

DETERMINANTS OF CAPITAL STRUCTURE: EMPIRICAL STUDY OF THE INDUSTRIAL COMPANIES IN NORTH MACEDONIA

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ABSTRACT

This study explores the determinants of capital structure within industrial firms in North Macedonia, focusing on a decade-long panel of companies listed on the Macedonian Stock Exchange from 2012 to 2022. Using panel regression analysis, the research examines the impact of key factors—firm size, profitability, asset tangibility, growth, risk, and taxation—on the leverage decisions of these firms. The results reveal that firm size and asset tangibility are positively associated with leverage, indicating these companies' reliance on debt, especially when supported by substantial physical assets. In contrast, profitability demonstrates a negative relationship with leverage, consistent with the Pecking Order Theory, suggesting that profitable firms in this emerging market prefer internal financing. Growth, measured through sales, shows a positive correlation with leverage, though the impact varies with growth metrics. Overall, this study highlights the unique capital structure dynamics in a transitioning economy and provides valuable insights for financial managers operating in similar markets.

Keywords: *Capital structure, Leverage, Theories of capital structure, Trade-off theory, Pecking order theory.*

JEL classification: *G21, G30, G32, G33.*

1. INTRODUCTION

The decision on a company's capital structure—its balance between debt and equity financing—remains one of the most fundamental challenges in corporate finance. Since Modigliani and Miller's groundbreaking theory in 1958, known as the Irrelevance Theorem, which suggested that a firm's value is unaffected by its capital structure in a perfect market, numerous studies have sought to address the complexities of real-world factors that influence these choices. Their theory, which overlooked practical factors like taxes and bankruptcy costs, laid the foundation for further research and refinement through alternative theories, most notably the Trade-Off Theory and the Pecking Order Theory.

The Trade-Off Theory proposes that companies aim to balance the tax advantages of debt against the costs of financial distress, seeking an optimal structure where the benefits and costs of debt are equalized. Contrastingly, the Pecking Order Theory suggests firms prioritize internal over external financing to avoid signaling risks to investors, turning to debt only when internal resources are insufficient. This study builds on these theoretical frameworks by

examining the capital structure determinants within North Macedonia's industrial sector, an economy in transition from a centrally planned to a market-oriented system. Such a context offers a unique opportunity to understand capital structure dynamics in an emerging economy, where institutional and market conditions markedly differ from those in developed economies. Through an empirical analysis of firms listed on the Macedonian Stock Exchange from 2012 to 2022, this research investigates the impact of factors such as company size, profitability, asset tangibility, growth, risk, and tax considerations on leverage decisions. Findings from this study aim to deepen our understanding of financing behaviour in transitioning economies and to provide insights relevant to academics, financial managers, and policymakers involved in similar economic environments.

In part 2 of this paper, we provide a literature review, part 3 gives an overview of the data used and measurement of the variables, part 4 gives results of the analysis and part 5 concludes.

2. LITERATURE REVIEW

The decision of capital structure over the years has inspired and fascinated many researchers. There is a large scope of studies and research on this topic, both theoretical and empirical, that attempt to answer Myers's (1984) 40-year-old question: "How do companies choose their capital structure?". Many theoretical models and studies provide an answer to this question from a different point of view.

Franco Modigliani and Merton Miller are considered to have laid the foundations of capital structure theories with the publication of their research in 1958. In the Modigliani-Miller theory, also known as the *Irrelevance Theorem*, it is assumed that in a perfect market, the choice of capital structure is not relevant to the value of the company. Later, in 1963, they proposed a modification of the theory after adjusting their original assumptions to include corporate taxes. Although this theory contains many weaknesses, Modigliani and Miller's proposals are the basis for the research and development of many other theories related to this subject. The most important theories stand out: is the trade-off theory, according to which companies have a mixture of debt and equity that is considered as optimal (Kraus and Litzenberger, 1973). The impact of asymmetric information on capital structure was originally observed by Jensen and Meckling (1976). The group of the most significant theories also included the Pecking Order Theory developed by Myers and Majluf (1984) and complemented by Myers (1984), which assumes that companies follow a certain order to minimize the problem of information asymmetry. However, these findings did not provide us with an explanation for why some companies prefer debt over equity and vice versa.

In order to find an answer to the set question, a lot of theoretical and empirical research has been done on this topic recently. For example, according to Rajan and Zingales (1995), larger companies have higher leverage, and the profitability of the company has a negative impact on the leverage. Harris and Raviv (1991) state that the underlying theories in most of the research have not been empirically proven. Baker and Wurgler (2002) introduced the Market Timing Theory, according to which companies prefer debt when the stock price is overvalued, otherwise they prefer equity. In his research, Bauer (2004) considers the most important determinants of capital structure by analysing companies listed on the Prague Stock Exchange, while De Wet (2006) conducts his research on companies listed on the South African Stock Exchange. De Wet concludes that a company with a lower cost of capital can maximize its value. A different type of research was carried out by Brav (2009), who made his analysis based on data from private and public companies. He concluded that private companies are more sensitive to changes in performance that may occur when making a capital structure decision and that they prefer debt financing. In their research, Akhtari and Oliver (2009) used a sample of domestic and multinational Japanese companies. The results that were drawn showed that

multinational Japanese companies are significantly less indebted than domestic companies. The same conclusion was reached in the scientific research done by Avarmaa et al. (2008), where Baltic multinational and domestic companies were the subject of analysis, and by Chen et al. (2014), who analysed multinational and domestic companies in the People's Republic of China. Chen (2004) independently researched the capital structure of Chinese companies. The results showed that Chinese companies do not follow either the Trade-Off Theory or the Pecking Order theory, that is, they follow the so-called "new adjusted Pecking Order Theory" due to the institutional differences and financial constraints between China and other countries.

Črnigoj and Mramor (2009) studied Slovenia, revealing that firm size and profitability influenced leverage, with governance shifts impacting decisions. Thippayana (2014) examined capital structure in Thailand, finding that firm size, profitability, and financial distress costs were key determinants. Czerwonka and Jaworski (2021) found that SMEs in CEE countries prioritized internal financing, with minimal industry and country-specific effects on debt levels, supporting the Pecking Order Theory. Gostkowska-Drzewicka and Koralun-Bereźnicka (2024) highlighted regional differences in agricultural financing, with Western EU firms relying more on debt. Jaworski et al. (2019) found Poland's food manufacturing sector favored debt due to stable demand, aligning with Trade-Off and Pecking Order theories. Nazarova and Budchenko (2020) noted that Chinese firms preferred retained earnings, adapting to banking constraints. ALmuaither and Marzouk (2019) observed that UK firms prioritized internal financing, with Brexit affecting external options. Mardan et al. (2023) reported that size and growth positively influenced capital structure in Indonesia, while profitability and liquidity had negative impacts. Růčková and Škuláňová (2022) found interest rates impacted European transport and storage firms, with profitability as a key factor. Barburski and Hořda (2023) showed EU energy and mining sectors relied on debt due to asset specificity and regulation. Akinyomi and Olagunju (2013) noted that asset tangibility and size positively affected leverage in Nigerian manufacturing. Raju (2024) found liquidity reduced leverage in India's pharmaceutical and chemical sectors, while size increased it, aligning with the trade-off theory. Köksal and Orman (2014) concluded that the trade-off theory best explained capital structure choices for Turkish firms, emphasizing firm size, asset tangibility, and economic stability.

Michaelas et al. (1999) and Ozkan (2003) did their research on a group of large and medium-sized companies from Great Britain and concluded that most of the determinants that were included in the analysis have an impact on the leverage. Later Antoniou et al. (2006) set up a sample in which UK companies were again included, but in this research also as part of the sample were analysed companies from France and Germany. The conclusion that was drawn from this analysis suggests that there are differences between companies from different financial systems, i.e. for companies from Great Britain the theories of debt maturity structure that were considered are applicable, while for companies from France and Germany, the results differ and were not specified. The first research where the focus was put on underdeveloped and developing countries was made by Demirgüç-Kunt and Maksimovic (1999), Keister (2004), and Benkato et al. (2005). In 2002, Nivorozhkin published research in which for the first time economies in transition were the subject of analysis and later this trend was followed by many other experts (Gonenc, 2003; Bauer, 2004; Delcoure, 2007; Kořak and Čok, 2008; Ribnikar and Kořak, 2011). Some of the studies that analyze these subjects lead to the conclusion that there are significant differences between countries that are in the post-transition period and developed countries (Mramor and Valentinčič, 2001; Filatotchev et al., 2003; Yeoh, 2007), therefore, results obtained from the analyses differ depending on the degree of economic development of the countries. In the last two decades, the interest in these countries has increased significantly and has become the main topic in several papers (Cvijanović and Redžepagić, 2011; Peev, 2001; Bena and Hanousek, 2008; Gonenc and Seifert, 2010; Teker et al., 2009). More recently, research has been carried out in the region that includes the Balkans

(Berk, 2007; Črnigoj and Mramor, 2009; Arsov and Naumoski, 2016), that argues that companies are mainly focused on applying the Pecking Order Theory.

These are just a few of the many studies that have been published on this topic over the years. There is no single theory that can answer the question of optimal capital structure and so this area will continue to be analysed and researched in the years to come. The results of this research are of great interest, mainly for financial managers who constantly strive to achieve maximization of the company's value.

3. RESEARCH METODOLOGY

3.1. Data and measurement

This research aims to determine the capital structure of industrial companies in the Republic of North Macedonia and to identify the key factors that influence these financing decisions. The study draws on data from a selected group of industrial companies listed on the Macedonian Stock Exchange, covering the period from 2012 to 2022—a span of 11 years. This data, sourced from audited financial statements, was obtained from both the official portal of the Macedonian Stock Exchange and the companies' websites.

After defining the sample and gathering relevant financial data, a statistical model was constructed to guide the empirical analysis. The study begins with descriptive statistics to summarize and interpret the key characteristics of the data. Following this, a panel regression analysis is conducted to evaluate the relationship between the dependent variable (leverage) and various independent variables, addressing the central research question regarding capital structure choices.

The analysis incorporates leverage as the dependent variable, represented in multiple forms, while the independent variables include company size, tax considerations, asset tangibility, profitability, growth, and risk. A detailed explanation of these variables and the methods used to calculate them is provided in the subsequent section.

3.2. Measuring dependent variable leverage

A dependent variable in the research is the company's leverage, which has a key role in determining the capital structure. In previous studies, by default, leverage is presented as a ratio between total liabilities and total assets, but in addition to the basic one, we can also find other variants for calculation. In this research, the dependent variable will be calculated in the following ways:

- as a ratio between total liabilities and total assets (total leverage or total liabilities-to-total assets ratio) marked as TL (total liabilities). This is the most commonly used way of calculating the leverage in this type of research;
- as a ratio between total debt and total assets (total debt-to-total assets ratio) marked as TD (total debt). Total debt means interest-bearing liabilities such as bank loans and
- as a relationship between long-term loans and total assets (long-term debt-to-total assets ratio) marked as LTD (long-term debt). This variant of the calculation is separated from the total debt/total assets indicator because it is considered that short-term loans are used by companies for everyday needs and do not affect the long-term capital structure.

3.3. Exogenous variables

Table 1 describes the exogenous variables used and their measurement.

Table 1: Exogenous variables measurement

Determinant	Symbol	Calculation	Type of determinant
LEVERAGE	TL	total liabilities/total assets	dependent
	TD	total debt/total assets	dependent
	LTD	long-term debt/total assets	dependent
SIZE	SIZE	natural log of net sales	independent
PROFITABILITY	PROF	operative profit/total assets	independent
TANGIBILITY	TANG	tangible assets/total assets	independent
GROWTH	GROWTH	natural log (sales from the current year - sales from the previous year) /sales from the previous year	independent
	INVEST	cumulative sum of investments in fixed assets in the last two years/total assets	independent
TAXES	TAX	(profit before taxes-profit after taxes)/profit after taxes	independent
RISK	RISK	standard deviation of operating profit/total assets for consecutive two years	independent

(Source: Authors' presentation)

4. EMPIRICAL DATA AND ANALYSIS

4.1. Descriptive analysis

In this paper, with the help of descriptive statistics, we can make a brief overview of the financial data of the Macedonian companies that are the subject of analysis. An initial picture of the sample used will be formed, and further, with the help of regression analysis, an attempt will be made to give an answer to the previously asked questions. The results obtained from descriptive statistics are shown in Table 2.

Table 2: Descriptive statistics

Determinant	Mean	Median	Maximum	Minimum	Standard Deviation
Total liabilities/total assets	0.4586	0.4266	1.0311	0.0657	0.2463
Total debt/total assets	0.2511	0.2237	0.9428	0.0000	0.2265
Long-term debt/total assets	0.1036	0.0483	0.5395	0.0000	0.1225
Company size	14.4446	14.2658	17.9093	8.9784	1.3973
Operational profit/total assets	0.0493	0.0389	0.3555	-0.2370	0.0979
Tangible assets/total assets	0.4489	0.4468	0.6660	0.0568	0.1242
Company's growth	0.0039	0.0024	0.2600	-0.3346	0.0473
Investments in fixed assets	0.0906	0.0729	0.3785	0.0015	0.0720
Tax	0.0820	0.0864	0.9316	-0.5438	0.1675
Risk	0.0316	0.0157	0.5153	0.0000	0.0572

(Source: Authors' calculations)

In descriptive statistics, all types of variables are included: the dependent variable – leverage presented in three variants, and the independent variables are size, profitability, materiality, growth (expressed as growth rate and investments), risk, and taxes.

The research sample comprises 10 industrial companies from the Republic of North Macedonia, covering 11 years from 2012 to 2022, resulting in a balanced dataset of 110 observations. To enable comparative analysis, the collected data has been grouped accordingly. The average leverage ratio, calculated as the total liabilities-to-total assets ratio, is 45.8%, suggesting that a substantial portion of the analysed companies rely on debt financing. The minimum leverage value is 6.5%, while the maximum is 103%, which is unusually high due to one company reporting negative share capital and significant accumulated losses over multiple periods. Excluding this outlier brings the maximum leverage to 82.6%, still indicating a high level of liabilities among these companies.

To further assess debt financing in the Macedonian industrial sector, we used the ratio of total debt to total assets as a second leverage measure, excluding trade liabilities and employee obligations. The average for this metric is lower, at 25.1%, with a minimum of 0%, indicating that some companies do not use bank loans for financing. The maximum value is 94.2%, which again is influenced by the same outlier company. Excluding this outlier reduces the maximum to 59.3%, highlighting the impact of this one company on overall results.

The third leverage variant is the ratio of long-term debt to total assets. Long-term debt includes all bank credit obligations with a payment term exceeding one-year, which companies typically use for substantial investments. On average, 10.3% of companies in the sample have long-term debt, with some having none, as indicated by a minimum value of 0. These figures suggest that Macedonian industrial companies tend to rely more on short-term loans and liabilities.

The high standard deviation (1.39) and wide range in the size variable—from a minimum of 8.9 to a maximum of 17.9—indicate that the sample includes companies of varying sizes. The average company size, measured as the natural logarithm of net sales, is 14.4, with a negative skewness, suggesting a few companies have larger-than-average sales.

Profitability is measured as the ratio of operating profit to total assets. There is a wide gap between the extreme values, with some companies reporting negative profitability due to operating losses over the period analysed. The average profitability rate is 4.9%.

Asset tangibility, which represents the share of tangible assets in a company's total assets, averages 45% in the sample. Tangibility ranges widely, with some companies having as much as 66.6% and others as low as 5.6% in tangible assets.

Growth is calculated in two ways for regression purposes: the natural logarithm of the change in net sales from the previous year and the cumulative sum of fixed asset investments relative to total assets. Macedonian companies show low average growth across both measures, with maximum values of 37.8% (for fixed asset investments) and 25.9% (for sales growth). Some companies even exhibit no growth or negative growth.

The corporate tax variable has an average and median value of 8%, close to the nominal income tax rate. Some companies, however, benefit from various tax exemptions or have no tax liability, so the effective tax rate was used for a more accurate reflection. The effective tax rate varies significantly, with a maximum of 93.1% in one company (due to a high level of unrecognized expenses in 2012) and a minimum of -54.3% (due to deductible timing differences that resulted in a negative effective tax rate for another company).

Company risk, measured as the standard deviation of return on assets (ROA), averages 3.1%, with a maximum of 51.5%. This variable provides an indicator of financial stability, suggesting a relatively low level of risk across the sample.

Overall, the analysis reveals that most Macedonian industrial companies exhibit a leverage ratio below 1, meaning only a few companies are highly debt dependent. These outliers significantly impact the overall capital structure analysis. Consequently, when examining grouped data through descriptive statistics, certain companies exert a strong influence on average results. Over the observed period, no major shifts in capital structure were noted across the companies.

4.2. Regression analysis

The research was started by setting up the basic model:

$$LEVER_{i,t} = \beta_0 + \beta_1 SIZE_{i,t} + \beta_2 PROF_{i,t} + \beta_3 TANG_{i,t} + \beta_4 GROWTH_{i,t} + \beta_5 RISK_{i,t} + \beta_6 TAX_{i,t} + \epsilon_i$$

Through this model, an answer would be given to the question of how the capital structure (represented by leverage as a dependent variable) is affected by certain determinants, i.e. the independent variables: size, profitability, tangibility, growth, risk, and income taxes in the analysed companies from Republic North Macedonia. As a useful tool throughout the analysis was used statistical software. Since the sample consists of heterogeneous companies, the pooled regression model was not applied. In the analysis, the method of OLS (ordinary least squares) was applied with several variations of the basic model. An initial assumption is that the fixed effects model is appropriate, but for greater certainty, a Hausman test was conducted.

Six regression models were set:

$$\text{Model 1: } TL_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 PROF_{it} + \beta_3 TANG_{it} + \beta_4 INVEST_{it} + \beta_5 RISK_{it} + \beta_6 TAX_{it}$$

$$\text{Model 2: } TD_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 PROF_{it} + \beta_3 TANG_{it} + \beta_4 INVEST_{it} + \beta_5 RISK_{it} + \beta_6 TAX_{it}$$

$$\text{Model 3: } LTD_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 PROF_{it} + \beta_3 TANG_{it} + \beta_4 INVEST_{it} + \beta_5 RISK_{it} + \beta_6 TAX_{it}$$

$$\text{Model 4: } TL_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 PROF_{it} + \beta_3 TANG_{it} + \beta_4 GROWTH_{it} + \beta_5 RISK_{it} + \beta_6 TAX_{it}$$

$$\text{Model 5: } TD_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 PROF_{it} + \beta_3 TANG_{it} + \beta_4 GROWTH_{it} + \beta_5 RISK_{it} + \beta_6 TAX_{it}$$

$$\text{Model 6: } TL_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 PROF_{it} + \beta_3 GROWTH_{it} + \beta_4 RISK_{it} + \beta_5 TAX_{it}$$

where dependent variables are TL are total liabilities, TD is total debt and LTD is long-term debt; independent variables are SIZE is size, PROF is profitability, TANG is tangibility, INVEST are investments calculated through investment in fixed assets, GROWTH is the growth rate calculated through the annual change in sales, RISK is risk and TAX is income taxes. Detailed information about the variables and the method of their calculation is given in Table 3.

Since three ways were used to express leverage (total liabilities, total debt, and total long-term debt), the set models have different dependent variables with various combinations of independent variables. In some of the models, the growth is expressed through investment in fixed assets, in others is calculated as the change in net sales, while in one model the determinant tangibility of assets is excluded.

The results obtained from the panel's regression analysis are presented in Table 3. After we had done the Hausman test, it was shown that the use of the fixed effect model was appropriate for the first five models, while the use of the random effect model would be more appropriate for the last model.

Table 3: Panel regression analysis

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
C	-1.454326* (0.182729)	-1.209605* (0.220680)	-0.647742* (0.172916)	-1.253638* (0.213271)	-1.154938* (0.263967)	-0.867687* (0.219106)
Size	0.117747* (0.012321)	0.066359* (0.014880)	0.038264* (0.011660)	0.106133* (0.013758)	0.062579* (0.017028)	0.094798* (0.014142)
	-0.637243* (0.063259)	0.063259 (0.063259)	-0.147187 (0.147187)	-0.694362* (0.0694362)	0.046697 (0.046697)	-0.908261* (0.0908261)

Profitability	(0.157955)	(0.190761)	(0.149472)	(0.159042)	(0.196849)	(0.158991)
Tangibility	0.554289*	1.173316*	0.474001*	0.465766*	1.122221*	
	(0.122670)	(0.148147)	(0.116082)	(0.127745)	(0.158111)	
Growth (investment)	-0.093866	-0.261791	-0.063483			
	(0.148180)	(0.178955)	(0.140222)			
Growth rate				0.295699	0.082636	0.549499*
				(0.167694)	(0.207557)	(0.165970)
Taxes	0.042398	0.002007	-0.012622	0.040877	-0.000104	0.041499
	(0.045689)	(0.055178)	(0.043235)	(0.045037)	(0.055743)	(0.047798)
Risk	-0.009387	-0.130585	-0.004990	-0.005960	-0.136723	-0.120908
	(0.141293)	(0.170638)	(0.133705)	(0.139285)	(0.172394)	0.143416
p-value (Chi-Sq)	0.0164	0.0152	0.000000	0.000000	0.000000	0.4200
Probability (F-stat)	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Adjusted R ²	0.921991	0.865375	0.717556	0.924166	0.862542	0.533865
Model used	Fixed effects	Fixed effects	Fixed effects	Fixed effects	Fixed effects	Random effects
no. of observations	110	110	110	110	110	110

*Note: standard error in parentheses; *coefficients are statistically significant at 5% ($p < 0.05$)(Source: Authors' calculations)*

In summary, according to the adjusted coefficient of determination - R^2 , the most significant are the models in which as a dependent variable is leverage calculated as the ratio between total liabilities and total assets. In two of the models, the adjusted R^2 reaches a significantly high level, which shows that up to 92% of the variability is explained by the influence of the determinants included in the analysis.

5. RESULTS AND DISCUSSION

There is a positive and statistically significant relationship between the size and the leverage in all models. This positive relationship is consistent with most of the previous research. Banks are more open to lending more money to large companies because they see them as more stable and to companies with diversified portfolios that have higher transparency for potential and current investors, which can lead to a decrease in information and agency costs. In all the set models, size was found to be a statistically significant variable.

In four out of six models, profitability is found to be negatively related to leverage, which is somewhat of an expected result for this determinant. An explanation for this result can be found in the Pecking Order Theory. That is, profitable companies first choose internal sources and then if those are not sufficient to cover the operational and investment needs of the company, the company would turn to external financing through borrowing. In most cases, profitable companies use part of the realized profits and retained earnings to finance investments, so their need for external sources is limited, resulting in a low level of indebtedness. In the conducted research, there is a divided opinion about this determinant. In some of the researches a positive relationship was established in accordance with the trade-off theory (Frank and Goyal, 2009;

Jensen, 1986; Jõeveer, 2013), while certain authors, as in our case, found a negative relationship explained by the pecking order theory (Rajan and Zingales, 1995; Titman and Wessels, 1988; Nivorozhkin, 2004; Črnigoj and Mramor, 2009; Keđzior, 2012; Arsov and Naumoski, 2016). According to the theoretical point of view, a positive relationship is expected between tangibility and leverage. The results obtained in this research show the same: a positive and statistically significant relationship was established between leverage and tangible assets in our sample. After all, in this research, this variable has the highest degree of consistency compared to all the other determinants. This positive relationship can be explained through the trade-off theory and agency theory. As seen by lenders, tangible assets can be potential collateral in case the companies need to finance their activities using debt. Collateral offers greater security to lenders and contributes to the reduction of bankruptcy and agency costs i.e. financial distress costs. In our country, despite the high level of liquidity, banks are exclusively cautious when lending and are not prone to taking risks, so the obtained result can be explained to some extent by the banks' policies regarding the ratio of requested collateral compared to the loan exposure of a certain company. But, according to the research conducted in developing countries, this relationship has been shown to be negative. It is believed that this is because of underdeveloped secondary markets, which leads to uncertainty in determining the market value of assets, or that it is simply possible that companies with higher levels of tangible assets have a small need for additional external capital.

When it comes to growth, it has been theoretically shown that in developed countries the growth rate is negatively correlated with the leverage, while in developing countries this relationship is positive because companies that often make investments tend to use debt to finance their projects. But the completed analysis does not fully correspond to this, because the results obtained differ based on how the growth is expressed. Two approaches were used to calculate the growth rate: through the change in net sales and through realized capital investments. In our country, growth, seen as the annual increase of sales shows a positive and somewhat significant relationship, but capital investments turned out to be insignificant.

The impact of corporate taxes or specifically in this case income tax was found to be insignificant and no notable relationship with the level of indebtedness was established. The implementation of corporate taxes was crucial for establishing the first theories of capital structure, where the authors of the theories pay special attention to the benefits that companies have from the existence of a tax shield. In the research so far, there is a divided opinion, and the results obtained differ. In the analysis that we conducted on the selected sample, in some of the set models it was shown that the relationship is positive, while in some there is a negative relationship between leverage and corporate taxes. Anyhow, the influence of this determinant is not statistically significant for any of the defined models.

The results showed that there is an inverse and weak relationship between risk and leverage in all models and that this variable is statistically insignificant. The inverse relationship confirms the previously given opinion that companies with higher risk have a lower level of leverage because this can lead to a situation where the company falls into a greater financial crisis. Investors, banks, and other financial institutions usually do not tend to finance risky companies, which is in accordance with the results obtained. The results are consistent with other studies conducted for the countries covering the region (Črnigoj and Mramor, 2009; Arsov and Naumoski, 2016), but there are also studies where this relationship has been shown to be positive (Harris and Raviv, 1990; Huang and Song, 2002).

6. CONCLUSIONS

This study aimed to examine the determinants of capital structure in North Macedonia's industrial sector, focusing on ten companies listed on the Macedonian Stock Exchange over the

period from 2012 to 2022. The analysis explored key factors such as company size, profitability, asset tangibility, growth, risk, and taxes to understand their impact on leverage decisions within a transitional economy.

The findings indicate that the capital structures of industrial firms in North Macedonia are predominantly equity-based, with lower levels of debt, consistent with patterns observed in many developing economies. Additionally, companies tend to rely more on short-term debt, with limited reliance on long-term liabilities. This inclination aligns with the cautious lending environment in North Macedonia, where financial institutions typically favor short-term lending. Six determinants—size, profitability, tangibility, growth rate, taxes, and risk—were assessed using panel regression analysis, with leverage represented by total liabilities, total debt, and long-term debt.

Company size showed a positive relationship with leverage, suggesting that larger firms, due to their perceived stability and transparency, find it easier to secure debt financing. The study also found a significant negative relationship between profitability and leverage, as profitable firms tend to prioritize internal financing, in line with the Pecking Order Theory. This trend implies that profitable firms in North Macedonia rely on retained earnings to meet their capital needs, turning to debt only when internal resources are insufficient.

Asset tangibility was positively correlated with leverage, highlighting that tangible assets serve as collateral and reduce financial distress costs, making companies with substantial physical assets more attractive to lenders. The study observed a positive relationship between leverage and sales growth, as companies experiencing growth in revenues tend to increase borrowing to meet rising operational demands. However, growth measured by capital investment showed a negative relationship with leverage, a finding that warrants further investigation, as it diverges from typical expectations in a developing economic context.

The influence of income tax on leverage was insignificant, while higher risk had a negative impact on leverage. This result reflects the cautious approach of lenders and investors, who generally prefer not to finance higher-risk companies, thus limiting leverage in such firms.

These conclusions align with established capital structure theories. Larger companies with high asset tangibility exhibit a preference for debt, consistent with both the Trade-Off Theory and the Pecking Order Theory. Profitability's inverse relationship with leverage further supports the Pecking Order Theory, where internal funds are prioritized over external financing.

In conclusion, North Macedonian industrial firms do not appear to follow a fixed optimal capital structure but instead adhere to a financing hierarchy: they use internal funds first, then turn to debt financing, and finally consider equity issuance when necessary. This pattern reflects limited market development and reliance on bank loans in the absence of corporate bond issuance. Further research with a broader, more diverse sample across industries is recommended to gain deeper insights into the capital structure behavior of firms in this transitional economy.

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