Ekonomika Economics
Management Management
Inovace Innovation

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

ANALYSIS OF THE IMPACT OF SELECTED DETERMINANTS ON THE FORMATION OF THE FINANCIAL STRUCTURE OF SELECTED COMPANIES ENGAGED IN THE MANUFACTURE OF VEHICLES AND EQUIPMENT

Nicole Škuláňová, Veronika Šudová
Department of Finance and Accounting and Department of Informatics and Mathematics,
Silesian University in Opava, School of Business Administration in Karvina,
Czech Republic
skulanova@opf.slu.cz, O161041@opf.slu.cz

Abstract:

During the existence of the company, it is necessary to regularly analyze the financial situation of the company. For this purpose, the methods and indicators of financial analysis are used, among which the debt indicators and the related issues of capital or financial structure have an important position, as it is necessary to optimize the ratio of debt and own sources of financing. The analysis of the financial structure formation of companies engaged in the manufacture of vehicles and equipment in the countries of the extended Visegrád Group (V4, Austria, Bulgaria, Slovenia, Romania) is the subject of this research. A total of 2,912 companies are analyzed. These companies are included in the Orbis database and registered by the selected industry. Like everything in life, the creation of financial structure is influenced by a variety of factors, and the aim of research is to determine whether profitability, liquidity, asset structure, non-debt tax shield, GDP growth rate, reference interest rate and inflation rate affect total, long-term and short-term debt. The analyzed period is the period 2009–2018. The Generalized Method of Moments is used to determine the dependencies between the variables. The main finding of the research is that non-corporate factors have the most significant impact on debt levels, within which the reference interest rate has the greatest influence.

Key words:

Financial structure, Generalized Method of Moments, Internal determinants, Macroeconomic determinants.

JEL: G31, G32

1 Introduction

The life cycle of a company consists of different phases (introduction stage, growth stage, maturity stage and decline stage). Each of them lasts different period of time and for each phase, different financial resource is used. Corporate finances are divided by time periods duration (long-term, short-term), by ownership (equity, debts) and by method of acquisition (internal, external). Those six categories create the financial structure of the company, which is the subject of this research. The capital structure, which is a more frequent concept, includes only long-term sources of financing. Every company tries to find the optimal ratio between equity and debts because in case such ratio would be set in a wrong way (e.g. company would incline to use debt sources more often) company could even lead itself to the bankruptcy. Searching for relationship between equity and debt has also become important considering a scientific aspect of the issue as the extensive number of studies was elaborated

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

in the beginning of the last century. However, the most important study, which is connected with the emergence of modern corporate finance, was not written until 1958 when the economists Modigliani and Miller wrote "The Cost of Capital, Corporation Finance and the Theory of Investment". In this study, the authors dealt with the companies´ indebtedness and factors affecting it. The main finding was that whether the company is indebted or not, it has nothing to do with the value of the company and the cost of capital. This study has been and continues to be followed by other authors to this day. Subsequent studies have resulted in two basic theories of capital structure, the trade-off theory (Brealey et al., 2020) and the pecking order theory (Myers, 1984). The first of the theories seeks the optimal debt level by balancing tax benefits with the cost of possible financial distress; the second theory assumes to create a "ladder" of funding sources, from which it is clear that own resources are preferred over external sources.

Since the end of the 1950s, we can find a huge number of studies devoted to this issue in each decade (e.g. Modigliani and Miller (1963), Hirschleifer (1966), Baxter (1967), Toy et al. (1974), Ross (1977), DeAngelo and Masulis (1980), Stulz and Johnson (1985), Williamson (1988), Shleifer and Vishny (1992), Rajan and Zingales (1995), Michaelas et al. (1999), Nivorozhkin (2002), Bauer (2004), Frieder and Martell (2006), Bokpin (2009), Hanousek and Shamshur (2011), Jõeveer (2013), Růčková (2015b), Vo (2017), Bilgin (2019), Sikveland et al. (2022)) and nowadays also new studies are constantly emerging with new determinants and views on the issue. However, despite the large number of studies, it is important to continue to research this area as significant studies have shown that the results always strongly depend on geographical, size and industrial affiliation. The size of the sample examined is also important as there is a difference whether we analyze one company, Top20 or a much larger sample consisting of thousands of companies. For many fields, industries or even countries, there is still not sufficient number of studies with relevant results. According to Myers (2001), there are many factors that affect the financial sources structure. And therefore, no one has been able to create a universal theory that would apply to all companies in the world.

The effort to expand knowledge in the field of corporate indebtedness has become a motivation for this research. The authors of the research did not find a single study dealing with the selected industry. The financial structure of companies engaged in the manufacture of vehicles and equipment and coming from eight selected European countries forming the extended Visegrád Group is the subject of the research. The analysis of this industry is part of a broader research, which focuses on individual industries, primarily out of the primary, secondary and tertiary economic sectors. A total of 2,912 companies were found in the given database. The aim of the research is to find out whether profitability, liquidity, asset structure, non-debt tax shield, GDP growth rate, reference interest rate and inflation rate affect the level of total, long-term and short-term debt. As part of the panel regression, an analysis is performed for the period 2009–2018.

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 and provides with the characterization of industry, examined economies and endogenous variables. Section 3 describes the results of the analysis of variable dependencies using regression analysis and regression decision tree. Section 4 presents the conclusions.

2 Literature Overview

In the introduction, it was suggested that the formation and optimization of the financial structure is influenced by a myriad of determinants, which can be divided into internal and external ones. Internal factors are given by the internal environment of the company itself, while external factors are given by the external environment of the company and these factors are uncontrollable and often surprising. This research includes factors from both of these groups. Internal factors are represented by profitability, liquidity, asset structure and non-debt tax shield of selected companies. External factors are

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

represented by the development of the GDP growth rate, the inflation rate and the level of the reference interest rate of the given economy.

Before characterizing the effects of individual determinants on the debt level, it is necessary to justify why those have been selected. Determinants are chosen with respect to the frequency of their occurrence in previous studies. Many studies have been already elaborated for all selected determinants (for some determinants, there is a larger number of studies, for some of them, there is a less number of studies). Profitability and assets structure are generally the main determinants covered by most studies. The impact of these determinants in the countries of the extended Visegrád Group is often different than in other countries. The remaining determinants (especially liquidity, company size, GDP growth, inflation and interest rate) are no longer part of researches so often. At the same time, the coefficients for external determinants are often statistically insignificant and therefore, they need to be included in research as much as possible in order to achieve more statistically significant links thus extended knowledge, on which future studies can build their assumptions and recommendations. Insignificant results cannot create any expectations and suggestions for companies. Selected determinants are also logically connected with finances to be obtained. A certain profitability level allows using the certain financial sources. Company liquidity is a very common condition when company tries to obtain finances. A certain category of assets serves as a guarantee when obtaining finances. Economic development, the inflation rate and the reference interest rate are also directly connected to funds to be obtained.

In the following paragraphs, the assumptions and previous studies for the individual determinants will be mentioned in turn. It can be said that all factors can have a positive and negative impact on the debt level. It should be added that, unfortunately, there are no comprehensive studies that address all factors; therefore, an extensive literature overview of previous studies is needed to identify all possible impacts and their causes. For this reason, the following paragraphs may seem like a list of studies, but it is necessary to find out what has been found so far and how many authors have already dealt with it.

The literature overview contains both older and newer studies to make a comprehensive overview of the results, as previously the authors dealt mainly with listed large companies and recently the analyzed samples have been more diverse. It is therefore necessary to cite various old studies.

The impact of profitability on the debt level depends on such basic theory of capital structure we will hold. The positive impact is associated with trade-off theory (Brealey et al., 2020). The authors of this theory argue that a more profitable company would lower costs of financial distress and this way the probability of bankruptcy would be reduced. This fact should attract creditors. The positive impact was confirmed in these studies – Klapper et al. (2002), Pinková (2012), Aulová and Hlavsa (2013), Mokhova and Zinecker (2013) in Slovenia, and Růčková (2015a, 2015b, 2017) in the Czech Republic and Hungary. On the contrary, the negative impact is associated with the pecking order theory (Myers, 1984). The main idea of this theory was described in the introduction, namely the creation of preferences "ranking" when using funding sources. This theory claims that when profits increase, the company should use those own resources, e.g. in the form of retained earnings. The negative impact in previous research clearly dominates and can be found in a huge number of studies. This link was found in the following studies –Toy et al. (1974), Nivorozhkin (2002, 2005), Bauer (2004), Weill (2004), De Haas and Peeters (2006), Delcoure (2007), Črnigoj and Mramor(2009), Hernádi and Ormos (2010, 2012), Hanousek and Shamshur (2011), Jõeveer (2013), Mateev et al. (2012), Mokhova and Zinecker (2013) except Slovenia, Prędkiewicz and Prędkiewicz (2015), and Růčková (2015b, 2017) for Poland and Slovakia, Huong (2018), Matemilola et al. (2019), Moradi and Paulet (2019), Touil and Mamoghli (2020), Sikveland and Zhang (2020), Jin (2021), Sikveland et al. (2022).

The composition of corporate assets and the amount of liquid assets are related to the effect of liquidity on the debt level. Highly liquid assets can help a business to survive an unfavourable period. Therefore, each company should have a certain amount of such assets. However, many industries require a large amount of fixed assets to help to secure production; however, in case of financial

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

problems, those fixed assets are very difficult to use and mostly, it is the use at a significant loss. Intangible assets (patents, licenses, customer lists) are also difficult to sell, and if these assets predominate in the balance sheet, the entire company may be sold. Therefore, in addition to a certain amount of liquid assets, companies should finance illiquid assets with equity, while liquid assets should be financed by debt. This effect is supported by the results of e.g. Williamson (1988), Shleifer and Vishny (1992), Mateev et al. (2012), and Růčková (2015b). On the other hand, an explanation related to the potential conflict between managers and owners is used for the negative effect, where managers could freely dispose of corporate assets, so they could expropriate the owners by gradual sale. This influence is supported by Myers and Rajan (1998), Morellec (2001), Frieder and Martell (2006), De Jong et al. (2008), Lipson and Mortal (2009), Mateev et al. (2012), Pinková (2012), Aulová and Hlavsa (2013), and Růčková (2015b), Vo (2017), Bilgin (2019), Ramli et al. (2019), Sikveland and Zhang (2020).

The impact of the asset structure depends on the selected indicator, which represents this variable, and on the form of indebtedness. The following indicator is used in this research and in most previous studies: the ratio of tangible fixed to total assets. Tangible fixed assets are those assets being used as collateral to obtain debt financing. Previous studies suggest two possible impacts, namely a positive impact on the level of long-term debt and a negative impact on the level of short-term debt. These effects occur due to the fact that tangible fixed assets as long-term assets are used to hedge long-term liabilities not short-term ones. According to Titman and Wessels (1988), intangible assets are not used as collateral and, moreover, as has been said for liquidity, are very difficult to sell in case of existential problems. A positive impact can be found in the studies of Michaelas et al. (1999), Klapper et al. (2002), Nivorozhkin (2002), Delcoure (2007), De Jong et al. (2008), Hernádi and Ormos (2010, 2012), Kayo and Kimura (2011), Mokhova and Zinecker (2013), and Vo (2017). In contrast, the negative impact was revealed by Klapper et al. (2002), Nivorozhkin (2002), Bokpin (2009), Mokhova and Zinecker (2013), Vo (2017), Zhang and Liu (2017), Sikveland et al. (2022). However, there may be occasional variations in impacts for this variable. For example, in case of a market-oriented financial system, collateral cannot be envisaged, as it is only used in bank-oriented financial systems, as reported, for example, by Antoniou et al. (2002) and Acedo-Ramirez and Ruiz-Cabestre (2014) in their studies. The size of the company also has a major impact on the expected impacts, as large amounts of tangible assets are usually hold by medium and especially large companies, as stated by Michaelas et al. (1999), Klapper et al. (2002), Onofrei et al. (2015) and Lourenço and Oliveira (2017). Last but not least, it depends on particular sector as sectors with large amount of inventories, such as agriculture or construction, cannot use inventories as collateral; as reported by Aulová and Hlavsa (2013) and Růčková (2015a). It is not customary to use inventories or current assets as collateral for long-term liabilities.

The non-debt tax shield is linked to the tax shield and is considered its substitute, however, unlike the tax shield, which is expected to have a positive impact on the debt level, the non-debt tax shield should have a negative impact on the debt level. This assumption stems from what the non-debt tax shield represents, namely depreciation, which acts as an own source of financing that can be used for corporate financing. A negative relationship has been confirmed, for example, by Michaelas et al. (1999), Wald (1999), Klapper et al. (2002), Song (2005), Hernádi and Ormos (2012), and Acedo-Ramírez and Ruiz-Cabestre (2014), Hang et al. (2018), Ramli et al. (2019). The positive impact on the debt level is explained in two ways, either the value of depreciation and tangible assets can be almost the same (which brings us to the structure of assets) or there may be differences in tax regulations in the countries. Delcoure (2007), Hernádi and Ormos (2010), Aulová and Hlavsa (2013) and Mokhova and Zinecker (2013), Bilgin (2019), Lambrinoudakis et al. (2019), Touil and Mamoghli (2020), Sikveland et al. (2022) found a positive effect.

The economic cycle is associated with the impact of economic development on the debt level. The positive impact of GDP development on debt level means that if GDP grows, debt level should increase. In other words, when the economy is expanding and growing, individual companies in the economy usually thrive, and their profits usually grow and lenders are willing to lend. In a recession, the opposite

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

is true. The positive impact was confirmed in the studies by e.g. Gajurel (2006), Hanousek and Shamshur (2011), Salehi and Manesh (2012), Çekrezi (2013), Mursalim and Kusuma (2017), Yinusa et al. (2017), Huong (2018), Ramli et al. (2019) for Indonesia. The economic cycle also explains the negative impact of GDP on the debt level. If profits increase during expansion then these profits can be used by companies as their own source to finance their activities and the amount of debt can decrease. The negative impact has been confirmed, for example, by Cheng and Shiu (2007), Gajurel (2006), Bastos et al. (2009), Bokpin (2009), Hanousek and Shamshur (2011), Jõeveer (2013), Mursalim and Kusuma (2017), Khémiri and Noubbigh (2018), Bilgin and Dinc (2019), Ramli et al. (2019) for Malaysia.

The impact of the inflation rate on the debt level varies according to the form of debt. Long-term debt is expected to have a negative impact, as the inflation rate should reduce existing debt together with a decline in the real interest rate. This relationship can be found, for example, in Gajurel (2006), Cheng and Shiu (2007), Jõeveer (2013), Mokhova and Zinecker (2014), Öztekin (2015), Daskalakis et al. (2017), Bilgin and Dinc (2019). Short-term debt is expected to have a positive impact, given that creditors can hedge when real interest rates fall. For example, an interest rate can be linked to inflation. However, hedging is usually short-lived. This relationship can be found in Hanousek and Shamshur (2011), Mokhova and Zinecker (2014), Yinusa et al. (2017), Huong (2018), Ramli et al. (2019).

The effect of the external funding sources price should be based on a logical assumption that the higher the rate, the more expensive the funding sources and the lower the debt level, and vice versa. However, the impact of this variable can be explained differently, creating different expected impacts. Yinusa et al. (2017) state the influence of the quality of the institutional, legal and regulatory environment and divide the economies into developed and developing. The result of the study is that developed economies have a high-quality institutional environment, good creditor protection and legal enforcement of liabilities, while developing economies may lack the quality in these areas. It follows that developed economies should have a positive impact and developing economies a negative impact.

3 Data and Methodology

Companies from 8 selected countries of Central and Eastern Europe are the subject of this research. Specifically, these are the countries of the so-called extended Visegrád Group, which includes the Czech Republic (CZ), Slovakia (SK), Poland (PL), Hungary (HU), Austria (AT), Slovenia (SI), Romania (RO) and Bulgaria (BG). At first glance, it may seem that the economies do not belong together, but the representatives of those eight economies work together in different areas (e.g. agriculture, energy, climate policy), Austria wanted to join the V4 itself, territorial development coordination is ongoing with Bulgaria and Romania. Obviously, given economies have similar needs and problems, and although V4 is a "closed club", the term "V4+2" or "V4+4" is commonly used. Of course, the Austrian economy is somewhere else than the Romanian or Bulgarian ones in terms of indicators, but it is a relatively well-established combination of these economies in the extended Visegrád group, whose companies have therefore become the subject of this research.

As for the selected industry, the NACE classification C – Manufacturing and more specifically sub-industries 29 – Manufacture of motor vehicles, trailers and semi-trailers and 30 – Manufacture of other transport equipment are concerned. The selected industries are one of the most important industries in the world, as they are followed by the transport industry and global logistics and trade. Within the research, the companies are not divided by individual divisions; however, it is appropriate to characterize the composition of the industry. The researched sample includes all companies from the Orbis database belonging to the given industries. The sample contains a total of 2,912 companies. Table 1 shows the number of companies in each economy and in each sub-industry. The research was carried out for the period 2010–2018.The period was chosen with regard to the availability of data in the Orbis database. Of course, it was possible to select a few companies from the given economies and examine these companies in more detail, but this would not give an overall view on the industry. Therefore, the period is not entirely topical, and especially after the covid pandemic and the current war

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

in Ukraine, not all recommendations may fully apply. However, the analysis and recommendations are usually linked to the period and conditions during it, and therefore the obsolescence of the period is not an obstacle for conducting this research.

Table 1: Number of companies in individual economies and sub-industries

	2910	2920	2931	2932	3011	3012	3020	3030	3040	3091	3092	3099
CZ	46	52	64	321	20	0	38	43	5	33	24	5
SK	20	18	17	129	2	1	8	7	2	0	6	2
PL	68	145	49	372	75	63	43	32	4	4	57	25
HU	23	41	29	132	4	1	15	10	0	2	8	3
AT	24	60	8	43	3	10	12	8	1	2	5	13
SI	9	17	12	24	0	5	2	4	0	1	3	0
BG	0	7	17	29	9	2	14	1	0	0	11	0
RO	13	37	50	168	158	8	19	19	0	0	14	2

Source: Author's calculations based on data from database Orbis.

The aim of the research is to find out whether profitability, liquidity, asset structure, non-debt tax shield, GDP growth rate, reference interest rate and inflation rate affect the level of total, long-term and short-term debt. Within this goal, two research questions were formulated:

- Are there differences in impacts in terms of the different maturities of the used funding sources?
- What impact does the price of external financial sources have on the used sources?

Due to the overview of previous studies, it is possible to create assumptions of the resulting links for individual determinants. These assumptions are presented in Table 2.

Table 2: Expected impacts of determinants on the indebtedness level

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

Source: Author's calculations based on literature overview.

3.1 Methodology

A panel regression with respect to the amount of input data was selected to analyze the dependencies between the individual determinants and the debt level. However, the often-used least squares method is not entirely suitable, as the basic premise of this method is stationary time series, which macroeconomic series in particular may not meet, and thus the variables would be eliminated. At the same time, a large part of the literature of spatial econometrics focuses on cross-sectional or panel data, where the time dimension is small. Therefore, for a small-time dimension, estimation will be

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

possible only if a gentle structure is placed on the form of spatial interactions, which according to the author can be, for example, the Generalized Method of Moments (GMM). (Průcha, 2014)

This method is also recommended by other authors, such as Antoniou et al. (2002), Gaud et al. (2005), Mateev et al. (2012), Acedo-Ramírez and Ruiz-Cabestre (2014), Růčková (2017), Vo (2017), Yinusa et al. (2017), Matemilola et al. (2019), Touil and Mamoghli (2020).

Therefore, a modified panel regression was chosen in the form of a two-stage Generalized Method of Moments system, the development of which had a major impact on research in finance. This method overcomes a number of limitations of other methods – for example, there is no need for the already mentioned stationary data, nor is there a need to create distribution assumptions, which means that variables can show serial correlation and conditional heteroskedasticity. (Jagannathan et al., 2002)

The GMM method has its origins in these studies: Arellano and Bond (1991), Arellano and Bover (1995), Blundell and Bond (1998). At the same time, the general assumptions of this method are defined in these studies: short time series and many observations, linear functional relationship, one endogenous variable on the left, which is dynamic depending on its past values, exogenous variables, which may not be strictly exogenous (correlation with past or present errors), fixed individual effects and the autocorrelation and heteroskedasticity within individual observations, but not across them. The GMM model thus solves the endogeneity problem, which means the correlation between the explanatory variable and the error term. (Roodman, 2009)

The GMM method uses certain internal tools (lagged value of a dependent variable, internal transformation processes) in solving unobserved heterogeneity, simultaneity and dynamic endogeneity, which are sources of endogeneity. (Ullah et al., 2018)

The plausibility of the resulting model must always be tested with respect to the fact that variables can show autocorrelation and heteroskedasticity. The presence of these phenomena could skew the results. There are several tools to test credibility. In this research, the Sargan test is used to show whether we achieve the same results with a slight change in parameters. If its final value is higher than 0.05, the model has been compiled correctly and we can interpret its results. (Ullah et al., 2018)

The equation for this research looks like this:

$$Y_{it} = \alpha_0 + \beta_1 * Y_{it-1} + \beta_2 * ROA_{it} + \beta_3 * L2_{it} + \beta_4 * SA_{it} + \beta_5 * NDTS_{it} + \beta_6 * GDP_{it} + \beta_7 * INF_{it} + \beta_8 * IR_{it} + \varepsilon_{it} \quad (1)$$

where the endogenous variable is indebtedness in three forms (DER_{it}, DER_L_{it}, DER_S_{it}), where DER denotes the debt-to-equity ratio for the i-th number of companies in a given economy in a particular sector during period t (2009–2018). The right side of the equation consists of individual determinants (ROE, L2, SA, NDTS, GDP, INF, IR) and automatic components of the model – annual lagged debt value, constant α and the so-called random component ε, which includes all other factors that affect the amount of debt.

3.2 Variables

In the previous section, panel regression was discussed, which is used to determine the dependencies between variables. In this method, the variables are divided into endogenous and exogenous. The endogenous variable is the level of companies' debt, which is represented by the debt-equity ratio. With regard to the research aim, this indicator takes three forms, namely total debt (DER = ratio of total liabilities to equity), long-term debt (DER_L = ratio of long-term liabilities to equity) and short-term debt (DER_S = ratio of short-term liabilities to equity).

Exogenous variables are represented by seven selected determinants. Profitability takes the form of the ROE indicator, which in this case is the ratio of earnings before interest and taxes and equity. The L2 indicator (quick ratio) was selected from the liquidity indicators, i.e. the ratio of current assets excluding inventories and short-term liabilities. The structure of assets can also be expressed by

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

a number of indicators. In this research, it is the share of tangible fixed assets and total assets. The non-debt tax shield is represented by the ratio of depreciation and total assets. The remaining three variables represent the external environment of companies and are the GDP growth rate at market prices, the inflation rate and the reference interest rate of the given economy.

3.3 Economic development in individual countries

This section deals with a brief analysis of the economic development of selected countries during the period 2009–2018. A detailed description of key events in each country is important for the interpretation of statistically significant results, and therefore this section is only a brief summary of the most important events. The analyzed period is connected with several very significant economic events, which influenced many economies. The beginning of the period is associated with the financial crisis, which erupted in full in 2008 and in Europe was transformed into a European debt crisis in the following years. In 2012 and 2013, there was a global economic slowdown and global demand declined at the end of the period. In addition to these world events, each of the selected economies also had its internal problems and crises.

In five of the eight selected countries, development was flowing more or less without major fluctuations and the economies in question were not hit hard by the key events mentioned. This group of countries includes Poland, Bulgaria, the Czech Republic, Slovakia and Austria. The Polish economy, as one of few economies in the world, did not experience an economic decline during the entire period analyzed and showed a good growth rate. The Bulgarian and Slovak economies were affected by the financial crisis, but insignificantly, growing by average 2.5 % per year during the period under review. The Czech Republic recorded a decline in 2012/2013, which was caused by a decline in household consumption and investments. In Austria, the development of basic economic indicators was not favourable, but apart from the introduction of a deposit guarantee, the economy was no longer constrained.

The remaining three countries (Hungary, Romania and Slovenia) belong to the countries that have been hit hard by the global financial crisis. In Hungary and Romania, the government even had to apply for an international loan. In Romania, this loan served to kick-start the credit market and strength foreign exchange reserves. The Hungarian economy was struggling with poor government management and the orientation of loans that people and businesses took in foreign currencies, which strengthened against the forint during the crisis. The Slovenian economy was hit by the real estate and mortgage crises and subsequently by the banking crisis. However, the local government was able to solve these problems on its own and no international assistance was needed.

3.4 Development of endogenous variables in individual countries

Before interpreting results, it is appropriate to analyze the endogenous variable, i.e. corporate debt. In Table 3, we can see the amount and composition of liabilities and capital structure in individual considered economies.

Non-current liabilities (NCL) include long term liabilities of the company, which consist of long-term financial debts (e.g. loans, credits, bonds), other long-term liabilities (trade debts, group companies, pension loans, etc.), provisions (social security, taxes, etc.) and deferred taxes. Current liabilities (CL) consist of loans (e.g. to credit institutions, part of long-term financial debts payable within the year, bonds, etc.), debts to suppliers and contractors (trade creditors), and other current liabilities (pension, personnel costs, taxes, intragroup debts, accounts received in advance, etc.). Debt is the sum of the non-current and current liabilities. Equity includes capital and other shareholders funds. Debt-equity ratio (DER) is a share of total liabilities and equity.

We will first look at the composition of liabilities. It is clear from Table 3 that, in addition to Austrian companies, short-term liabilities clearly predominate, accounting for about 75 % of total liabilities. In the

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

case of Austrian companies, on the other hand, long-term liabilities predominate, accounting for 78 % of total liabilities.

Table 3: The amount and composition of liabilities and capital structure

	Average Non-current Liabilities	Average Current Liabilities	Average Equity	Average Debt	Average DER
CZ	20 %	80 %	48 %	52 %	109 %
SK	19 %	81 %	41 %	59 %	146 %
PL	28 %	72 %	40 %	60 %	149 %
HU	29 %	71 %	70 %	30 %	43 %
AT	78 %	22 %	43 %	57 %	133 %
SI	29 %	71 %	41 %	59 %	147 %
BG	27 %	73 %	46 %	54 %	117 %
RO	24 %	76 %	33 %	67 %	203 %

Source: Author's calculations based on data from database Orbis.

If we focus on the composition of financing sources, we can see that, apart from Hungarian companies, there is a slight tendency towards debt financing, which accounts for about 58 % of financing sources. The situation is different for Hungarian companies, with equity clearly dominating here, accounting for 70 % of total funding sources. Based on this characteristic, we come to the value of the debt-equity ratio, the value of which should not exceed 100 % and ideally should range between 30–80 %, which is considered the optimum when the company is not threatened due to huge debt. However, it really depends on the internal companies policies; some companies may practice aggressive financial policy when this indicator may exceed up to e.g. 500 % and the company´s existence can be put in danger. As seen in the table above, the DER is between 109 and 203 % except Hungary, whose only indebtedness is optimal.

4 Results and Discussion

In Table 4, we can see the results of panel regression using the GMM method for selected economies. At first glance, it is clear that the numbers of rows for individual forms of debt do not correspond to the numbers of selected economies. Therefore, there is the need to perform the Sargan test, which was discussed in the Methodology section. This test is used to verify the credibility of the resulting models with respect to the possible presence of autocorrelation and heteroskedasticity. Economies that are not represented by individual forms of debt did not pass this test, as the resulting J-stat. was less than 0.05. For the remaining economies, this value has been exceeded and the resulting models (models in Table 4) are plausible.

In the following paragraphs, the individual determinants for individual economies will be discussed, but some results can be summarized for all economies together, because the values of the coefficients reach very low numbers and in fact, there can be no significant effect on the debt level. This is the lagged value of debt and liquidity. As for the relationship between current and past debt, the negative impact clearly prevails. Given the size of the coefficients, we can only talk about an indication of the effect of this variable. The negative impact means that if companies used debt financing in the previous period, they are unlikely to use it in the following period and the level of debt will thus decrease. A positive relationship means the exact opposite, namely that if companies used debt financing in the previous period, they are likely to use it in the following period as well, and the debt level will increase.

In terms of liquidity, the negative impact on the debt level dominates in this case. The negative impact could mean that companies do not have highly liquid assets, as these assets are usually

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

acquired on debt. To confirm this statement, it would be appropriate to look at the detailed structure of the assets. It can also be conflicts between owners and managers and expropriation of owners. However, even that would require internal information. However, the values of the coefficients are very low, and therefore, we cannot speak of a significant effect thus a detailed analysis is not necessary. This result confirms the results of e.g. Mateev et al. (2012) and Aulová and Hlavsa (2013). A positive impact on the companies´ debt level can be attributed to higher amounts of liquid assets, as reported by Williamson (1988) and Shleifer and Vishny (1992). Even in this case, the values of the coefficients are very low and there is no need to deal with the composition of assets.

We now turn to the results for profitability and GDP growth, as these two variables often complement each other. If we look at the coefficients for profitability, we see that it is about half and half in terms of the resulting impacts. Both positive and negative effects on the debt level are justified. Polish, Bulgarian, Czech and Romanian companies have a positive impact on debt levels. At the same time, these results are supported by the results for GDP, for which positive effects on the debt level were also found. The positive impact means that, for example, in the case of economic growth, companies usually grow profits and thrive overall, which reduces the risk of bankruptcy and therefore lenders are willing to lend them additional funds. The positive impact of profitability can be found, for example, in the studies of Klapper et al. (2002), Pinková (2012) and Aulová and Hlavsa (2013) and the positive impact of GDP can be found in the studies of Salehi and Manesh (2012), Mursalim and Kusuma (2017) and Yinusa et al. (2017). The Polish economy did not experience a decline in GDP during the period analyzed and it is one of the few economies in the world that did not decline even during the financial crisis in 2008. This situation was helped by the co-organization of the European Football Championship in 2012. The Bulgarian economy also did not face significant problems and grew by an average of 2.2 % per year over the period. The Czech economy experienced a smaller recession in 2012 and 2013, however, for the rest of the period under review, the economy grew by an average of 3.6 % per year. The Romanian government had to seek international help as a result of the financial crisis, but apart from 2010, the economy grew by an average of 3.8 % per year. From these brief characteristics, we can conclude that the economies have prospered and the situation has been favourable for increasing debt.

Profitability of Slovenian, Slovak, Hungarian and Austrian companies, on the other hand, had a negative impact on the debt levels and these results are also supported by the results for the impact of GDP. The identified negative effects for profitability are followed by studies such as of Črnigoj and Mramor (2009), Hernádi and Ormos (2010, 2012), Mokhova and Zinecker (2013), and Růčková (2015b, 2017). The negative effects for GDP follow the results of studies by Bastos et al. (2009), Bokpin (2009) and Jõeveer (2013). The negative impact means that if these companies grow their profits (which is common in good times), companies should prioritize rising profits as a source of financing, and the debt level should therefore fall. The Austrian and Slovak economies did not suffer from major problems and grew throughout the period under review, averaging 1.5 % (AT) and 3.1 % (SK) per year. The Slovenian economy went through a real estate and banking crisis, and in addition fell into recession during 2012 and 2013. However, for the rest of the period under review, this economy grew by an average of 3.4 % per year. Hungary was hit hard by the financial crisis and the government had to ask for international help. However, apart from a smaller decline in 2012, the economy was otherwise doing well and growing at an average of 3.6 % per year. We can see that those economies had been more successful and their companies had been able to generate higher profits and use them to finance their activities.

The relationship between asset structure and debt levels should be positive for long-term debt and negative for short-term debt, as found in the studies of Klapper et al. (2002), Nivorozhkin (2002), Song (2005), Cheng and Shiu (2007), Mateev et al. (2012) and Vo (2017). The positive impact means that the higher the share of tangible fixed and total assets, the higher the value of debt. This relationship assumes that tangible fixed assets can be used as collateral, usually for long-term debt, which is not the

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

case for short-term debt. The results of this research show that the debt levels of Slovenian, Slovak, Bulgarian, Polish and Romanian companies are positively affected by the asset structure, while the debt levels of Hungarian and Austrian companies are negatively affected by the asset structure. These results may occur due to the fact that the group of countries with a positive impact reports on average 44 % of tangible fixed assets within total assets. Thus, less than half of the assets can be used as collateral for additional debt financing. Hungarian companies have 23 % and Austrian companies 28 % of such assets in total assets. Although the ratio is high compared to other industries, this ratio is probably not sufficient to increase debt.

Table 4: Results of GMM models

Total debt								
	DER(-1)	**ROE**	**L2**	**SA**	**NDTS**	**GDP**	**INF**	**IR**
PL		8.7912[a]	-0.0350[c]		-7.7655[a]	40.9552[a]		
AT	-0.4011[a]			-7.3477[b]		-3.8098[b]	68.0820[a]	
SI	0.0689[a]	-14.6367[b]	-0.6309[c]	17.0686[b]				110.9662[a]
BG	-0.0255[a]	13.7392[a]			-9.1503[a]		-31.1300[a]	245.6184[a]
Long-term debt								
CZ		4.7020[a]			-15.0226[a]		-6.5323[b]	
SK	-0.2262[a]	-1.0382[b]		2.4230[a]		-29.1356[a]		61.7722[b]
HU	-0.1284[a]		-0.0434[b]	-14.9147[a]			-187.2304[a]	-68.3159[a]
SI	-0.3208[a]		0.3146[a]		-4.6711[b]	-42.9008[a]	-149.2576[a]	
BG		3.5450[a]		1.5604[a]		18.9322[a]		143.5248[a]
Short-term debt								
PL	0.0132[a]		0.0021[a]	1.7719[b]			77.7935[a]	90.5969[b]
HU	0.0579[a]	-2.3059[a]	-0.0012[b]		-20.224[b]	-16.5807[a]		
AT	-0.6831[a]	-6.2441[a]		-4.7898[a]	-27.7488[a]		50.5281[a]	
RO		1.3425[a]		2.4650[c]		6.7246[a]		-120.5911[a]

Source: Author's calculations based on data from database Orbis.

The non-debt tax shield should have a negative effect on the debt level. This assumption was confirmed in all cases and thus supported the results of the Wald (1999), Klapper et al. (2002), Hernádi and Ormos (2012). Companies with negative coefficients benefit from depreciation, which serves as their own source of financing, and should therefore acquire more assets that can be depreciated and, if possible, assets having higher depreciation rates. The resulting companies have more than 23 % tangible fixed assets within total assets. These assets are those being depreciated. One-fifth or more of such assets in total assets thus have considerable scope for depreciation.

The resulting coefficients for the impact of the inflation rate on the debt level more or less meet the expected impacts. The results for long-term and short-term debt are exactly as expected based on studies by Cheng and Shiu (2007), Hanousek and Shamshur (2014), Mokhova and Zinecker (2014), and Öztekin (2015). We can see one positive and one negative coefficient in total debt. The negative coefficient is probably based on the fact that short-term debt is expected to have a positive impact and that short-term debt clearly prevailed among Bulgarian companies. On the contrary, the positive coefficient may be due to the fact that Austrian companies found a positive impact on the amount of short-term debt, which was reflected in the total debt, which is unexpected, as long-term liabilities predominate in these companies. The average inflation rate in the Czech Republic was 1.6% during the period under review, in Hungary 2.4%, in Bulgaria 1.5% and in Slovenia 1.2%. If we look at the values of

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

the reference interest rate, which averaged 0.4% (CZ), 3.1% (HU) and 0.3% (SI), we see that the inflation rate could significantly reduce real interest rates, thus reducing debt. On the other hand, the average inflation rate during the period under review was 1.9% in Austria and 1.5%in Poland. For most of the period, the inflation rate fluctuated around this value in various ways, but it never reached, for example, double-digit values in order to hedge against its growth. Although a positive impact on short-term debt is expected, it is difficult to be explained for these companies and economies.

The resulting coefficients for the impact of the inflation rate on the debt level more or less meet the expected impacts. The results for long-term and short-term debt are exactly as expected based on studies by Cheng and Shiu (2007), Hanousek and Shamshur (2014), Mokhova and Zinecker (2014), and Öztekin (2015). We can see one positive and one negative coefficient for total debt. The negative coefficient is probably based on the fact that short-term debt is expected to have a positive impact and that short-term debt clearly prevailed among Bulgarian companies. On the contrary, the positive coefficient may be due to the fact that Austrian companies found a positive impact on the amount of short-term debt, which was reflected in the total debt, which is unexpected, as long-term liabilities predominate in these companies. The average inflation rate in the Czech Republic was 1.6 % during the period under review, in Hungary 2.4 %, in Bulgaria 1.5 % and in Slovenia 1.2%. If we look at the values of the reference interest rate, which averaged 0.4 % (CZ), 3.1 % (HU) and 0.3 % (SI), we see that the inflation rate could significantly reduce real interest rates, thus reduce the debt. On the other hand, the average inflation rate during the period under review was 1.9 % in Austria and 1.5 % in Poland. For most of the period, the inflation rate fluctuated around this value in various ways, but it never reached, for example, double-digit values in order to hedge against its growth. Although a positive impact on short-term debt is expected, it is difficult to be explained for these companies and economies.

The last determinant, the reference interest rate is; it was expected to have a negative impact on the debt level. We see that the resulting impacts differ. We will first focus on the positive effects we can see in Slovenian, Slovak, Polish and Bulgarian companies. Slovakia and Slovenia are part of the euro area and are subject to the monetary policy of the European Central Bank, which tried its best to help with various crises and economic problems during the period under review, with an average reference interest rate of 0.34 %. The Bulgarian central bank also wanted to help the economy, and the interest rate in this country was also very low, averaging 0.05 %. Such low interest rates brought very low costs of debt financing, which thus became very attractive, and therefore the debt level of companies rose. Poland is an exception, where, at the beginning of the period, the reference interest rate ranged between 3.5 and 4.5 %. However, for the rest of the period, the rate fell and averaged 2.5 %, which is still high compared to the mentioned economies; but in the last four years of review period, this rate was 1.5 %. The decline in the rate may have meant an increase in the attractiveness of debt financing, even though the average rate appeared to be higher. On the other hand, we find a negative impact on Hungarian and Romanian companies. The Romanian reference interest rate averaged 3.56 % with a peak of 6.25 % in 2010. The Hungarian interest rate averaged around 3.07 % with a peak of 7 % in 2011. We see that the values are really high compared to the rest of the economies, but it must be added that they gradually decreased since their peaks in 2010/2011 and, for example, the Hungarian interest rate reached 0.9 %in 2016–2018, which already brought the advantage of lower debt financing costs. Unfortunately, interest rates were higher for most of the period under review, and their resulting development outweighed the resulting coefficient.

A brief summary should be provided at the end of this section. If we look at the level of coefficients, we can say unequivocally that non-corporate factors, in which the reference interest rate significantly dominates, have a fundamental effect on the indebtedness level. Its resulting impact is related to the level of interest rates in individual economies; however, the results follow a more or less basic logic, which says that the higher the interest rate, the higher the cost of debt financing, and the less companies will use this method of financing.

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

5 Conclusions

This research looked at the financial structure of companies from the Manufacture of motor vehicles, trailers and semi-trailers and Manufacture of other transport equipment industries, which are some of the most important industries in Europe and the world, as they are followed by the transport industry and global logistics and trade. The analyzed companies operate in eight selected European economies - the Czech Republic, Slovakia, Poland, Hungary, Austria, Bulgaria, Romania and Slovenia. The aim of the research was to find out whether profitability, liquidity, asset structure, non-debt tax shield, GDP growth rate, reference interest rate and inflation rate affect the level of total, long-term and short-term debt. Within this goal, two research questions were formulated: 1. Are there differences in impacts in terms of the different maturities of the used funding sources? 2.What impact does the price of external financial sources have on the used sources?

A total of 2,912 companies were analyzed during the period 2010–2018. The Generalized Method of Moments was used to determine the impacts of selected factors.

Given the number of determinants, economies and endogenous variables, it is clear that the results are plentiful and cannot be summarized in a few sentences. However, the main finding of the research is that the indebtedness level of selected companies is very significantly influenced by the determinants of the companies´ external environment (measured by the value of coefficients) and at the same time, it is necessary to consider the effect of profitability (measured by the frequency of coefficients).

Out of the non-corporate determinants, the reference interest rate, which reached the highest coefficients in most cases, has a significant effect on the indebtedness level. The impacts vary from one economy to another, but it can be said that the direction of the impact follows the basic assumption – the higher the cost of acquiring debt financing, the less it will be acquired. The reference interest rate therefore has a positive impact on the indebtedness level in economies, which were supported by central banks, with interest rates being zero or very low for most of the period under review. These are the Czech Republic (average rate during the period under review 0.4 %), Slovakia, Slovenia, Austria (0.3 %) and Bulgaria (0.05 %). In contrast, in higher-rate economies, the impact of the interest rate on the debt level was negative. These are Romania (3.6%) and Hungary (3.1 %). The only exception Polish companies are which were found to have a positive impact on the debt level, even though the average interest rate was 2.5 %. At the beginning of the period, this rate ranged between 3.5 and 4.5 %. However, for the rest of the period, the rate fell and averaged 2.5 %, which is still a high value compared to the mentioned economies; in the last four years of the reviewed period, this rate was 1.5 %. The decline in the rate may have meant an increase in the attractiveness of debt financing, even though the average rate appeared to be higher.

In terms of profitability, it can be stated that both negative and positive impacts on the debt level were found. Given that the selected economies did not more or less go through any major problems in the analyzed period and some had a significant GDP growth rate, both impacts can be easily explained. The results suggest that Polish, Bulgarian, Czech and Romanian companies were taking advantage of creditors' willingness to lend and thus increased their debt in times of economic prosperity. On the other hand, Slovenian, Slovak, Hungarian and Austrian companies used these profits as a source to finance their activities due to growing welfare profits.

6 Acknowledgments

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.

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

7 Bibliography

Acedo-Ramírez, M. A., & Ruiz-Cabestre, F. J. (2014). Determinants of capital structure: United Kingdom versus continental European countries. *Journal of International Financial Management & Accounting*, 25(3), 237-270. DOI: 10.1111/jifm.12020

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. DOI: 10.2139/ssrn.302833

Arellano, M., & Bond, S. (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. DOI: 10.2307/2297968

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68, 29-51. DOI: https://doi.org/10.1016/0304-4076(94)01642-D

Aulová, R., & Hlavsa, T. (2013). Capital structure of agricultural businesses and its determinants. *Agris on-line Papers in Economics and Informatics*, 5(2), 23-36.

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. DOI: 10.2139/ssrn.1365987

Bauer, P. (2004). Determinants of capital structure: Empirical evidence from the Czech Republic. *Czech Journal of Economics and Finance*, 54(1-2), 2-21.

Baxter, N. (1967). Leverage, Risk of Ruin and the Cost of Capital. *The Journal of Finance*, 22(3), 395-403. DOI: https://doi.org/10.1111/j.1540-6261.1967.tb02975.x

Bilgin, R. (2019). Relative importance of country and firm-specific determinants of capital structure: A multilevel approach. *Prague Economic Papers*, 28(5), 499-515. DOI: 10.18267/j.pep.700

Bilgin, R., & Dinc, Y. (2019). Factoring as a determinant of capital structure for large firms: Theoretical and empirical analysis. *Borsa Istanbul Review*, 19(3), 273-281. DOI: https://doi.org/10.1016/j.bir.2019.05.001

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115-143. DOI: https://doi.org/10.1016/S0304-4076(98)00009-8

Bokpin, G. A. (2009). Macroeconomic development and capital structure decisions of firms: Evidence from emerging market economies. *Studies in Economics and Finance*, 26(2), 129-142. DOI: 10.1108/10867370910963055

Brealey, R. A. et al. (2020). Principles of Corporate Finance. 10th Ed.: McGraw-Hill, New York.

Çekrezi, A. (2013). The determinants of capital structure: Evidence from Albania. *Academic Journal of Interdisciplinary Studies*, 2(9), 370-376. DOI: 10.5901/mjss.2014.v5n13p482

Cheng, S. R., & Shiu, C. Y. (2007). Investor protection and capital structure: International evidence. *Journal of Multinational Financial Management*, 17(1), 30-44. DOI: 10.1016/j.mulfin.2006.03.002

Črnigoj, M., & Mramor, D. (2009). Determinants of capital structure in emerging European economies: Evidence from Slovenian firms. *Emerging Markets Finance & Trade*, 45(1), 72-89. DOI: 10.2753/REE1540-496X450105

Daskalakis, N. et al., (2017). The behaviour of SMEs' capital structure determinants in different macroeconomic states. *Journal of Corporate Finance*, 46, 248-260. DOI: https://doi.org/10.1016/j.jcorpfin.2017.07.005

De Haas, R., & Peeters, M. (2006). The dynamic adjustment towards target capital structures of firms in transition economies. Economics of Transition, 14, 133-169. DOI: 10.1111/j.1468-0351.2006.00237.x

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. DOI: https://doi.org/10.1016/j.jbankfin.2007.12.034

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

DeAngelo, H. & Masulis, R. W. (1980). Optimal capital structure under corporate and personal taxation. *Journal of Financial Economics*, 8, 3-29. DOI: https://doi.org/10.1016/0304-405X(80)90019-7

Delcoure, N. (2007). The determinants of capital structure in transitional economies. *International Review of Economics & Finance*, 16(3), 400-415. DOI: 10.1016/j.iref.2005.03.005

Frieder, L., & Martell, R. (2006). *On capital structure and the liquidity of a firm's stock*. Purdue University, Krannert School of Management. DOI: http://dx.doi.org/10.2139/ssrn.880421

Gajurel, D. P. (2006). *Macroeconomic influences on corporate capital structure*. DOI: 10.2139/ssrn.899049

Gaud, P. et al. (2005). The capital structure of Swiss companies: An empirical analysis using dynamic panel data. *European Financial Management*, 11, 51-69. DOI: https://doi.org/10.1111/j.1354-7798.2005.00275.x

Hang, M. et al.(2018). Measurement matters—A meta-study of the determinants of corporate capital structure. *The Quarterly Review of Economics and Finance*, 68, 211-225. DOI: https://doi.org/10.1016/j.qref.2017.11.011

Hanousek, J., & Shamshur, A. (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. DOI: 10.1016/j.jcorpfin.2011.07.004

Hernádi, P., & Ormos, M. (2010). Capital structure and its choice in Central and Eastern Europe. *Acta Oeconomica*, 62(2), 229-263. DOI: 10.1556/AOecon.62.2012.2.5

Hernádi, P., & Ormos, M. (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. DOI: 10.1080/1406099X.2012.10840517

Hirshleifer,J. (1966). Investment Decision under Uncertainty: Applications of the State-Preference Approach. *The Quarterly Journal of Economics*, 80(2), 252-277. DOI: https://doi.org/10.2307/1880692

Huong, P. T. Q. (2018). Macroeconomic factors and corporate capital structure: Evidence from listed joint stock companies in Vietnam. *International Journal of Financial Research*, 9(1), 31-40. DOI: https://doi.org/10.5430/ijfr.v9n1p31

Jagannathan, R. et al. (2002). Generalized Method of Moments: Applications in Finance. *Journal of Business and Economic Statistics*, 20(4), 470-481. DOI: https://doi.org/10.1198/073500102288618612

Jin, X., 2021. Corporate tax aggressiveness and capital structure decisions: Evidence from China. *International Review of Economics & Finance*, 75, 94-111. DOI: https://doi.org/10.1016/j.iref.2021.04.008

Jõeveer, K. (2013). Firm, country and macroeconomic determinants of capital structure: Evidence from transition economies. *Journal of Comparative Economics*, 41(1), 294-308. DOI: 10.1016/j.jce.2012.05.001

Kayo, E. K., & Kimura, H. (2011). Hierarchical determinants of capital structure. *Journal of Banking & Finance*, 35(2): 358-371. DOI: https://doi.org/10.1016/j.jbankfin.2010.08.015

Khémiri, W., & Noubbigh, H. (2018). Determinants of capital structure: Evidence from sub-Saharan African firms. *The Quarterly Review of Economics and Finance*, 70, 150-159. DOI: https://doi.org/10.1016/j.qref.2018.04.010

Klapper, L. F. et al. (2002). *Small- and Medium-Size Enterprise Financing in Eastern Europe*. World Bank Policy Research Working Paper No. 2933.

Lambrinoudakis, C. et al. (2019). Capital structure and financial flexibility: Expectations of future shocks. *Journal of Banking & Finance*, 104, 1-18. DOI: https://doi.org/10.1016/j.jbankfin.2019.03.016

Lipson, M. L., & Mortal, S. (2009). Liquidity and capital structure. *Journal of Financial Markets*, 12(4), 611-644. DOI: https://doi.org/10.1016/j.finmar.2009.04.002

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

Lourenço, A. M., & Oliveira, E. C. (2017). Determinants of debt: Empirical evidence on firms in the district of Santarém in Portugal. *Contaduría y Administración*, 62(2), 625-643. DOI: https://doi.org/10.1016/j.cya.2016.06.010

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. DOI: https://doi.org/10.1016/j.ribaf.2012.05.002

Matemilola, B. T. et al.(2019). Impact of institutional quality on the capital structure of firms in developing countries. *Emerging Markets Review*, 39, 175-209. DOI: https://doi.org/10.1016/j.ememar.2019.04.003

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. DOI: https://doi.org/10.1023/A:1008010724051

Modigliani, F., & Miller, M. H. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *American Economic Association*, 48(3), 261-297.

Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *American Economic Association*, 53(3), 433-443.

Mokhova, N., & Zinecker, M. (2013). The determinants of capital structure: The evidence from the European Union. *Acta Universitatis Agriculturae et SilviculturaeMendelianaeBrunensis*, 61(7), 2533-2546. DOI: 10.11118/actaun201361072533

Mokhova, N., & Zinecker, M. (2014). Macroeconomic factors and corporate capital structure. *Procedia – Social and Behavioral Sciences*, 110, 530-540. DOI: https://doi.org/10.1016/j.sbspro.2013.12.897

Moradi, A., & Paulet, E. (2019). The firm-specific determinants of capital structure – An empirical analysis of firms before and during the Euro Crisis. *Research in International Business and Finance*, 47, 150-161. DOI: https://doi.org/10.1016/j.ribaf.2018.07.007

Morellec, E., 2001. Asset liquidity, capital structure, and secured debt. *Journal of Financial Economics*, 61(2), 173-206. DOI: https://doi.org/10.1016/S0304-405X(01)00059-9

Mursalim, M. M., & Kusuma, H. (2017). Capital structure determinants and firms' performance: Empirical evidence from Thailand, Indonesia and Malaysia. *Polish Journal of Management Studies*, 16(1), 154-164. DOI: 10.17512/pjms.2017.16.1.13

Myers, S. C. (1984). The capital structure puzzle. *Journal of Finance*, 39, 575-592. DOI: 10.2307/2327916

Myers, S. C. (2001). Capital structure. *The Journal of Economic Perspectives*, 15(2), 81-102. DOI: 10.1257/jep.15.2.81

Myers, S. C., & Rajan, R. G. (1998). The Paradox of liquidity. *The Quarterly Journal of Economics*, 113(3), 733-771. DOI: 10.1162/003355398555739

Nivorozhkin, E. (2002). Capital structures in emerging stock markets: The case of Hungary. *The Developing Economies*, 40 (2), 166-187. DOI: 10.1111/j.1746-1049.2002.tb01006.x

Nivorozhkin, E. (2005). Financing choices of firms in EU accession countries. *Emerging Markets Review*, 6(2), 138-169. DOI: 10.1016/j.ememar.2004.10.002

Onofrei, M. et al. (2015). Determinant Factors of Firm Leverage: An Empirical Analysis at Iasi County Level. *Procedia Economics and Finance*, 20, 460-466. DOI: https://doi.org/10.1016/S2212-5671(15)00097-0

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. DOI: https://doi.org/10.1017/S0022109014000660

Pinková, P. (2012). Determinants of capital structure: Evidence from the Czech automotive industry. Acta Universitatis *Agriculturae et SilviculturaeMendelianaeBrunensis*, 60(7), 217-224. DOI: 10.11118/actaun201260070217

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

Prędkiewicz, K., & Prędkiewicz, P. (2015). Chosen determinants of capital structure in small and medium-sized enterprises – Evidence from Poland. *Finanse, RynkiFinansowe, Ubezpieczenia*, 74(2), 331-340.

Průcha, I. R. (2014). *Instrumental Variables/Method of Moments Estimation*. In: Fisher, M. M. and Nijkamp, P. (ed.) Handbook of Regional Science. Heidelberg: Springer.

Rajan, R. G. & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance*, 50(5), 1421-1460. DOI: https://doi.org/10.1111/j.1540-6261.1995.tb05184.x

Ramli, N. A. et al.(2019). Determinants of capital structure and firm financial performance—A PLS-SEM approach: Evidence from Malaysia and Indonesia. *The Quarterly Review of Economics and Finance*, 71, 148-160. DOI: https://doi.org/10.1016/j.qref.2018.07.001

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata* Journal, 9(1), 86-136. DOI: https://doi.org/10.1177/1536867X0900900106

Ross, S. A. (1977). The determination of financial structure: The incentive-signalling approach. *The Bell Journal of Economics*, 8(1), 23-40. DOI: https://doi.org/10.2307/3003485

Růčková, P. (2015a). Impact of fixed assets share and profitability on use of debt sources of companies in the building industry in V4 countries. *Acta academicakarviniensia*, 15(2), 122-135.

Růčková, P., (2015b). Impact of liquidity and profitability on use of debt finance sources of companies in manufacturing industry in V4 countries. *Acta academicakarviniensia*, 15(3), 69-79. DOI: 10.25142/aak.2015.032

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.

Salehi, M., & Manesh, N. B. (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.

Shleifer, A., & Vishny, R. W. (1992). Liquidation values and debt capacity: A market equilibrium approach. *The Journal of Finance*, 47(4), 1343-1366. DOI: https://doi.org/10.1111/j.1540-6261.1992.tb04661.x

Sikveland, M., & Zhang, D. (2020). Determinants of capital structure in the Norwegian salmon aquaculture industry. *Marine Policy*, 119. DOI: https://doi.org/10.1016/j.marpol.2020.104061

Sikveland, M. et al.(2022). Determinants of capital structure in the hospitality industry: Impact of clustering and seasonality on debt and liquidity. *International Journal of Hospitality Management*, 102. DOI: https://doi.org/10.1016/j.ijhm.2022.103172

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.

Stulz, R., & Johnson, H. (1985). An analysis of secured debt. *Journal of Financial Economics*, 14, 501-521. DOI: https://doi.org/10.1016/0304-405X(85)90024-8

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance*, 43, 1-19. DOI: https://doi.org/10.1111/j.1540-6261.1988.tb02585.x

Touil, M., & Mamoghli, CH. (2020). Institutional environment and determinants of adjustment speed to the target capital structure in the MENA region. *Borsa Istanbul Review*, 20(2), 121-143. DOI: https://doi.org/10.1016/j.bir.2019.12.003

Toy, N. et al. (1974). A comparative international study of growth, profitability, and risk as determinants of corporate debt ratios in the manufacturing sector. *The Journal of Financial and Quantitative Analysis*, 9(5), 875-886. DOI: https://doi.org/10.2307/2329684

Ullah, S. et al. (2018). Dealing with Endogeneity Bias: The Generalized Methods of Moments (GMM) for panel data. *Industrial Marketing Management*, 71, 69-78. DOI: https://doi.org/10.1016/j.indmarman.2017.11.010

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022

EMI, Vol. 14, Issue 2, 2022
ISSN: 1804-1299 (Print), 1805-353X (Online)
www.emijournal.cz

Vo, X. V. (2017). Determinants of capital structure in emerging markets: Evidence from Vietnam. *Research in International Business and Finance*, 40, 105-113. DOI: https://doi.org/10.1016/j.ribaf.2016.12.001

Wald, J. K. (1999). How firm characteristics affect capital structure: An international comparison. The Journal of Financial Research, 22(2), 161-187. DOI: https://doi.org/10.1111/j.1475-6803.1999.tb00721.x

Weill, L. (2004). What determinants leverage in transition countries? *Czech Journal of Economics and Finance*, 54(5-6), 234-242.

Williamson, O. E. (1988). Corporate finance and corporate governance. *The Journal of Finance*, 43(3), 567-591. DOI: https://doi.org/10.1111/j.1540-6261.1988.tb04592.x

Yinusa, O. G. et al. (2017). Macroeconomic determinants of capital structure of firms: Evidence from Nigeria. *Journal of Knowledge Globalization*, 9(2), 1-21.

Paper received: 6.12.2021 Paper revised: 25.5.2022 Paper accepted:20.9.2022