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CAPITAL ADEQUACY AND MATURITY MATCHING STATUS OF HUNGARIAN DISTRICT HEATING COMPANIES

Анотація. В Угорщині послуги централізованого опалення охоплюють 650 тис. домогосподарств (понад 2 мільйони побутових споживачів) і велику кількість громадських та промислових споживачів. Достатність капіталу та статус відповідності термінів залучення коштів строкам їх використання для угорських компаній централізованого теплопостачання є важливими, оскільки це впливає на їх здатність справлятися з економічними кризами. Фінансовий стан компанії або групи компаній у галузі аналізується за допомогою показників структури фінансування. У цьому документі розглядається відповідність достатності капіталу та строків погашення боргів компаній централізованого теплопостачання в Угорщині з використанням дезагрегованих річних звітів. Методологія ґрунтується на аналізі звітів із використанням даних з облікових записів компаній, що надають послуги централізованого теплопостачання в Угорщині - 72 компанії складають вибірку. Аналіз дає повну картину достатності капіталу та коефіцієнтів покриття компаній централізованого теплопостачання й показує, що принцип узгодження строків погашення боргових зобов'язань реалізується по-різному для різних профілів компаній централізованого теплопостачання. Для досягнення цілей дослідження здійснено вертикальний і горизонтальний аналізи. Виходячи з бухгалтерської звітності, можна констатувати, що на структуру власного капіталу та зобов'язань теплопостачальних компаній суттєво впливає розмір продажів та структура власності. Принцип узгодженості строків активів і пасивів реалізується по-різному. У цьому дослідженні проаналізовано характеристики власного капіталу та зобов'язань компаній централізованого теплопостачання за допомогою горизонтальних і вертикальних досліджень, зосереджуючись на двох основних показниках. Найбільшу частку власного капіталу та зобов'язань теплопостачальних компаній становить власний капітал із середнім значенням понад 50% щороку. В середньому, компанії з профілем централізованого теплопостачання, найбільшим обсягом продажів, власним виробництвом тепла, а також більшість компаній, які не є приватними, характеризуються вищим рівнем покриття.

Ключові слова: структура власного капіталу та зобов'язань, теплопостачання, аналітична звітність.

JEL Classification: D24



Absztrakt. Magyarországon a távhőszolgáltatás 650 000 háztartást (több mint 2 millió hazai fogyasztót), valamint nagyszámú lakossági és ipari fogyasztót érint. A magyar távhőszolgáltatók számára fontos a tőke megfelelősége, a forrásbevonás ütemezése és felhasználásának megfelelő időzítése, hisz befolyásolja a gazdasági válságokkal való megküzdési képességet. A finanszírozási szerkezet mutatói segítségével elemzésre kerül az iparágban egy vállalat vagy vállalatcsoport pénzügyi helyzete. Jelen cikk a magyarországi távhőszolgáltatók tőkéjének megfelelőségét és adósságlejáratát vizsgálja nem összevont éves jelentések segítségével. A módszertan a Magyarországon távhőszolgáltatást nyújtó társaságok beszámolóiból származó adatok felhasználásával készült jelentések elemzésén alapul - a mintát 72 cég alkotja. Az elemzés teljes képet ad a távhőszolgáltató társaságok tőke- és fedezettségi mutatóiról, és azt mutatja, hogy az adósságtörlesztési feltételek összeegyeztetésének elve a távhőszolgáltatók különböző profiljainál eltérően valósul meg. A tanulmány céljainak elérése érdekében vertikális és horizontális elemzéseket végeztünk. A számviteli kimutatások alapján megállapítható, hogy a hőszolgáltató társaságok saját tőkéjének és forrásainak szerkezetét jelentősen befolyásolja az árbevétel mértéke és a tulajdonosi szerkezet. Az eszköz- és forrásfeltételek megfeleltetésének elvét különböző módokon valósítják meg. Jelen tanulmány horizontális és vertikális tanulmányozáson keresztül elemzi a távhőszolgáltató társaságok tőke- és kötelezettségi mutatóit, két fő mutatóra fókuszálva. A hőszolgáltató társaságok saját tőkéjének és kötelezettségeinek legnagyobb hányadát az évente átlagban 50%-os értéket meghaladó saját tőke teszi ki. Átlagosan a központosított hőszolgáltató profillal, legnagyobb értékesítési volumennel, saját hőtermeléssel rendelkező cégekre, valamint a legtöbb nem magánvállalkozásra jellemző a magasabb lefedettség.

Kulcsszavak: saját tőke és források szerkezete, hőszolgáltatás, analitikus jelentés.

Abstract. In Hungary, district heating services cover 650,000 households (more than 2 million residential consumers) and a large number of public and industrial consumers. The capital adequacy and maturity matching status of Hungarian district heating companies is important because it has an impact on their ability to cope with economic crises. The financial situation of a company or a group of companies in an industry is analyzed by means of ratios of the financing structure. This paper examines the capital adequacy and maturity matching of district heating companies in Hungary using disaggregated annual reports. The methodology is based on report analysis, using data from the accounts of the companies providing district heat services in Hungary -72 companies make up the sample-. The analyses provide a comprehensive picture of the capital adequacy and coverage ratios of the district heating companies and show that the maturity matching principle is implemented differently for the different profiles of district heating companies. To achieve the research objectives, vertical and horizontal analyses were needed. Based on the accounting unbundled reports, it can be stated that the structure of owner's equity and liabilities of district heating companies is significantly influenced by the sales size and ownership structure. The principle of maturity consistency is implemented in different ways. This study has analyzed the characteristics of the owner's equity and liabilities of district heating companies - through horizontal and vertical studies - focusing on two main indicators. The largest share of the owner's equity and liabilities of district heating companies is represented by equity, with an average value of more than 50% each year. On average, the companies with a district heating profile, the largest sales size, own heat production, and the majority of the companies that are not privately owned are characterized by higher coverage.

Keywords: structure of owner's equity and liabilities, district heating service, report analysis

Introduction. In Hungary, district heating services cover 650,000 households (more than 2 million residential consumers) and a large number of public and industrial consumers. The vast majority of publications on district heating deal with the industry from a technical perspective. In Hungary, Németh [1] and Kádárné [2] investigated the pricing of district heating suppliers. In their dissertations and analyses,

they have presented in detail the regulatory environment, the theoretical and practical foundations for pricing

There are few analyses in the literature that examine the operation of heat supply companies using the tools of accounting analysis in a comprehensive way or focusing on a specific area. Information from such studies is particularly useful as it can be used as a benchmark for industry professionals to analyse the performance of their company and the district heating sector. The capital adequacy and maturity matching status of Hungarian district heating companies is important because it has an impact on their ability to cope with economic crises.

Literature review. For businesses, making financing decisions can be seen as a complex and difficult problem, as there is a wide range of resources available to businesses. One important indicator for assessing a company's financial position in terms of resources is its capital adequacy, which is more favorable from a financing point of view the higher it is. The debt ratio (also known as the matching ratio or indebtedness ratio) is the complement to the equity ratio, which is:

- considered favorable if it is around 50-60%,
- noteworthy for companies with a value above 60%,
- unfavorable if it is 100% or above (Although the "ratio of own to external resources cannot be clearly stated") [3].

Depending on whether current or non-current liabilities are included, it provides information on short-term/temporary or long-term/permanent indebtedness. The debt/equity (D/E) ratio also provides information on long-term indebtedness. An important tool for assessing the company is the ratio of assets to liabilities, the ratio of which is expressed by the coverage ratio indicators, which, in addition to monitoring the equity ratio for total assets, can also show the ratio for a selected set of assets and liabilities.

No general statement on the optimal capital structure can be given, but "most professional source studies suggest that it is desirable to have equity capital of no less than 1/3 of the resources ..., with the equity ratio within total resources for Hungarian companies being 30-40%" [4].

The literature contains research on the valuation of assets and liabilities and their main issues [5-10]. We use the book value as a starting point in our analyses.

Purpose of the study. Previous studies have shown [11] that the resource structure of district heating companies is different, and the principle of maturity matching is implemented in different ways. This paper examines the capital adequacy and maturity matching of district heating companies in Hungary using disaggregated annual reports. In this research, we conduct further investigations focusing on the data from the disaggregated annual reports, in order to gain a more in-depth understanding of the owner's equity and liabilities of these companies. The analyses provide a comprehensive picture of the capital adequacy and coverage ratios of the district heating companies and show that the maturity matching principle is implemented differently for the different profiles of district heating companies.

Methods and methodology. To achieve the research objectives, vertical and horizontal analyses were needed. For each breakdown by a given grouping criterion, the capital adequacy (Equity/Total Resources) was first examined by performing analyses of variance and Post Hoc tests, followed by the maturity matching using two

coverage ratios - Coverage of Invested Assets I (Equity/Invested Assets) and Coverage of Invested Assets II (Equity + Long-Term Liabilities/Invested Assets) - and descriptive statistics tools. The novelty of the research is that the coverage ratios are also calculated on the basis of a database including disaggregated annual reports.

The database for the study consists of the companies' annual reports between 2009-2017. In Hungary, 89 companies are currently providing district heat services in 93 settlements, of which 72 were included in the sample.

The calculation of the indicators required the annual reports of the companies, which were the first type of data. The second type of data analyzed was the technical and economic data that companies are required to provide each year on the basis of Annex 4 to Government Decree 157/2005 (VIII.15) implementing Act XVIII of 2005 on district heating. From 2012 onwards, this information must be published by district heating companies. The analysis tool was partly the Excel program of the Microsoft Office 365 ProPlus suite and partly the SPSS 24 program.

Research results and discussions. The first step was to examine the structure of owner's equity and liabilities in general (Fig.1).



Figure 1. The structure of owner's equity and liabilities of district heat suppliers 2009-2017

Source: Self-made edit based on a database including information from the accounting unbundled reports

Based on the data from the nine years' annual reports, the average equity ratio (capitalization) of the companies included in the study was above 50% each year. Comparing this with the ratio of fixed assets (average fixed asset stock exceeded 60% in each year), the long-term coverage ratio ranged between 70% and 90% over the period under review [12]. However, in the case of the indicators from the disaggregated annual reports, we obtain a slightly different picture than we would expect from the asset structure since in the owner's equity and liabilities, we obtain higher long-term coverage ratios calculated from this source of information, which is also reflected in the coverage of fixed assets.

Over the nine years under review, the average capital adequacy ratio declined by almost 4 percentage points on average, falling until 2014, after which no significant change was observed. When comparing this indicator with the ratio of fixed assets, a divergent trend was observed (interestingly, it was at its peak in 2012 and 2013), so

the coverage of fixed assets (equity/invested assets) showed a higher variance at the sectoral level. Therefore, the analysis of the assets more closely related to district heat services shows that, on average, capitalization and coverage ratios are 4-8 percentage points higher in this sector than in others, with similar trends over the period under review.

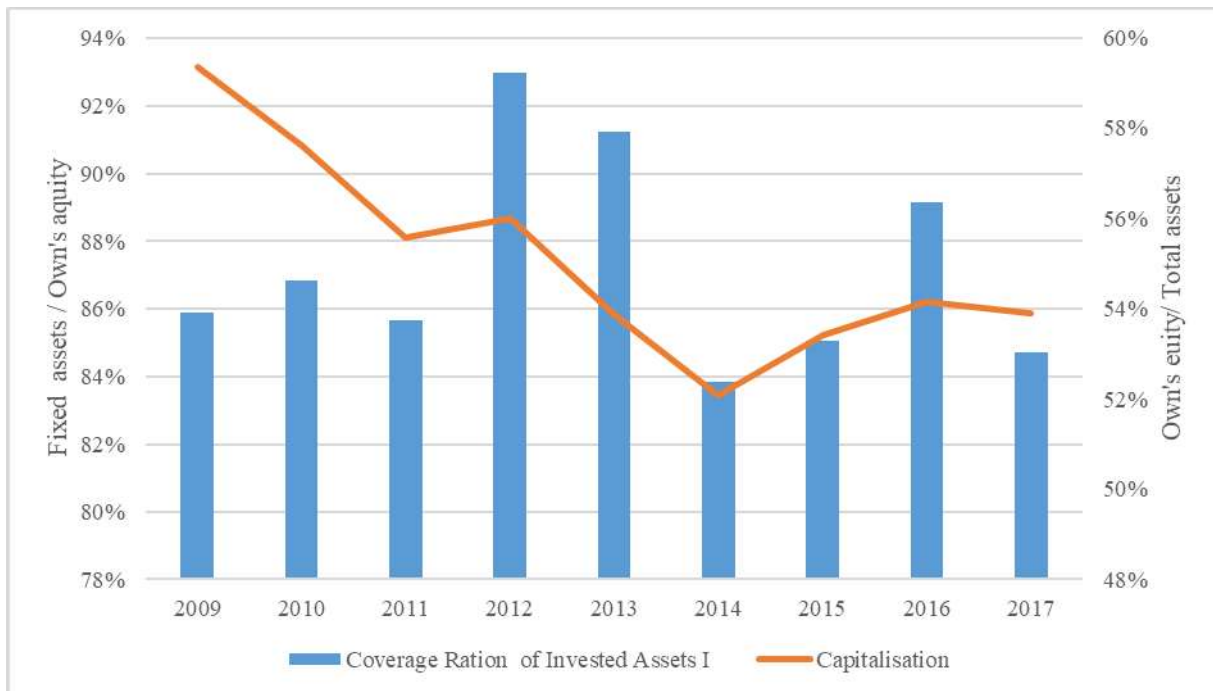


Figure 2. Average Capitalization of District Heating Companies and Coverage of Invested Assets I. 2009-2017

Source: Self-made edit based on a database including information from the accounting unbundled reports.

In the second part of our analysis, we looked at how capital adequacy and the coverage of fixed assets change when we look at them by different subgroups. In this study, the subgrouping of vertical and horizontal studies was based on the type of activity carried out.

Act XVIII of 2005 on district heating and the related regulations do not prohibit those who carry out this activity from carrying out additional activities. Accordingly, most of the 89 heat suppliers in Hungary also perform other activities in addition to district heating. Those companies where the proportion of district heating activity was lower than the sector average were labelled "Other profile", while the other part of the companies where the district heating activity was predominant was labelled "District heating profile".

The analyses carried out show that

- at the beginning of the period under examination, the capital structure of FŐTÁV Zrt. differed significantly from that of the other undertakings, and by the end of the period it had converged with the average structure of the other district heating companies,

- the companies with other profiles, providing services other than district heating to an above-average extent, have a higher equity ratio from 2011 onwards, but by the

end of the period, they had diverged significantly from the average of companies whose main activity is district heating. As previous studies on the asset structure have shown that other companies are characterized by a higher fixed asset ratio, the maturity matching principle is implemented at a higher level for these companies from the annual reports (focusing on district heating activities).

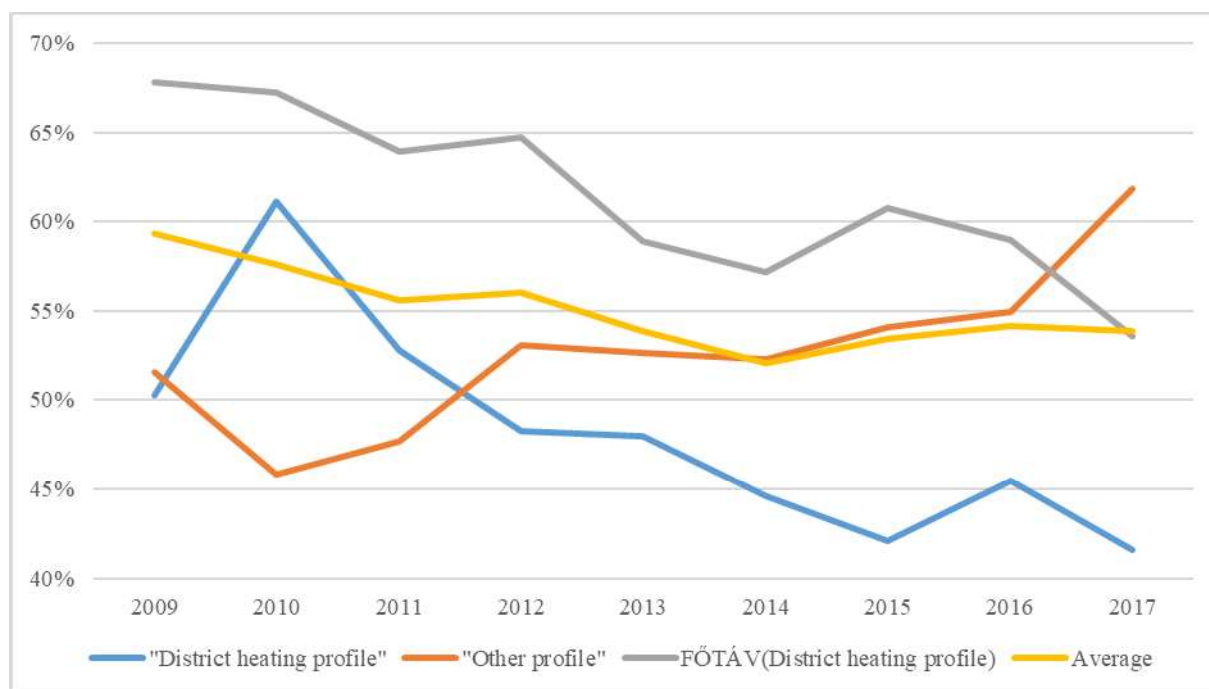


Figure 3. Capitalization of district heating companies grouped by activity

Source: Self-made edit based on a database including information from the accounting unbundled reports.

However, it is also important to examine how good a differentiating criterion the activity breakdown is for this indicator.

With regard to capital adequacy, I found significant differences between companies with a district heating profile and companies with other profiles in the first four years under investigation, which, based on the Post Hoc tests carried out, 40% of the cases were caused by a reason other than the specificity of the resource structure of FŐTÁV Zrt.

As regards the coverage of fixed assets, from 2010 onwards, companies with a district heating profile have been operating with lower and lower coverage of fixed assets than companies with other profiles, a difference that became significant by the end of the period under review, with the coverage rate doubling for companies with other profiles.

Compared to all the companies, the coverage of FŐTÁV Zrt. is significantly higher, which is the reason for the main differences shown in the analysis of variance.

In the analysis of fixed assets, previous studies have concluded that grouping by sales size generates a larger difference than grouping by activity, and therefore we have examined the grouping by this criterion for capital adequacy too. In this case, we have found similar results, with the size of sales affecting the capital adequacy of

companies in all of the nine years examined, according to the accounting unbundled reports too.

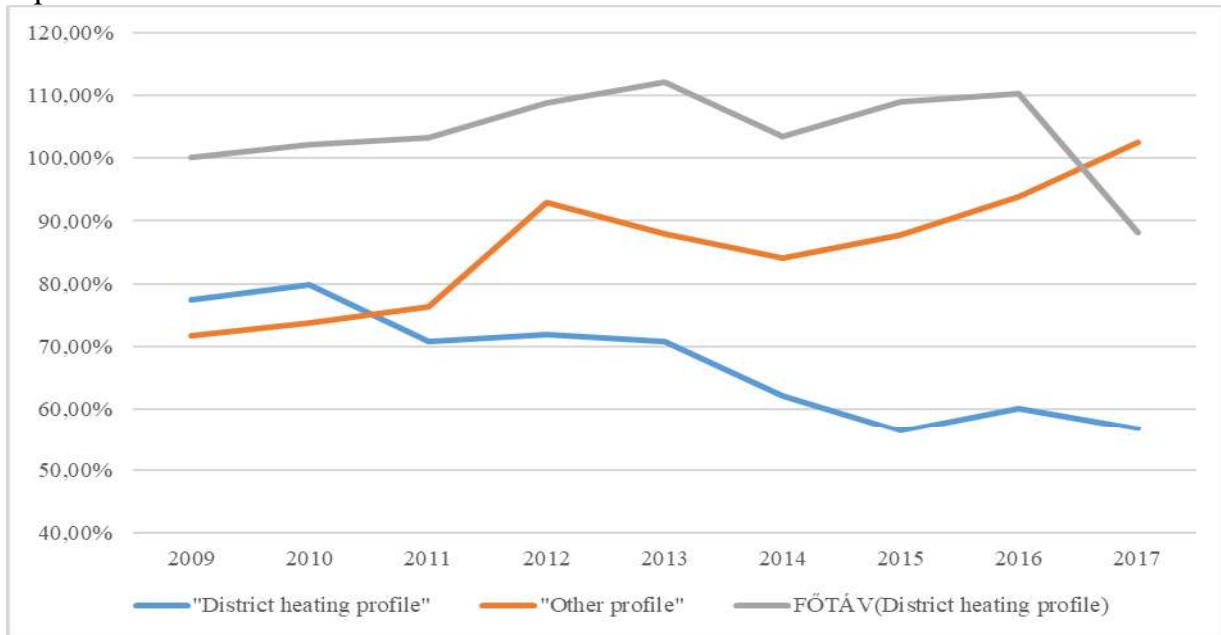


Figure 4. Coverage ratio of district heating suppliers by activity grouping

Source: Self-made edit based on a database including information from the accounting unbundled reports

The capitalization of the largest district heating companies (over 1000 TJ and FŐTÁV) was on average 62%, significantly higher than that of the other companies by 18 percentage points on average, and in 75% of cases, the difference in the equity ratio of the largest companies was the reason for the differences between the groups, i.e. the companies with the largest output differed from all other groups.

Fixed asset coverage indicators were also examined based on size groupings.

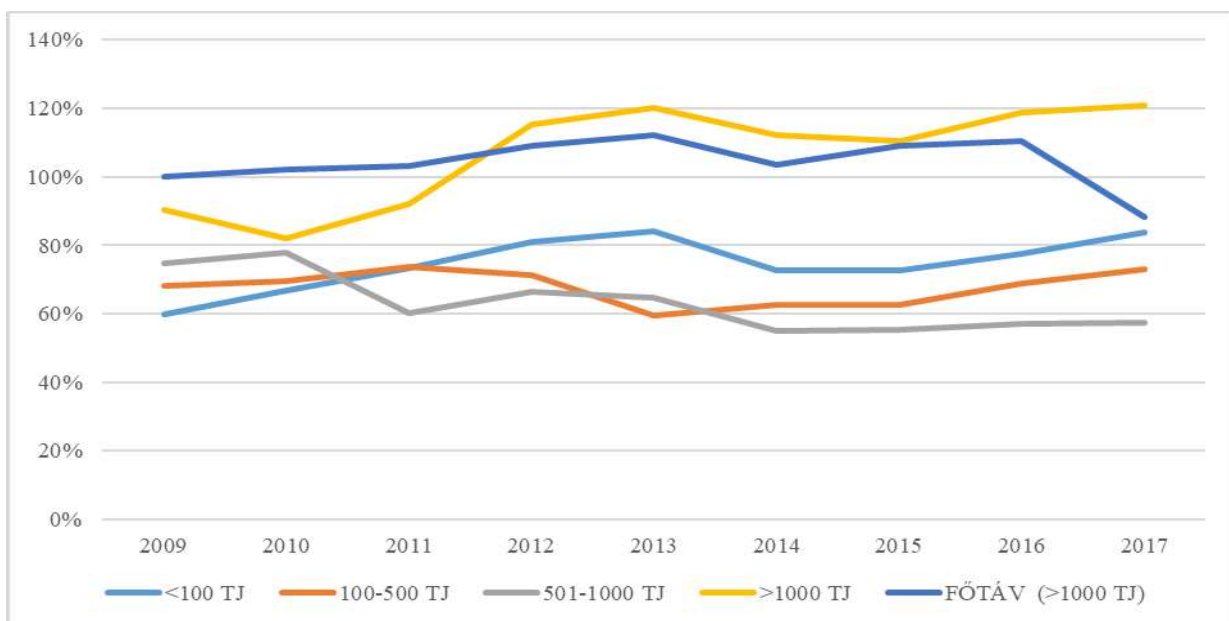


Figure 5. Coverage ratio of the fixed assets of district heating suppliers based on the size of their output.



Source: Own editing based on a database including information from the accounting unbundled reports

The results show that sales size is a significant determinant of capital adequacy in all years and that the largest suppliers (FŐTÁV and suppliers with over 1000 TJ output) have operated on average with a higher maturity match over the years examined.

An interesting investigation is whether heat production activity affects the coverage of fixed assets.

Table 1. Values of Coverage Ratio of Fixed Assets I and II as a function of the activity of heat production 2009-2017

Coverage ratio of fixed assets I.	2009	2010	2011	2012	2013	2014	2015	2016	2017
No	62%	65%	63%	69%	62%	59%	61%	66%	77%
Yes	81%	82%	79%	91%	89%	81%	79%	84%	85%
Yes (FŐTÁV)	100%	102%	103%	109%	112%	103%	109%	110%	88%
Coverage ratio of fixed assets II.	2009	2010	2011	2012	2013	2014	2015	2016	2017
No	82%	81%	78%	90%	80%	84%	86%	91%	100%
Yes	96%	97%	105%	111%	107%	102%	100%	103%	103%
Yes (FŐTÁV)	101%	102%	103%	109%	112%	104%	109%	110%	89%

Source: Own editing based on a database including information from the accounting unbundled reports

On average, companies that produce their own heat have an 18 percentage point better coverage rate on both indicators.

Based on previous studies, it was clear that ownership background also plays a role in the structure of the source side. In six out of the nine years, the fact that the equity ratio of predominantly privately owned companies was significantly lower than that of other companies by an average of 23 percentage points was a significant characteristic. In 83% of these cases, the reason for the moderately strong links was that the equity ratio of the majority of privately owned companies was significantly lower than that of other companies, by an average of 23 percentage points.

Conclusions and prospects for further research. This study has analyzed the characteristics of the owner's equity and liabilities of district heating companies - through horizontal and vertical studies - focusing on two main indicators. The largest share of the owner's equity and liabilities of district heating companies is represented by equity, with an average value of more than 50% each year. A lower share is found in companies with other profiles (providing services other than district heating to an above-average extent). The capital adequacy of FŐTÁV Zrt. and its variation is the main cause of the significant difference between the indicators for companies with other profiles and those with a district heating profile. Over the period under review, the average capitalization of district heating companies (76.5%) is on average 8 percentage points higher than that of other companies.

Based on the accounting unbundled reports, it can be stated that the structure of owner's equity and liabilities of district heating companies is significantly influenced

by the sales size and ownership structure. The principle of maturity consistency is implemented in different ways. On average, the companies with a district heating profile, the largest sales size, own heat production, and the majority of the companies that are not privately owned are characterized by higher coverage, while the most conservative financing strategy based on the long-term coverage ratio indicators is that of FŐTÁV Zrt.

The largest share of the costs of district heating services is accounted for by material and energy costs. For further research, a specific analysis of the explanatory notes provides an opportunity to examine what long-term contracts are in place for the purchase of fossil fuels (e.g. the volume of natural gas committed and the fixed purchase price) and whether these have a detectable impact on the capital adequacy and maturity matching status of Hungarian district heating companies.

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