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Factors affecting the financial structure of Slovak and Czech enterprises in the Manufacture of machinery and equipment industry

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Abstract

The financial structure of enterprises is influenced by many factors. The aim of this paper is to analyze, evaluate and assess the effect of selected internal corporate factors and external macro-environment factors on the financial structure of enterprises. All the studied enterprises were operating in the Manufacture of machinery and equipment industry. We have also analyzed whether there were any differences in the action of these factors between enterprises operating in various countries—Slovakia and Czech Republic (i.e., what was the impact of the environment on the corporate financial structure). The analysis has been done for the years 2009–2014. The research results pointed to the fact that although the influence of some macro-environment factors has been proved, that were the internal corporate factors which had dominant position in shaping the financial structure of Slovak and Czech enterprises (concerning the Manufacture of machinery and equipment industry).

Keywords: Financial structure, internal corporate factors, external factors of macroenvironment.

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1. Literature review

Financial and capital structure is being at the centre of financial science and practice for a long time. Numerous studies deal with the influence of especially internal corporate factors on the financial structure of enterprises (Kakilli Acaravci, 2015; Miguel & Pindado, 2001). The aforementioned studies have largely not taken into account the impact of external macroeconomic environment (e.g., the impact of the economic cycle, effect of inflation tax rates), in which companies operate and which, in our opinion, to a considerable extent affects the possibilities of obtaining various forms of funding sources. The relationship between selected factors of macro-environment and financial structures of companies has been studied by Bokpin (2009). The conclusions of the study underline the importance of inflation and the economic cycle as factors determining the financial structure of enterprises. The above results have been confirmed by the study of Jong, Kabir and Nguyen (2008), who in addition to the impact of the economic cycle and inflation add other macro-environment factors that affect the financial structure of companies, namely the openness of the economy and the level of legal environment. Impact of macro-environment on the financial structure has been also studied by Booth, Aivazian, Demirguc-Kunt and Maksimovic (2001). According to their findings, the variables that affect the financial structure and indebtedness of American and European companies are also important in developing countries, despite significant differences in institutional factors in these countries. The impact of parallel action of the external macro-environment factors and internal corporate factors on financial structure of the small and medium enterprises has been analyzed by Joeveer (2005). The result of the analysis was that especially small and unlisted companies were affected by external factors of the country—these factors explain more than 50% of indebtedness of non-listed companies.

2. Material and methods

The financial statements required for this study have been obtained from the Cribis database and from Albertina. We have chosen a number of selection criteria for selecting the companies. The primary criterion was the affiliation of enterprises to the industry—we have chosen SK NACE (CZ NACE) C—Industrial manufacturing, Group 28—Manufacture of machinery and equipment. Further, from all these companies, we have selected just the legal entities—capital companies. We have analyzed the years 2009–2014. By setting criteria for the studied enterprises and after exclusion of companies whose financial statements were incorrect, our total sample group consists of 753 Czech and 297 Slovak enterprises. The direction and intensity of selected factors influence on the financial structure of the surveyed agricultural enterprises have been analyzed by the multiple regression analysis model:

$$\begin{aligned} MZ_{it} = \beta_0 + \beta_1 \times GDP_t + \beta_2 \times HICP_t + \beta_3 \times i_t + \beta_4 \times tax_t + \beta_5 \times ROA_{it} + \beta_6 \times size_{it} + \\ \beta_7 \times liq_{it} + \beta_8 \times AsSt_{it} + \beta_9 \times risk_{it} + \beta_{10} \times NDTS_{it} + \beta_{11} \times age_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

Where MZ – selected debt ratio of the studied sample of enterprises,

i – number of enterprises in the sample,

t – specifically analyzed period,

β_0 – the intercept parameter,

$\beta_1 - \beta_8$ – regression coefficients, *independent variables: GDP*—GDP growth, HICP—harmonized inflation rate, *i*—interest rate, tax—tax rate, ROA—gross return on assets, size—logarithm of revenues reflecting the size of the enterprise, liq—liquidity, AsSt—assets structure, risk—risk level of the company, NDTS—non-debt tax shield, age—the number of years since the company's establishment to the observation date, ε_{it} random errors.

The direction of impact of selected factors is determined by the regression coefficients. If the sign of the regression coefficient is positive, there is a positive correlation between the independent variable and the indebtedness of the companies. A negative sign would mean a negative correlation. The intensity and statistical significance of the examined factors is being measured by the *p*-value and assessed in accordance with the standards used in analogous foreign researches (e.g., Bhaird & Lucey, 2010; Korajaczyk & Levy, 2001).

Dependent variable—in the model studied by us as the dependent variable appears to be the financial structure of enterprises. In the research by the corporate financial structure, we understand the structure of the total financial sources by which the enterprise is being funded. In this research, it has been decided to test the impact of selected variables on the total debt (designed as borrowed capital to total assets), short-term debt (short-term borrowed funding sources to total assets) and credit debt (bank loans to total assets of enterprises).

Independent variables—when selecting the factors, which as we assume affect the financial structure of the studied Czech and Slovak agricultural enterprises, we based our selection on a study of numerous domestic and foreign researches dealing with the issue of factors determining the financial structure of enterprises. The aforementioned factors are generally divided into two main groups—the external macro-environment factors and internal corporate factors. The summary of studied determinants, as well as the way of their expression, is listed in Table 1.

Table 1. The summary of studied determinants of financial structure and the way of their expression

Independent variables	Indicator
Economic cycle	GDP growth
Inflation	HICP
Interest rate	Average interest rates on loans to enterprises
Corporate tax rate	(EBT – net profit)/EBT
Profitability	Profit before tax/total assets
Size of a company	Natural logarithm of turnover
Liquidity	Current assets/short term liabilities
Assets structure	Tangible fixed assets/total assets
Business risk	Taffler model
Non-debt tax shield	Depreciation/total assets
Age of the company	The number of years since the company's establishment to the observation date

Source: own processing by authors.

3. Results and discussion

Before the examination of selected factors' impact on the corporate financial structure we investigate first whether, there is not any colinearity among the factors. In the case of the colinearity occurrence, the results of the analysis would lose the informative value. By a strong connection between the factors, we consider when it applies that $|r_{xixj}| \geq 0.7$ for any of the coefficients.

Table 2. The study of the relationship tightness among the independent variables in the Slovak sample of enterprises

	GDP	HICP	*i*	Tax	ROA	Size	Liq	AsStr	Risk	NDTS	Age
GDP	1.0000										
HICP	−0.1411	1.0000									
i	−0.0113	0.0290	1.0000								
tax	−0.0378	0.0281	−0.0076	1.0000							
ROA	0.0322	0.0256	−0.0133	0.0209	1.0000						
size	−0.0015	0.0249	0.0174	0.0186	0.1189	1.0000					
liq	−0.0175	−0.0002	−0.0012	−0.0160	−0.0127	−0.3119	1.0000				
AsStr	−0.0098	−0.0096	0.0011	−0.0023	−0.0930	0.3358	−0.1182	1.0000			
risk	0.0382	−0.0008	−0.0080	−0.0129	0.1604	−0.1957	0.6077	−0.1174	1.0000		
NDTS	−0.0019	−0.0439	0.0053	0.0262	−0.0547	−0.0211	−0.0501	0.1733	−0.0276	1.0000	
age	−0.2046	−0.2526	0.0018	0.0484	−0.0116	−0.0199	−0.0131	−0.0231	−0.0418	−0.0046	1.0000

Source: compiled by authors.

The correlation matrix for the group of Czech enterprises is not stated in the paper. The testing results of the relations' tightness among the different variables in all groups show that there are not any that would be strongly dependent on each other.

The summary of selected factors' direction and intensity on the financial structure of the studied Czech and Slovak enterprises is presented in Table 3. There are also presented coefficients of these factors and their statistical significance.

Table 3. Summary of direction and intensity of analyzed factors on financial structure of the studied enterprises

Independent variable	Total debt		Short-term debt		Credit debt	
	SK	CZ	SK	CZ	SK	CZ
Economic cycle	−0.0144	−16.8393	0.0369	−9.9632	−0.0666	−0.1379
Inflation	0.0402	29.7922	−0.4036	31.6307	0.3955	0.2865
Interest rates	−0.0001	0.00254	−0.0001	0.0015	−4.2299**	−0.0001
Tax rate	0.0103	−0.1772	−0.0058	−0.1183	0.0068**	0.0010
Profitability	−0.5182***	−1.0703***	−0.4754***	−0.3822***	−0.0304**	−0.0003
Size	−0.0311***	−9.7354***	−0.0425***	−6.0139***	0.0058*	0.0089**
Liquidity	−0.0037***	−0.1755***	−0.0042***	−0.1154***	0.0001	−0.0001
Asset structure	−0.0421	4.8523	−0.2478***	2.9736	0.1366***	0.1221***
Risk level	−0.0253***	1.4521***	−0.0178	0.9555***	−0.0044**	0.0003
Non−debt tax shield	0.2428**	−10.2188	0.0980	−6.4180	−0.0472	−0.5930***
Age	−0.0083	0.0379	−0.0048	0.0086	−0.0041**	−0.0046***
Adj. R square	0.1867	0.1968	0.1927	0.1925	0.1035	0.0274

*** indicates significance at the 1% level, ** indicates significance at the 5% level and * indicates significance at 10 % level.

Source: compiled by authors.

The results of our research indicate interesting findings concerning the factors affecting the financial structure of Slovak and Czech enterprises (operating in the Manufacturing of machinery and equipment industry). Although the direction of action of more factors is identical, we can find here also some differences—both, as in the intensity of action of these factors, and in some cases even in the direction of their influence.

In general, we can say that the impact of external macro-environment factors on the financial structure of Slovak or Czech companies has not been confirmed. Solely, in the case of credit indebtedness of Slovak companies, the interest rates and tax rates showed to be a statistically significant factor. There is an inverse relationship between the interest rates and the credit indebtedness—when there is a decrease in interest rates, companies use to increase the share of bank loans in their financial structure. It also applies that there is a positive correlation between tax rates and credit indebtedness.

The impact of almost all internal corporate factors is statistically highly significant. The significance of these factors depends on the indebtedness level of the studied enterprises. There is a negative correlation between profitability, size, liquidity of the companies on one side and total and short-term indebtedness of the Slovak and Czech enterprises on the other side. For example, in the case of total and short-term indebtedness, the difference can be observed by effect of risk—there is an inverse relationship between the financial structure of Slovak enterprises and risk but as for the Czech enterprises a statistically significant positive correlation has been detected. Monitoring the influence of non-debt tax shield on the total indebtedness of Slovak companies seems to be interesting, as well. Although the results of several studies show a negative impact (Ameer, 2013; Reznakova, Svoboda & Polednakova, 2010), the results of our research show a positive correlation. It can be explained by the fact that the benefits of non-debt tax shield can only be used by those enterprises that were able to generate sufficient funds during the financial year. If the companies cannot use these advantages, the depreciation expenses would only increase their total costs. It worsens the reported financial results and leads to a decrease of own funds and the increase of external funding sources.

In the case of credit indebtedness, we find that the impact of some factors is different from in the case of total or short-term indebtedness. While the size of a company influenced the total and short-term indebtedness in a negative way, there is a positive correlation with the credit indebtedness, i.e., the increasing size category of companies leads to an increase in their credit indebtedness. We do believe that this result is related to the risk of individual size categories of enterprises—big companies are generally less risky than small enterprises and banks are therefore more willing to provide loans especially to big companies. Similarly, we find a positive correlation between the structure of assets and credit indebtedness. This finding can be explained by the fact that companies that have higher volume of fixed assets can use them to secure their loans, which means less risk that the loan will not be repaid to banks. There is also an interesting finding concerning the age of companies and the financial structure of Slovak and Czech enterprises. The impact of this factor was statistically significant only in the case of credit indebtedness, where we have found a negative correlation between the age of companies and their credit indebtedness. We assume that companies that operate in the market for a longer time have larger volumes of business activities from which they can also generate larger amount of their own funds.

4. Conclusion

Our research points to a number of findings concerning the financial structure of studied Slovak and Czech enterprises. The aim was to examine the impact of selected internal corporate factors and external macro-environment factors on the financial structure of enterprises and determine whether there were any differences in the action of these factors between different countries. The research has shown that the financial structure of enterprises operating either in one or the second country is influenced mainly by internal corporate factors. The impact of external macro-environment factors on the total and short-indebtedness has not been proved at all. Some statistically significant effect of interest rates and tax rates has been found solely in the credit indebtedness of Slovak companies. Despite the fact that the influence of macro-environment factors has not been proved, in-depth analysis of the internal corporate factors' impact revealed some differences (mainly in the intensity of the impact of these factors and in some cases also in a different direction of the impact—e.g., the influence of risk on financial structure) between companies operating in Slovakia and the Czech Republic. We believe that the variation in the intensity of the statistically significant factors can be indirectly affected by the environment in which these companies operate. We assume that in this case of enterprises in the studied countries it would be very interesting to assess also the impact of institutional factors (e.g., law enforcement, level of corruption, protection of creditors' rights) on the financial structure of enterprises—an earlier research carried out through questionnaires (Kalusova, 2015) pointed out to a strong influence of these factors. Unfortunately, due to the high difficulty to rearrange these indicators in a measurable form, it is also very difficult to include and quantify these variables in the regression analysis.

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