 and 1990, a total of 1.2 million homes were aimed to be built within the framework of the housing programs I and II (Kádárné Horváth, 2012). In the case of the prefabricated buildings built at the time, one-pipe internal heating systems without connecting sections were constructed to ensure the fastest and most "economical" construction (Egedy, 2003). Experts did not consider it feasible – or justified – to regulate the heating of apartments individually (Cselédes, 2009).

"In order to complete high figures of the plans for housing projects, solutions with a minimal investment need were preferred in both home construction and the creation of district heating systems. This was also supported by the prevailing architectural concept at the time that panel flats had a steady heat demand. The option of differentiated heating of the flats was not considered acceptable due to the different degrees of thermal expansion. In addition, Hungary received Russian natural gas extremely cheaply so there was no need for savings." (Kádárné Horváth, 2010, p. 30).

Since in many municipalities district heating services were used to remove waste heat from an industrial facility, such as the Lenin Metallurgical Works in Miskolc, there was no need to insulate the pipes in order to perform the task "more efficiently".

Experts consider the period from the change of regime in 1990 to the millennium to be one of the most difficult periods in the history of district heating, as consumer prices rose in addition to rapidly increasing energy prices and the cost disadvantage of heat supply became increasingly apparent also to consumers (Orbán, 2016), and there were significant changes in the operation and maintenance of these systems. In practice, this meant that with the introduction of market economy conditions, the energy management of the country was also transformed. The possibility to procure previously inexpensive sources of energy was eliminated, prices and operating costs increased significantly and the ownership structure of both the heat producers and consumers changed (Vadász, 2015). Pipe systems formerly considered "efficient" waste heat exhaust became loss sources of the system because previously many cities used district heating to remove waste heat from the heavy industry, but after the decay of these industries, heat production and the inefficient insulation became a serious problem. Similarly, the lack of regulation of individual heating in homes became a bottleneck and a source of loss, as without it, the excessive temperature in the homes could be decreased only by opening the windows, which, although acceptable in the previous period, became a major factor of inefficiency with the change in market conditions.

INDICATORS OF THE FINANCIAL SITUATION ANALYSIS

An analysis of the financial position of a company is possible by studying its balance sheet. Depending on the depth and approach of the analysis, the overall analysis of the balance sheet and the detailed examination of the certain/different balance sheet items can be distinguished (Pucsek, 2011).

The analysis of the assets and finances using the balance sheet data can be carried out in a number of ways. Based on the methodology of the analysis of deviations, the following methods can be distinguished:

- the method of absolute differences, when the difference between the absolute data of two or more years/periods is calculated and this is to be explained by exploring causal relationships,
- in the case of the method of relative differences, absolute data are only starting points as ratios and indices are calculated from them (Kardos et al., 2007). In some areas of research, it might be important to analyze some of the key assets in detail. In such cases, the method of relative differences can be used.

The balance sheet may be analyzed:

- vertically, when the source of information is either the asset side or the liability side,
- horizontally, when information is used for the calculation of the indices from both the asset and the liability side (Siklósi and Veress, 2016).

Table 1 shows the most important indicators and their calculation methods.

Table 1
Key indicators of assets and capital structure based on the methodology of vertical analysis

Focus of the analysis / Indicator name		**Calculation of the indicator**	
		Numerator	**Denominator**
Indicators of asset structure	**General way of calculating the indicator**	Asset item	Asset group
	Examples	Fixed assets	Total assets
		Tangible asset	Total assets
		Current asset	Total assets
Indicators of capital structure	**General way of calculating the indicator**	Capital item	Capital group
	Examples	Equity	All liabilities
		Debt	All liabilities
Intensity indicators	Tangible asset intensity	Tangible asset	Tangible assets + Current assets
	Equity intensity	Equity	Equity + Debt

Source: Own compilation

In vertical analysis, we can understand the asset structure, the capital structure and their changes by calculating different distribution ratios. A number of indicators can be constructed from them. Based on the underlying methodology, the following ratios can be distinguished:

- the rate of the main balance sheet group to the total assets or liabilities,
- the rate of the balance sheet group to the main group,
- examining the structure of the given asset or liabilities group using ratios calculated from rows within the group,
- other vertical ratios that are (distribution) ratios calculated by aggregating several asset or liability items (Pucsek, 2016) -

There are no generally accepted values of the assets. They can be different in different industrial sectors and may vary from time to time. According to Illés (2000), at the end of the 1990s the district heating system was "the most valuable asset of heat supply companies, accounting for 67% of the total fixed capital in the case of Budapest District Heating Works" (Illés, 2000, p. 25). Moreover, by examining the asset composition of a company, conclusions can be drawn regarding the industrial sector where it operates. Moreover, asset structures of the companies of a given industrial sector can serve as a benchmark for the companies operating in the given sector.

Similarly, no general proposal can be given about the optimal capital structure, but "according to the bulk of the professional literature, it is desirable that the equity should not be less than one third of the liabilities…., in the case of Hungarian companies, the rate of equity to the total liabilities is 30-40 % "(Béhm et al., 2016, p.32; see also Szemán, 2017; Musinszki, 2016).

Vertical and horizontal analyses include the formation of specific indicators of the financial situation and of the financing structure.

THE AIM OF THE EMPIRICAL RESEARCH AND THE APPLIED METHODOLOGY

The objective of the empirical research is the analysis of the asset structure of the companies providing district heating in Hungary. According to previous studies focusing on these types of companies operating in the country (Németh, 2008; Kádárné Horváth, 2010), there is a significant difference in the ownership background and operating structure of the companies. Accordingly, the following research questions were asked: do these factors affect the asset structure of the companies, is there any significant difference based on these characteristics, what additional factors can have a significant effect on the companies?

The *database* of the research includes the 2009-2017 financial reports of the companies. Currently in Hungary, 89 companies provide heat in 93 settlements. At the beginning of the research, the aim was to conduct a full-scale analysis, but the population had to be truncated later. This was partly due to the lack of data, partly due to preliminary statistical research results showing that some companies with outstanding values would have distorted the values of the indicators. There are two reasons for the lack of data and the existence of outliers. Firstly, some companies were transformed several times or changed

their owners over the years. In the case of some of these companies, it was not possible to identify the predecessors and successors and they were therefore excluded from further analysis. It is justified to exclude these companies from an accounting point as well since the termination with legal succession is not part of the "normal" business process and the management information of the years before and after the termination would not have contributed to a realistic and faithful picture of the examined population. Secondly, there were companies whose data could not be obtained. After the truncation, 72 companies became part of the examined population. It is important to highlight the representativeness of the examined population to the whole population; this was tested from several aspects like the amount of heat sold, the territorial or regional distribution or the number of customers.

The amount of heat sold by the 89 companies and the number of customers serviced by them varies widely; the amount of heat sold and the number of customers belonging to the 72 companies of the examined population exceeds 95% of the total amount of heat sold and the total number of customers of the 89 companies. It follows that the conclusions drawn from the examined population adequately describe the position and condition of the whole population.

The calculation of the indicators of the asset structure required the annual reports of the companies, which is considered the first type of data. Currently no database with data at the balance sheet item level is available in Hungary[1] therefore manual data collection was required. The other type of examined data includes the technical and economic data that companies have to provide yearly according to the Annex 4 of Government Decree no. 157/2005 on the implementation of Act XVIII of 2005 on District Heating Services. Since 2012, district heat suppliers have had the obligation to disclose these data to the public.

The availability of the necessary data was ensured by several data sources, which were:

- Ministry of Justice, Company Information and Electronic Company Registration Service (https://e-beszamolo.im.gov.hu)
- Websites of companies in the case of the parts of the reports that were made public and for technical and economic data[2],
- Direct contact with the companies by letter to obtain technical and economic data[3].

Act XVIII of 2005 on District Heating Services, Chapter 3, Article 18/A requires "that cogeneration shall be published broken down by premises, that district heat supply shall be published by settlements separately and that other activities shall be published in the supplement of the annual report as if it was carried out within the framework of an autonomous company". This implies that besides their regular balance sheet and profit and loss account, these companies have to prepare a balance sheet and a profit and loss account at the activity level (broken down by premises for district heat production and by settlements for district heat supply). Databases including the companies' annual reports were not relevant for my research because they do not include the data separated at the balance sheet group level or main group level.

The tools of the analysis were the Excel program of the Microsoft Office 365 ProPlus package and SPSS 24 software. The data of the companies' annual reports were uploaded into an Excel file. The final Excel file included 648 rows (72 companies and 9 years) and 640 columns (representing variables).

As for the methodology of the analysis, Excel provided the opportunity to carry out descriptive statistical analysis and the SPSS software package made it possible to carry out more complex analysis (like analysis of variance, univariate analyses, panel regression).

The purpose of the empirical research of the study is to test the following hypotheses:

H1: Fixed assets represent the greatest part in the asset structure of district heating suppliers, while other companies (performing non-heating activities to a greater extent than the average) are characterized by a lower rate of fixed assets.

H2: The fixed asset ratio of district heat suppliers is significantly affected by the size of district heat supplier: higher produced heat volume is associated with a higher fixed asset ratio.[4]

H3: There is a relationship between the number of consumers supplied, the pipeline length and the tangible asset ratio. Higher tangible asset ratios belong to companies with more consumers and with longer pipeline networks.

[1] *Several databases summarizing data and companies were examined before the manual data collection, but the breakdown of the available data was not deep enough, not even in one of the best-known databases, Opten.*

[2] *According to the Annex 4 of the Government Decree no. 157/2005 (August 15), companies have to publish management and technical data on their website for three years. In order to extend the time horizon of the analysis in the case of these special cases as well, I used the recovery function of the stored versions of Google's search sites to gain access to data for further years.*

[3] *Although the Government Decree requires the publication of data, there were shortcomings in the case of many, typically smaller, businesses; therefore, I needed to contact the companies by phone or by email.*

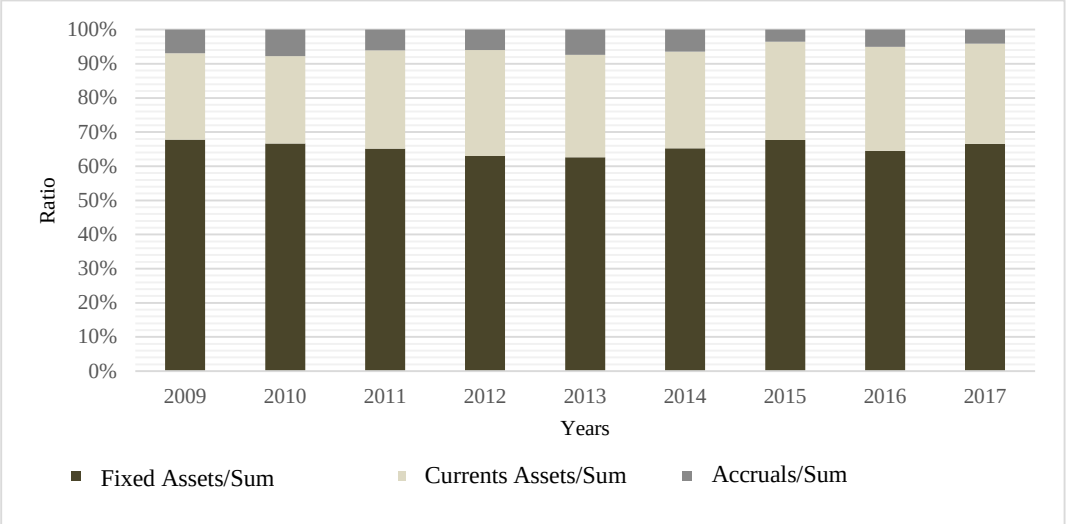
[4] *The fixed asset ratio and the tangible asset ratio of district heat suppliers can be determined by further factors like the age or the amortization rate of the assets. There were no available data for the age of the assets and there is no significant difference among the applied amortization rates based on the supplements (the rates defined by the Act on corporate tax are mostly applied); therefore, the current research does not include the examination of these factors.*

RESULTS OF THE RESEARCH

To test the first hypothesis, the asset structure of the 72 examined companies was analyzed.

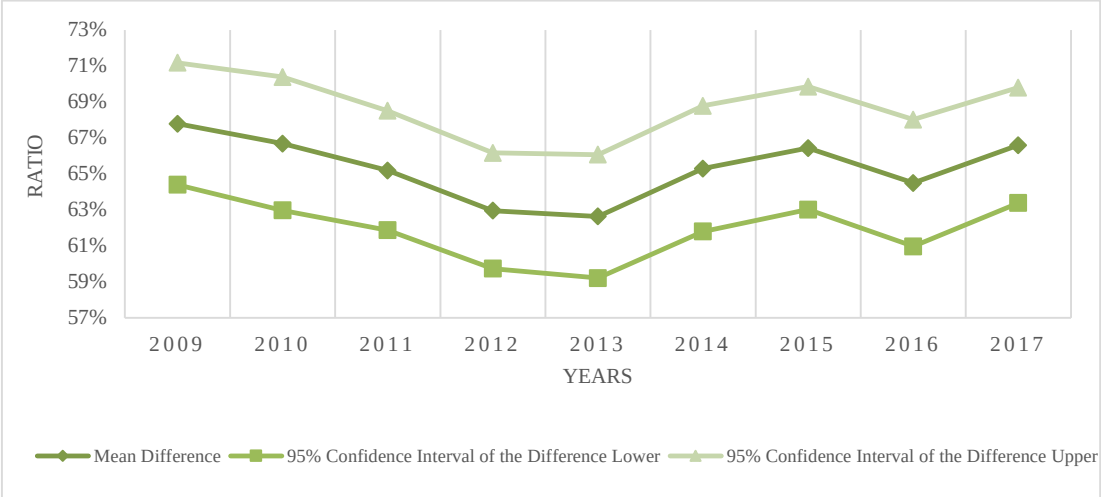
Data of the reports of nine years show that the average rate of fixed assets of the examined 72 companies exceeded 60% every year, which is as expected. The bulk of the corporate assets is indeed made up of properties that serve the activity in the long run.

The deeper analysis of the rate of fixed assets to total assets provides further information. Figure 2 shows the fixed asset ratio in the entire district heating sector in Hungary at the 95% confidence level. It implies that there have been some changes in the value of the ratio over the examined nine years. The average value of the ratio steadily declined up to 2013, indicating that the replacement of fixed assets lagged behind their depreciation. The trend reverse might have been influenced by the Decree of the Minister of National Development no. 50/2011 (September 30), as this decree specifies a profit limit for district heat suppliers. It implies that the profit before tax derived from activities covered by the Act on District Heating Services may not exceed the product of the gross book asset value taken into consideration in the pricing process and the profit factor, which is set as 2% by the Decree. The Decree also provided that "the profit above the profit limit is to be spent by the company on investments to increase the energy efficiency of the district heat production and district heat supply or to decrease their costs" . Accordingly, the investment of the amount above the profit limit began and its effects became visible in the balance sheets after the activations.



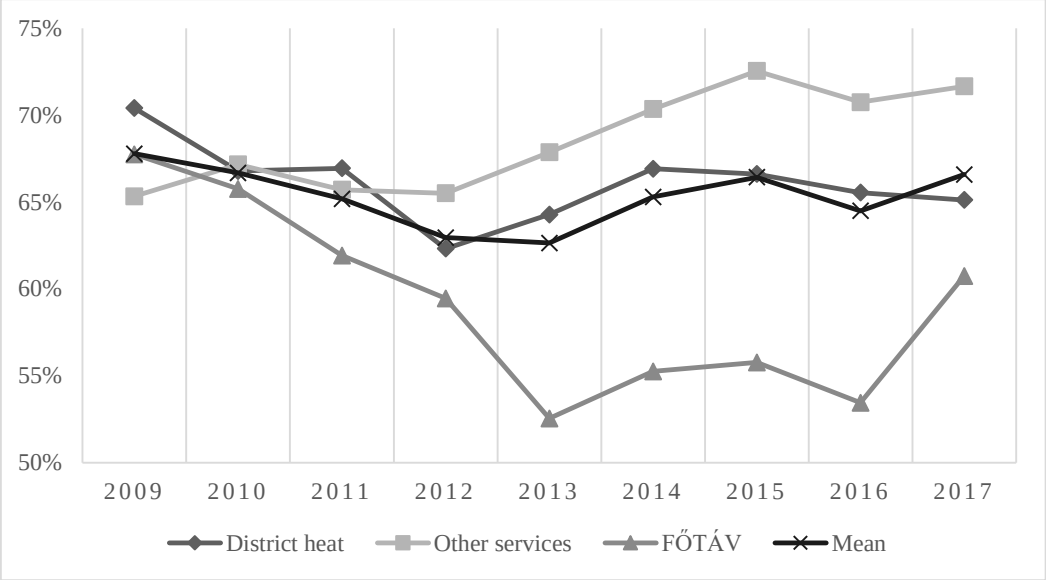
Source: Own compilation based on annual report data

Figure 1. Asset structure of district heat suppliers, 2009-2017



Source: Own compilation based on annual report data

Figure 2. Average fixed asset ratio of the Hungarian heat suppliers at the 95% confidence level



Source: Own compilation based on annual report data

Figure 3. Average fixed asset ratio of district heat suppliers based on activities

The second part of the hypothesis is related to a different law. Act XVIII of 2005 on District Heating Services defines district heating as follows: "A commercial public service provided by the licensee, which supplies consumers with energy intended for heating or other heat utilization. The service is provided from a district heat producing facility through a district heating pipeline network". The Act and the related decrees do not prohibit that companies providing these activities from engaging in other activities as well. Accordingly, besides district heating, the bulk of the 89 Hungarian district heat suppliers carry out other activities, including district heat production, electricity production, waste management, water utility supply and other activities related to urban management. The above-mentioned Article 18/A of the Act provides that the balance sheet and the profit and loss account have to be prepared at the activity level as well. This provided me with the opportunity to examine the rate of the total assets related to district heating and other activities and to examine what percentage of the net receipt of sales comes from performing district heat supplier activities. In the case of the examined population in 2017, the average rate of turnover from other (not district heating service) activities was 28%, while this rate was 33% for the assets. On this basis, I divided the district heat suppliers into two categories. Companies with an asset or turnover rate exceeding the average are labeled by "other services", while other companies are labeled by "district heat". The annual averages calculated based on this classification are reflected in Figure 3.

Although classification by activity would justify the creation of only two groups, preliminary calculations and statistical analyses (including the box-plot shown in Figure 4) justified the separate analysis of Hungary's largest heat provider (FŐTÁV Private Co. Ltd.), which supplies Budapest. There is a difference in magnitude between this company and the other providers, which is reflected in the quantities of heat sold and in its asset position, since 26% of the total assets of the 72 companies belong to FŐTÁV Private Co. Ltd. Based on Figure 3, it can be concluded that:

- the decrease in the asset structure of FŐTÁV Private Co. Ltd. played an important role in the decline of the fixed asset ratio of heat suppliers up to 2013,
- contrary to previous expectations, it is the 'other' companies (providing non-heating service to a greater extent than the average) are characterized by a higher fixed asset ratio; it was higher on average by 5 percentage points than for companies providing mainly heating supply. The difference can be explained by the fact that even though district heat supply requires a large asset lockup, the other tasks that can be classified as other activities operate with an even higher asset lockup.

It is also important, however, to consider whether the activity breakdown is an appropriate grouping criterion in the case of this indicator. The result of the analysis of variance is shown in Table 2.

Table 2
Significance levels and the analysis of the strength of the relationship over years

Year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Sig	*0.007*	0.441	0.272	0.083	*0.001*	*0.001*	*0.000*	*0.000*	*0.019*
Eta	*0.367*	0.153	0.192	0.264	*0.423*	*0.417*	*0.460*	*0.470*	*0.330*

Source: Own compilation based on annual report data

Table 3
Results of the Post Hoc Tests in the significantly different cases

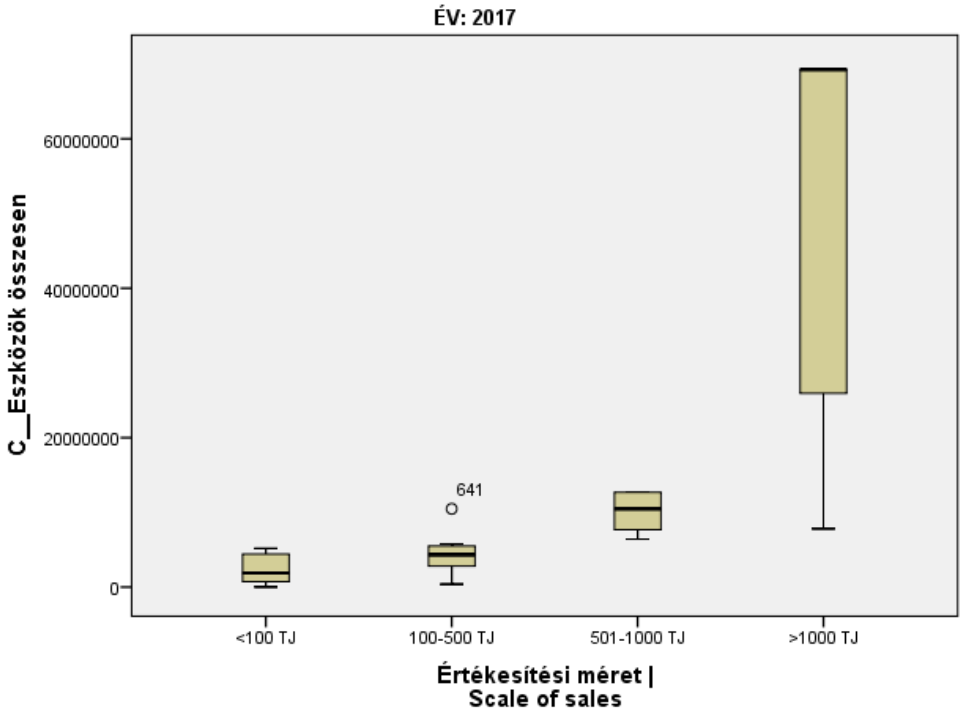
	(I) Activities		**Mean Difference (I-J)**	**Std. Error**	**Sig.**	**95% Confidence Interval**	
						Lower Bound	**Upper Bound**
2013	FŐTÁV_ (district heat)	District heat	-.12668*	0.04199	0.004	-0.2105	-0.0429
		Other activities	-.14539*	0.03941	0.000	-0.2240	-0.0668
2014	FŐTÁV_ (district heat)	District heat	-.11667*	0.04242	0.008	-0.2013	-0.0320
		Other activities	-.15107*	0.04033	0.000	-0.2315	-0.0706
2015	FŐTÁV_ (district heat)	District heat	-.10856*	0.04135	0.011	-0.1911	-0.0260
		Other activities	-.16791*	0.03927	0.000	-0.2463	-0.0895
2016	FŐTÁV_ district heat)	District heat	-.12103*	0.04173	0.005	-0.2043	-0.0378
		Other activities	-.17309*	0.03968	0.000	-0.2523	-0.0939

Source: Own compilation based on annual report data

With the exception of three consecutive years (2010-2012), there is a weak or middle strong relationship among the groups. In order to reveal the groups among which differences can be found, Post Hoc Tests had to be performed, which I examined for the four periods when the relationship was the strongest (2013-2016).

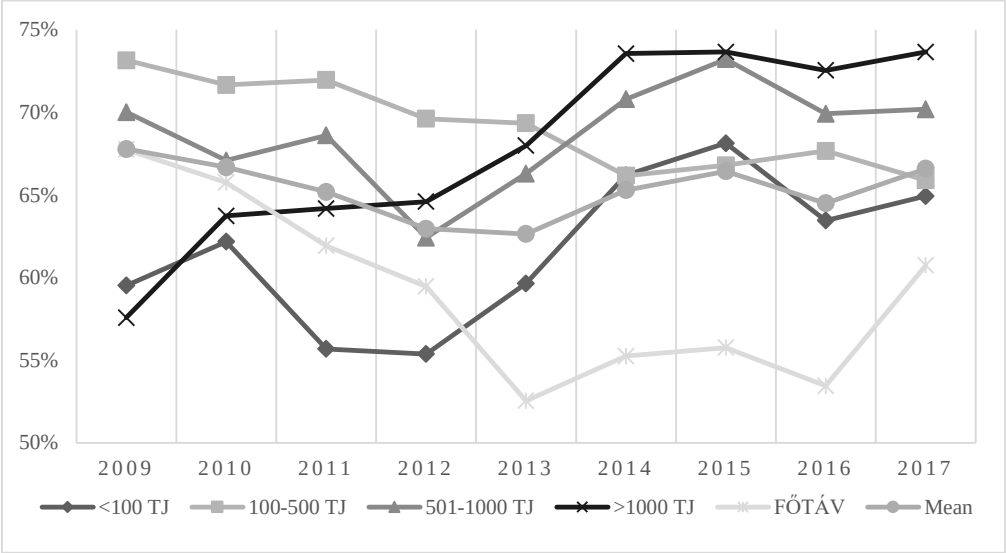
Post Hoc Tests show that the reason for the differences among groups is the significant difference in the asset structure of FŐTÁV Private Co. Ltd. from that of the other groups. However, it should also be taken into account that FŐTÁV Private Co. Ltd. belongs to "district heat" companies regarding its activity, so in this aspect there is a significant difference between the average values of the two groups.

The second and third research questions aim to explore further relationships. The Association of Hungarian District Heat Suppliers (Magyar Távhőszolgáltatók Szakmai Szövetsége) and the Hungarian Energy and Public Utility Regulatory Authority (Magyar Energetikai és Közmű-szabályozási Hivatal) classify district heating suppliers into four groups according to their size. The above mentioned problem of magnitude regarding FŐTÁV Private Co. Ltd. can be observed here as well.



Source: Own compilation based on annual report data

Figure 4. Distribution of the asset value of district heat suppliers (four size classes), 2017



Source: Own compilation based on annual report data

Figure 5. Distribution of the asset value of district heat suppliers based on size classes (FŐTÁV Private Co. Ltd. treated separately)

While the companies falling into the first three class intervals form a homogenous category on the basis of distributions, the last group, made up of companies performing at the highest level, clearly shows the difference in magnitude of Hungary's biggest district heating company, FŐTÁV. Therefore, it is justified to treat that company separately in this case, too, and to create a separate size class as a consequence of which groups will be more homogeneous. This permits calculation of group averages and allows me to draw conclusions.

The averages of the examined companies clearly point out that the fixed asset ratio of FŐTÁV Private Co. Ltd.is significantly different from that of other companies. Not only the degree of the differences is of interest, but also their changes over the years, because the changes for FŐTÁV Private Co. Ltd. were often completely different

from those for other companies. Since 2013, however, companies with higher emitted heat quantities have more assets and also the variation of the asset value was the highest for those companies. It is also interesting to examine the years in which sales volume influenced the dependent factor. Figure 6 shows the significance levels and the strength of the relationships.

Compared to previous studies, classification by sales generates a greater difference than classification by activity since there were only two years when there were no significantly differently groups at the 5% significance level. The classification by sales is also characterized by stronger relationships. Post Hoc Tests were carried out in this case, too, highlighting that the main reason for the differences is the different value of fixed asset ratio of FŐTÁV Private Co. Ltd., while there were significant differences between the two groups with the lowest emissions in several years (2011-2013).

Annex 4 of Government Decree no. 157/2005 (August 15) defines the technical and economic data that heat suppliers must provide each year concerning their operation. The third research question focuses on the relationship between two of these indicators – the operated pipeline length and the number of supplied household consumers – and the tangible asset ratio.

Table 4
Significance level and strength of the relationship, 2009-2017

Year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Sig	0.046	0.493	0.024	0.040	0.002	0.004	0.002	0.001	0.077
Eta	0.364	0.221	0.390	0.370	0.475	0.447	0.464	0.483	0.341

Source: Own compilation based on annual report data

Table 5
Correlation among the tangible asset ratio, the value of tangible assets and some selected indicators

		Pipeline length		**No. of fee payers**		**Tangible/Total**		**Tangible**	
		Pearson Corr.	Sig.	PearsonCorr.	Sig.	Pearson Corr.	Sig.	Pearson Corr.	Sig.
2013	Pipeline length			.976**	0.00	-0.03	0.88	*.898***	*0.00*
	Number of fee payers	.976**	0.00			-0.03	0.88	*.915***	*0.00*
	Tangible/Total	-0.03	0.88	-0.03	0.88			0.23	0.05
	Tangible	.898**	0.00	.915**	0.00	0.23	0.05		
2014	Pipeline length			.976**	0.00	0.00	1.00	*.891***	*0.00*
	Number of fee payers	.976**	0.00			-0.01	0.94	*.902***	*0.00*
	Tangible/Total	0.00	1.00	-0.01	0.94			.233*	0.05
	Tangible	.891**	0.00	.902**	0.00	.233*	0.05		
2015	Pipeline length			.974**	0.00	0.00	0.99	*.879***	*0.00*
	Number of fee payers	.974**	0.00			0.00	0.98	*.884***	*0.00*
	Tangible/Total	0.00	0.99	0.00	0.98			0.20	0.09
	Tangible	.879**	0.00	.884**	0.00	0.20	0.09		
2016	Pipeline length			.975**	0.00	-0.03	0.83	*.895***	*0.00*
	Number of fee payers	.975**	0.00			-0.04	0.81	*.902***	*0.00*
	Tangible/Total	-0.03	0.83	-0.04	0.81			0.17	0.15
	Tangible	.895**	0.00	.902**	0.00	0.17	0.15		

2017	Pipeline length			.975**	0.00	0.01	0.93	.920**	0.00
	Number of fee payers	.975**	0.00			0.00	1.00	.921**	0.00
	Tangible/Total	0.01	0.93	0.00	1.00			0.17	0.16
	Tangible	.920**	0.00	.921**	0.00	0.17	0.16		

**. Correlation is significant at the 0.01 level (2-tailed)

Source: Own compilation based on annual report data

Contrary to preliminary assumptions, the companies' tangible asset ratio is completely independent of the pipeline length and of the number of fee payers. This implies that when a district heat supplier serves more customers or provides services in a greater area, besides the increase in items that contribute to the assets in the long run, other asset items (like the amount of current assets) rise proportionately. The analysis also reveals that serving a wider group of customers is possible only with a significantly higher value of asset lockup and longer pipeline length.

CONCLUSIONS

The aim of the study was to analyze the fixed asset and tangible asset ratios of Hungarian district heat suppliers.

Based on the analysis, hypothesis H1 can partially be accepted and the following conclusion can be drawn regarding the companies' fixed asset ratio:

Fixed assets represent the highest portion in the asset structure of district heat supplier companies. Its average value for the whole population was 59%–71% (at the 95% confidence level) between 2009 and 2017. Other companies (performing non-heating activities to a greater extent than the average) have a higher ratio, while the fixed asset ratio of FŐTÁV Private Co. Ltd. causes a significant difference between the indicators of "other" and of "district heating" companies.

Hypothesis H2 can be accepted with some modifications: The fixed asset ratio of district heat suppliers is significantly affected by the size of district heating and this effect is stronger than the classification based on activities. Since 2013, higher heat emission performance is associated with a higher fixed asset ratio, except for the case of FŐTÁV Private Co. Ltd.

Hypothesis H3 is not supported by the results of the regression analysis. No relationship was found between the indicators describing business performance (pipeline length and number of supplied consumers and the tangible asset ratio of district heat suppliers. Higher corporate performance is associated with a higher tangible asset ratio, but it is also associated with the increase of other asset items. In the further part of the research, it would be interesting to examine whether there is a relationship between network density and orography facilities and between fixed asset ratio and tangible asset ratio.

The findings of the study provide opportunities for further research, including the further analysis of the asset and liability structure.

Acknowledgement

This research was supported by the project no. EFOP-3.6.2-16-2017-00007 titled Aspects on the development of intelligent, sustainable and inclusive society: social, technological, innovation networks in employment and digital economy. The project has been supported by the European Union, co-financed by the European Social Fund and the budget of Hungary.

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ADDITIONAL SOURCES

Act XVIII of 2005 on District Heating Services
Government Decree no. 157/2005 (August 15) on the implementation of the Act XVIII of 2005 on district heating services
Annual Reports of the companies