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Analysis of the Creditworthiness of Local Government-owned Companies with a Credit Scoring Method

SUMMARY: In this study, we analyse the creditworthiness of local government-owned companies by means of a modelled scoring system, a scorecard-based credit scoring method adapted to local government-owned companies. The analysis that uses an objective factor-based scoring system covers all the areas of operation of the companies, encompassing their management. The scoring system is used to classify the examined companies into appropriate categories based on their key financial indicators. The analysis covers the period between 2013 and 2016. The study gives us an overview of the credit rating of local government-owned companies, which will be examined on a territorial dimension, as well, for the purpose of levelling. Based on the results of the research, the creditworthiness of local government-owned companies changed in a hectic manner in the examined period, but the majority of the public companies examined belong to the creditworthy category.

KEYWORDS: local government controlling, liquidity, profitability, creditworthiness
JEL-CODES: H11, H40, H70, M41

INTRODUCTION

Local government-owned companies play a key role in serving domestic population, in performing the statutory tasks of local governments, as they are responsible for public duties locally. As far as rating is concerned, local government-owned companies have special characteristics because they can borrow from banks subject to restriction and a government licence. Furthermore, the extent to which they can comply with the requirements of an independent and modelled creditworthiness assessment conducted by a bank and their solvency are attributes that reflect their financial health and sustainable operation. Our analysis deals with this topic within the framework of empirical research.

REVIEW OF THE ACADEMIC LITERATURE

Findings of research conducted in Hungary on the operation of local government-owned companies

Hungarian academic literature examined several aspects of the operational risks of lo-

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cal government-owned companies, covering indebtedness, inappropriately established owner's controls and their effects on local governments as owners.

In their study, *Homolya and Szigel* (2008) compared the indebtedness of local governments with that of the local government-owned companies. Based on their investigations, they established that no credit boom occurred in the segment of local government-owned companies as may be expected considering the owners, however, they predicted the evolution of risks that they expected to be mainly due to the deficiencies of the information system. In their analysis, the found that by 2008 the loans disbursed to local government-owned companies had reached 25–30 per cent of the debts of the whole local government sector, which they estimated had made up 0.6–0.8 per cent of the GDP of the time. Based on their investigations conducted on data from the court of registration and statistics from the central bank, they established that the concentration of borrowing was very high, as 90 per cent of the loans had been taken out by the first 100 companies with the highest amount of debt. At the same time, the majority of borrowers made a loss in 2006. The loans of local government-owned companies were estimated to amount to HUF 170–200 billion. This statement was supported by the fact that such loans constituted almost 3–4 per cent of the corporate loan portfolio of the banks, while loans disbursed to local government-owned companies made up about 20 per cent of their exposures to local governments.

In their study published in 2012, *Aczél and Homolya* estimated based on audits conducted in 2011 that the amount of bank exposures exceeded HUF 200 billion.

As a result of the amendment of Act LXVI of 2011 on the State Audit Office of Hungary, the State Audit Office of Hungary was given the power to control local government-owned companies. It can be established based on the report of the State Audit Office of Hungary that the indebtedness of local government-owned companies increased between 2007 and 2010. Local authorities failed to pay enough attention to the increase of the debts of such companies, and to present the financial risks to town councils.

The report published by the SAO stated that the balance sheet and off-balance-sheet liabilities arising from contractual relationships between companies and their owner, as well as liabilities to third parties are not directly and fully available. The audit by the SAO regarding the period 2007–2010 found that the role of companies had grown in the fulfilment of voluntary tasks, and the number of guarantees and direct suretyships had quadrupled in the case of towns with county rank (from HUF 9.4 billion in 2007 to HUF 40.3 billion in 2010).

Szabó (2012) examined how towns with county rank performed their tasks and compared the size of the budgetary and extra-budgetary service-providing sectors. Based on his analyses, he came to the conclusion that the dominant players of asset management carried out by local governments are local government-owned companies.

Lentner (2013, 2014 and 2015) examined and assessed the enforcement of the going concern accounting principle in the case of local government-owned companies, exploring the analytical framework for the enforcement of the principle.

Németh (2016) published his findings based on the experience gained from audits conducted at local government-owned companies, dealing with two sectors relevant to our topic (waste management and district heating service), as well as with public transportation and non-profit theatres providing cultural services. Between 2008 and 2012, the SAO audited altogether 36 district heating com-

panies and 9 waste management companies. In contrast with our analysis, the sample did not require town status, therefore companies owned by villages, towns, towns with county rank and the capital were audited. The findings are summarised as follows:

- although no business plan is required by the law, 23 out of 36 district heating companies did not have one,
- in the study, two out of nine waste management companies did not have a net cost calculation policy, four companies did not have well-founded tariff calculation owing to inappropriate regulation, and the audit found errors in the case of six district heating providers,
- regarding the management of companies, 2009 was the best year,
- it is alarming that 8 district heating companies and one waste management company closed all the audited years with positive results, while 18 companies made a loss and 7 companies were subsidised by the local government,
- regarding loss-making companies, the registered capital of 11 companies fell below 50 per cent, while the equity of 7 companies became negative in certain years of the audit,
- based on the analysis, the receivables increased drastically, however, the companies did not make use of any statutory recovery instruments to manage their receivables,
- local governments basically managed to enforce ownership rights, to set up supervisory committees and comply with the rules in an appropriate way. However, only two companies had rolling planning and the preparation of a quarterly controlling report prescribed, the lack of ownership control at 2/3 of the companies indicates the dysfunction of ownership control.

Horváth (2016) examined the effects of state price control, commonly known as util-

ity cost reduction, on waste management and district heating service. In their analysis, the authors established that in the sectors affected by the utility cost reduction, the value of liabilities peaked in 2012 when 40 per cent of the audited companies had long-term liabilities, while 60 per cent of the companies had short-term liabilities. The latter mainly consisted of trade payables. In the period examined, the aggregated balance sheet earnings of HUF 3.7 billion were positive. The companies of smaller settlements made a loss.

In relation to the reform of state management, based on SAO reports published between 2011 and 2015, *Domokos et al.* (2016a and 2016b) revealed several deficiencies related to the operation of local government-owned companies, in particular the existence of performance requirements, ownership and management controls. In this context, they put forward several recommendations for the operation of local government-owned companies. These recommendations concerned the role of the owners, the management of the companies and the supervisory boards.

Credit scoring system

Based on the definition of the FHA, the *credit scoring* system is a statistically relevant, empirically-calculated credit scoring system. The definition above predestines that the creditworthiness of a company cannot be estimated completely accurately, therefore the continuous development enables the improvement of the method (Errington et al., 1983).

According to *Schreiner*, this formula allocates weights to the characteristics of the borrower based on which the probability of the occurrence of certain events is estimated. *Oravecz* (2007) believes that the aim of the method is to provide information for the assessment of the

lending risk and define the relationship based on historical data from databases.

In his study, *Kiss* (2003) presented the main credit scoring procedure, the indices on which it is based and the BACMIR procedure based on which the model was calculated.

Srinivasan and Kim examined the accuracy of credit scoring procedures by analysing the accuracy of 8 indices.

Methods applied in credit scoring:
• linear probability models,
• probit and logit models,
• discriminant analysis,
• linear programming,
scorecard-based systems. Certain methods lead to a kind of scorecard system, giving a weighted or unweighted result ("score"), which decides on creditworthiness (Oravecz, 2007). In our study, we used a method based on the scorecard system.

Material and methodology

The aim of our analysis is to examine the creditworthiness of local government-owned companies, their degree of compliance with a modelled scoring system used by banks and the percentage of creditworthy and uncreditworthy companies among them. As a result of the regulatory environment, local government-owned companies are allowed to take out a limited amount of loans, as pursuant to the amendment to the Stability Act of 2015, the borrowing of local government-owned companies requires government licence. Consequently, the aim is not to assess whether a specific company complies with the system of creditworthiness criteria in a modelled situation, but to identify the operational characteristics of the examined portfolio of a local government-owned company.

As opposed to general banking practice, the modelled scoring system presented in the

theoretical analysis contains only objective elements worth 90 scores. The length of the analysis did not allow the examination of subjective elements, but generally, it can be stated that such factors have no significant effect on the results of the analysis due to the positive general opinion of local government-owned companies.

The reason for this is that in subjective analyses the management and the owners are rated by banks as stable, as the banking system has unbroken confidence in local governments, which was apparent at the time of the issue of a considerable amount of bonds. On the other hand, the customers' side can also be regarded as stable, as the clientele principally consists of the citizens, whose net financial assets have been increasing since 2011, based on the statistics of the National Bank of Hungary (MNB).

In view of the above, subjective factors were not considered, and we focused on the results based on objective elements instead. The creditworthiness of companies was examined not only in temporal dimensions, but also according to territorial and municipal categories.

▶The horizon of the analysis covers the financial years 2013–2016. The source of the data is the Amadeus database. This period was chosen because the state regulation, which had a tangible effect on the situation of public utility companies, came into force as of 2013 (see: *Table 1*).

▶Territorial dimensions meant regional location.

▶The companies analysed included several categories, such as companies owned by the local governments of towns, villages, the capital and districts, as well as companies in the possession of asset management holding companies and companies of the local government foundations.

▶Based on the data available, a random sample was taken from the companies in the

Table 1

THE NUMBER OF COMPANIES INVOLVED IN THE ANALYSIS

Years examined	The number of companies involved in the analysis	The number of available companies
2013	129	1,291
2014	134	1,342
2015	144	1,441
2016	132	1,320

Source: Own edition based on the Amadeus database

given year. In the year in question, 10 per cent of the companies were selected.

Between 2013 and 2016, the aggregate asset value of local government-owned companies showed a rising tendency, as it increased by 23 per cent compared to 2013 *(see: Table 2).* The aggregate value of revenue realised by local government-owned companies reached its peak in 2015. Despite the slight drop in 2016, the aggregate revenue increased by 17 per cent in the sector since 2013. In the period examined the aggregate result of local government-owned companies was positive, as the value of their equity grew year by year, calculating with a basis ratio, it had an incremental value of 17 per cent compared to 2013.

The only negative trend was that the value of the equity of local government-owned companies did not grow by such an extent compared to the asset value. Their ratio fell to 32 per cent from 34 per cent in 2013.

Most companies deal with water supply and waste management. In addition, a lot of companies specialise in real estate management *(see: Figure 1).* The latter is considered to be a classic economic function of local governments, as they manage the real estate assets acquired during the change of regime. The high number of companies dealing with arts can be explained by the fact that local authorities converted their companies, which had operated as budgetary authorities before, into non-profit limited liability companies from 2006.

Table 3 shows the set of indices used. The indicators reveal that banking practice uses only a few indicators which are different from those used in the course of the normal
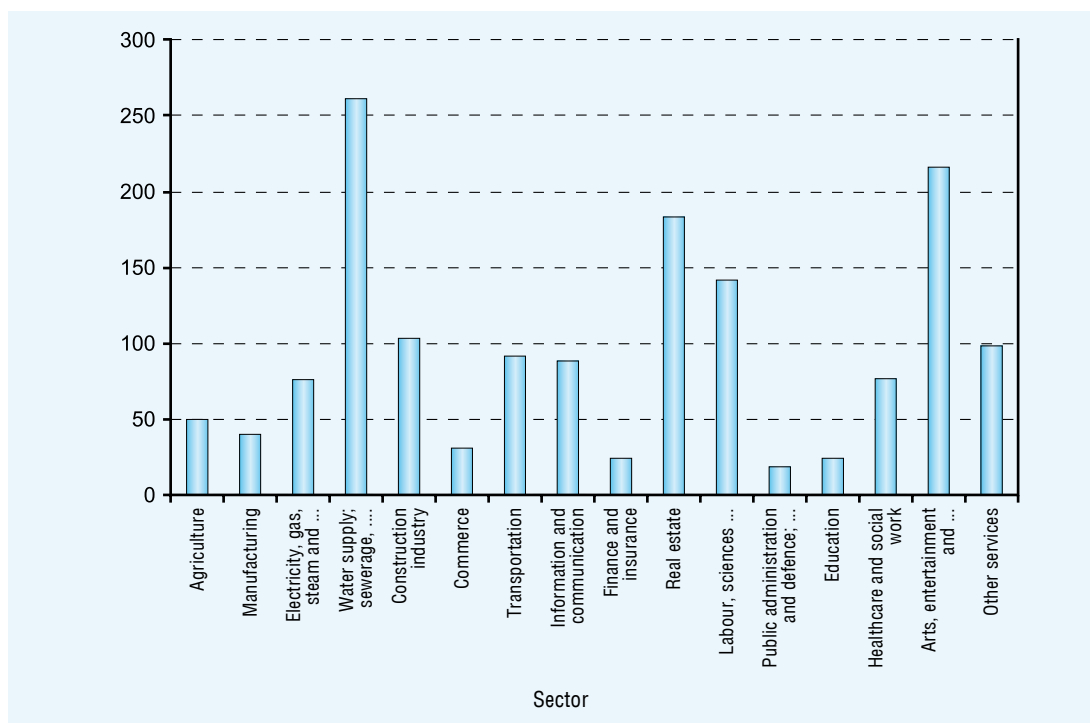
Table 2

KEY DATA OF THE EXAMINED COMPANIES
(IN MILLION HUF)

	2013	2014	2015	2016
Assets	2,070,477	2,353,682	2,484,957	2,564,401
Revenues	878,591	979,771	1,050,976	1,034,850
Equity	716,082	728,443	812,516	840,061

Source: Amadeus database, 2018

Figure 1

SECTORIAL DISTRIBUTION OF THE EXAMINED COMPANIES

Source: the authors' own research, 2018

operation of companies, as the format of the accounting report is the same as that in the case of companies in the market. As opposed to local government-owned companies in Germany or Italy, such companies in Hungary do not have a different organisational form from companies in the market. In our analysis, we detected three different variables which indicate the special characteristics of local government-owned companies: revenue independence, net investment and the modified loan-to-value ratio. The selection of the first index is justified by the fact that in many cases, the operation of the companies is subsidised by local governments, therefore this indicator shows to what extent the company is able to realise revenue independently. The index of net investment shows to what extent were the companies able to contribute to the

growth of the national assets, ignoring the invested financial instruments. The value of this indicator is favourable if it is positive. In the course of establishing the scoring system, we also considered the sector-specific features of other revenues to calculate the loan-to-value ratio.

On the top companies in the category classification defined in *Table 4* are those that belong to Category A. Their indices are outstanding regarding all factors, as they reached 81 out of the total score of 90. Companies in Category *B* performed worse in some respects, but the financing institution provided the loan to them unconditionally. Even companies in Category *C* can obtain financing if they have powerful collateral. Categories *D* and *C* were deemed to be uncreditworthy.

Table 3

THE SET OF INDICATORS EXAMINED

Indicator group	Indicator	Maximum score	Minimum score
Analysis of the financial situation	Equity ratio (equity/total resources)	8	0
	Equity turnover (equity/net revenue	4	0
	Reinvestment of after tax profit	4	0
	Fixed assets coverage ratio (equity + long-term liabilities/ fixed assets)	4	0
Examination of the financial situation	Liquidity ratio	6	0
	Acid-test ratio	6	0
	Dynamic liquidity (revenue/short-term liabilities)	5	0
	Buyer maturity	2	0
	Net investment (change in the invested assets - depreciation /value of invested assets)	4	0
	Supplier maturity	4	0
Examination of the profitability situation	Revenue independence (other revenue/revenue)	4	−1
	Return on Assets	5	−1
	Return on equity	5	−1
	Speed of circulation of inventories	5	0
Debt service	Debt ratio (long-term liabilities/equity)	6	0
	Short-term indebtedness indicator (short-term liabilities/ equity)	6	0
	Debt service cover ratio	6	0
	Loan-to-value indicator (net revenue + other revenue/short-term liabilities)	6	0

Source: the authors' own research, 2018

Table 4

FINDINGS BY CATEGORY

Category A	Absolutely creditworthy
Category B	Creditworthy
Category C	Creditworthy in a limited way
Category D	Uncreditworthy
Category E	Uncreditworthy

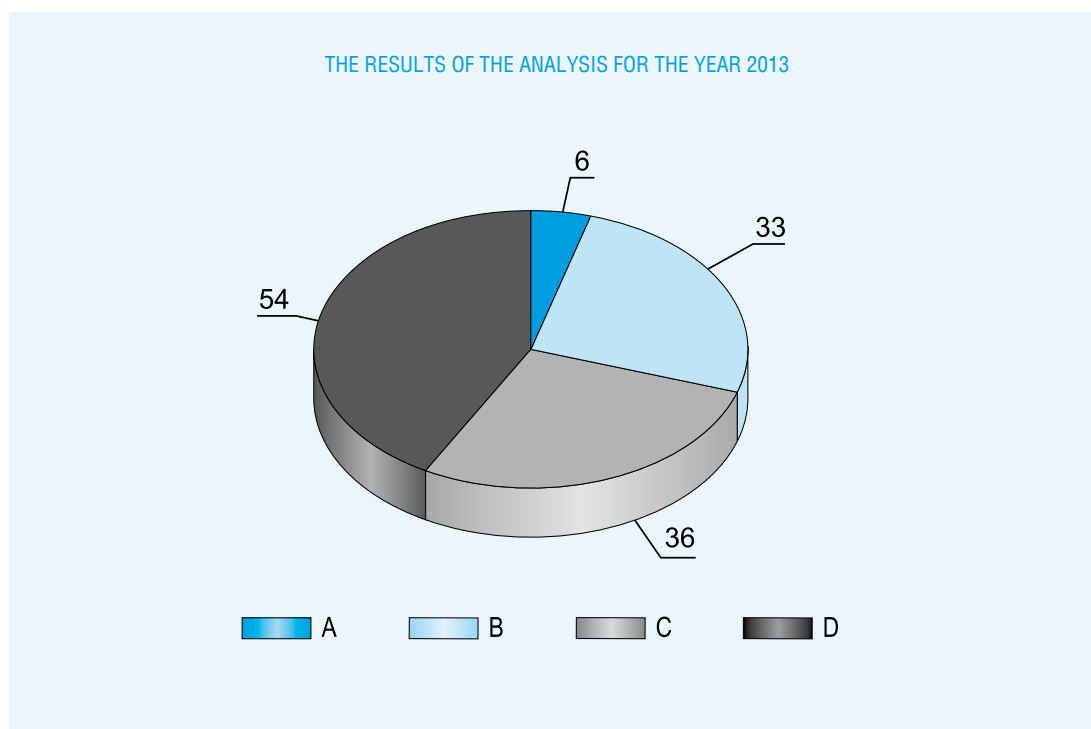*Source:* the authors' own research, 2018

Table 5

SUMMARY OF THE HYPOTHESES AND METHODS

Goal	Premises	Method	Hypothesis
Assessment of creditworthiness between 2013 and 2016	Hegedűs (2016) Zéman (2017) Domokos et al. (2016) Németh (2016) Horváth (2016)	Descriptive Statistics	The features of the creditworthiness of local government-owned companies deteriorated during the period in question.
Is there any relationship between territorial location and corporate creditworthiness?	authors' own assumption	Variance analysis (post hoc: Scheffé test)	There is significant difference between regional location and corporate creditworthiness.
Is there an relationship between the settlement category and the creditworthiness category?	authors' own assumption	Variance analysis (post hoc: Scheffé test)	There is significant difference between the settlement category and corporate creditworthiness.

Source: the authors' own research, 2018

Figure 2

CREDITWORTHINESS ASSESSMENT (BY CATEGORIES)

THE RESULTS OF THE ANALYSIS FOR THE YEAR 2013

A B C D

Source: the authors' own research, 2018

The aims and methods defined in the course of the research are summarised in *Table 5*.

As *Figure 2* shows, no completely uncreditworthy companies (Category *E*) were involved in the analysis. However, the percentage of uncreditworthy companies in Category (*D*) is high (42 per cent). Based on this, we can conclude that a significant part of the sample would not get any loan from the banks under market conditions.

31 per cent of the companies belong to categories with good creditworthiness (categories *A* and *B*), while the remaining 28 per cent belong to the grey zone. On the positive side, despite their low number (no more than 5 per cent), there were some companies which fully complied with the creditworthiness criteria, therefore they received the highest rating.

Regarding creditworthiness, the most pow-erful companies operated in the capital, Pest County and in the Central Transdanubian region. In the latter case, mainly in the seat of Fejér County. As *Figure 3* shows, companies operating in the Central Hungarian and the Western Transdanubian regions have creditworthiness characteristics belonging to Category *B*. Classified by county, these companies are also located in Fejér County. Companies operating in the Northern Great Plain and Southern Transdanubia had the worst features in the year examined. Surprisingly, the number of such companies was high in the Central Hungarian region, as well. From the central region 9 companies, mainly from the capital, belonged to this category. On the positive side, every company in the Central Transdanubian region complies with the minimum requirements for creditworthiness.

Figure 3

CREDITWORTHINESS CATEGORIES BY REGION, IN 2013
(THE CATEGORIES ARE INDICATED BY NUMBER)
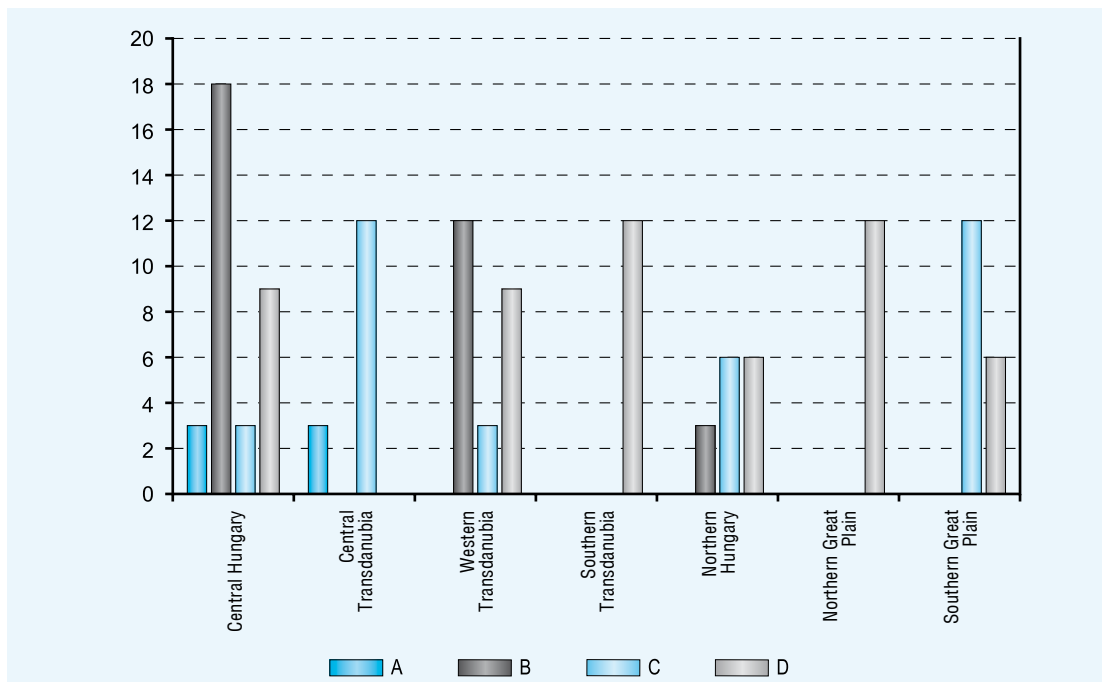
Source: the authors' own research, 2018

Based on the data analysed, all companies in the capital fall into the creditworthy category. By contrast, in the case of the companies in towns with county rank and towns, uncreditworthy companies are in majority. However, a high percentage of the companies operating the districts of the capital are creditworthy *(see: Figure 4)*. At the same time, among social organisations and holdings operated by local governments, creditworthy and uncreditworthy companies are represented equally.

The assessment conducted in 2014 found that the majority of the companies fell into the mediocre category regarding creditworthiness. Most companies are creditworthy, however, 25 per cent of the companied assessed would not be creditworthy based on the data of the method described *(see: Figure 5)*. On the negative side, some companies that were given the best credit rating disappeared, and

the average scores in Category *B*, which is still considered a category with high rating, decreased, as well, by 2014. 46 per cent of the companies had median index value (Category *C*), while 28 per cent had appropriate indices (Category *B*). In relative terms, there was some improvement compared to 2013. The percentage of companies with mediocre characteristics (Category *C*) increased by 68 per cent compared to the first year examined.

As *Figure 6* illustrates, in the case of the assessment conducted for the year 2014, the majority of the companies in the capital had favourable creditworthiness features, however, there were also some uncreditworthy organisations among them. In the case of towns with county rank, the situation improved slightly compared to the previous year, because the number of uncreditworthy companies had decreased. The ratio improved somewhat in the case of towns. On the positive side, there were
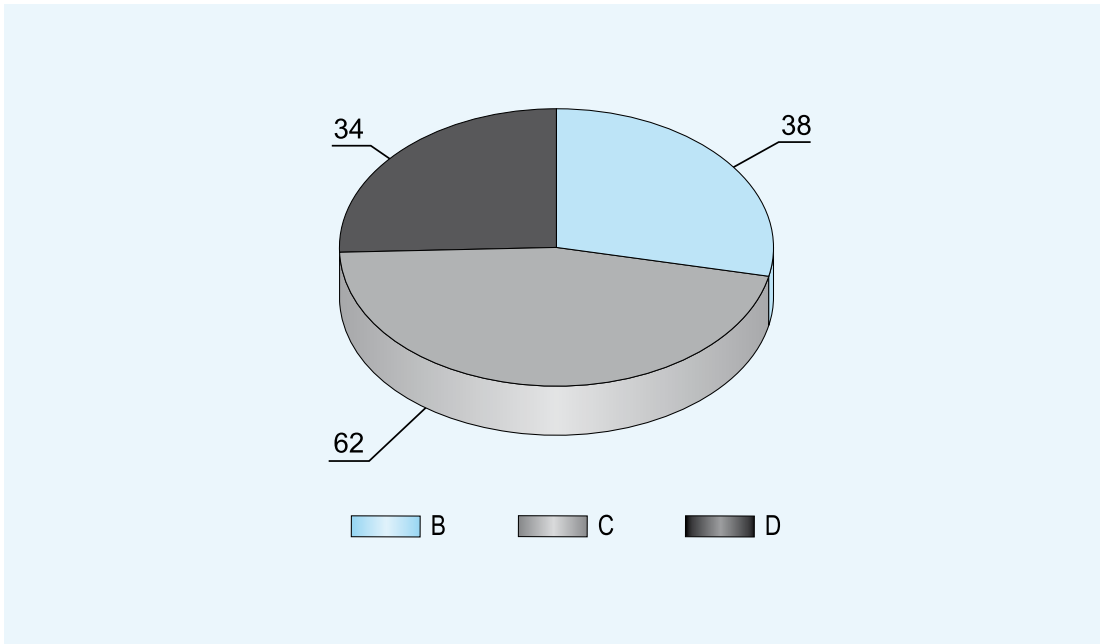
Figure 4

**COMPANY CATEGORIES BY SETTLEMENT
(THE CATEGORIES ARE INDICATED BY NUMBER)**
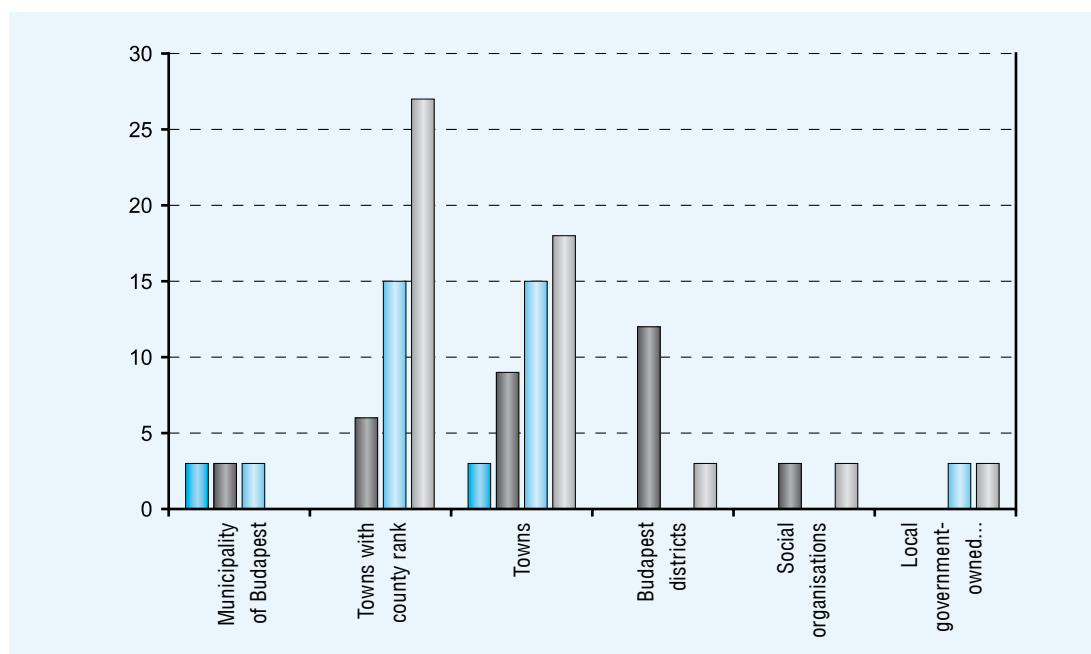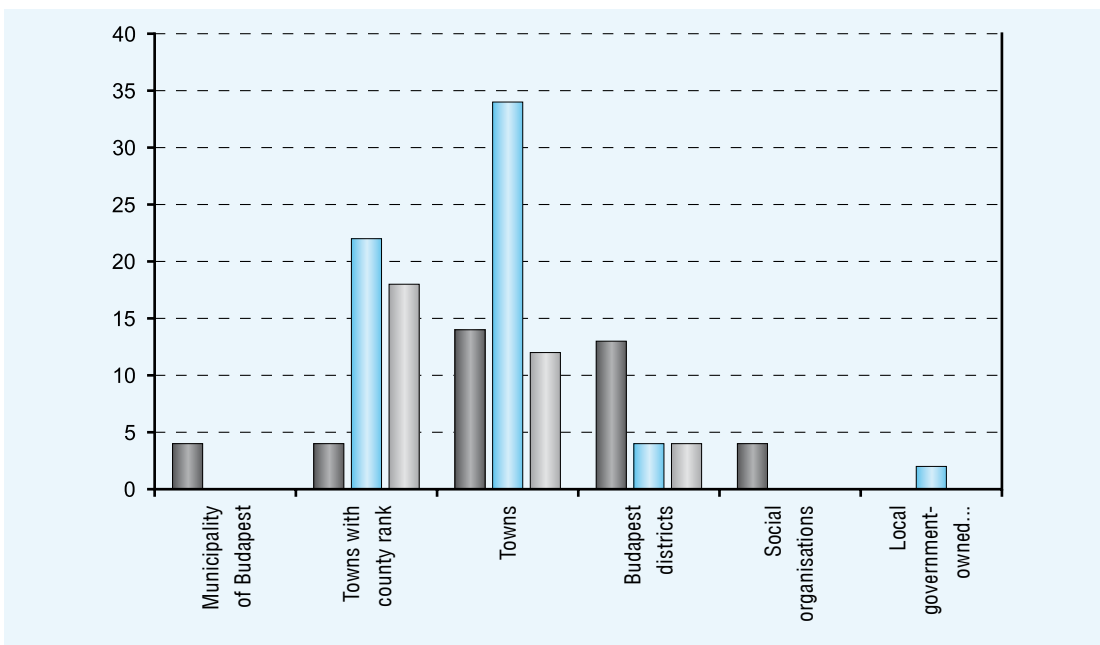

Source: the authors' own research, 2018

THE RESULTS OF THE CREDITWORTHINESS ASSESSMENT FOR THE YEAR 2014
(THE CATEGORIES ARE INDICATED BY NUMBER)

Source: the authors' own research, 2018

COMPANY CATEGORIES BY SETTLEMENT IN 2014
(THE CATEGORIES ARE INDICATED BY NUMBER)

Source: the authors' own research, 2018

no uncreditworthy companies owned by the capital in 2014.

As far as territorial location is concerned, the data show that the percentage proportion of creditworthy companies was higher among companies operating in Central Hungary or Western Hungary regions, especially in Győr-Moson-Sopron County. The situation improved a lot in the Southern Great Plain region due to the values of companies in Bács-Kiskun County *(see: Figure 7)*. Based on the assessments conducted, the creditworthiness related performance of local government-owned companies deteriorated in Central Transdanubia and Southern Transdanubia. The situation in Northern Hungary slightly improved.

The distribution of the results of the 2015 assessment was different from that of the assessment conducted in 2014. At the same time, the percentage of uncreditworthy com-

panies was the same as in 2013 (36 per cent) *(see: Figure 8)*. The number of companies with appropriate creditworthiness in Category *B* significantly dropped, as their percentage was just 17 per cent. Similarly to the assessments conducted in 2013 and 2014, most companies (47 per cent) belonged to Category *C* or the grey zone. This ratio equals the 2014 data. In conclusion, it can be established that as opposed to the improvement in 2014, the creditworthiness index of the companies slightly declined and the percentage of uncreditworthy companies increased in 2015. Another negative factor is that no company belonged to the best group (Category *A*) regarding creditworthiness assessments.

Data concerning settlement categories show that all companies operated by the capital itself were creditworthy, while the number of uncreditworthy companies owned by the districts of the capital rose *(see Figure 9)*.
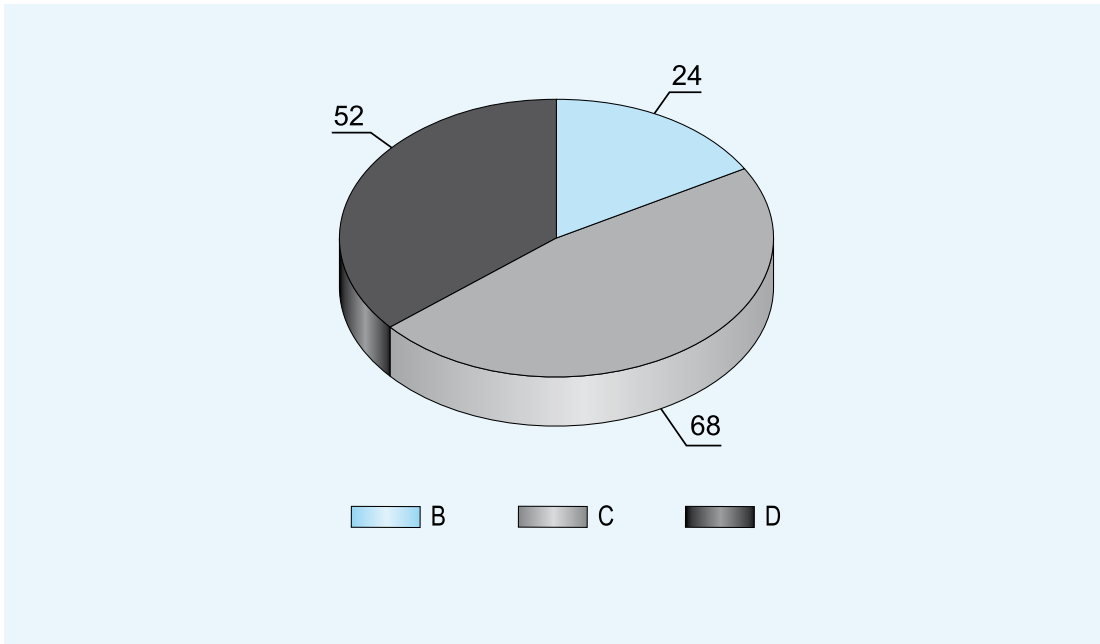
Figure 7

CREDITWORTHINESS CATEGORIES BY REGION, IN 2014
(THE CATEGORIES ARE INDICATED BY NUMBER)
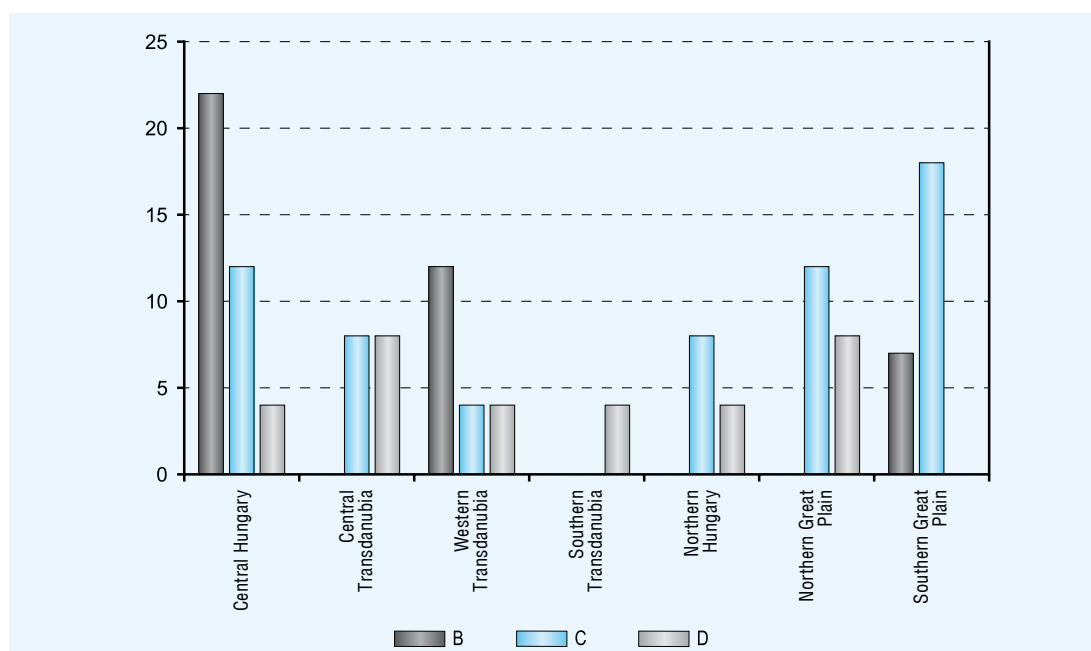
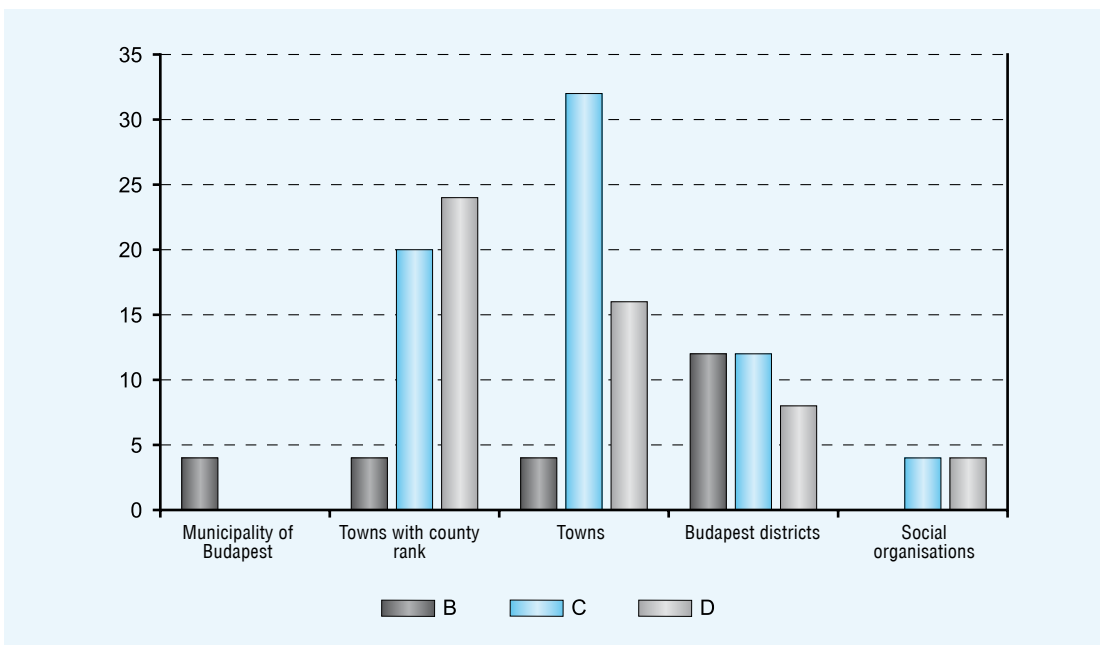*Source:* the authors' own research, 2018

Figure 8

**THE RESULTS OF THE CREDITWORTHINESS ASSESSMENT FOR THE YEAR 2015
(THE CATEGORIES ARE INDICATED BY NUMBER)**

Source: the authors' own research, 2018

Figure 9

**COMPANY CATEGORIES BY SETTLEMENT IN 2015
(THE CATEGORIES ARE INDICATED BY NUMBER)**

Source: the authors' own research, 2018

A similar process is seen concerning towns with county rank compared with 2013. the percentage of uncreditworthy companies is the highest among companies owned by local governments of this status. The number and percentage of uncreditworthy companies also rose in towns compared to 2013 data. Uncreditworthy companies appeared in the districts of the capital, as well. Their number and percentage increased compared to the previous year examined.

Data concerning regional distribution show that the percentage of creditworthy local government-owned companies was high in the Central Hungarian region in 2015. However, the percentage and number of uncreditworthy companies significantly increased, as well, compared to previous years *(see: Figure 10)*. In addition, the number of companies in Category *B* is the highest in Western Hungary, especially in Győr-Moson-

Sopron County. In other regions, companies were only categorised into Category *C*. In conclusion, the creditworthiness of local government-owned companies was appropriate in the most developed counties. The situation is bad regarding the local government-owned companies in the Southern Transdanubia and Northern Great Plain regions. Most uncreditworthy public service providers operate in the Northern Great Plain, Central Hungary, Southern Transdanubia and Southern Great Plain regions.

The results of the assessment for the year 2016

Based on the assessment of 2016, it was welcome news that the number of uncreditworthy companies significantly decreased. It was the lowest during the four-
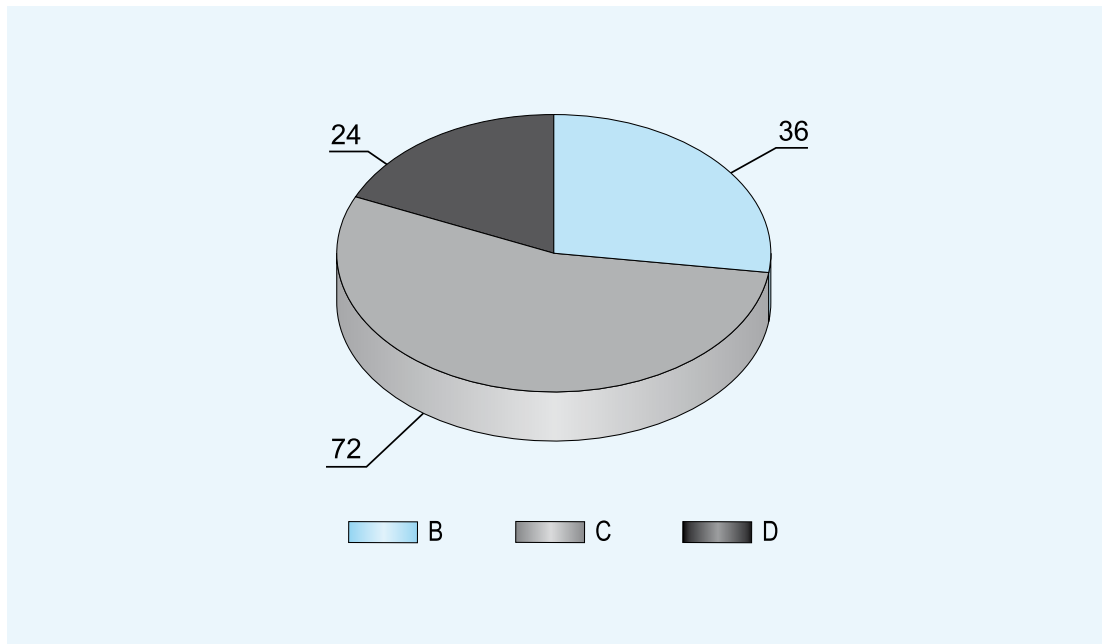
Figure 10

CREDITWORTHINESS CATEGORIES BY REGION, IN 2014
(THE CATEGORIES ARE INDICATED BY NUMBER)
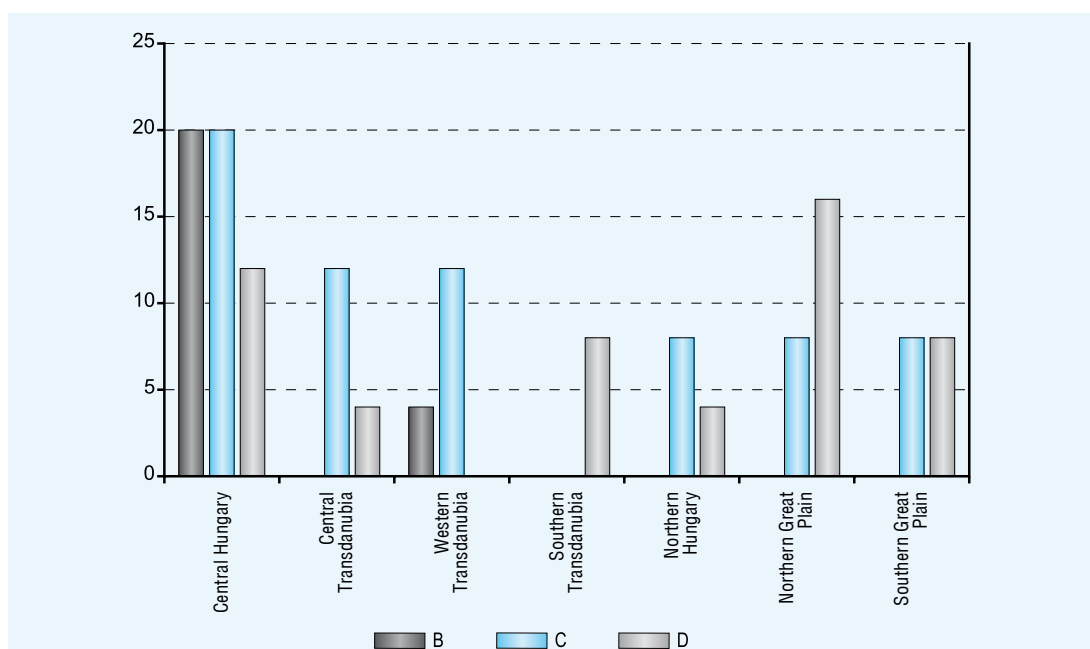
Source: the authors' own research, 2018

CREDITWORTHINESS ASSESSMENT FOR THE YEAR 2016
(THE CATEGORIES ARE INDICATED BY NUMBER)

Source: the authors' own research, 2018

year-long period examined *(see: Figure 11)*. As far as their proportion and value is concerned, the number of the companies in the more favourable Category *B* increased the most following the last year examined, resulting in a percentage that is the second highest value. A large percentage of companies belong to the mediocre, grey zone, similarly to previous years. No company belongs to Category *A*.

By 2016, the regional classification significantly changed. In particular, the performance of companies from well-performing regions deteriorated, but, surprisingly, despite the fact that companies in Western Hungary performed better, the uncreditworthy companies were located also in these regions *(see: Figure 12)*.

Based on *Figure 13*, we have concluded that most creditworthy companies work in towns, towns with county rank, while the most uncreditworthy companies are managed by the

asset management holdings of local governments. Fundamentally, the management of such companies would not be the responsibility of local governments, but that of the manager of the holding company, therefore this trend might lead to the evolvement of an unfavourable process.

It can be established that there is a significant difference in territorial location in the examined period. The two examined variables, the territorial location and the level of significance are below the 5 per cent value in all cases *(see: Table 6)*. It has been proven by post-hoc tests that the data from Central Hungary, Northern Great Plain, Southern Transdanubia, Central Transdanubia and Western Transdanubia were significantly differed for each year.

When we looked at settlement categories, the variance analysis did not reveal any significant difference in any of these years. Consequently, the settlement category does not
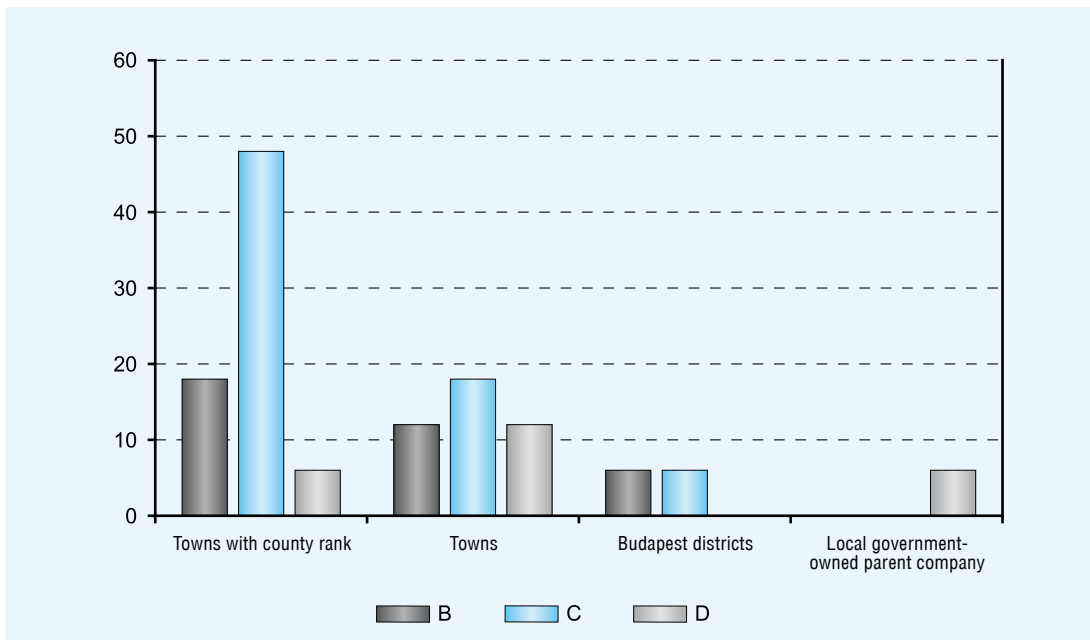
Figure 12

CREDITWORTHINESS ASSESSMENT BY REGION, FOR THE YEAR 2016
(THE CATEGORIES ARE INDICATED BY NUMBER)
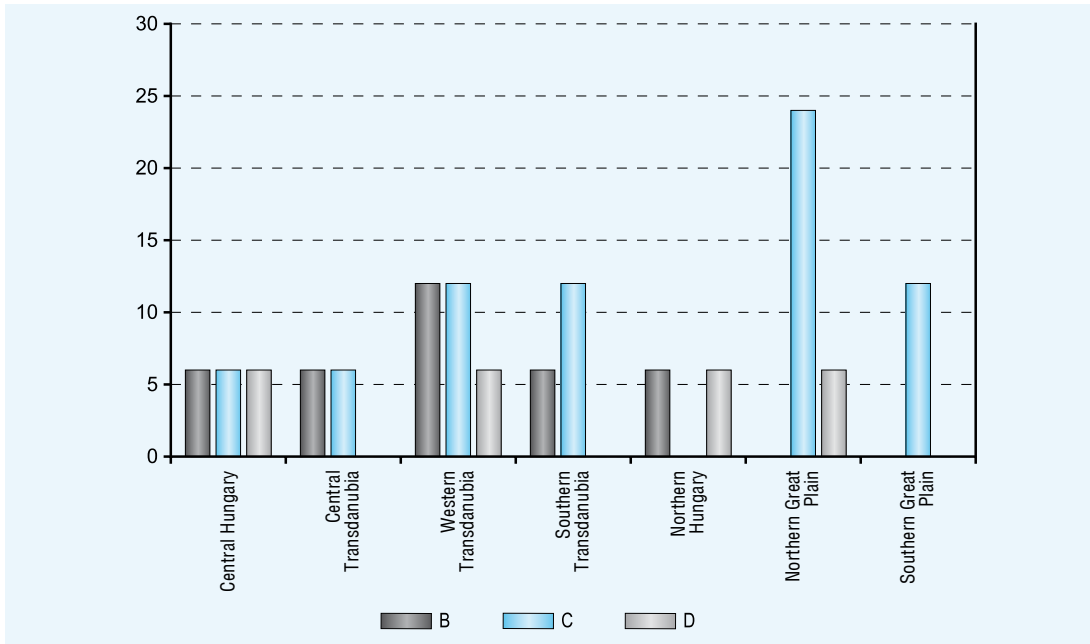
Figure 13

CREDITWORTHINESS ASSESSMENT BY SETTLEMENT FOR THE YEAR 2016
(THE CATEGORIES ARE INDICATED BY NUMBER)

Table 6

VARIANCE ANALYSIS FOR THE EXAMINED VARIABLES

ANOVA-Region	F	Sig.	Anova- Settlement category	F	Sig.
Pont 2016	0.557	0.046	Pont 2016	0.953	0.436
Pont 2015	2.631	0.037	Pont 2015	0.897	0.478
Pont 2014	1.598	0.019	Pont 2014	0.826	0.542
Pont 2013	1.675	0.020	Pont 2013	0.746	0.452

Source: the authors' own research, 2018

Table 7

ANALYSIS OF THE PANEL SURVEY

	2013	2014	2015	2016
A	1	0	0	0
B	10	9	6	8
C	10	8	11	14
D	9	13	13	8

Source: the authors' own research, 2018

lead to considerable difference in relation to creditworthiness scores.

In the panel survey, there were 30 companies with a valid value for every year, therefore the direction of the change could be evaluated on the basis of their data *(see: Table 7)*. As it is obvious based on previous analyses, the sample analysed included no companies rated with the highest creditworthiness value since 2013. The number of companies in the second best category (Category *B*) decreased until 2015, but then slightly increased by 2016, which is considered to be positive. The number of companies in the mediocre category grew by the last year, owing to the fact that less companies fell into the worst category. Similarly to the trend outlined by means of annual assessments, it is apparent that the creditworthiness characteristics of lo-

cal government-owned companies improved by 2016. Based on the panel survey, the worst years were 2014 and 2015. The fact above contradicts to the analysis conducted on the whole sample, where the worst years were 2013 and 2015. An upward trend was visible in even years.

Based on territorial location, it can be stated that the processes were similar to those outlined in the analysis of the sample, which means that the creditworthiness of the companies in Central Hungary, Western and Central Transdanubia was the most appropriate, as none of these companies fell into the uncreditworthy category. Uncreditworthy companies concentrated in the Southern Transdanubia, Southern Great Plain and Northern Great Plain regions.

In the course of the panel survey, it is worth

CONCLUSION OF THE RESEARCH

Hypothesis	P&L
The features of the creditworthiness of local government-owned companies deteriorated during the period in question.	Dismissed
There is significant difference between regional location and corporate creditworthiness.	Proven
There is significant difference between the settlement category and corporate creditworthiness.	Dismissed

Source: the authors' own research, 2018

considering sectorial classification, as well. Based on this, it can be concluded that water companies and district heating providers fell into the same creditworthy category each year. Out of the 5 company types, they were classified into Category *B* each year. Uncreditworthy companies primarily dealt with real estate management and arts in the period in question.

CONCLUSIONS

The first hypothesis has been dismissed as the deterioration of creditworthiness could not be evaluated due to the fluctuating results of the assessments. 2014 and 2016 were considered to be better years, while the number and percentage of uncreditworthy companies sharply increased in odd years *(see: Table 8)*. Not even the findings of the panel survey prove the evolvement of a clearly deteriorating tendency, as the year 2016 changed the trend seen in 2014–2015.

The second hypothesis has been proven as the variance analysis was significant each year. Furthermore, the post-hoc tests revealed some differences between better and worse performing regions.

The third hypothesis has been dismissed as the owners were the same each and every year examined, therefore it could not be substantiated.

References

Aczél Á., Homolya D. (2012). *Az önkormányzati szektor eladósodottságának kockázatai pénzügyi stabilitási szemszögből* (Risks of the Indebtedness of the Local Government Sector from the Point of View of Financial Stability) *MNB-szemle* [Public Finance Review of the National Bank of Hungary], 6 (3), pp. 1–11

Csiszárik-Kocsir Á. (2008). Nem marad érintetlenül az önkormányzati szektor sem – avagy a subprime válság hatásai a helyhatóságoknál [The Local Government Sector Will Not Remain Unaffected Either or the Effects of the Subprime Crisis on Local Authorities] IN: *Comitatus Önkormányzati Szemle [Comitatus Local Government Review]*, 18 (11–12), pp. 60–69

Domokos L.,Várpalotai V., Jakovác K., Németh E., Makkai M. (2016). *Az Állami Számvevőszék hozzájárulása az „állammenedzsment" megújításához.* [Contribution of the State Audit Office of Hungary to the Renewal of "Public Management"] In: A jó

kormányzás építőkövei – fókuszban a legfőbb pénz-ügyi ellenőrző szerv, az Állami Számvevőszék [Building Blocks of Good Governance – Focus on the Supreme Audit Institution, the State Audit Office of Hungary] State Audit Office of Hungary, Budapest, pp. 4–58

Domokos L., Várpalotai V., Jakovác K., Németh E., Makkai M., Horváth M. (2016). Szempontok az állammenedzsment megújításához [Proposals for Improving Public Management] *Public Finance Quarterly*, 61 (2), pp. 185–204

Erlington, S. G., Birchall, J. A., Mudge PGL, Gillett, E. R. (1983). *A guide to credit scoring.* Finance Houses Association

Hegedűs Sz. (2016). Önkormányzati tulajdonú gazdasági társaságok eladósodásának és tőkeszerkezetének vizsgálata Magyarországon [Research in the Indebtedness and Capital Structure of Companies Owned by Local Governments in Hungary]. PhD thesis, Gödöllő

Homolya D., Szigel G. (2008). Önkormányzati hitelezés-kockázatok és banki viselkedés [Risks Posed by the Loans Provided to Local Governments and the Behaviour of Banks)] *MNB-szemle* [Public Finance Review of the National Bank of Hungary], 6 (9), pp. 20–29

Horváth M. (ed.) (2016). Önkormányzatok többségi tulajdonú távhőszolgáltató gazdasági társaságai gazdálkodásának egyes elemei a rezsicsökkentés tükrében [Certain Elements of the Financial Management of a District Heating Company in Majority Local Government Ownership in the Light of Utility Cost Reduction] State Audit Office of Hungary, Budapest

Kiss F. (2003). A credit scoring fejlődése és alkalmazása [The Development and Use of Credit Scoring], PhD thesis, Budapest University of Technology and Economics

Lentner, Cs. (2014). Enforcement of the Principle of Going Concern: with Special Regard to Public Service Providers. In: Hyránek, Eduard, Nagy, Ladislav (eds.): Zborník Vedeckých Statí: Priebežné výsledk y riešenia grantovej úlohy VEGA č. 1/0004/13: Aktuálne trendy a metódy vo finančnom riadení podnikov a ich vplyv na finančnú stabilitu podniku. pp. 9–17

Lentner, Cs. (2014). *A vállalkozás folytatása számviteli alapelvéről* [On the Accounting Principle of Going Concern] *Gazdaság és Jog* [Economy and Law], 22 (3), pp. 3–8

Lentner, Cs. (2015). *A vállalkozás folytatása számviteli alapelvének érvényesülése közüzemi szolgáltatóknál és költségvetési rend szerint gazdálkodóknál – magyar, európai jogi és eszmetörténeti vonatkozásokkal* [The Enforcement of the Going Concern Accounting Principle at Utility Service Providers and Budgetary Companies – with Hungarian and European Legal and Ideological Aspects] In: Lentner Cs. (ed.). *Adózási pénzügytan és államháztartási gazdálkodás: Közpénzügyek és Államháztartástan, II.* [Taxation Finance and Public Finance Management: Public Finances and the General Government II] p. 858

Németh E. (2016). *Fókuszban a közszolgáltatás* [Public Service in Focus] *A hulladékgazdálkodó és távhőszolgáltató önkormányzati többségi tulajdonú társaságok ellenőrzési tapasztalatai* [Audit Experience of Waste Management and District Heating Companies Majority-Owned by Local Governments], State Audit Office of Hungary, Budapest

Oravecz B. (2007): *Credit scoring modellek és teljesítményük értékelése* [Credit Scoring Models and the Assessment of their Performance] *Hitelintézeti Szemle* [Financial and Economic Review], 6 (6), pp. 607–627

Schreiner, M. (2001). Credit Scoring for Micro–finance *Working Paper*, Washington University, St. Louis

Srinivasan, V., Kim H. Y. (1987). Credit granting: A comparative analysis of classification procedures, *Journal of Finance,* 42 (3), pp. 665–683

Szabó I. (2012). *Önkormányzati feladatellátási modellek a megyei jogú városok önkormányzatainál* [Local Government Task Fulfilment Models in Towns with County Rank] *Polgári Szemle* [Civic Review] 3 (1–2)

Vigvári A. (2009). Pénzügyi kockázatok az önkormányzati rendszerben [Risk Management in the Local Government System] *Public Finance Quarterly*, 4 (1), pp. 68–87

Zéman Z. (2017). *A pénzügyi controlling kockázatcsökkentő szerepe önkormányzati szervezeteknél* [The Risk-Mitigating Role of Financial Controlling at Local Government Entities] *Public Finance Quarterly*, 62 (3), pp. 294–309