

# WHAT AFFECTS THE FINANCIAL STRUCTURE OF FIRMS IN THE ICT INDUSTRY IN SELECTED EUROPEAN COUNTRIES

[Co ovlivňuje finanční strukturu firem v ICT průmyslu ve vybraných evropských zemích]

Petra Růčková<sup>1</sup>, Nicole Škuláňová<sup>2</sup>, Veronika Šudová<sup>3</sup>

<sup>1</sup> Slezská univerzita, Obchodně podnikatelská fakulta, Univerzitní nám. 1934/3,733 40 Karviná  
Email:ruckova@opf.slu.cz

<sup>2</sup> Slezská univerzita, Obchodně podnikatelská fakulta, Univerzitní nám. 1934/3,733 40 Karviná  
Email:skulanova@opf.slu.cz

<sup>3</sup> Slezská univerzita, Obchodně podnikatelská fakulta, Univerzitní nám. 1934/3,733 40 Karviná  
Email:O161041@opf.slu.cz

**Abstract:** During its life cycle, a company needs different amounts of funds, which can come from different entities. Each company has a specific structure of funding sources with respect to geographical and industry affiliation. The size of the company also has an impact on the structure of these sources. There is a number of determinants that affects the financial structure which is why a universal recommendation cannot be found. Thanks to these facts, more and more research has been created for over half a century. However, it is not possible to focus on individual companies and so compare different industries and economies. This research expands knowledge in the industry of information and telecommunication technologies in the countries of the extended Visegrád Group (V4 plus Austria, Bulgaria, Romania, Slovenia). Medium and (very) large companies during the period 2010–2018 are analysed. The aim of this research is to determine whether profitability, liquidity, asset structure, GDP growth rate, inflation rate and reference interest rate affect the level of total, long-term and short-term debt. The Generalized Method of Moments was chosen to determine these impacts. The main conclusion is that without regard to the size, the level of debt is most affected by determinants that represent the external environment of companies with the level of the reference interest rate having the most significant impact. Therefore, when optimizing and creating the financial structure, companies should take this factor into account and monitor the central bank's comments on the future development of this interest rate.

**Keywords:** asset structure, financial structure, GDP, inflation, interest rate, liquidity, profitability.

**JEL classification:** G32

Received: 19.2.2022; Reviewed: 7.3.2022; 24.3.2022; Accepted: 23.11.2022

## Introduction

Variouly, the life cycle of a company is demanding some amount of funds. Within its establishment, development and every investment activity, a company usually needs a considerable amount of funds. These funds can be obtained from various entities – produced profit, shareholders, banks, etc. Examining either the capital or financial structure, basically, the aim of the research is still to search for the right optimum of own and debt sources of funding. However, economists have been working on this problem since the beginning of the last century, and no one has been able to answer it unequivocally up to now. The reason, as Myers (2001) states, is probably the fact that a number of determinants can influence the formation of the financial structure. That is why it is appropriate to dedicate to this issue as we do not even need to know some determinants. In comparison, for those we have already known, the impact on the financial structure varies considerably with respect to company size, industry, geographical affiliation and sample size. In the following chapter, this fact will be proved based on the research already provided in previous studies.

The ambiguity and diversity of results have become the motivation for this research that focuses on the influences affecting the financial structure (specifically the level of debt) in companies belonging to the information and telecommunication technology sector. The analysed companies come from eight selected economies of Central and Eastern Europe, which are not usually the subject of research in this area. The aim of this investigation is to determine whether profitability, liquidity, asset structure, GDP growth rate, inflation rate and reference interest rate affect the level of total, long-term and short-term debt.

Dissemination of knowledge not only in the field of selected industries and economies but also in the financial structure itself should become a contribution of the research. Companies will be divided by size into medium and large ones and as such compared; such analysis is not provided frequently. Once this detailed analysis is finalized, the results can be applied directly to selected companies in given economies and industry. Last but not least, this research analyses all companies of the relevant database. In total, 10,538 information companies and 1,366 telecommunication companies will be tested.

This paper is organized as follows. Section 1 defines earlier researches on the financial structure and selected determinants suggested by this study. Section 2 presents the research methodology, data and variables as well as it provides the characterization of industry and examined economies. Section 3 describes the results of the analysis of variable dependencies using panel regression. Section 4 offers the conclusions.

## 1 Literature Overview

As it has been mentioned in the introduction, economists have been dealing with the issue of financial structure since the beginning of the last century. However, the fundamental study was not written until 1958 by Modigliani and Miller, the authors of the study “The Cost of Capital, Corporation Finance and the Theory of Investment”. Thanks to this study, two basic theories of capital structure emerged – the trade-off theory and the pecking order theory. The basic idea of the first theory is to find a balance between the interest tax shield and the cost of financial distress, which should find the optimum of the capital structure, as stated by Brealey et al. (2011). On the contrary, the second theory and Myers (1984) created a “ladder” of financing sources, in which an equity occupied the first place followed by debt sources. These two studies are followed by another research.

As mentioned above within the introduction part, the formation of the financial structure is influenced by a number of determinants being divided into internal and external ones. In this research, internal determinants are represented by profitability, liquidity and asset structure, while GDP growth, inflation and the reference to interest rate characterize external determinants. The following paragraphs will be devoted to a brief literature review of these determinants having a possible both positive and negative effect on the level of debt.

The positive effect of profitability is explained by Brealey et al. (2011), who argues that the costs of financial distress, indicating the risk of bankruptcy, are falling for more profitable companies. Such lower costs, the more suitable companies are from a creditors’ point of view to obtain a loan. This effect has been confirmed, for example, by Klapper et al. (2002), Pinková (2012), Aulová and Hlavsa (2013) and Mokhova and Zinecker (2013) for Slovenian companies, Růčková (2015a, 2015b) for Czech and Hungarian companies. On the contrary, the negative effect of profitability is associated with the idea that if the company’s profit grows, one of its components can retain earnings being, in fact, a cheap source of financing. The negative effect of profitability clearly dominates in previous studies, even when dividing

debt into long-term and short-term. Nivorozhkin (2002, 2005), Bauer (2004), Weill (2004), Črnigoj and Mramor (2009), Hernádi and Ormos (2010, 2012), Hanousek and Shamshur (2011), Jõeveer (2013), Mateev et al. (2012), Prędkiewicz and Prędkiewicz (2015).

If a company finds itself in an unfavourable existential situation, a higher amount of highly liquid assets can help to survive such situation. The reason is that liquid assets can be sold almost immediately (albeit at a loss). Therefore, for each company it is appropriate to have a certain amount of such assets in case of emergency. On the contrary, illiquid assets such as patents, licenses, goodwill, valuable rights or customer databases are very difficult to sell if necessary. In this case, it is usually needed to sell the whole company. What follows is that liquid assets should rather be financed by debt while illiquid assets should rather be acquired from own funds. This shows the positive impact of liquidity on the debt level being already confirmed in studies by e.g. Williamson (1988), Shleifer and Vishny (1992), Mateev et al. (2012) for long-term debt, Růčková (2015b) for the Czech Republic. On the other hand, the negative impact of liquidity may be caused by a possible conflict between owners and managers, who, if they could dispose of corporate assets freely, could gradually expropriate the owners. A positive impact was revealed by e.g. Myers and Rajan (1998), Morellec (2001), Frieder and Martell (2006), De Jong et al. (2008), Lipson and Mortal (2009), Mateev et al. (2012) for short-term debt, Pinková (2012), Aulová and Hlavsa (2013), Růčková (2015b) for Poland and Slovakia.

In case of the assets structure, it depends on the specific form of the variable. This research works with the variable in form of ratio tangible/total assets. Therefore, a positive effect on the amount of long-term debt and a negative impact on the amount of short-term debt are both expected here. These expectations have been confirmed by e.g. Nivorozhkin (2002), Mateev et al. (2012), Prášilová (2012), Mokhova and Zinecker (2013) in Bulgaria, Hungary and Slovenia. Tangible assets are assets that can be used as collateral when applying for a loan.

The impact of GDP growth is linked to the economic cycle. When the economy grows, most economic entities should prosper and their profits should increase. High profits may indicate a lower risk of bankruptcy, and so the effect of the variable should have a positive impact on the level of indebtedness. Similarly, if there is a recession or crisis, the access to debt financing becomes difficult. However, there is also the possibility of a negative impact in case the increased profitability is used as a funding source within the period of economic boom. The positive effect was confirmed by e.g. Gajurel (2006) for long-term debt, Yinusa et al. (2017) for long-term debt, Hanousek and Shamshur (2011) for unlisted companies. A negative impact can be found e.g. in Gajurel (2006) for total and short-term debt, Cheng and Shiu (2007), Bokpin (2009), Hanousek and Shamshur (2011) for listed companies, Jõeveer (2013) for unlisted companies.

The impact of the inflation rate is linked to the interest rate as the inflation rate reduces the value of existing debt as it lowers the real interest rate. A negative impact can be found in studies like, for example, Gajurel (2006) for total debt, Cheng and Shiu (2007), Jõeveer (2013), Mokhova and Zinecker (2014) for France and the Czechia, Öztekin (2015). The positive impact of the inflation rate is usually expected only for short-term debt, as creditors can provide themselves against the risk of rising inflation in the short term, e.g. by linking interest rates to inflation, risk premiums, etc. The positive effect was confirmed by Hanousek and Shamshur (2011), Mokhova and Zinecker (2014) for France, Yinusa et al. (2017).

The last variable is the reference to interest rate. Here, there is a completely logical assumption – the lower the costs associated with debt financing, the more debt financing companies will demand. Keeping this idea in mind, this variable is expected to have a negative effect on the level of indebtedness, as confirmed by e.g. Antoniou et al. (2002) and Yinusa et al. (2017).

Unfortunately, the results for external determinants are very often statistically insignificant. Therefore, it is important to include these determinants in research in order to obtain more relevant and statistically significant results.

## 2 Data and Methodology

This research focuses on the financial structure of companies belonging to the section J – Information and Communication according to the NACE classification. The whole industry is not analysed, only a part of it. Specifically, these are divisions 61 – Telecommunications, 62 – Computer programming, consultancy and related activities, 63 – Information service activities. The research examines differences between divisions 61 and 62 + 63. The industry is defined as a combination of economic activities that produce technologies and services primarily used to process, communicate and distribute information electronically including its capture, storage, transmission and display. This investigation focuses on the part that is more service-oriented. Taking into account that today's society is an information society, this industry is a very important part of the public, business and private spheres. At the same time, it is an industry that produces a large amount of innovation every year.

The time series of items belonging to the balance sheet and profit and loss statement come from the Orbis database. The World Bank database and the databases of central banks of selected economies were used for macroeconomic variables. A total of 10,538 information companies (9,420 medium-sized and 1,117 large and very large) and 1,366 telecommunication companies (1,075 medium-sized and 291 large and very large) are analysed. These are all companies of the Orbis database. The research covers the period 2010–2018.

The above mentioned companies come from eight selected economies of Central and Eastern Europe. Concretely, these are the economies that belong to the grouping of the extended Visegrád Group – the Czech Republic (CZ), Slovakia (SK), Poland (PL), Hungary (HU), Austria (AT), Slovenia (SI), Bulgaria (BG), Romania (RO). The last four economies are included in the original V4 because representatives of these economies attend V4 meetings very often and cooperate with it in certain areas. Selected economies were chosen with regard to their frequency (which is not high) in previous research.

The aim of this research is to determine whether profitability, liquidity, asset structure, GDP growth rate, inflation rate and reference interest rate affect the level of total, long-term and short-term debt. With regard to the literature review, the following two research questions have been formulated:

1. Do the impacts differ depending on different maturity in funding sources use?
2. Does the price of financial external sources affect the use of them?

Taken into consideration that neither the aim nor the research questions suggest possible relationships between the variables, Table 1 includes the expected impacts of the determinants on the level of indebtedness.

**Table 1:** Expected influences of determinants on the level of debt

	Total debt	Long-term debt	Short-term debt
Profitability	-	-	-
Liquidity	-	-	-
Asset structure	-/+	+	-
GDP growth rate	-/+	+	-
Inflation rate	-/+	-	+
Reference interest rate	-	-	-

Source: author's calculations

## 2.1 Variables

As a part of the panel regression, which will be discussed in the following subchapter, it is necessary to analyse the endogenous and exogenous variables being used in this method. Taking into account that the subject of the research is to find out how given determinants affect the amount of indebtedness, it is clear what will be endogenous variable. The endogenous variable will consist of three forms for three forms of indebtedness. Total debt will be the ratio of total liabilities to equity (DER). Long-term debt will account for the ratio of long-term liabilities to equity (DER\_L). Short-term debt will be the ratio of short-term liabilities and equity (DER\_S).

Individual determinants present exogenous variables. The analysis of this industry and the influence of selected determinants is part of a broader research, and therefore it may seem that the determinants are selected without prior literature research, but in the Literature Overview section, studies have been identified that show potential for selection. The overview shows that, for example, profitability is a frequent part of researches of financial structure or that external determinants have stated that it is necessary to obtain more statistically significant coefficients for them to gain an overview of the financial structure of companies and make recommendations. Return on equity (ROE) is the share of profit before tax and interest and equity. Quick ratio (L2) is the ratio of current assets adjusted for inventories to current liabilities. The share of tangible and total assets presents the structure of assets (SA). GDP growth rate at market prices, inflation rate (INF) and the reference to interest rate of the economy (IR) are macroeconomic determinants.

## 2.2 Methodology

A lot of methods can be used to analyse the dependencies between individual determinants and the level of debt. This research applies a two-stage Generalized Method of Moments (GMM) system, which is one of the panel regression methods that allows to create more dynamic models while monitoring company heterogeneity. Unfortunately, the often-used least squares method is not suitable for this research, as the time period is not very long and stationary data are needed, which, e.g. macroeconomic time period may not always meet. (Průcha 2014)

The GMM method eliminates the shortcomings of the least squares method and other methods and it is frequently used in the field of finance. (Jagannathan et al. 2002)

At first, this method was introduced in the Arellano and Bond study (1991) and subsequently developed in the Arellano and Bover (1995) and Blundell and Bond studies (1998). In his study, Roodman (2009) summarizes the basic characteristics of this method: suitability for shorter time series; existence of linear functional relationship; the presence of fixed individual effects; the dependent variable on the left side of the equation is dynamic and depends on its lagged values; independent variables do not have to be strictly independent which means that the variables can be correlated with past and present errors; autocorrelation and

heteroskedasticity should not be through observation (both of these phenomena cannot be tested in this method). The GMM method eliminates the endogeneity problem (correlation between the independent variable and the error term). Ullah et al. (2018) state that this problem is solved with the help of e.g. internal tools that eliminate unobserved heterogeneity, simultaneity and dynamic endogeneity-mentioned as sources of endogeneity.

Ullah et al. (2018) further notes that since the GMM method cannot test the autocorrelation and heteroskedasticity of variables, some tool needs to be used to test the credibility of the model. There are several tools to choose from. The Sargan test is used in this research. If its value exceeds 0.05, then the model is correctly constructed, and even if we slightly change the parameters, we should get the same results.

The equation of the model looks as follows:

$$Y_{it} = \alpha_0 + \beta_1 * Y_{it-1} + \beta_2 * ROE_{it} + \beta_3 * L2_{it} + \beta_4 * SA_{it} + \beta_5 * GDP_{it} + \beta_6 * INF_{it} + \beta_7 * IR_{it} + \varepsilon_{it}; \quad (1)$$

Within the above-mentioned equation, the  $Y_{it}$  represents the endogenous variable DER/DER\_L/DER\_S of the  $i$ -th number of companies in the given economy in selected industry for the period 2010–2018. Exogenous variables representing selected determinants are in the coefficients  $\beta_2$ – $\beta_7$ . Among the exogenous variables there is also  $Y_{it-1}$ , which is generated automatically by the model and which allows modeling of the mechanism of partial adaptation in a dynamic model. This variable indicates the lagged value of the endogenous variable with one-year lag specifically as all data represent an annual frequency. In equation we can see the symbols  $\alpha$  and  $\varepsilon$ , which are an automatic part of the model and which represent the constant and the random component of the model. The random component contains all other existing determinants of the financial structure that are not addressed in the research.

### 2.3 The amount and composition of liabilities and capital structure in individual economies

Before analysing the resulting relationships between determinants and the level of debt, it is appropriate to perform an analysis of the endogenous variable – debt. Table 2 shows the average values for medium and large companies in terms of non-current liabilities (NCL), current liabilities (CL), debt, equity and debt-equity ratio (DER). Letter I is a significant part of the industry focused only on IT companies and letter C is a significant part of the industry focused only on telecommunication companies.

Thinking about the possible composition of assets of companies operating in the ICT industry, the assets will be rather long-term tangible (equipment) and may contain a significant amount of intangible assets in the form of patents, licenses, etc. However, as these examples of assets are long-term assets, long-term debt sources should predominate in financing.

The table 2 shows that in terms of the composition of liabilities, in case of information companies (regardless of size), short-term liabilities clearly predominate accounting for about 80 % of total liabilities on average. However, there are exceptions, namely Austrian medium-sized companies and Austrian and Hungarian large companies, in which long-term liabilities dominate. As far as telecommunication companies are concerned, the situation of medium-sized companies is similar to information companies, also with the exception of Austrian companies. However, the situation is different for large companies – liabilities are almost balanced with a slight predominance of long-term liabilities.

**Table 2:** The amount and composition of liabilities and financial structure

	CZ	SK	PL	HU	AT	SI	BG	RO
NCL_I_medium (%)	16	18	24	13	88	27	23	21
NCL_C_medium(%)	24	16	30	24	92	44	39	9
NCL_I_large (%)	9	18	34	66	89	18	27	19
NCL_C_large(%)	52	48	51	48	76	52	53	51
CL_I_medium (%)	84	82	76	87	12	73	77	79
CL_C_medium(%)	76	84	70	76	8	56	61	91
CL_I_large (%)	91	82	66	34	11	82	73	81
CL_C_large(%)	48	52	49	52	24	48	47	49
Debt_I_medium (%)	49	63	53	54	64	51	48	66
Debt_C_medium (%)	53	49	37	36	37	46	38	15
Debt_I_large (%)	48	52	42	41	68	56	43	53
Debt_C_large (%)	56	60	36	47	31	50	55	27
Equity_I_medium (%)	51	37	47	46	36	49	52	34
Equity_C_medium (%)	47	51	63	64	63	54	62	85
Equity_I_large (%)	52	48	58	59	32	44	57	47
Equity_C_large (%)	44	40	64	53	69	50	45	73
Debt-equityratio_I_medium	0,96	1,75	1,09	1,22	1,82	1,11	0,9	1,96
Debt-equityratio_C_medium	0,93	1,1	1,8	1,74	1,67	1,27	1,92	5,61
Debt-equityratio_I_large	0,94	1,22	0,7	1,15	2,3	1,41	0,71	1,17
Debt-equityratio_C_large	0,78	0,65	1,84	1,16	2,54	1,03	0,83	3,14

Source: author's calculations based on the data from Orbis database

If we look at the indebtedness of companies of the ICT industry, we see that Czech companies do not reach the warning value  $DER = 1$  in all cases, which means that equity and debt sources contribute to the company's financing in the same amount. We can also find lower values of debt-equity ratio in case of medium-sized Bulgarian information companies and large Polish companies and large telecommunication Slovak and Bulgarian companies. Firms of the remaining economies have a DER above 1. Even Romanian telecommunication companies exceed values 3 and 5. However, it cannot be said that the higher ratio is bad as it always depends on the company's strategy, which at such values can be very aggressive and do not necessarily mean financial problems. Also, higher indebtedness can represent cheaper sources of funding, which can bring excessive profits. ICT companies very often generate revolutionary innovations that need appropriate initial funding.

### 3 Research Results and Discussion

Tables 3, 4, 5, 6 show the resulting coefficients of the GMM method for information and telecommunication companies for three forms of debt. Complete results for all economies and determinants are not available for any form of debt. The missing determinants were not statistically significant and the models of the missing economies did not meet the condition of the Sargan test. Thus, the J-stat values were lower than 0.05 and the resulting models are not trusted, that is why they were deleted from the tables.

In the first column, we can see the results of a variable that does not represent any selected determinant but an automatic part of the models – the lagged value of the endogenous variables. Overall, the positive impact prevails which means that if a given company finances its investment activities with debt in the previous period, it will continue to do so in the following period. If we divide companies according to size, the predominance of positive impacts is typical for medium-sized companies and for large information companies while the predominance of negative impacts is typical for large telecommunication companies. On the contrary, the negative impact means that if debt financing is used in the previous period, it will no longer be used or, if so, it will be used to a much lesser extent in the following period. Unfortunately, the coefficients are so low (with one exception) that we cannot talk about any

impact but rather about the direction in which this variable could affect the level of indebtedness.

**Table 3: GMM for medium-sized information companies**

Total debt								
	DER(-1)	ROE	L2	SA	GDP	INF	IR	J-stat.
CZ	0.021 <sup>a</sup>				21.207 <sup>c</sup>		28.786 <sup>b</sup>	0.179
SK	0.228 <sup>a</sup>	1.809 <sup>a</sup>	0.011 <sup>a</sup>			-104.301 <sup>a</sup>	571.002 <sup>b</sup>	0.339
PL	0.051 <sup>a</sup>		-0.001 <sup>a</sup>	-2.147 <sup>a</sup>	19.797 <sup>b</sup>			0.648
AT	-0.885 <sup>a</sup>	-31.485 <sup>b</sup>		-819.732 <sup>a</sup>	3,365.906 <sup>a</sup>	10,529.300 <sup>a</sup>	-29,216.110 <sup>a</sup>	0.189
BG	-0.003 <sup>c</sup>			-3.668 <sup>b</sup>		25.188 <sup>a</sup>	-358.982 <sup>c</sup>	0.129
Long-term debt								
PL	-0.104 <sup>a</sup>	0.310 <sup>c</sup>	-0.001 <sup>a</sup>			5.004 <sup>a</sup>	-4.144 <sup>a</sup>	0.292
AT	-1.008 <sup>a</sup>	-2.162 <sup>a</sup>		-59.462 <sup>a</sup>	515.052 <sup>b</sup>	802.458 <sup>a</sup>	-2,687.412 <sup>a</sup>	0.071
SI	0.455 <sup>a</sup>		0.001 <sup>a</sup>	-0.889 <sup>a</sup>			4.685 <sup>a</sup>	0.353
Short-term debt								
CZ	0.018 <sup>a</sup>		-0.006 <sup>a</sup>		15.841 <sup>a</sup>			0.115
SK	0.231 <sup>a</sup>	1.573 <sup>a</sup>		-8.376 <sup>a</sup>		-85.737 <sup>a</sup>	575.717 <sup>a</sup>	0.705
PL	0.049 <sup>a</sup>		-0.015 <sup>a</sup>		13.989 <sup>a</sup>		-14.290 <sup>b</sup>	0.570
AT	0.029 <sup>a</sup>		-0.025 <sup>a</sup>			309.805 <sup>a</sup>	-283.972 <sup>a</sup>	0.951
RO		0.002 <sup>a</sup>		-5.433 <sup>a</sup>		21.508 <sup>b</sup>	-470.666 <sup>b</sup>	0.269

Source: author's calculations based on data of Orbis databases

Symbols <sup>a</sup>, <sup>b</sup>, or <sup>c</sup> indicate significance at 1 %, 5 %, or 10 %.

Profitability was expected to have a negative impact on all forms of debt but the results showed the exact opposite in most cases. The companies that met negative expectations are the following: Austrian medium-sized and Czech, Hungarian large information companies, Czech medium-sized and Bulgarian and Romanian (for short-term debt) large telecommunication companies. The identified negative influences are followed by studies such as Črnigoj and Mramor (2009), Hernádi and Ormos (2012), Mokhova and Zinecker (2013), Růčková (2017). The remaining coefficients are positive. A positive effect can be found, for example, in the studies of Klapper et al. (2002), Pinková (2012), Aulová and Hlavsa (2013), Růčková and Škuláňová (2021) for Slovenia and Hungary. For Czech and Bulgarian companies, the negative impact is in line with the results for the GDP growth rate having also a negative impact on these economies, which means that companies use equity before debt financing in times of economic prosperity. However, neither the negative nor the positive impact is surprising in spite of some problems at the beginning of the period due to the financial crisis of 2008/2009, the monitored economies performed very well for at least half of the period under review and also despite the GDP growth rate being very good in some economies. Thus, in these economies, the conditions for both the use of own resources (increasing retained earnings) due to increasing profitability and economic development were conducive to the use of debt financing.

In contrast to profitability, liquidity results in most cases confirmed our assumption of a negative impact on the level of indebtedness. We can find this impact for example in studies of Myers and Rajan (1998), Mateev et al. (2012) and Aulová and Hlavsa (2013). With five exceptions, the coefficients are very low and so the effect of liquidity on the level of indebtedness cannot be discussed. However, those exceptions are very interesting. These are Austrian medium-sized and Hungarian and Bulgarian large telecommunication companies for total and long-term debt. All these coefficients are positive, which means that these companies may have a larger amount of liquid assets. This result follow for example these studies – Williamson (1988) and Shleifer and Vishny (1992). Unfortunately, the Orbis database does not allow such detailed approach to see if this is true, but if we look only at the composition of assets in terms of the division into tangible and intangible, we find out that 40



% of assets are tangible ones certainly belonging to liquid assets. The percentage is high, so the positive impact has its justification in these economies.

**Table 4:** GMM for medium-sized telecommunication companies

Total debt								
	DER(-1)	ROE	L2	SA	GDP	INF	IR	J-stat.
CZ	0.021 <sup>a</sup>	-1.139 <sup>a</sup>	-0.001 <sup>c</sup>		-9.432 <sup>a</sup>	-12.506 <sup>a</sup>	-30.915 <sup>a</sup>	0.064
AT	0.162 <sup>a</sup>	4.553 <sup>a</sup>	2.419 <sup>a</sup>	2.060 <sup>a</sup>	-19.908 <sup>a</sup>	-243.872 <sup>a</sup>	-390.960 <sup>a</sup>	0.154
SI	0.291 <sup>a</sup>	0.698 <sup>a</sup>	-0.032 <sup>a</sup>	3.072 <sup>a</sup>	-44.444 <sup>a</sup>	-202.025 <sup>a</sup>	362.881 <sup>a</sup>	0.224
BG	0.143 <sup>a</sup>			1.751 <sup>c</sup>	-20.249 <sup>a</sup>	-8.412 <sup>a</sup>	380.637 <sup>b</sup>	0.285
RO	-0.367 <sup>a</sup>	52.148 <sup>a</sup>	-0.437 <sup>a</sup>			-14.721 <sup>b</sup>		0.417
Long-term debt								
CZ	0.150 <sup>a</sup>	-0.310 <sup>a</sup>		0.436 <sup>a</sup>	-1.040 <sup>b</sup>		6.644 <sup>a</sup>	0.722
AT	0.075 <sup>a</sup>	3.379 <sup>a</sup>	2.127 <sup>a</sup>	4.421 <sup>a</sup>	-42.997 <sup>a</sup>	-106.123 <sup>a</sup>	-478.889 <sup>a</sup>	0.208
SI	0.053 <sup>a</sup>	0.060 <sup>a</sup>	-0.007 <sup>b</sup>	5.355 <sup>a</sup>	-11.507 <sup>a</sup>	-142.063 <sup>a</sup>	4.334 <sup>a</sup>	0.150
RO		3.478 <sup>a</sup>		12.357 <sup>a</sup>	232.224 <sup>a</sup>		190.492 <sup>b</sup>	0.075
Short-term debt								
CZ	0.013 <sup>a</sup>	-0.983 <sup>b</sup>	-0.001 <sup>c</sup>		-7.254 <sup>a</sup>	-8.657 <sup>b</sup>	-37.533 <sup>a</sup>	0.072
SI	0.138 <sup>a</sup>	0.849 <sup>a</sup>	0.024 <sup>a</sup>	1.250 <sup>a</sup>	-31.020 <sup>a</sup>	-30.734 <sup>a</sup>	248.273 <sup>a</sup>	0.232
BG	0.120 <sup>a</sup>		-0.021 <sup>a</sup>		-13.357 <sup>b</sup>		210.235 <sup>c</sup>	0.453
RO	-0.402 <sup>a</sup>	58.204 <sup>a</sup>	-0.431 <sup>a</sup>	28.064 <sup>a</sup>			-121.712 <sup>a</sup>	0.186

Source: author's calculations based on data from Orbis databases

Symbols <sup>a</sup>, <sup>b</sup>, or <sup>c</sup> indicate significance at 1 %, 5 %, or 10 %.

Regarding the impact of the asset structure, a positive impact on the level of long-term debt and a negative impact on the level of short-term debt were expected, as stated, for example Klapper et al. (2002), Nivorozhkin (2002), Song (2005), Cheng and Shiu (2007), Mateev et al. (2012) and Vo (2017). Information companies, regardless of size, showed negative links regardless of the form of indebtedness. Negative impacts may occur due to the fact that medium-sized companies achieve on average 16 % of tangible assets out of total assets; large companies reach an average of 10 %. Such low ratios mean that companies do not have enough tangible assets that can serve as collateral to increase debt. The situation is slightly different for telecommunication companies, as a positive impact on debt levels has been revealed for medium-sized companies, regardless of its form, but for large companies this impact is negative. The positive impact is related to the ratio of tangible assets to total assets, which is on average 36 % for these companies, which is already a significant amount of such assets to increase debt. However, large companies have this average ratio of around 44 %, which is more than for medium-sized companies, but apparently these assets are not used to obtain additional debt financing.

The results of GDP growth rates are mixed. The Czech, Austrian and Bulgarian information companies are affected positively, while telecommunications companies are affected in negative way. Various results can also be found in previous studies. A positive impact can be found in the studies of Salehi and Manesh (2012), Mursalim and Kusuma (2017) and Yinusa et al. (2017), while a negative impact was found in these studies – Bastos et al. (2009), Bokpin (2009) and Jõeveer (2013). Slovak and Slovenian companies are affected negatively in both sectors while Hungarian ones are affected positively. Romanian and Polish companies lack results for one of the industries. Romanian telecommunication companies and Polish information companies are positively affected. As already indicated in the impact of profitability, neither the negative nor the positive effect is unexpected, because despite some problems at the beginning of the period due to the financial crisis of 2008/2009, the monitored economies were very successful for at least half of the period. Thus, in these economies, the conditions for both the use of own resources (increasing retained earnings) due to increasing profitability and economic development were conducive to the use of debt financing.

**Table 5:** GMM for large and very large information companies

Total debt								
	DER(-1)	ROE	L2	SA	GDP	INF	IR	J-stat.
CZ	0.114 <sup>a</sup>	-8.337 <sup>a</sup>		-4.602 <sup>a</sup>		-42.121 <sup>a</sup>	56.789 <sup>a</sup>	0.068
SI	-0.176 <sup>a</sup>	4.823 <sup>a</sup>	-0.921 <sup>a</sup>	-4.161 <sup>a</sup>	-107.259 <sup>a</sup>	111.118 <sup>a</sup>	-670.178 <sup>a</sup>	0.267
Long-term debt								
PL	0.016 <sup>a</sup>					-3.050 <sup>a</sup>		0.410
SK	0.042 <sup>a</sup>	0.197 <sup>a</sup>	-0.092 <sup>a</sup>	-0.849 <sup>a</sup>	-13.580 <sup>a</sup>	8.103 <sup>a</sup>	-54.812 <sup>a</sup>	0.315
Short-term debt								
HU	0.162 <sup>a</sup>	-7.405 <sup>a</sup>		-4.606 <sup>b</sup>	5.065 <sup>b</sup>	-31.356 <sup>a</sup>	-50.943 <sup>a</sup>	0.078
AT	-0.179 <sup>a</sup>	4.318 <sup>a</sup>	-0.802 <sup>a</sup>	-3.500 <sup>a</sup>	92.205 <sup>a</sup>	105.444 <sup>a</sup>	-600.483 <sup>a</sup>	0.190
BG	0.119 <sup>a</sup>	18.591 <sup>a</sup>	-0.287 <sup>a</sup>		820.699 <sup>a</sup>	366.168 <sup>a</sup>	22,278.880 <sup>a</sup>	0.286

Source: author's calculations based on data from Orbis databases

Symbols <sup>a</sup>, <sup>b</sup>, or <sup>c</sup> indicate significance at 1 %, 5 %, or 10 %.

Our assumptions for inflation rate were clearly fulfilled by Hungarian and Romanian companies, regardless of size and industry. Negative effects were identified for long-term debt and positive effects for short-term debt. We can find these results for example on studies of Gajurel (2006), Cheng and Shiu (2007), Hanousek and Shamshur (2014), Mokhova and Zinecker (2014), Öztekin (2015) and Yinusa et al. (2017). Romania achieved the highest inflation rate out of the examined countries during the observed period. The average inflation rate was 2.7 %, and even 4.8 % during the period 2010–2013. In addition, higher inflation may have brought the advantage of cheaper debt – it is applied to long-term debt. While in case of short-term debt, credit insurance for creditors was likely to be applied as evidenced by the positive impact. The same explanation can be applied to the Hungarian economy having an average inflation rate of 2.4 % and during the period 2010–2013 even 4 %. For the remaining economies, it is more difficult to find an explanation for the resulting impacts, as these economies had average inflation rates from 1.2 to 1.9 %, being considered the normal inflation rate. Frequently, economies even achieved deflation. For this variable, it would be appropriate to analyse companies for individual years, which could specify the direction of impact and so it could be better explained. In some economies, the inflation rate was higher than the average value – e.g. in case of Poland in 2010, 2011, 2012; Austria for 2011 and 2012; Slovenia and the Czech Republic in 2012; Slovakia for the years 2011 and 2012. The development of the inflation rate will be reflected also in the products of selected companies, moreover, it will subsequently influence companies through the level of profits, etc.

The reference interest rate was the last variable analysed. There should be a clear negative impact on companies from Romania, Poland and Hungary as these economies have had relatively high rates. The same results were found out by Růčková and Škuláňová (2021). The Romanian interest rate averaged 3.6 %, the Hungarian 3.1 % and the Polish 2.5 %. However, the maxima in the first half of the observed period exceeded 5–6 %. High rates carry high debt acquisition costs causing reduced debt as companies did not want to use debt financing. A negative impact was found for medium-sized companies regardless of industry and for large information companies. Unfortunately, there was a positive impact on the indebtedness found out for Hungarian and Romanian telecommunication companies. This difference may be explained by the fact that at the end of the period under review, interest rates fell to as low as around 1 %, which may have led to the increase in indebtedness and thus it outweighed the majority of the negative effects from the beginning of the period. In the remaining economies, rates averaged around 0.3 % indicating very low debt financing costs and, at the same time, explaining the positive effects in all remaining economies. Unfortunately, the negative effects are difficult to explain. For example, companies did not want to go into debt despite low

interest rates being, however, a reasonable fact given that economy was more prosperous and companies could reduce their debt as well as they could prepare themselves for worse times.

**Table 6:** GMM for large and very large telecommunication companies

Total debt								
	DER(-1)	ROE	L2	SA	GDP	INF	IR	J-stat.
CZ	-0.521 <sup>a</sup>	3.191 <sup>a</sup>	-0.017 <sup>a</sup>	-45.127 <sup>a</sup>	-456.274 <sup>a</sup>	1162.858 <sup>a</sup>	-1,038.722 <sup>a</sup>	0.263
SK	-0.396 <sup>a</sup>	6.627 <sup>a</sup>	-0.297 <sup>a</sup>	-16.298 <sup>a</sup>	-82.647 <sup>a</sup>	16.245 <sup>b</sup>		0.320
HU	0.489 <sup>a</sup>	11.716 <sup>a</sup>	2.566 <sup>a</sup>	-35.863 <sup>a</sup>	49.941 <sup>a</sup>	-12.955 <sup>a</sup>	91.789 <sup>a</sup>	0.323
AT	-0.512 <sup>a</sup>	34.776 <sup>a</sup>	-0.003 <sup>a</sup>	-5.793 <sup>a</sup>	-115.336 <sup>a</sup>	-1246.887 <sup>a</sup>	2,306.612 <sup>a</sup>	0.411
BG	-0.516 <sup>a</sup>		5.991 <sup>a</sup>	-23.960 <sup>a</sup>	-144.172 <sup>a</sup>	-92.442 <sup>b</sup>	788.381 <sup>b</sup>	0.197
RO	0.191 <sup>a</sup>		0.036 <sup>a</sup>	-3.766 <sup>a</sup>	59.381 <sup>a</sup>	-69.876 <sup>a</sup>	187.023 <sup>a</sup>	0.193
Long-term debt								
CZ	-0.521 <sup>a</sup>	1.887 <sup>a</sup>	-0.022 <sup>a</sup>	-22.641 <sup>a</sup>	-88.478 <sup>a</sup>	1405.941 <sup>a</sup>	-1,115.886	0.074
SK	-0.491 <sup>a</sup>		0.066 <sup>a</sup>	-12.037 <sup>a</sup>	-17.451 <sup>a</sup>	15.398 <sup>a</sup>	16.287 <sup>c</sup>	0.503
HU	0.452 <sup>a</sup>	13.255 <sup>a</sup>	2.460 <sup>a</sup>	-25.407 <sup>a</sup>	27.512 <sup>a</sup>	-3.783 <sup>a</sup>	119.723 <sup>a</sup>	0.416
AT	-0.452 <sup>a</sup>	29.178 <sup>a</sup>	-0.283 <sup>a</sup>	-3.483 <sup>a</sup>	-88.380 <sup>a</sup>	-798.909 <sup>a</sup>	1,523.710 <sup>a</sup>	0.294
SI	0.519 <sup>a</sup>		cor ROE			10.298 <sup>b</sup>	-26.141 <sup>a</sup>	0.280
BG	-0.273 <sup>a</sup>	1.586 <sup>b</sup>		-21.728 <sup>a</sup>	-206.207 <sup>a</sup>	-51.314 <sup>a</sup>	-1,108.001 <sup>a</sup>	0.541
RO	-0.016 <sup>a</sup>	4.017 <sup>a</sup>	0.005 <sup>a</sup>	-1.574 <sup>a</sup>	54.115 <sup>a</sup>	-82.353 <sup>a</sup>	211.989 <sup>a</sup>	0.115
Short-term debt								
CZ	-0.515 <sup>a</sup>	1.144 <sup>a</sup>	0.001 <sup>a</sup>	-21.337 <sup>a</sup>	-362.099 <sup>a</sup>	-240.310 <sup>a</sup>	67.474 <sup>a</sup>	0.235
SK	-0.049 <sup>a</sup>	4.750 <sup>a</sup>	-0.363 <sup>a</sup>	-5.422 <sup>a</sup>	-58.696 <sup>a</sup>	-8.634 <sup>a</sup>		0.219
HU	0.667 <sup>a</sup>		0.292 <sup>b</sup>	-11.152 <sup>a</sup>	20.635 <sup>a</sup>	12.876 <sup>a</sup>	13.887 <sup>a</sup>	0.322
AT	-0.587 <sup>a</sup>	0.199 <sup>a</sup>		-1.434 <sup>a</sup>	-12.989 <sup>a</sup>	-456.838 <sup>a</sup>	808.130 <sup>a</sup>	0.353
BG	-0.323 <sup>a</sup>	-2.663 <sup>c</sup>	0.816 <sup>a</sup>		-64.499 <sup>a</sup>	-41.562 <sup>a</sup>	1,402.730 <sup>a</sup>	0.193
RO	0.115 <sup>a</sup>	-0.514 <sup>b</sup>	-0.079 <sup>a</sup>	-6.583 <sup>a</sup>		26.276 <sup>a</sup>	29.973 <sup>a</sup>	0.175

Source: author's calculations based on data from Orbis databases

Symbols <sup>a</sup>, <sup>b</sup>, or <sup>c</sup> indicate significance at 1 %, 5 %, or 10 %.

A brief summary is appropriate at the end of the chapter. Regardless of the industry, the main finding is that the level of indebtedness of companies operating in the ICT industry is most influenced by the determinants of their external environment. By far, the level of the reference interest rate, which slightly outweighs the overall positive impact, becomes the most significant impact. Looking at individual industries and company sizes, it is slightly different. Information companies, regardless of size, are negatively affected by the interest rate while large telecommunication companies are mainly affected positively and for medium-sized companies it is half and half. This difference may be due to the fact that in the analysed sample, the number of information companies was seven times higher than the number of telecommunication companies. At the same time, short-term liabilities of information companies also reached higher values than in telecommunication companies. Current liabilities include spontaneous sources of funding that are not affected by the interest rate. The explanation could also be the fact that telecommunication companies were more dependent on a larger amount of investments than information companies, but unfortunately the data available for research did not include the volume of investments. However, telecommunication companies show a higher share of tangible fixed assets, which increased for most companies during the period under review, which can be considered as a larger investment, in which interest rates already play a large role in debt financing.

## Conclusion

This research analysed the financial structure of companies belonging to the ICT sector and the determinants that could affect it. The aim of this research was to determine whether profitability, liquidity, asset structure, GDP growth rate, inflation rate and reference interest rate affect the level of total, long-term and short-term debt. With regard to the literature review, two research questions were formulated:

1. Do the impacts differ depending on different maturity in funding sources use?
2. Does the price of financial external sources affect the use of them?

Regarding the impact of selected determinants, both internal and external determinants have an impact. However, the impact of determinants of the external environment is stronger—economic development, the inflation rate and the reference interest rate. Detailed results can be found in the previous chapter where everything is summarized. The main conclusion is that the level of indebtedness of the ICT sector companies is most influenced by determinants of their external environment. By far, the most significant impact is the level of the reference to interest rate, which slightly outweighs the overall positive impact. When taking a look at individual industries and company sizes, it is slightly different. Considering the influence of the interest rate and information companies, regardless of size, they are affected negatively while large telecommunication companies are mainly affected positively and as it comes to medium-sized companies, it is half and half.

Taking into consideration our results in detail, the clear negative impact should be on companies from Romania, Poland and Hungary, as these economies had relatively high rates. High rates carry high debt acquisition costs, which reduced debt as companies did not want to use debt financing. A negative impact was found for medium-sized companies, regardless of industry, and for large information companies. Unfortunately, a positive impact on the indebtedness of Hungarian and Romanian telecommunication companies was seen. This difference may be explained by the fact that at the end of the period under review, interest rates fell sharply (by a few percent), which may have led to the increase in indebtedness and thus it outweighed the majority of the negative effects from the beginning of the period. In the remaining economies, rates were very close to zero indicating very low debt financing costs and, at the same time, explaining the positive effects in all remaining economies. Unfortunately, the negative effects are difficult to explain. For example, companies did not want to go into debt despite low interest rates being, however, a reasonable fact given that economy was more prosperous and companies could reduce their debt as well as they could prepare themselves for worse times.

### Acknowledgement

This article was supported by SGS/16/2020 Influence of selected internal and macroeconomic determinants on financial structure of companies in selected countries of Central and Eastern Europe.

### References

- [1] ANTONIOU, A. et al., 2002. *Determinants of corporate capital structure: Evidence from European countries*. Centre for Empirical Research in Finance, Department of Economics and Finance, University of Durham. Retrieved August 27, 2020, from [https://www.researchgate.net/publication/239504636\\_Determinants\\_of\\_Corporate\\_Capital\\_Structure\\_Evidence\\_from\\_European\\_Countries](https://www.researchgate.net/publication/239504636_Determinants_of_Corporate_Capital_Structure_Evidence_from_European_Countries)
- [2] ARELLANO, M. and S. BOND, 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, **58**(2), 277-297. ISSN 1467-937X.
- [3] ARELLANO, M. and O. BOVER, 1995. Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, **68**, 29-51. ISSN 0304-4076.

- [4] AULOVÁ, R. and T. HLAVSA, 2013. Capital structure of agricultural businesses and its determinants. *Agris on-line Papers in Economics and Informatics*, **5**(2), 23-36. ISSN 1804-1930.
- [5] BASTOS, D. D. et al., 2009. Determinants of capital structure of publicly-traded companies in Latin America: The role of institutional and macroeconomic factors. *Journal of International Finance and Economics*, **9**(3), 24-39. ISSN 1086-7376.
- [6] BAUER, P., 2004. Determinants of capital structure: Empirical evidence from the Czech Republic. *Czech Journal of Economics and Finance*, **54**(1-2), 2-21. ISSN 2464-7683.
- [7] BLUNDELL, R. and S. BOND, 1998. Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, **87**(1), 115-143. ISSN 0304-4076.
- [8] BOKPIN, G. A., 2009. Macroeconomic development and capital structure decision of firms: Evidence from emerging market economies. *Studies in economics and finance*, **26**(2), 129-142. ISSN 1555-6336.
- [9] BREALEY, R. A. et al., 2011. *Principles of Corporate Finance*, 10th Ed. New York: McGraw-Hill. ISBN 978-0077404895.
- [10] CHENG, S. R. and C. Y. SHIU, 2007. Investor protection and capital structure: International evidence. *Journal of Multinational Financial Management*, **17**(1), 30-44. ISSN 1042-444X.
- [11] ČRNIGOJ, M. and D. MRAMOR, 2009. Determinants of capital structure in emerging European economies: Evidence from Slovenian firms. *Emerging Markets Finance & Trade*, **45**(1), 72-89. 1558-0938.
- [12] DE JONG, A. et al., 2008. Capital structure around the world: The roles of firm- and country-specific determinants. *Journal of Banking & Finance*, **32**(9), 1954-1969. ISSN 0378-4266.
- [13] FRIEDER, L. and R. MARTELL, 2006. *On capital structure and the liquidity of a firm's stock*. Purdue University, Krannert School of Management. Retrieved August 27, 2020, from <https://ssrn.com/abstract=880421>.
- [14] GAJUREL, D. P., 2006. *Macroeconomic influences on corporate capital structure*. Retrieved August 27, 2020, from: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=899049](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=899049).
- [15] HANOUSEK, J. and A. SHAMSHUR, 2011. A stubborn persistence: Is the stability of leverage ratios determined by the stability of the economy? *Journal of Corporate Finance*, **17**(5), 1360-1376. 0929-1199.
- [16] HERNÁDI, P. and M. ORMOS, 2010. Capital structure and its choice in Central and Eastern Europe. *Acta Oeconomica*, **62**(2), 229-263. ISSN 1804-2112.
- [17] HERNÁDI, P. and M. ORMOS, 2012. What Managers Think of Capital Structure and How They Act: Evidence from Central and Eastern Europe. *Baltic Journal of Economics*, **12**(2), 47-71. ISSN 1406-099X.
- [18] JAGANNATHAN, R. et al., 2002. Generalized Method of Moments: Applications in Finance. *Journal of Business and Economic Statistics*, **20**(4), 470-481.
- [19] JÕEVEER, K., 2013. Firm, country and macroeconomic determinants of capital structure: Evidence from transition economies. *Journal of Comparative Economics*, **41**(1), 294-308. ISSN 0147-5967.

- [20] KLAPPER, L. F. et al., 2002. *Small- and Medium-Size Enterprise Financing in Eastern Europe*. World Bank Policy Research Working Paper No. 2933. Retrieved August 27, 2020, from [https://www.researchgate.net/publication/23722678\\_Small-\\_and\\_Medium-Size\\_Enterprise\\_Financing\\_in\\_Eastern\\_Europe](https://www.researchgate.net/publication/23722678_Small-_and_Medium-Size_Enterprise_Financing_in_Eastern_Europe)
- [21] LIPSON, M. L. and S. MORTAL, 2009. Liquidity and capital structure. *Journal of Financial Markets*, **12**(4), 611-644. ISSN 1386-4181.
- [22] MATEEV, M. et al., 2013. On the determinants of SME capital structure in Central and Eastern Europe: A dynamic panel analysis. *Research in International Business and Finance*, **27**(1), 28-51. ISSN 0275-5319.
- [23] MICHAELAS, N. et al., 1999. Financial policy and capital structure choice in U.K. SMEs: Empirical evidence from company panel data. *Small Business Economics*, **12**(2), 113-130. ISSN 1573-0913.
- [24] MODIGLIANI, F. and M. H. MILLER, 1958. The Cost of Capital, Corporation Finance and the Theory of Investment. *American Economic Association*, **48**(3), 261-297. ISSN 0002-8282.
- [25] MOKHOVA, N. and M. ZINECKER, 2013. The determinants of capital structure: The evidence from the European Union. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, **61**(7), 2533-2546. ISSN 2464-8310.
- [26] MOKHOVA, N. and M. ZINECKER, 2014. Macroeconomic factors and corporate capital structure. *Procedia – Social and Behavioral Sciences*, **110**, 530-540. ISSN 1877-0428.
- [27] MORELLEC, E., 2001. Asset liquidity, capital structure, and secured debt. *Journal of Financial Economics*, **61**(2), 173-206. ISSN 0304-405X.
- [28] MURSALIM, M. M. and H. KUSUMA, 2017. Capital structure determinants and firms' performance: Empirical evidence from Thailand, Indonesia and Malaysia. *Polish Journal of Management Studies*, **16**(1), 154-164. ISSN 2081-7452.
- [29] MYERS, S. C., 1984. The capital structure puzzle. *Journal of Finance*, **39**, 575-592. ISSN 1540-6261.
- [30] MYERS, S. C., 2001. Capital structure. *The Journal of Economic Perspectives*, **15**(2), 81-102. ISSN 0895-3309.
- [31] MYERS, S. C. and R. G. RAJAN, 1998. The Paradox of liquidity. *The Quarterly Journal of Economics*, **113**(3), 733-771. ISSN 1531-4650.
- [32] NIVOROZHKIN, E., 2002. Capital structures in emerging stock markets: The case of Hungary. *The Developing Economies*, **40**(2), 166-187. ISSN 1746-1049.
- [33] NIVOROZHKIN, E., 2005. Financing choices of firms in EU accession countries. *Emerging Markets Review*, **6**(2), 138-169. ISSN 1566-0141.
- [34] ÖZTEKIN, Ö., 2015. Capital Structure Decisions around the World: Which Factors Are Reliably Important? *The Journal of Financial and Quantitative Analysis*, **50**(3), 301-323. ISSN 1756-9616.
- [35] PINKOVÁ, P., 2012. Determinants of capital structure: Evidence from the Czech automotive industry. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, **60**(7), 217-224. ISSN 2464-8310.

- [36] PRÁŠILOVÁ, P., 2012. Determinanty kapitálové struktury českých podniků. *Ekonomika a management*, **15**(1), 89-104. ISSN 2336-5064.
- [37] PRĘDKIEWICZ, K. and P. PRĘDKIEWICZ, 2015. Chosen determinants of capital structure in small and medium-sized enterprises – Evidence from Poland. *Finanse, Rynki Finansowe, Ubezpieczenia*, **74**(2), 331-340. ISSN 2450-7741.
- [38] PRŮCHA, I. R., 2014. Instrumental Variables/Method of Moments Estimation. In Fisher, M. M. & P. Nijkamp (Ed.), *Handbook of Regional Science*. Heidelberg: Springer, 1597-1617. ISBN 978-3-642-23429-3.
- [39] ROODMAN, D., 2009. How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal*, **9**(1), 86-136. ISSN 1536-8734.
- [40] RŮČKOVÁ, P., 2015a. Vliv podílu dlouhodobého majetku a rentability na využití cizích zdrojů financování firem v odvětví stavebnictví v zemích V4. *Acta academica karviniensia*, **15**(2), 122-135. ISSN 2533-7610.
- [41] RŮČKOVÁ, P., 2015b. Vliv likvidity a rentability na využití zdrojů financování ve zpracovatelských podnicích v zemích V4. *Acta academica karviniensia*, **15**(3), 69-79. ISSN 2533-7610.
- [42] RŮČKOVÁ, P., 2017. Evaluation of profitability impact on selection of financing sources under conditions in Visegrád Group countries in the field of power engineering. *Scientific Papers of the University of Pardubice*, **D**(39), 140-150. ISSN 1804-8048.
- [43] RŮČKOVÁ, P. and N. ŠKULÁŇOVÁ, 2021a. The determination of financial structure in agriculture, forestry and fishing industry in selected countries of Central and Eastern Europe. *E&M Economics and Management*, **24**(3), 58–89. ISSN 2336-5064.
- [44] SALEHI, M. and N. B. MANESH, 2012. A study of the roles of firm and country on specific determinates in capital structure: Iranian evidence. *International Management Review*, **8**(2), 51-62. ISSN 1551-6849.
- [45] SHLEIFER, A. and R. W. VISHNY, 1992. Liquidation values and debt capacity: A market equilibrium approach. *The Journal of Finance*, **47**(4), 1343-1366. ISSN 1540-6261. ISSN 1540-6261.
- [46] SONG, H. S., 2005. *Capital structure determinants – An empirical study of Swedish companies*. Working paper No. 25, The Royal Institute of Technology, Centre of Excellence for Science and Innovation Studies.
- [47] ULLAH, S. et al., 2018. Dealing with Endogeneity Bias: The Generalized Methods of Moments (GMM) for panel data. *Industrial Marketing Management*, **71**, 69-78. ISSN 0019-8501. ISSN 0019-8501.
- [48] VO, X. V., 2017. Determinants of capital structure in emerging markets: Evidence from Vietnam. *Research in International Business and Finance*, **40**, 105-113. ISSN 0275-5319.
- [49] WEILL, L., 2004. What determinants leverage in transition countries? *Czech Journal of Economics and Finance*, **54**(5-6), 234-242. ISSN 2464-7683.
- [50] WILLIAMSON, O. E., 1988. Corporate finance and corporate governance. *The Journal of Finance*, **43**(3), 567-591. ISSN 1540-6261.
- [51] YINUSA, O. G. et al., 2017. Macroeconomic determinants of capital structure of firms: Evidence from Nigeria. *Journal of Knowledge Globalization*, **9**(2), 1-21. ISSN 1938-7008.