SZENT ISTVÁN EGYETEM

THESIS OF THE DOCTORAL (PhD) DISSERTATION

EXAMINATION OF THE CAPITAL STRUCTURE OF HUNGARIAN SME'S AND COMPARISON WITH THE INTERNATIONAL TRENDS

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CONTENTS

1. INTRODUCTION

The aim of the current dissertation is the examination of the capital structure theories on an international large sample and in the same time to reveal the differences between the East - West or post socialist - western type economics. In all part of the world the main purpose of the enterprises is maximizing the wealth of the shareholders which is influenced strongly by financing decisions, in other words how do we combine liabilities that stand behind the assets.

The importance of the topic

The capital structure decisions have an impact on the profitability of the company and on the amount of the payable profits, that's why it is relevant for the shareholders how the managers determine the capital structure of the company. My assumption is that there are similarities between geographical regions, which is explained by on the one hand the historical past and the tighter economic relations and on the other hand the financing policy pursued by credit institutions, which play a decisive role in fund-raising. The examination of these two factors has not been given much emphasis in the Hungarian and Eastern European context, similarly to the research published in this topic, the focus was on the mainstream theories, the territorial diversification and the international comparisons had less importance.

Main Questions

For a proper financing decision, the manager should first consider the origin of the available source, make use of external or internal funding, decide on its expiration and, last but not least, the level of the gearing, which puts up further questions both within the company and on financier side. Excessive usage of external funds has a negative effect on the solvency of the company, the insolvency risk increases and at creditor side there are doubts about the repayment, so the cost of the funds will increase. High debt ratio, due to the lowering effect on the tax base of the interest rate, has positive effect on the amount of tax-based savings and reduces the amount of free cash flows that can be spent by the managers, thereby increasing the security of the shareholders wealth. The expiration of the loan is also important because of its costs that is not only influenced by the company's management, but also by the organization or persons providing the loan. On their side there is a risk of repayment, which is influenced by several other factors besides the company's reputation or the existence of collateral-intensive assets. How do these factors prevail in the case of regions with similar economic development, where 30 years ago there was a different view about the effective market mechanisms? How does this territorial diversification influences capital structure decision and does it have an

impact on measures made on the financier side? My doctoral thesis would like to deliver the answer for all these questions.

1.1 RESEARCH GOALS

C1

Processing the literature, paying special attention to researches carried out on international databases and their results. During this I presented the development of the capital-structural theories and the characteristics experienced in countries with different economic development histories.

C2

During the examination of the database, my first objective is to discover the changes in the capital structure indicators using descriptive statistical methods in order to obtain a general picture of the average level of indebtedness and trends based on expiry, company size and sectoral classification. The analysis was carried out at country and regional level, and during the presentation of the results, I placed more emphasis on Hungary.

C3

Grouping the companies of the database according to indebtedness, profitability and the structure of assets and the median values of the financial ratios valid for the obtained clusters. Further analyzes of the resulted capital structure samples gives more opportunity to verify country-specific impacts.

C4

My aim was to examine the validity of the capital structure theories in the regions covered by the database, during the period affected by the global economic crisis. Is there a difference in the measure and the direction of the impact of the factors influencing the capital structure, according to the different territorial entities.

1.2 HIPOTHESISES

The main question of the dissertation is how capital structure theories prevail in the two groups differs on a geographic and economic development history. The empirical research focuses primarily on the analysis of indicators gathered from financial reports, considering the scope of available data and their quantification. In case of the micro factors, the role of subjectivity is not relevant, the explanatory variables can be characterized by one or more indicators based on the appropriate lines of the audited balance sheet and P/L accounts in a standardized form for each country. During my research,

I try to find out whether there is a difference between the composition and the explanatory power of the independent variables affecting the leverage within the groups of different economic development. To do this, first the test of the mainstream theories is necessary, where the group-related and the group-specific independent variables have more attention.

H1: The capital structure theories are similarly applied in groups of countries with different economic development histories, but there are significant differences in the explanatory power.

The common characteristic of countries with different development history is that the political-economic system change was taken place in the same time, at the time of the fall of the Soviet Union. Although these processes did not take place from one day to another, the transition was completed by the end of the 90's and the rules of the market economy are applied in all the examined countries. In my opinion, however, this transition has some of the utterances that appear in the financing decisions of companies, and these decisions show similarities along the east-west line of fractures. The development of the capital markets and the financial system as well as the different regulatory environment may lead to the emergence of certain country-specific capital structure patterns, which in this case show the similarities in the groups I separated. I suppose that the previous theories will be valid for both groups, but we may find differences in the strengths of the relationships that are similar within a group and will be different outside of the group.

H2: in the group of the developed countries, the leverage and the long-term liabilities ratio will be higher due to the more favorable financial environment.

In case of the Western countries, a higher leverage could be explained by several factors on the basis of capital structure theories, such as the higher equity ratio that may serve as a collateral for borrowing or a more aggressive financing policy supported by the more liberal financial system and regulatory environment. Accordingly, the membership of to the group may directly affect the capital structure when the deviation is due to a specific feature of a group, typically the characteristics of the institutional system. At the same time, this effect can be indirect when it has an effect through a company specific factor and they are similar within the groups.

H3: There is a positive relationship between the fixed assets ratio and the leverage

According to the trade off theory, the company borrows credit until the marginal income of tax savings from borrowing exceeds the marginal cost of financial distress. Fixed assets can be considered as collateral in a credit transaction and hence the debt ratio may be higher while bankruptcy costs remain low. Therefore, the leverage optimum is extended, companies with higher fixed assets will have more benefits on tax savings and, consequently, they will operate with higher leverage according

to the theory. Although the direction of the relationship is assumed to be independent from countries, however, the impact can be influenced by the institutional features and regulatory differences that characterize each territorial entity. Banks' credit policy and the selling opportunities of the tangible assets on a given market may vary, which can still affect the strength of the relationship despite the transition to the market economy.

H4: There is a positive relationship between company size and leverage

From the aspect of financial distress, large corporations are less vulnerable than small-size companies due to their diversification, so size is in a negative relationship with the probability of default. The cost of bankruptcy is also lower, which can lead to more favorable conditions for external resources, and therefore the level of the leverage will be higher in their case.

H5: There is a positive relationship between company age and leverage

More maturated companies are the main targets of the credit institutions, as they may face a lower probability of default considering the long-term continuous operation. As a result, these companies may have access to external resources under more favorable conditions, which leads to higher leverage.

H6: There is a negative relationship between profitability and leverage

According to the pecking order theory, companies where profit is available as unpaid dividends, will primarily prefer these resources to finance future investments against external sources. Thus, in these firms, the theory assumes a lower level of leverage, which results in a negative relationship with profitability. There is an opposite effect from the trade off theory, the probability of financial distress is lower at the profitable firms, and therefore the negative will appear at higher leverage. The existing profit makes it possible to use the tax saving options offered by the tax shield.

H7: there is a negative relationship between growth potential and long-term debt ratio

The growth of the company assumes the need for intensive fundraising, which goes beyond the opportunities offered by the retained profits, and therefore they are characterized by a higher level of leverage. Here appears the question of the risk of growth, smaller companies are intended to take an unreasonably high risk, because in case of a positive outcome, profit growth only affects their outcome, and the creditor side receives only a fixed interest payment from the cash flow, which is independent from the level of profitability. Due to the resulting moral hazard, on the financial institution side we must calculate with higher costs. The solution can be the use of short-term funds which would resolve the agent problem.

H8: there is a negative relationship between liquidity and leverage

High liquidity assumes a high proportion of liquid assets that can be considered as a collateral on the asset side, which has a positive impact on the company's creditworthiness, so a positive relationship can be assumed between leverage and liquidity. According to the pecking order theory, the available liquid assets are preferred against the external funding, so the direction of the relationship will be negative between the two variables. The anomaly above can be solved by the examination according to the expiration of the credit, suggesting that the relationship will be positive against the long-term debt because of the collateral and because of the lower supplier ratio I assume a negative relationship against the short-term liabilities.

H9: If non-debt tax saving options are available, companies prefer it against raising the leverage.

Profitable companies can reduce the amount of payable corporate tax by increasing their leverage as the interest rates of the loans can be deducted as costs, thus reducing the profit before tax. The limitation of this approach is also the increased risk of financial distresses mentioned in the trade off theory, which explains the practical absurdity of total indebtedness. One form of the non-debt tax savings is the profit reducing effect of the amortization, which implies the existence of the non-current

assets. The other option is the use of tax credit opportunities which directly reduces the amount of payable corporate tax.
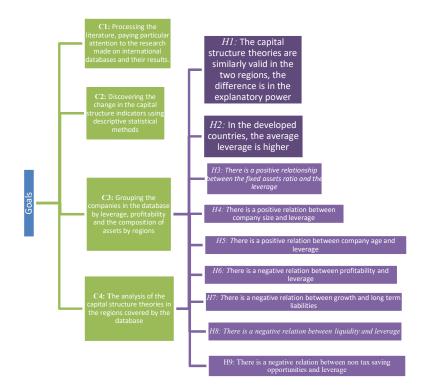

Figure 1.: Summary of goals and hypothesises

Source: own research

2. MATERIAL AND METHOD

2.1 THE STRUCTURE OF THE DATABASE

The company data required for the empirical research was downloaded from the database of the Belgian provider Bureau van Dijk Orbis database, which includes the financial data of nearly 200 million companies and financial institutions from 200 countries around the world. Because of the different accounting rules in each country the content of the accounts is not always the same, and therefore such comparison might be a problem, which is solved by the service provider using a standard format which is suitable for all account type format. The resulting 23 balance sheet and 23 P/L account lines are the result of a smaller data reduction, but the advantage is that it completely solves the comparability problem, allowing to analyze the data from different countries. Classification of the activities

was based on the NACE Rev 2[1] classification used by the EU, where I took the first level containing 21 sectors with the codes from A to U. In Hungary until 2012 the TEÁOR'03 classification was used, which successor was TEÁOR'08, that corresponds to the NACE Rev 2 system.

As the research covers a longer period, the search criteria also include the data availability in every year, so only those companies are in the sample that have data for the entire period and for all the variables used during the analysis. Based on this, the criteria for the selection included the 8 selected countries (4-4 in the two regions, in the east Hungary, Slovakia, Czech Republic and Poland, in the West Germany, Austria, Italy and France), where for the separation of the geographical entities, the country ISO code is available. The company size classification was based on the categories of SME classification, which distinguishes large, medium-sized, small and micro-enterprises based on the number of employees, total assets and turnover figures. As a result, companies where all 3 types of data were missing were excluded.

Thanks to this balanced panel, I could reduce the distortive effects of data loss and the estimation of a random effect model could also be solved, and the existence of the indicators for the entire time series assumes that companies with truly active economic activity have been included in the sample.

I have only considered the data of the unconsolidated accounts, which does not exclude the companies that have both types of accounts, but only unconsolidated data was taken into account during the analysis. This is due to the distorting effect of the consolidated data, because in this case the database may contain one of the companies involved in the consolidation, so the same performance would appear in the statements. An active legal status was also a requirement, therefore only companies were taken into account that were operating throughout the whole period. This also has some distorting effect, with the exclusion of active companies that disappeared in the meantime or operated shorter than the examined period, we get a little bit different picture of reality but without the data reduction the multivariate analysis would not have been feasible. The timeframe is 8 years, from 2008 to 2015. Although data for 2016 is partly available, the deadline for the submission of the balance sheets is quite mixed in the sample countries, so the 2016 balance sheets could not be fully considered at the time of the empirical study.

After determining the sample size for each country, I sorted the companies randomly in each category and downloaded the previously calculated dataset and data content. Outliers would distort both the cluster and the regression analysis, so companies with values outside of the three-times interquartile

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[1] Regulation (EC) No 1893/2006 of the European Parliament and of the Council of 20 December 2006 establishing the statistical classification of economic activities NACE Rev.2 and amending Council Regulation (EEC) No 3037/90 as well as the EC Regulation on certain statistical areas, regulation. Source: https://www.ksh.hu/docs/oszt-alyozasok/teaor/teaor_rovid_leiras.pdf

range were excluded. Thus, the final sample size was 29,639, which is shown in Table 2 based on the industrial activity codes.

Table 2.: Number of companies in the sample according to countries and activities

Activities	AT	CZ	DE	FR	HU	IT	PL	SK	Total
A		253	12	67	78	104	25	164	703
B	2	10	9	19	3	17	28	4	92
C	203	884	612	1151	474	1770	1330	666	7090
D	17	41	318	3	6	14	101	27	527
E	6	51	72	49	13	67	171	32	461
F	53	330	119	1319	148	668	254	221	3112
G	220	886	735	3169	934	1803	1239	942	9928
H	40	139	84	313	44	199	92	140	1051
I	9	47	2	540	41	183	43	33	898
J	20	113	37	188	32	256	60	84	790
K	7	7	6	91	2	30	8	1	152
L	15	130	321	165	14	123	246	107	1121
M	26	223	65	609	47	283	106	179	1538
N	30	106	48	320	18	179	43	86	830
O	1		11		2				14
P	2	14	10	51	3	30	24	8	142
Q	6	49	155	176	4	122	86	101	699
R	1	18	17	50	2	41	8	17	154
S	5	8	22	203	16	49	12	6	321
Total	**663**	**3309**	**2655**	**8483**	**1896**	**5939**	**3876**	**2818**	**29639**

Source: Own research

From the country-specific data, the database for banks was downloaded from the Bureau van Dijk "Bankscope" database, which contains the basic data and the financials for more than 30,000 financial institutions for 20 years. I used the Doing Business database for corporate governance and the legal environment, which includes 11 business indicators from 190 countries around the world. The methodology for data collection and evaluation is the same for all countries, so data does not require any further calculation to meet the criteria for comparability.

After defining the final sample, I carried on the descriptive statistical and multivariate analyzes, the company-specific part is based on the financial statements of the companies, so I had values only with information about the book values. The financial indicators can be divided into two groups, the indicators that are considered as variables describing the capital structure were the dependent variables, and according to my assumptions, a set of other independent variables that describe the leverage. In the literature, leverage is most often described with the ratio of long-term liabilities to total assets, but it is also common to take all liabilities or short-term liabilities into account against all liabilities.

When categorizing companies by size, I took the categories defined by the Act XXXIV of 2004. At the same time, it can cause a number of methodological problems, considering the reporting requirements in each country, which are not primarily financial reporting but other data submission such as number of employees. In addition, if the examined entity has a related shareholder or subsidiary, it is necessary to consider the percentage of the ownership, which is available in case of low number of companies in the Hungarian database. Therefore, the applied size categories, as in the case of SMEs classified, consider the turnover, the total assets and the number of employees figures, but does not count with the presence of the affiliated company.

The long-term liabilities contain 3 rows in standard format, consisting of the long-term loans, the other long-term liabilities and a "redemption" line, which is according to my experience items that were not necessarily belonged to this chapter in the original report, but the consistency of comparability could only be maintained in this way. For example, in the case of Hungarian data, the provisions, which originally were within the shareholders funds. Short-term liabilities include loans and suppliers, and other short-term liabilities, which is a calculated value. The two mentioned balance sheet lines are deducted from the main line. During the analysis, I used only indicators that contain only the main balance sheet lines, so their presence was a selection criterion.

The capital structure indicators and their calculations are shown in Table 3.

Table 3. The capital structure ratios used during the analysis

Label	Formula	Abbreviation
Debt ratio	Total debt/Total liabilities	ITA
Short term liabilities ratio	Short term liabilities/Total liabilities	RLK
Long term liabilities ratio	Long term liabilities/Total liabilities	HLK

Source: own research

A significant part of the capital structure ratios was already available in the database, and the absent ones were calculated from the balance sheet lines. Indicators describing profitability do not contain the extraordinary results, which is due to the fact that this P/L line is not part of the profit and loss account in all countries. In Hungary these items have to be displayed in other income / expense items from 2016 onwards. Based on the previous studies, I used the return on assets and the profit before tax to determine the profitability. In case of the fixed assets ratio that describes the combination of the assets, I compare the tangible assets under fixed assets line to all assets, bearing in mind that the indicator should express the ratio of assets that can be considered as a col, so that significantly more difficult salable intangible assets are not considered. In the case of tax and non-tax savings, I

considered the tax ratio and the amount of amortization compared to the total assets, in both cases I calculated the ratios from the P/L lines. In case of size and age, I used the natural logarithms of the nominal values in the regressions, as it was common in the previous researches. The database does not include the R & D expenses, so by determining the growth I took the indicator calculated from the ratio of the growth of the sales revenue over two consecutive years. As a measure of the market concentration, the Herfindahl-Hirschman index can be applied, which is the sum of squares of the market share of companies on the particular market. Based on this value, we distinguish 3 types of market types: non-concentrated market, moderately concentrated market and high concentration market. The balance sheet line used as the basis of the ratio was the average asset value of the banks, as the income statement does not include the turnover. The indicators that determine the capital structure and the formulas used to calculate them are listed in Table 4.

Table 4.: Factors influencing the capital structure

Label	Formula	Abbreviation
Tangible assets ratio	Tangible assets / total assets	TEA
Ratio of fixed assets	Fixed assets / total assets	BEF_eszk
Size	LN Revenue	LN_ARBEV
Disease	Number of years since founding	KOR3
tax Effect	Corporate tax / profit before tax	ADH
Tax advantage of amortization	Amortization / total assets	AM_EF
Revenue is a Proportional Profit	Net income from pre-tax profit / sales	Profit Marzs
Revenue is proportional to operating profit	Net income from operating income / sales	EBIT
Return on assets	Pre-tax profit / total assets	ROA
Equity return	Profit before tax / equity	ROE
Dynamics of Revenue Growth	Pre-tax profit t / pre-tax profit t-1	Növekedes
Quick liquidity ratio	(Current assets-current assets) / short-term liabilities	LIQ
Location	East = 1, West = 0	Regio
Risk	ROA standard deviation	RISK
Liquidity indicator	Current assets / short-term liabilities	LILL
Expiration fit	(Equity + long-term liabilities) / (Non-current assets + non-current assets)	LILL2
Tax ratio	(tax liability / pre-tax profit) / Corporate tax rate	ADH/CT
Net interest margin	Net interest income / total source of income	NIM
Banking concentration	$$HHI = \sum_{i=1}^{N} s_i^2$$	HHI
Managers' accountability	Doing Business Ranking 1-10	MANLIA
Protecting Investors	Doing Business Ranking 1-10	INVPRO

Ownership interests	Doing Business Ranking 1-10	SHINT
Insolvency treatment	Doing Business Ranking 1-16	INSOLV
The size of the recovered wealth	The amount of property recovered in%	RECOVERY
Validity of Treaties	Doing Business Ranking 1-10	CONTENF

Source: own research

2.2 THE DESRIPTION OF THE METHOD

The first step in the exploration of the capital structure patterns was the grouping of observation units based on financial indicators describing their operations. Due to the large number of involved indicators, I decided to do a data reduction as the data became more transparent and most of the content of information was scattered. The exploration of the latent structure behind the indicators was made with the help of factor analysis. The main point of the method is that the original larger number of variables are compressed into a smaller number of main components based on the relation between them, which are linear combinations of the variables and are not correlating with each other. Based on the resulting factor variables, I tried to sort the companies in the sample into homogeneous groups by cluster analysis, where the distance within the groups was the smallest and the highest among the groups. There are several techniques for clustering, we distinguish between hierarchical and non-hierarchical methods, where I chose K-means clustering for analysis. The essence of the method is to list the observation units in a predetermined number of clusters and the iteration continues until they are closest to their own cluster center (Barna-Székely, 2004).

For the analysis, besides the traditional, ratio evaluation, I was looking for a regression method that allows a simultaneous analysis of cross-sectional and time series data, so I chose the panel-regression method. Data is always collected from the same observation units, but this is done over a longer period, so it is possible to examine the consequences of the decisions (Woolridge, 1999). My goal is not to predict, but rather to test the hypotheses based on the direction of the links and the values of the parameters that apply to the time series in the database.

Four types of models are distinguished based on how the unobservable heterogeneity of the data is considered, during the analysis the fixed (fixed) and the random (random) models were used. The model of random effects uses the differences of the variance of the error variable to model the groups together, assuming a fixed constant and slope, whereas the fixed effect model assumes that the variables are constant in time but different within each other. The coefficients are estimated using the least squares method. The regressive relation among the data of the time series with time variable n and period T is described by the following equation:

$$Y_{it} = \beta X_{it} + a_i + \varepsilon_{it}$$

Which is, in fact, the linear model of the non-observed variables, written for panel data

where Y is the dependent variable

β the coefficients of the model,

X the independent variables

the a_i is the non-observed variable, that contains the time and individual effects

ε_{it} is the residuals

The value of a_i is constant in time, so this effect is often referred as a fixed property of the observation units. For example, in case of a country these can be a geographical location, weather or natural resources data. The fixed effect estimation allows the non-observable effect to correlate with the independent variables if there is no such regressor in them that is constant for all observations in time.

From this comes the following equitation

$$\overline{Y}_i = \beta \overline{X}_i + \overline{a}_i + \overline{\varepsilon}_i \text{, where}$$

$$\overline{Y}_i = \frac{1}{T}\sum_{t=1}^{T} Y_{it} \text{ , } \overline{X}_i = \frac{1}{T}\sum_{t=1}^{T} X_{it} \text{ , } \overline{\varepsilon}_i = \frac{1}{T}\sum_{t=1}^{T} \varepsilon_{it}$$

Extracting the two equitations from each other:

$$\left(Y_{it} - \overline{Y}_i\right) = \left(X_{it} - \overline{X}_i\right)\beta_i + \left(a_i - \overline{a}_i\right) + \left(\varepsilon_{it} - \overline{\varepsilon}_i\right)$$

Estimation of the model's coefficients is based on these equations.

For the random effect model, the parameter ai of the non-observed effect is included in the vit compound error tag, which also contains the idiosyncratic error:

$$Y_{it} = \beta X_{it} + \upsilon_{it}$$

where $\upsilon_{it} = a_i + \varepsilon_{it}$

The assumption of the fixed effect that variables differ between each other, but constant in time, the estimation uses the least squares method based on the 3. equation, according to the between effect the difference of the variables will be constant while timely not constant. The random effect is the weighted average of the previous two equations. To decide between the two models, I applied the Hausman test, which examines whether there is a significant correlation between the individual

random effects and the regressors. If this is the case, the random effect should be used, if this does not exist, the fixed effect is valid.

When examining the factors affecting the capital structure, one of the error sources is the potential endogenous nature of the determinants where the causal relationship is changed and the dependent variable fulfills the predictive role. An appropriate model specification to resolve the problem is the Arellano and Bover (1995) and Blundell and Bond (1998) system-GMM (General Moment Method) estimate, which uses the delayed values of both dependent and endogenous variables as an instrument, which is probably the best solution to treat endogenity. The time series correlation between observation units was verified by the Arellano-Bond test.

3. RESULTS

The aim of this chapter is to present and interpret the results of the analysis done by various methods. Firstly, I present the evolution of capital structure trends by analyzing the average values of the indicators, where breakpoints are drawn along regions with different economic development and gives a good basis for evaluating multivariable statistical analyzes used for testing the hypotheses.

The clusters defined by the factor variables can be described as follows: the two clusters with the entities of highest leverage differ significantly according to the ratio of profitability and the availability of assets considered as a collateral. In one case, the high proportion of external capital is coupled with a low fixed assets ratio, which influences the expiry-based resource structure. In this group, short-term liabilities are dominating within the external funds, which is reflected in the liquidity and expiration fit indicators. However, with the high level of leverage, most of the companies can show a profitability close to the average of the population, and in case of the return on equity they even exceed it. For cluster 5, the high level of leverage has been coupled with ineffective operation, due to the existence of long-term liabilities, the liabilities that expire over one year, have a significant proportion in the funding structure, yet they are in a disadvantageous situation both from liquidity and expiration fit point of view, because of the low level of equity. In these clusters, therefore, the predominance of the foreign capital is not coupled with the profitable operation, the members of the group do not prefer the external resources because they can reduce their tax base and thereby their taxpaying obligation. On the contrary, the level of indebtness has a negative effect on the profitability, which is further strengthened by the anomalies of the asset financing. The paid tax is roughly the same as the corporate tax rate expected, so we cannot talk about tax credit opportunities outside of the tax shield. The 2nd and 3rd cluster, which are characterized by the average leverage level, are separated by the long-term liabilities and the profitability ratio. Due to the former, the long-term

liabilities ratio is higher for Cluster 3, which cost is well demonstrated by the difference between the level of operating and pre-tax profitability. Its scale is still not enough high that any of the examined profitability ratios would fall below the population average, while in case of liquidity and asset efficiency this cluster is far below the average of the sample. Cluster 2 is the most profitable, in case of the assets financing, the members of this group are closest to the optimum level, while the difference between the two profitability indices is marginal, so the financial results charged with interest rate expenses does not lower significantly the profit before tax. In the same time, they fulfill their tax payment obligations below the expected level, so they can use other tax-saving opportunities than the increase of the leverage. The relation between the expiration of the liabilities and the existence of the fixed assets are confirmed here, and the primary tool for tax optimization due to high profitability is not the profit lowering effect of the interest rate expense resulting from the increase of the leverage, but the other corporate tax exemptions opportunities that do not affect the profit before tax. The 1st Cluster which contains mostly East European companies has the lowest level of leverage, according to the liquidation and profitability, they are above the average. Based on the tax rate ratio, they fulfill their tax obligations on the expected level, despite of this they do not use the opportunity of external debt to lower their tax base, while because of the available fixed assets there would be an opportunity to increase the leverage. In case of the other low leverage level cluster, the profitable organizations are dominating, from the point of liquidity they are over the average of the whole population, but in case of the fixed assets they are lower than the average.

The explanatory power of the regression model was highest for the Hungarian sample and the determinants were significant except in one case at 5% at the fixed-effect model, the dynamic panel did not show any relation for age, size and tax ratio. The V3 and the Western models have a similar coefficient, and there are more similarities between the direction and strength of the relation. Based on this it can be stated that the leverage independent from the expiration in Hungary is more dependent on the internal circumstances of the enterprises than in case of the economies of similar economic development or in the dominant economies in the Western European region.

With regard of the non-current liabilities, the explanatory power is the lowest, only 11.8% for the V3 model, and the highest R^2 was observed for the Western European companies, while the Hungarian model was somewhere between these two. According to this the availability of long-term liabilities is less dependent on the company-specific factors in the V3 countries, but the explanatory power suggests that macro-factors are more likely to influence the long-term debt in the western countries. On the contrary determinants have a great importance since the long-term liabilities are those source types that's availability is mostly dependent from other factors, the presence of the source is desirable for many reasons, but not all organizations can meet the requirements of the source provider.

The highest explanatory power can be observed in the model of the short-term liabilities, similarly to the analysis for all foreign sources, the Hungarian model proved to be the best one. Thus, the obtained result coincides with the results of the research carried out by Krénusz (2007) on the Hungarian corporate sample, where short-term funding also plays a significant role in the financing, and the corporate-specific factors play a significant role in the explanation of the dependent variable.

4. NEW AND NOVEL SCIENTIFIC RESULTS

In the relation of the East and West, I have compiled an international database that focuses on Hungary on several aspects. The countries of the Visegrád Group are connected besides the common interest representation, by the geographic location and the same economic development. Western countries, alongside they are the key players in the European Union's economy, all of them play a decisive role in the development of the Central European region, including through bilateral trade relations and the interests of their companies.

1. **During the research, I proved that there was no significant difference in the composition of the endogenous factors determining the capital structure, the same company-specific factors were found to be significant for each of the examined groups and the direction of the relation was the same, the difference appeared in the explanatory power and in the coefficient values.**

Multivariate statistical analyzes have shown that leverage has declined steadily throughout the examined period and proved to be significant for each year with negative coefficients. This finding was valid both for the two groups and for the Hungarian model, which proved that not only the composition of the indicators, but also the trend of the change in leverage is the same in the two regions. Earlier researches covered the periods of the 1990s and 2000s, and in many cases the relation confirmed by international studies were not shown. The findings of my research from this point of view are also a step forward in the examination of the capital structure of the domestic enterprises because, in addition that it examines the current period of the world economic crisis, it also reveals similarities determined by regional origin.

2. **During the examination of the composition of the factors determining the capital structure, we have come closer to the causes of higher leverage in the Western countries, as the company-specific factors did not show any significant deviation, so the role of macro-factors, and in particular the more favorable financial environment, proved to be decisive.**

Earlier domestic research refers to the lack of fixed assets used as a collateral, as an explanation of the limited lending (Cornelli et al., 1996).

3. **I proved in my dissertation that this factor has a positive effect on lending in domestic terms, but this effect is not as strong as in the Western economies.**

The analyzes failed to reveal a clear connection between leverage and company age and tax rate. I conclude that the increase in the transparency of available company-specific data nowadays has reached the level that the age of the enterprise is not relevant in the forecasting models carried on before the credit decision, which also means that the given variable is less differentiating regarding the insolvency so during the decision making it has less importance.

4. **Examining the relation between leverage and profitability, the hypothesis of the hierarchy theory that there is a negative relationship between the two indicators has been confirmed and validated for all capital structure ratios and geographic regions.**

The direction of the relation also confutes the presumption of trade off theory, whereby profitable companies prefer external sources in their financing structure due to their lower bankruptcy probability. On the other hand, profitable operation encourages the reinvestment of equity rather than involving external sources. Considering the time frame and the diversity of the geographical location of the companies in the sample, we come closer to a general statement that will help to decide between the opposite point of the two theories.

5. CONCLUSIONS AND PROPOSALS

When evaluating the hypotheses, I considered the results of all the methods used in the dissertation, but I tried considering with higher weight the conclusions supported by multivariate statistical methods. Therefore, first I always evaluated the results obtained from the cluster and regression analyzes, and then, as a confirmation, I compared the correlations with the descriptive statistical analyzes. Some of the assumptions do not specify exactly which capital structure index was targeted, but name as leverage the dependent variable, which is in line with the name used in the earlier researches. Since the surveys also cover indicators based on expiration, therefore, during the evaluation of the hypotheses, I considered the relation between the three indices of leverage and if the direction and the existence of the relationship were not coherent, then I tried to make a clear statement with the help of the most relevant ratio regarding the acceptance of the hypothesis.

The effect of the non-current assets was measured by the ratio of fixed assets and tangible assets indicators, and only the latter was used in the regression analysis, since the relation is based on the presence of assets used as a collateral, which is not applicable in case of the intangible assets. The

indicator proved to be significant for all three dependent variables, the direction of the relation only in case of the long-term liabilities was in line with my expectations, which does not contradict to the economic rationality, taking into account the components of the indicators. The non-current liabilities ratio mostly covers loans with an expiration of more than 1 year, while short-term liabilities are usually contain suppliers' obligations, which can be interpreted in two ways: the company is in dominant position and financing a part of its assets with the suppliers, because of the lowest cost of resources, this mode of financing is preferred. However, it is easy to see that this is not a speciality of the SME sector, the high number of suppliers outstandings are supposing cumulation of invoices and late payments, which is the consequence of the inefficient management. At this type of obligation, the relevance of the assets that can be considered as collateral is not significant, the negative relation supported mostly by sector specific factors and the perfect expiration fit, which was valid for the whole sample. The same applies to the ratio of the proportion of all debts, as generally speaking, the dominance of short-term liabilities prevails within the resource structure, so its effect determines the direction of the relation. A solution could be the application of a database where the loans are displayed separately for each expiration, currently it is limited by data providing rules that do not require such detail under a certain size. During the cluster analysis, the group can be well separated, where the high ratio of non-current liabilities coupled with high fixed assets ratio. In case of long-term liabilities, the use of fixed assets as a collateral, which is in line with the international trends, has been proved, and because of the reasoning above **I accept the H3 hypothesis at the given expiration and I consider it valid for all geographic regions.**

The LNArbev indicator describing the size of the company shows a consistent picture in case of the fixed-effect model, and almost at all expirations showed a significant positive correlation, only in case of short-term liabilities there was no confirmation for the Western European sample. The dynamic panel only showed a significant effect for the long-term liabilities, there the direction of the relation was the same as at the fixed effect model. Although at the cluster analysis the size did not take part of any of the factors that provided the basis for the clustering, during the analysis of the indicators the cluster with the highest proportion of long-term liabilities had the highest median of the ratio that describes the company size. The result on the given timeframe is in line with the findings of the Hungarian and international researches, therefore, **in case of long-term liabilities, the hypothesis is accepted and on other expirations are partly accepted.**

The relation between profitability and leverage was detected at all expirations and regions, the coefficients were consistently negative for all models, the values did not show any significant deviation, therefore **I consider the H6 hypothesis accepted at all expirations.** The results are in line with the pecking order theory that profitable companies are preferring internal sources against external capital.

Like in the case of indicators used for examining the fixed assets, at the liquidity ratio there were also predetermed consistences that come from the composition of the ratio. One of the driving forces of the change is the alteration in short-term liabilities, so the increase of the short-term liabilities has a negative effect on the indicator, and this relation can indirectly determine the direction of the co-movement between long-term liabilities and fixed assets ratios. The significance and the direction of the relation are in line with the requirements during the regression analysis, the variable has a significant and positive coefficient for long-term liabilities, so the effect of liquidity on the payment behavior prevelars, which has a positive effect on the availability of credit institution sources. But it contradicts to the theory, that retained profit assumed by high liquidity has a negative impact on lending, due to the pecking order theory's preference order. On the other hand, the results of the cluster analysis support this, at that group where the proportion of the non-current liabilities was high, the liquidity was one of the lowest, the explanation should lie in the composition of the indicator. The high amount of non-current assets is associated with a lower liquid asset ratio, and as the total debt ratio was at average level, short-term debt was not negligible and the average volume exceeded its liquid assets. The contradictory findings draw attention that the results have to handled cautiously and the need for deeper analysis.

The significance of the indicators used to test mainstream theories did not differ in most cases, and the results of international researches proved to be valid for the groups developed along similar economic environment. There was a significant difference in the explanatory power in many cases, in western countries, the value of R^2 in case of short and long-term external liabilities exceeded the V3 countries, according to this company-specific factors have a more significant effect on the two types of leverage in that group. Among the coefficient values there are differences, the most prominent fixed asset ratios and the liquidity ratios, where the impact of the relevant long-term liabilities was stronger than at the model performed for the Western countries. The clusters formed during the clustering, with the exception of two, which seemed to be the two extremes in terms of sales slowness, were not considered homogeneous, and the regions were almost identical in each cluster. **On this basis, I accept H1 hypothesis that capital structure theories are similarly applied to groups of countries with different economic development, but there are differences in the explanatory power.**

The segregation of the capital structure patterns based on the regions was already evident during the descriptive statistical analysis, the segregation of the groups formed by the Eastern and Western European companies can be observed in the whole period, and the trends were also similar, the level of leverage constantly decreased in the sample for all countries. The composition of the groups defined by the geographical location and the economic development history did not correspond to the ones I

imagined at two points: the average leverage of the companies in Italy significantly exceeded the western group average, and Slovakia would fall into the other group based on the average leverage. Not considering the latter, two groups are emerging, where the companies in the 3 countries belonging to the eastern bloc significantly have lower leverage. This is also confirmed by the cluster analysis, where cluster composition of the lowest and highest ratios is consistent with the hypothesis. The affiliation of Slovak companies has highlighted an important factor, namely the Eurozone membership, which may also affect the availability of loans due to lower interest rates. Because of the group membership of the Slovakian companies, **I consider the H2 hypothesis to be partially accepted, but this reinforces the argument about a favorable financial environment.** A summary of the hypotheses is given in Table 4.

Table 4.: The results of the hypotheses

Hypothesis	Method	Results	Notes
H1: The capital structure theories apply similarly to groups of countries with different economic development history, but there are significant differences in explanatory power.	*Cluster analysis, regression analysis*	*Accepted*	
H2: the proportion of leverage and long-term liabilities in the group of developed countries will be higher due to a more favorable financial environment	*Descriptive statistical analysis Cluster analysis, regression analysis*	*Accepted*	*Slovakia was later removed from the group due to the average leverage*
H3: There is a positive relationship between fixed assets ratio and leverage	*Cluster analysis, regression analysis*	*Partly accepted*	*The assumed direction of the relationship is valid to the long-term liabilities*
H4: There is a positive relationship between company size and leverage	*Regression analysis*	*Accepted*	
H5: There is a positive relationship between age and leverage	*Regression analysis*	*Denied*	*In case of significant coefficients, the value was very low*
H6: There is a negative relationship between profitability and leverage	*Cluster analysis, regression analysis*	*Accepted*	
H7: there is a negative relationship between growth potential and long-term debt ratio	*regression analysis*	*Denied*	*The direction of the relationship is not clear*
H8: there is a negative relationship between liquidity and leverage	*Cluster analysis, regression analysis*	*Partly accepted*	*It applies to total debt and to short-term liabilities*
H9: If non-debt tax saving options are available, companies prefer it against raising the leverage.	*Cluster analysis, regression analysis*	*Partly accepted*	*The impact of amortization can be detected, but the tax rate indicator did not prove to be significant.*

Source: own research

6. SUMMARY

The main motivation of writing my doctoral thesis was the follow up of the capital structure research in Hungary and its extension on international level because previously the lack of appropriate databases proved to be a real obstacle for such studies. Then it was possible to answer the currently open questions and to discover those relations where the usage of an international database is inevitable.

Why the capital structure and why in this context do I examine the explanatory factors? Being a head of company, I was facing many times with regional differences, during the financial decisions I had significantly less opportunities in the different phases of the company development then in case of the parent company, however the economic rationality did not explain this. So, I presume that the reasons to look for are not in the corporate specific factors but more on the diversities created by the financial intermediary system and to discover this I tried to prove that the micro factors effects are independent from the countries.

The first part of the dissertation deals with the definition of the financing and the capital structure of the SME's. Then it is followed by the literature overview where the capital structure theories are being introduced as far as possible organized according to chronological order and different approaches. In the next chapter I give an overview about the endogenous or company specific factors determining the capital structure where I tries to highlight those variables which were also involved in the empirical research. The exogenous factors are less in the focus due to their more difficult justification and the financial indicators-based study however in case of the most important the results of the previous studies are presented.

The hypothesis can be divided into two parts, one of them refers to testing of the general capital structure theories in the period affected by the economic crisis and the other part is examining the differencing effect of the regions separated by their economic development. During the introduction of the database I give a detailed description about the rules used during the sampling and the background of the country selection. It is followed by introduction of the dependent and independent variables and the formulas used for their calculation then came the description of the applied methods.

The next chapter starts with the descriptive statistics of the dependent variables, here the reader already gets a general overview about the average level of the leverage which projects the direction of the relations to be tested with the multivariate statistical analysis. The decreasing tendency of the leverage is valid not only for the total sample but for each country and the two regions are separated clearly according to the average value of the ratio with two exceptions: in case of Italy the leverage is beyond of the already higher values of the western countries while Slovakia does not fit the eastern European average, considering its value it should be part of the other group. This explained the usage of the V3 during the regression analysis.

During the factor analysis I suppressed the original variables into 3 factors and these were used as a clustering variable which at the end classified into 6 clusters the companies included in the sample. The applied database has a panel structure the data covers the period between 2008 and 2015, that's why the item number in the final sample is 8 times more. After the clustering not only the variables involved in the factor analysis were examined but the median of all variables considered relevant were involved and took part in describing the different groups. One of the most important finding refers to the regional composition which confirms that the east-west relation does not play a significant role in participation of the groups only in two – form leverage aspect are the two extremes – clusters were experienced relevant differences. In these two cases I discovered the dynamics of the clusters which well-illustrated the migration from the higher leverage group to the groups carry on a more conservative financial policy.

During the panel analysis I applied the fixed effect model and the Arellano-Bover/Blundell-Bond system GMM estimation which delivered a consistent result in most of the cases. I valuated my

hypothesis considering these results and formulated the new and novel findings. The factors determining the capital structure proved to be significant in case of the fixed assets, profitability, amortization ratio and liquidity which were in line with the results of the international research were valid for all examined regions. However, there were differences in the explanatory power which confirmed that assumption that there are no differences in the type of the determining factors, but the power of the effect is slightly higher in case of the western countries. The other hypothesis affected by the regional belonging was also confirmed which stated that the average level of the gearing is higher at western European companies, according to my assumption it is due to the more developed financial intermediary system and the favorable interest rate level. Considering the results of the domestic researches it seems to be there is an evolutionary process regarding the capital structure policy which strongly converges to the trends of the developed economies. In my point of view this conversion will be fulfilled with the joining the eurozone and the development of the domestic financial sector.

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