

MAIN CHARACTERISTICS OF THE PROFITABILITY OF HUNGARIOAN DISTRICT HEAT SUPPLIERS BASED ON THE 2009-2017 FINANCIAL STATEMENTS

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Abstract: *In Hungary, district heating supplies 15% of the population which accounts for 1.5 million people. This activity is carried out by 89 companies. There are differences in the ownership background, in the technical structure, in the activities carried out and in the number of supplied consumers of district heat suppliers. The current study describes some specificities of the income statement of the Hungarian district heating companies. In the first part of the study, the methodology exploring profitability is described. Then in the second part, the study describes the main features of the income statement of the heating suppliers. Using data derived from the accounts of the Hungarian district heat suppliers and from technical and economic pieces of information, nine years (2009-2017) were analyzed. The empirical analysis using the gathered data aims at revealing how the operational and regulation characteristics of the district heat sector are reflected in the income statement and how legislative changes have affected profitability indicators.*

Keywords: *District heat supply; District heat producers; District heat suppliers; income statement; profitability.*

JEL Classification: *K32.*

1. Literature review

In accordance with International Accounting Standard (IAS) 1 Presentation of Financial Statements, the elements of the financial statements are as follows:

- a balance sheet,
- an income statement,
- a statement of changes in equity,
- a cash flow statement,
- notes.

Income statement includes a deduction of the company's profit. It introduces the main factors influencing the generation and modification of the income, the components and the formation of the income. The standard does not prescribe a predefined structure. It defines only possible forms and minimum content. (IAS 1, Horngren - Datar - Foster, 2006)

According to Hungarian accounting regulations, profit before tax is the sum of the profit from normal operations and the profit from financial activities. In accordance with international practice, company can define this profit in two ways. The first method

focuses on the value of the goods and services produced in the examined period. The profit is the difference between the produced (and wholly or partly sold) goods and services and the operating costs (like material costs, labor costs or depreciation expense) of the given period. The second method focuses on sales. In this case, the result can be derived as follows:

- turnover
- costs related to the production of the sold product or service (product cost)
- costs related to the operation of the given period, in addition to the above (period cost) (Fenyves et al, 2018).

The income statement primarily helps analyze the profitability and efficiency situation. When analyzing profitability, we can examine among others:

- the composition of revenues, returns, costs, expenses and income,
- changes in revenues, returns, costs, expenses and income elements,
- profitability calculated for different bases and
- the relationship between the main items of the income statement (and the balance sheet).

When analyzing profitability, we can also compare certain income categories to some bases. Profitability indicators constructed in such a way:

- provide information on changes in efficiency,
- can be used as a base for analyzing trends in profitability,
- make the comparison of the given company with other companies or with the industrial average possible.

Income categories that may be taken into consideration when calculating profitability indicators include contribution margin, EBIT or EBITDA. Some bases:

- revenues,
- capital,
- total balance sheet,
- a specific group of assets,
- labor costs,
- personnel costs,
- average number of employees,
- revenue per major markets and per customer (Tóth - Zéman, 2018, Brealey et al, 2011).

One of the most important profit level indicators on turnover is gross profitability, also known as the coverage rate. The contribution margin is the difference between revenue and variable costs. The coverage rate is the ratio of the contribution margin to the revenue. Financial accounting, however, does not group costs based on their relationship with the volume of production. The master schedule and therefore the financial statements does not include variable and constant costs. (Cf. Musinszki, 2013)

There are, of course, methods and recommendations for decomposing accounting costs into fixed and variable elements. (See, for example, Elijah, 1997 or Horngren – Datar - Foster, 2006). The simplest and the roughest method is to consider direct costs as variable, and indirect costs as constant. This is, however, an option only if the company prepares its income statement using expense method. The coverage rate measures the profitability of the supply of the goods or services. A broader picture

of the company could be obtained if this indicator was determined by product or major market, but there is no requirement to provide the necessary information in the report.

When determining the Return on Equity ratio (ROE), we compare return to capital, typically to equity or to share capital. When calculating ROE, it is not clear what is to be considered a return out of the profit categories defined in the Hungarian Accounting Act. We can define the indicator in the form of operating profit / equity or in the form of aftertax profit / equity.

In the case of the Return on Assets indicators, we compare a certain category of profit to a specific group of assets or the total balance sheet. One possible definition of the Return on Assets (ROA) indicator used in international practice is: aftertax profit / total balance sheet. It is acceptable when the calculation of the indicator includes only fixed assets or working capital (total assets - liabilities) in the denominator. It is also acceptable to include a different profit category in the numerator. This indicator shows how effectively the company uses the available assets. It shows the average return on total assets of the company. In addition to owners and creditors, the indicator can be important also for the management. For all parties, the ROA is satisfactory if higher than the average interest rate on loans taken. (Bozsik, 2010)

One of the most widely used profitability indicators, still an innovation of the DuPont Company, was the development of Return on Investment (ROI) and the related indicator system. Pierre du Pont believed that former profitability indicators on sales and costs were not suitable to measure the company's profitability. The indicator developed to support investment decisions can be defined as the ratio of net return to net asset value. There are recommendations (Anthony - Govindarajan, 2009) on what to consider as return (like operating profit or after tax profit) and what to consider as investment (fixed assets or some prescribed elements of fixed assets + current assets), but giving purport to the two categories is basically the sovereign decision of the company. (Bozsik, 2010, Brealey et al, 2011, Fenyves et al. 2018, Molnár, 2016)

2. The aim of the empirical research and the applied methodology, results

The aim of the empirical research is to outline two important factors of the performance features of district heating companies in Hungary and to establish future research questions.

It deals with answering two research questions:

H1: Sectoral features like the high rate of other revenues (that has a lower value for companies that carry out non-district heating activities to an extent higher than the average) are well reflected in the income statements of district heat suppliers.

H2: The efficiency of district heat suppliers is considerably influenced by the changing regulatory environment.

The database of the research includes the companies 2009-2017 reports. The tools of the analysis were the Excel program of the Microsoft Office 365 ProPlus package and the SPSS 24 software.

The first striking features of the profitability specificities of the heating sector are illustrated in Figure 1 describing net sales and various costs types at the sector level.

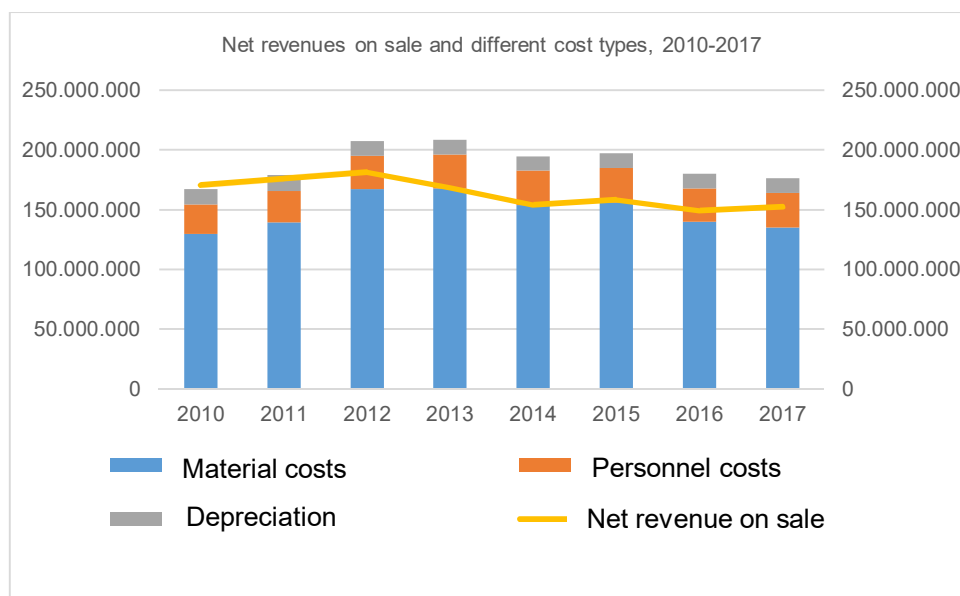


Figure 1: Net revenues on sales and different cost types in the whole sector between 2010 and 2017

Source: Own compilation based on annual report data

The figure shows that net revenues on sales have not cover material and personnel costs since 2011. The reason for this is that Act XXIX of 2011 on the Amendment of the Laws on Energy froze the retail prices and the prices of specially treated institutions as at 31 March 2011. It is the Minister of National Development who is responsible for setting the prices of heat sold to the public and to specially treated institutions as the highest official price, by taking into account the proposal of the Hungarian Energy and Public Utility Regulatory Authority. The loss of revenue derived from applying official prices is covered by the district heating subsidy. Its amount is fixed at a level that cannot exceed the net cost of providing the public service, i.e. the difference between the costs incurred and the revenue generated by the public service, by taking into account a reasonable return on equity. As for reasonable return, a profit margin was defined, which is 2% of the gross book asset value related to these activities based on the audited accounting unbundling and as at 31 December of the year preceding the year under review of the before tax profit derived from district heat production and district heat supply activities.

The Figure 2 highlights that other revenues represent a significant part of the revenue of the district heating provider. This high proportion is due to district heating subsidy from 2012.

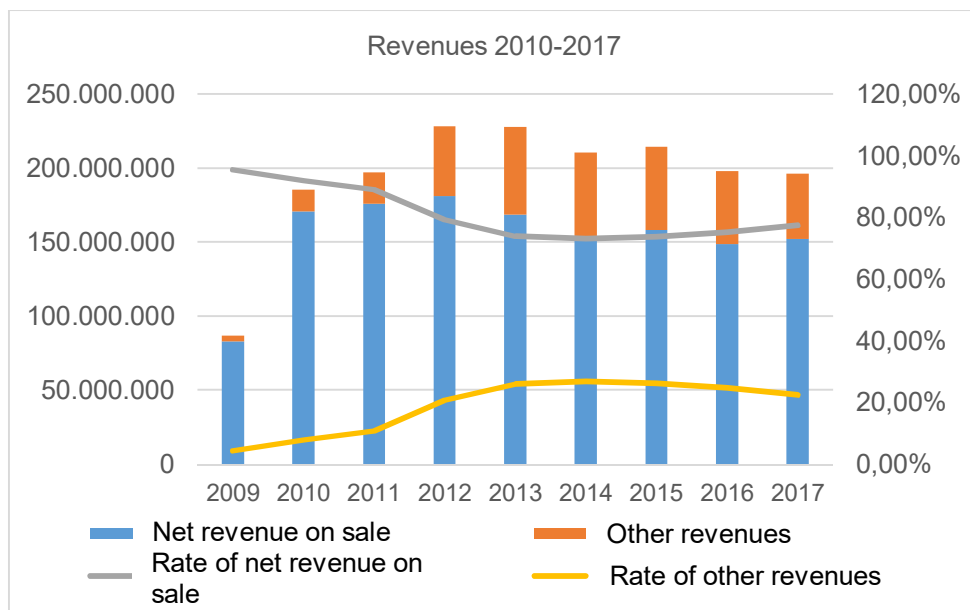


Figure 2: Cumulative values of net revenues on sale and of other revenues and changes of their rate between 2010 and 2017

Source: Own compilation based on annual report data

Examining the structure of the rate of net revenues on sale and of the expenditures of district heating suppliers and the structure of revenues, it can be concluded that profitability of district heating suppliers is strongly influenced by the authority's regulations.

The indicators examined above describe only a slice of the factors influencing the profitability of district heating suppliers. They can, however, provide a pronounced picture of the operation of a highly regulated sector.

The second part of the hypothesis one requires the knowledge of an additional part of the law. The Act XVIII of 2005 on District Heating Services defines district heating. The Act and the related decrees do not prohibit that companies providing these activities are engaged in other activities as well. Accordingly, besides district heating, the bulk of the 89 Hungarian district heat suppliers does other activities, including district heat production, electricity production, waste management, water utility supply and other activities (like the ones related to urban management). 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 labelled by "other activities", while other companies are labelled by "district heat". Even if decomposition based on activity would have justified the creation of only two groups, the result would not

reflect a homogenous picture if these two groups are analysed. Figure 3 visualises the reason for it.

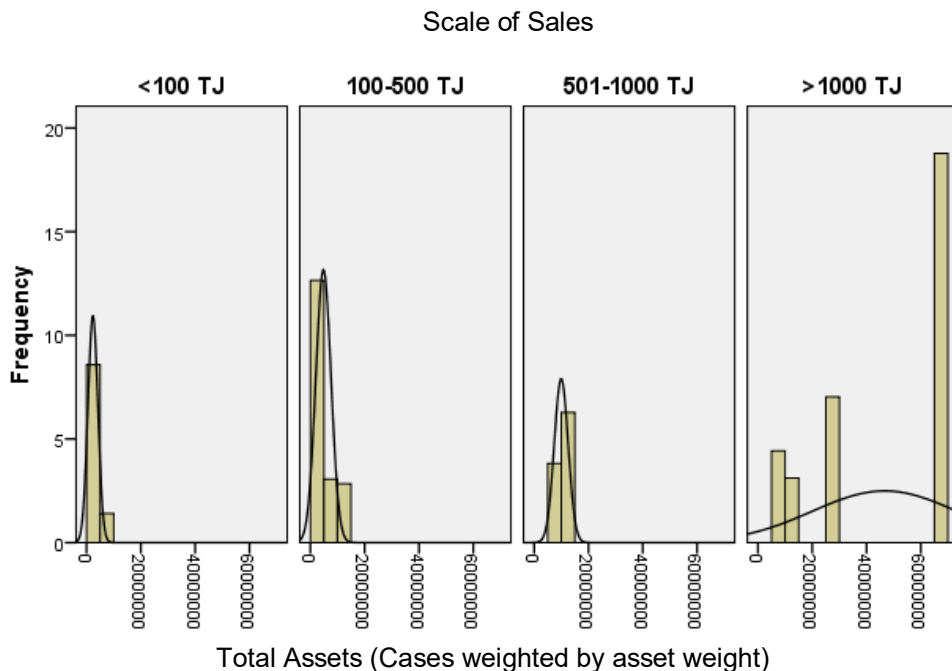


Figure 3: Distribution of the asset value of district heat suppliers
Source: Own compilation based on annual report data

Figure 3 illustrates the grouping of district heat suppliers based on the scale of sales in accordance with the classification of the Association of Hungarian District Heating and the Hungarian Energy and Public Utility Regulatory Authority.

While companies falling into the first four class intervals form a homogenous group based on the distributions, the last group including companies with the highest output clearly highlights the difference in magnitude of FŐTÁV Private Co. Ltd., Hungary's largest Heat Provider (almost 40% of the amount of heat sold and 26% of the district heat assets belong to this company).

Therefore, it was justifiable to examine this company separately and to create a further category for it in both cases resulting in more homogenous groups.

Then, the rate of other revenues (other revenue / other revenue + turnover) was examined, which is visualized on Figure 4.

It is confirmed that the rate of other revenues is surprisingly high in the sector due to the typical aids in the district heat sector. Our expectations about the differences among the rate of revenues based on activities are also met. The effect of the system of aids is clear as the rate of other revenues was lower by 6-8 percentage points on average in the examined years in the case of companies that provide "other services"

to a higher extent. Simple ANOVA revealed that in most part of the examined period, there were significant differences among the examined groups. It was important for us to examine the causes of differences and whether grouping by activity is an appropriate grouping criteria in this category. The results of the PostHoc tests confirm that grouping based on activity significantly affect the results.

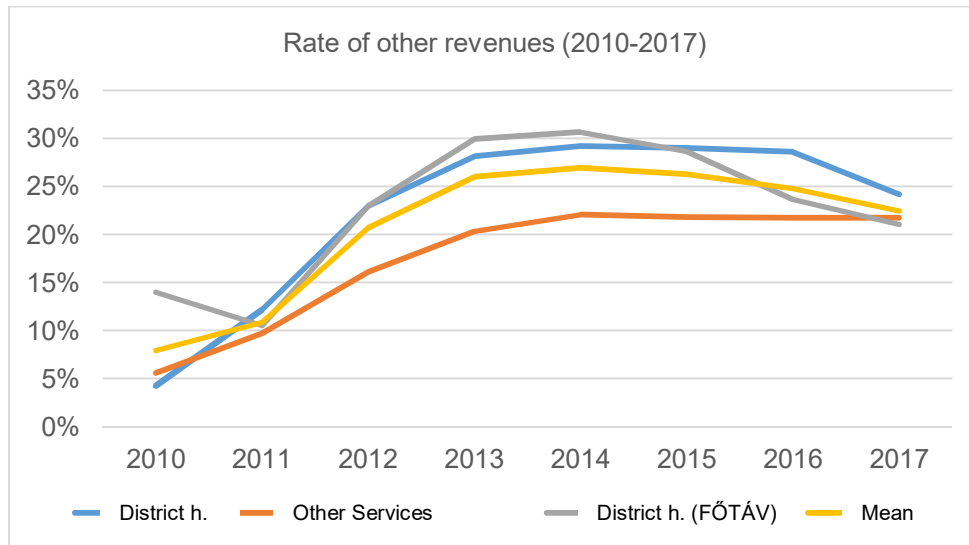


Figure 4: Rate of other revenues in the categories based on activity
Source: Own compilation based on annual report data

The aim of the second research question is to reveal the effect of the changing regulatory environment on profitability and on liabilities, with special regard to equity. To do so, three indicators (ROA, ROI and ROE) were examined. Our calculations revealed that all the three indicators changed in the same way in the examined period therefore we visualize the value of one of these indicators, the Return On Equity, over time, describing legislative changes picturesquely on Figure 5.

The average value of ROE did not change considerably in the examined period, while it changed considerably among the groups, it reached an average value of 2% after 2011.

It was important for us to examine which legislative changes were relevant to the sector during the period under review (more than 25 acts or government decrees were examined). Based on them, the four most significant changes that have a demonstrable impact on the sector's profitability were identified.

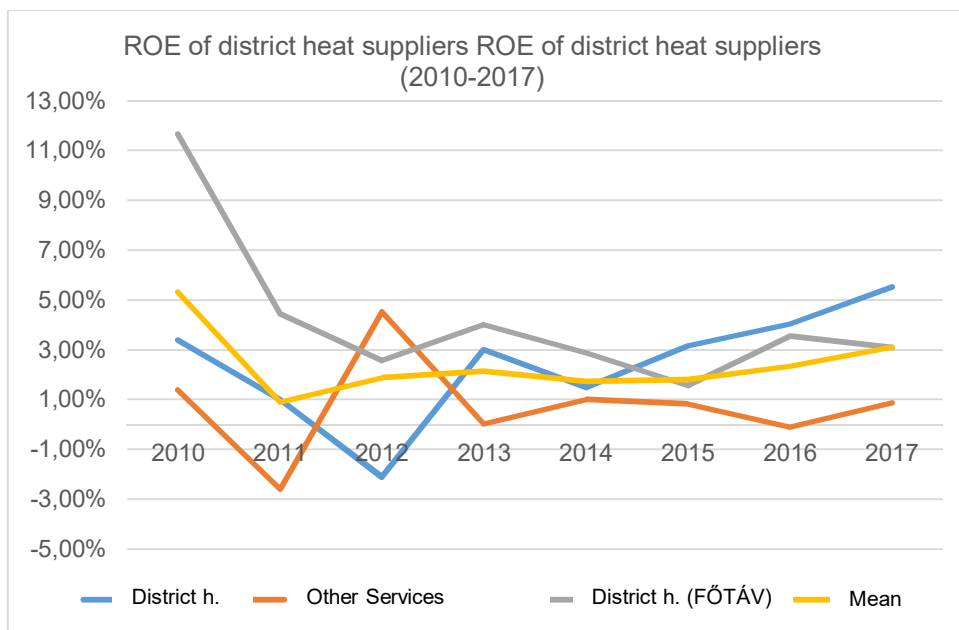


Figure 5: ROE of district heat suppliers depending on activity groups
Source: Own compilation

The regulatory factors determining the efficiency of district heat suppliers, which can be observed in the values of ROE, ROA and ROI were as follows,.

1. Freezing of Service fees. The Act XXIX of 2011 on the amendment of the energy related laws froze the retail prices and the prices of specially treated institutions as at 31 March 2011. **It is the Minister of National Development who is responsible for setting the prices of heat sold to the public and to specially treated institutions as the highest official price, by taking into account the proposal of the Hungarian Energy and Public Utility Regulatory Authority. Its impact was noticeable one year later, in 2012, especially for companies with a predominantly district heating profile.**
2. Transformation of the energy support system. Since 2012, the loss of revenue derived from applying official prices has been covered by the district heating subsidy. Its amount is fixed at a level that cannot exceed the net cost of providing the public service, i.e. the difference between the costs incurred and the revenue generated by the public service, by taking into account a reasonable return on equity, expected based on the equity share related to providing public service. As for reasonable return, a profit margin was defined, which is 2% of the gross book asset value related to these activities based on the audited accounting unbundling and as at 31 December of the year preceding the year under review of the before tax profit derived from district heat production and district heat supply activities.

Its impact could also be observed one year later (in 2013), especially for companies with a mainly district heating profile.

3. Utility price cuts. The biggest change in the operating conditions of the heat suppliers was implemented based on the Act LIV of 2013 on the execution of utility price cuts. As a result of the price cuts in district heating, total savings of 20% was realized by the consumers on the whole in more stages. As of January 2013, there was another change in the price system for heating supply as the basic and heat price decreased by 10% and then decreased by another 11.1% from 1 November. As a result of the implementation of the Act LIV of 2013 on the execution of utility price cuts, retail consumers' gas, electricity and district heating costs decreased by a total of 20% from December 2012 to November 2013, followed by a further 3.3% decrease from October 1, 2014.
4. Repeated change of the support system, resulting in the operational support of district heat suppliers having two elements from October 1, 2015. This change led to an improvement in the profitability situation of the examined companies.

3. Conclusions

The purpose of the current research was to present some features of the profitability of heat suppliers. As a first step, literature describing profitability was introduced briefly, followed by the presentation of the empirical research. Hypothesis H1 was totally failed to be rejected. Sectoral characteristics of district heating service and the impact of the legal framework are reflected in the composition of revenues and heat suppliers are characterized by high revenue ratio, especially those whose rate of revenue and asset related to non-district heating activity is below the average in their activity structure. Hypothesis H2 aimed at examining the impact of the changing regulatory environment on profitability and on liabilities, especially on equity. As a result, it can be concluded that changes in the regulatory environment are reflected in the ROE, ROA and ROI values and the regulations about the operation of district heat companies have a more direct effect on companies whose portfolio includes district heating activity with higher proportion.

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Bio-notes:

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