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*Original Article*

# What Drives Capital Financing in Europe? Evidence from Listed Firms in Germany

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*Abstract. This article analyzed the factors that affect the capital financing of German non-financial corporations listed on the German Stock Exchange from 2017 to 2021. By applying a panel data regression model and the Generalized Least Squares (GLS) approach, the results show that the debt-to-assets ratio, equity multiplier, and long-term debt ratio are significantly impacted negatively by profitability as determined by the assets return. Firm size is positively correlated with both the equity multiplier and the long-term debt ratio, suggesting that larger companies use more long-term debt. Growth has a significant positive impact on the equity multiplier and long-term debt ratio but has little influence on the debt-to-assets ratio. Long-term debt is unaffected by liquidity, although the debt-to-assets ratio and equity multiplier are adversely impacted. The GMM method is used during the robustness check, and the findings are consistent with the major GLS findings. These results highlight how important firm-specific factors are in influencing choices about financial structure. The results of this research may be used as a guide for companies operating in Europe and offer valuable information about how to optimize capital structures in various financial contexts. Policymakers could also use the results of this investigation as a reference for creating financial laws and regulations that facilitate non-financial enterprises' access to financing and effective capital allocation.*

*Keywords: Capital Financing; Profitability; Firm Size; Growth; Liquidity*

## Introduction

The decision of capital structure influences business performance, risk, and sustainability over time. It is also a key factor in forming a corporate finance policy. A special convergence of institutional, regulatory, and economic factors drives the financing system in Germany. Although bank loans have historically been a major source of funding for German businesses, indicating a bank-dominated structure, there is a current movement toward more use of stock markets. By analyzing the relationship between profitability, firm size, growth, and liquidity, this study seeks to identify the main forces behind capital financing among non-financial companies listed on the German stock market. For firms that looking to finance operations, expansion, and innovation, understanding the dynamics of capital financing [1].

A firm's capacity to generate cash directly affects its profitability, which is a primary metric of operational effectiveness and financial health [2]. Because of their established resource base and market position, larger firms often have better access to wider financing choices, while smaller firms can be

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subject to more stringent requirements [3], [4]. Hence, the financial position of a company at a specific time is indicated in its performance. Moreover, the profitability generated by the company determines its financial success, which is important to identify growth potential. This also acts as a means of accountability to investors for meeting set goals and expectations [5]. The main aim of a company's operations is to make a profit, and the process of increasing or decreasing capital, as the case may be in accordance with the proportion of the resources of a transaction, is in terms of profit. Growth in profit at healthy levels also signifies a healthy financial condition, which eventually increases the company's worth [6].

The literature on the structure of capital has expanded since the investigation of Modigliani and Miller in 1958 [7]. Despite being a hot issue among financial analysts for many years, there is no theory yet to adequately explore the decision of financial structure. There are some hypotheses that have been announced to explore the function of capital structure, for instance, the trade-off theory by [8], [9], the pecking order theory by [10], and agency theory by [11]. Trade-off theory claims that controlling capital structure involves weighing the benefits and risks of debt, while the pecking order theory indicates that corporations must aim for a hierarchical funding structure. Agency theory also argues that debt at a reasonable amount has an advantage in reducing agency costs and information asymmetry. From the above argument, the best type of capital structure should be followed to avoid the risk of bankruptcy [12].

In the empirical literature, many studies provided some proof toward the choice of capital structure, however, their findings are not consistent. For example, [3], [13] firm-specific traits significantly impact the structure of a company's capital, either favorably or unfavorably. [4], [14] discovered that in a crisis, businesses often raise their debt levels. To the best of our knowledge, few studies have explored what drives capital financing among non-financial companies in Germany.

Even with significant research on capital financing, there are still few empirical studies that concentrate on German non-financial companies, especially those that have traded on the German stock market. The majority of previous studies tended to concentrate primarily on financial organizations or extend findings across nations. The impact of industry diversity, firm-specific factors, and institutional structures on capital structure choices in Germany has received little consideration. Furthermore, previous research frequently ignores how these companies modify their financing practices in reaction to shifting financial markets and economic situations.

Due to their significant economic contribution and distinctive financing practices, German non-financial companies are crucial to the research topic of capital structure influences. Non-financial enterprises are more suited for researching finance options because they have more opportunities to select their equity and debt funding, which are governed by capital management. Additionally, German non-financial firms operate across a range of industries, allowing for a comprehensive analysis of how firm-specific factors impact their financial practices. The current study aimed to investigate what drives capital financing in Europe with a focus on the German stock exchange. The results of this research may be used as a guide for companies operating in Europe and offer valuable information about how to optimize capital structures in various financial contexts. Additionally, the findings might help businesses make sensible financing decisions that maintain a balance between risk and growth potential. Policymakers could

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also use the results of this investigation as a reference for creating financial laws and regulations that facilitate non-financial enterprises' access to financing and effective capital allocation.

# 1. Literature Review

## 1.1 Conceptualization

### *1.1.1. Profitability as the primary motive for capital financing*

Profit is a key motivator for capital financing as businesses want to generate profits by efficiently using their acquired capital. A company's ability to guarantee that revenue surpasses financial costs is a measure of both its operational performance and the efficacy of its financial management. For this reason, maintaining business development and improving capital allocation methods are influenced by profit [15], [16]. Firm profitability can be measured in several ways based on assets and profits that are compared over time [6], [17]. The success can also be attributed to its ability to turn a profit over a given period. Therefore, investors should evaluate the returns that they receive based on their invested capital. Lenders could also consider a company's profitability when assessing its operating activities and ability to repay their loans [18].

A study by [19] argues that there is a good relationship between capital financing and profitability and they complement each other. Capital financing provides the resources that firms need for investment. When investors trade strategically, they must strike a balance between profitability and strong capital financing because it can increase investor confidence and increase the overall value of the company [20]. Hence, profitability is expected to have a significant effect on capital financing. Previous research offers some conclusions about this relationship. Depending on the circumstances, the exact relationship between financial decisions and corporate profitability may change. The link between capital structure decisions and performance is influenced by multiple elements, including firm size, economic environment, and the stage of state development [21]. An organization's ability to produce a profit is demonstrated by how effectively management uses resources to optimize returns. Increased profitability from improved business operations promotes long-term industry growth and raises the worth of the company [5], [22].

### *1.1.2. Firm size as a key motivator for capital financing*

Tools that determine company size based on readings of past studies divide company size into four theories. They are a theory of technologies, organizational theory, and financial theory [23]. Because in companies there is an accepted hierarchy concern for capital financing. Domestic funds of finance are regarded as the first preferred source of capital financing. The borrowing process is used as a secondary source of capital financing. However, the issuance of new shares is considered another form of capital financing, which affects the ownership structure [24]. [25] proposed this type of hierarchy called the reference hypothesis [26]. Therefore, firm size plays an important role in firms' capital financing patterns [27]. However, corporate managers must have a clear policy in formulating capital finance plans [28]. Providing the necessary financial resources for companies is considered one of the most important aspects of a successful management system. Therefore, the size of the company plays an important role in accessing various financial resources, including debt [29]. Because debt is always a

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key option for financing companies, it can be a key factor in long-term sustainability and growth [30]. Therefore, opportunities to work in the sector by large companies can be considered if the necessary amount of capital is available. This situation is a key gateway to sustainable growth and expansion. Therefore, firm size is one robustness indicator for capital diversification [31]. On the other hand, capital markets are considered to be another source of capital financing in the world that is becoming increasingly important. Company size plays an important role here too, so larger companies have easier access to a range of capital markets, including issuing bonds and stocks, which they have a significant impact on firm performance [32]. Because a strong company can raise capital with a more favorable set of conditions, smaller companies have more conditions and sometimes restrictions on their entry into the capital markets [33].

### *1.1.3. Firm growth as the primary driver for capital financing*

The theory of grounded vision, as one such theory, assesses the capability of firms. The extent to which the company's capital and skills are used properly to provide economic growth [34]. Therefore, companies often face various problems and obstacles as a result of searching for new sources of financing in order to finance capital. The business's primary goal is to maximize shareholder wealth, promoting constant growth and development. Profit can support sustainable development, but not at all costs. Financial management explores the connection between real-world business operations and long-term sustainable performance, but corporate managers may not fully understand long-term sustainable development capabilities [35]. Growth theory emphasizes that capital and high skills are two of the main factors of development [36]. In emerging economies, companies play an important role in sustaining economic growth because they create jobs and increase national productivity [37]. To respond to this type of growth, the amount of capital financing must be targeted and innovative to achieve the objective. At the same time, alternative non-debt opportunities such as equity investments should be thoroughly explored [38]. Internal review ensures company growth by moving from low level to strong, which empowers them to be competitive [39]. In this process, companies must continuously monitor external and internal resources and practice opportunities promptly. This type of practice will accelerate development and ensure long-term sustainability [40].

### *1.1.4. Company liquidity as a primary motivator for capital financing*

According to experimental studies, the capital structure of manufacturing enterprises is significantly and negatively impacted by liquidity. The availability of money is crucial. Manufacturing firms need to think about liquidity when choosing their capital structure. Companies with liquidity are more successful and can avoid using debt since they have enough cash on hand to cover short-term obligations and high expenses. Thus, companies with significant liquidity tend to have high capital structures [41]. To function and fulfill both short- and long-term financial obligations on schedule, a business needs liquidity [42]. There is a strong correlation between liquidity and capital structure as the current assets can be used to settle the debts. Every company needs liquidity to continue operations to meet its financial obligations, whether short-term or long-term. In other words, liquidity is an important factor in assessing the company's ability [6]. Liquidity is an indicator applied to assess a company's capacity to repay its short-term loans. If a company's current assets exceed its entire short-term debt, it may be considered to have more available funds [18]. The ability to meet short-term financial obligations and the speed at which an asset can be turned into cash are both evaluated by liquidity. A popular indicator

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of liquidity is the current ratio, which shows that there is enough money for operations, investments, and working capital. A high ratio lowers the need for outside funding by guaranteeing sufficient cash inflows [43]. The capacity of a business to fulfill temporary obligations is shown by the liquidity ratio.

## 1.2 Theoretical background

### *1.2.1 Agency Theory*

Agency theory is considered the foundation of economic theory, which is particularly related to corporate governance. The agency concept discussed by [11] gives power to the shareholders who own the company and managers to manage the company and make decisions in the company's interest to promote it. However, because company ownership and managers are not always together in the company, the decision-making process may go another way and create agency problems [44]. [11] also define agency theory as a contract whereby managers work for the owner to perform activities on their behalf. This theory leads to an explanation of the relationship between managers and the shareholders of the company [45]. The theory argues that debt may be a solution to reduce the conflict of interest as managers carefully make their decisions about a company's operation [44].

### *1.2.2 Pecking Order Theory*

This theory believes in the pyramid method of financing for firms. It was developed by arguing that the company can obtain more financial resources, which are divided into equity and debt [46]. According to this assumption, business owners can decide which type of capital to use for long- and short-term investment [47]. Therefore, the capital structure of a company refers to the relationship between the actual capital of the owners and the capital acquired through long-term debt. Managers can select financing sources that encourage firms to achieve higher profit margins [48].

### *1.2.3 Trade-Off Theory*

In 1958, Modigliani and Miller proposed the irrelevance hypothesis. It is considered the first hypothesis to attempt to highlight the problem of capital structure. According to Modigliani and Miller's hypothesis, the assets owned by the firm influence the value of the firm, not the capital structure or the amount of equity or debt provided [49]. This concept encourages businesses to use a sufficient amount of debt rather than high equity, as debt is less expensive for the firm since it offers tax advantages and reduces the weighted average cost of capital [50]. However, the theory claims that high dependence on debt may increase capital expenses and lead to bankruptcy [4].

## 1.3 Empirical Review

Empirical research continuously ties the origins of capital structure to both external and internal business features. In this section, the empirical literature on capital structure and its determinants is reviewed.

A study by [18] aims to determine how company value is affected by capital structure, growth, liquidity, and profitability. The study obtained data between 2017-2022 of listed firms in the food and beverage sector on the Indonesian capital market. The findings indicated that the value of the firm has a favorable

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impact on its capital financing. Profitability is positively related to firm value. However, the value of the company has no growth impact. [51] examined how debt financing and equity capital affected its wealth. The study uses financial data and survey responses from 81 CCUs covering 2017 to 2021. The findings indicated that net worth is highly heterogeneous, and capital structure has the least impact. Equity capital and growth are positively correlated. The study suggests evaluating debt management strategies and giving priority to equity investment in order to enhance financial stability and growth.

Another research by [52] argues that companies are always trying to balance the risk and return of their day-to-day operations with their financial investments. The study examines the relationship between short-term borrowing and profitability across six sectors of Chinese firms, highlighting the moderating effects of ownership status, firm size, and leverage level. In contrast to most of the literature, the present study uses principal components analysis to generate principal proxies for principal analysis. The fixed effect model is compared with two machine learning approaches to ascertain whether the estimation method is more successful. The findings validate the presence of a nonlinear, inverse U-shaped correlation between capital structure and firm performance.

Moreover, the objective of the study [53] is to find out how the capital adequacy ratio, inefficient finance, finance-to-deposit ratio, operating expenses, and operating income affect profitability. Profitability in this study is determined by return on assets (ROA). This study uses avoidance distributed regression (ARDL) methodology as a quantitative tool. Time-series data are used in this study, and the study covered data between 2012 and 2021. The outcomes of the research display that the capital adequacy ratio has a negative partial effect, non-performance financing has a beneficial partial effect, and the pay-to-deposit ratio has an adverse effect on profitability. [54] explored the determination of capital structure via profitability ratio, and liquidity ratio. The study used data from companies that provide logistics and transportation services listed on the Indonesian capital market between 2020-2021. Descriptive and collaborative research techniques are used by the author. Out of 28 businesses in the transportation and logistics services, 22 businesses were used as the final sample. Linear regression using the SPSS analysis was the method of data analysis. The study findings indicated that while profitability ratios seem to have an impact on financial crisis, liquidity ratios, and capital structure had a significant impact.

A study by [37] worked to determine the impact of financial resources on financial performance. The data were obtained through a questionnaire with 384 correctly retrieved questionnaires divided into six provinces. SPSS was employed for the purpose of analysing the observed data. The results show a statistically significant relationship between all variables applied in this study. In particular, the investigation established that trade debt has a crucial impact on performance primarily. At the same time, share issuance secondarily affects the financial performance. [30] analyzed the effect of a firm's capital structure on profitability using secondary data gathered from the five automakers over twelve years. Researchers used multiple regression models with R programming to evaluate the findings. The authors observe a significant connection between the explained and explanatory variables, revealing that capital structure has a meaningful impact on profitability.

Further investigation by [43] aimed to investigate the effects of firm-specific characteristics on capital structure development in a balanced panel sample of 559 businesses in six European countries for the years 1999–2015. Outcomes display that net equity financing is significantly and positively correlated

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with euro crisis impacts, growth, profitability, and tax protection, while the impact on debt-to-equity ratio is significantly negative. [3] investigated how cash flow (CF) leverage and working capital (WC) affect firm profitability. The study also used capital structure (CS) as a moderating variable. The data about listed corporations in the Qatar stock market for the years 2018–2022 was used. The results show that capital structure (CS) worsens the influence of WC on ROA but has no effect on the influence of CF and leverage on ROA.

A study of [21] focused on the link between governance and capital structure. The research used OLS regression models and examined data from 42 non-financial firms listed between 2017 and 2021 on the German and Norway stock exchanges. Key findings are that the size of the board and audit committee are positively related to capital structure, while board meetings and board responsibility negatively affect the debt ratio. There is a weak connection between DTA and chief executive officer and CEO tenure. The size of the firm is favourably linked to the debt ratio, but the current ratio (CR) is inversely related. [43] focused on influencing the effect of capitalization ratio on Portuguese business performance. The authors examined data from 4,233 small and medium non-financial businesses and 37 big non-financial organizations from 2010 to 2016, with a particular emphasis on the 2010–2014 period. The study looks at debt maturity and firm-specific factors affecting capital structure using a dynamic method, such as (GMM). Large enterprises suffered the most from the Economic Adjustment Program because of heightened scrutiny and external pressures. According to the findings, capital structure decisions vary by firm size and economic cycle.

Another study by [55] experimentally examined the connection between capital structure and corporate success in non-financial firms listed in Germany from 1993 to 2016. The applied IFRS in 2005 is regarded as a pivotal event that affected this connection. According to the investigation, German non-financial enterprises have a significant leverage level compared to their peer countries, with debt financing accounting for more than 60% of their assets. Based on the results, there is a favorable association between capital financing and firm performance, and the implementation of IFRS strengthens and improves business performance. The favorable correlation may be due to tax shield benefits and lower debt costs than stock issuance. [56] considered the mediating function of company leverage in analyzing the correlation between capital financing and business performance in both Malaysia and Indonesia between 1990 and 2010. The findings indicate that capital financing and related factors directly affect firm performance. There is a strong association between corporate effectiveness and performance since Malaysian enterprises rely on outside capital to boost performance. Corporate leverage mediates the relationship in Malaysia, but not in Indonesia. Based on the above explanation, below is a research framework:

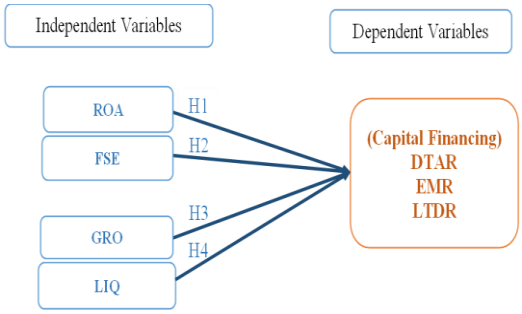


*Figure 1. Research framework*
*(Source: developed by the authors)*

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# 2 Methodology

## 2.1 Research design

To investigate the connections between explained and explanatory variables, the present research uses panel data regression methods, namely, the Generalized Least Squares (GLS) method is employed. To provide statistical validity, the significance of the correlations is examined before the analysis is performed. Additionally, multicollinearity tests are conducted to ensure that there are no collinearity problems in the data. EViews 22 is used for data analysis since it has advanced panel data processing and regression analysis features. To consider firm-specific factors and reduce biased selection and endogeneity problems, macroeconomic variables such as GDP were added to the study models in addition to running the regression with the GMM method for the robustness check

## 2.2 Data collection

The present research is regarded as one of the quantitative research studies that uses secondary data to evaluate the determinants of capital financing. The firms' audited financial statements of 30 non-financial firms registered on the German stock market between 2017-2021 were used in this investigation to explore the impact of profitability, size, growth, and liquidity on financial structure. Table 1 provides a summary of factors utilized in this research:

| Variable | Abbrev. | Measurement | Source |
|---|---|---|---|
| Capital Financing | DTAR | Total debt/Total assets | Annual report |
| | EMR | Total Assets/Total Shareholder's Equity | |
| | LTDR | Long-term debt/Total assets | |
| Profitability | ROA | Net income/Total assets | |
| Firm size | FSE | Log of firm assets | |
| Growth | GRO | (Current year assets-Previous year assets)/Previous year assets | |
| Liquidity | LIQ | Current assets/Current liabilities | |

*Table 1. Definition of variables*
*(Source: created by the authors)*

Model 1: $$\boldsymbol{DTAR_{it} = a_0 + \beta 1 ROA_{it} + \beta 2 FSE_{it} + \beta 3 GRO_{it} + \beta 4 LIQ_{it} + e_{it}}$$

Model 2: $$\boldsymbol{EMR_{it} = a_0 + \beta 1 ROA_{it} + \beta 2 FSE_{it} + \beta 3 GRO_{it} + \beta 4 LIQ_{it} + e_{it}}$$

Model 3: $$\boldsymbol{LTDR_{it} = a_0 + \beta 1 ROA_{it} + \beta 2 FSE_{it} + \beta 3 GRO_{it} + \beta 4 LIQ_{it} + e_{it}}$$

Where,

DTAR: Debt to Asset Ratio (Dependent variable); EMR: Equity Multiplier Ratio (Dependent variable); LTDR: Long-Term Debt Ratio (Dependent variable); ROA: Return on Asset (Independent variable); FSE: Firm Size (Independent variable); GRO: Growth (Independent variable); LIQ: Liquidity (Independent variable); a: Constant; β1, β4: Partial Coefficient Regression; e: Error

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Moreover, other variables, such as gross domestic product (GDP) were added to the models during the robustness check to consider firm-specific factors and reduce the bias from choosing variables. Furthermore, to enhance the validity of the results and consider the issues of endogeneity, the Generalized Method of Moments (GMM) was applied for the robustness check.

# 3 Results and discussion

## 3.1 Analyzing descriptive statistics

Table 2 show the statistical information about the study variables. The debt-to-asset ratio indicates a standard deviation of 0.176 and a mean value of 0.547, with the highest value of 0.944 and the lowest value of 0.090. Nevertheless, the Equity Multiplier ratio indicates the highest value and lowest value of 25.746 and 0.699, with a mean value of 3.045, and a deviation of 2.875. At the same time, the long-term debt ratio of German companies has the highest value of 0.622, while the lowest value is 0.000. The mean value is 0.179, and the deviation with a value of 0.135. In contrast, return on assets as one of the independent variables has the highest and lowest values of 0.661 and -2.762, with a deviation of 0.352 and a mean value of 0.027. The deviation of the company size indicates 2.044, with a mean value of 21.146. The highest value is 25.736, and the lowest value is 16.804. Meanwhile, corporate growth and liquidity indicate the highest values of 2.882 and 15.060 and lowest values of -0.237 and 0.250, with deviations of 0.309 and 1.982, respectively. They also have a mean value of 0.152 and 2.377 respectively.

| | **DTAR** | **EMR** | **LTDR** | **ROA** | **FSE** | **GRO** | **LIQ** |
|---|---|---|---|---|---|---|---|
| Mean | 0.547 | 3.045 | 0.179 | 0.027 | 21.146 | 0.152 | 2.377 |
| Median | 0.578 | 2.451 | 0.159 | 0.102 | 21.546 | 0.097 | 1.770 |
| Maximum | 0.944 | 25.746 | 0.622 | 0.661 | 25.736 | 2.882 | 15.060 |
| Minimum | 0.090 | 0.699 | 0.000 | -2.762 | 16.804 | -0.237 | 0.250 |
| Std. Dev. | 0.176 | 2.875 | 0.135 | 0.352 | 2.044 | 0.309 | 1.982 |
| Observation | 150 | 150 | 150 | 150 | 150 | 150 | 150 |

*Table 2. Descriptive statistics*

*(Source: EViews version 12 data processing)*

## 3.2 Results of Correlation

According to the results in Table 3, which indicates the existence of a matrix correlation among the independent variables and the dependent variables, the Return on Asset in German companies has a non-significant negative relationship with each debt ratio; the equity multipliers ratio and has values of -0.117 and -0.037. Meanwhile, the return on the asset has a significant negative relationship with the long-term loan ratio, with a value of -0.275, at a significance level of 1%. Debt ratio and equity multiplier ratio have a meaningful relationship with a value of 0.547 and 0.273 with firm size at 1%. The size of the firm, on the other hand, has a positive correlation with the long-term loan ratio with a value of 0.153 at a significance level of 10%. However, growth has a non-significant negative correlation with the debt-to-asset ratio and a positive non-significant correlation with the equity multiplier ratio with values of -0.108 and 0.032. However, despite this result, growth has a meaningful relationship with the long-term loan ratio of 0.140 at a significance level of 10%. Debt-to-assets ratio, equity multiplier ratio, and long-

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term loan ratio have a negative correlation with liquidity with values of -0.570, -0.172, and -0.139 at 1%, 5%, and 10% significant level. In general, the results in Table 3 indicate that there is a moderate correlation between most variables. If the result of the relationship is less than 0.30, it is considered a weak relationship. At the same time, results of 0.30 to 0.60 are considered a moderate relationship. If the results are greater than 0.60, it is considered a strong relationship.

| | ***DTAR*** | ***EMR*** | ***LTDR*** | ***ROA*** | ***FS*** | ***GRO*** | ***CR*** |
|---|---|---|---|---|---|---|---|
| DTAR | 1 | | | | | | |
| EMR | 0.576*** | 1 | | | | | |
| LTDR | 0.447*** | 0.230*** | 1 | | | | |
| ROA | -0.117 | -0.037 | -0.275*** | 1 | | | |
| FSE | 0.547*** | 0.273*** | 0.153* | 0.375*** | 1 | | |
| GRO | -0.108 | 0.032 | 0.140* | 0.014 | -0.180** | 1 | |
| LIQ | -0.570*** | -0.172** | -0.139* | -0.293*** | -0.503*** | 0.025 | 1 |

*Notes: ***Significant at 10% level; **Significant at 5% level: *Significant at 1% level*

*Table 3. Pearson correlation*

*(Source: EViews version 12 data processing)*

Moreover, the results of Table 4 demonstrate the degree of multicollinearity among the study factors. This test is used via a statistical method known as variance inflation factor (VIF). Compared to the case where the predictor variables are not perfectly correlated, the VIF quantifies the degree to which the variance of the computed regression coefficients is inflated. According to [57] the relationship between variables is considered unrelated if the VIF is 1, moderately related if the VIF is between 1 and 5, and they are strongly related if the VIF is between 5 and 10. From the results of table 4, all variables in this study are in the safe zone and do not have any problems of multicollinearity.

| **Variable** | **VIF** | **Tolerance** |
|---|---|---|
| ROA | 1.431 | 0.699 |
| FSE | 1.711 | 0.585 |
| GRO | 1.102 | 0.907 |
| LIQ | 1.390 | 0.719 |

*Table 4. Variance Inflation Factors (VIF)*

*(Source: EViews version 12 data processing)*

## 3.3 Regression analysis

Table 5 indicates the results of the Generalized Least Square (GLS) method. According to the model selection test, the fixed effect model is a suitable method, but the results of the Heteroskedasticity and normality tests, as shown in table 5, indicate that the fixed effect model is not accurate in this study. Therefore, the GLS approach was found to be more effective and reliable in this investigation. According to [58] GLS is resistant to problems including heteroskedasticity across panel data, cross-sectional dependency, and first-order autocorrelation. To consider firm-specific factors and reduce bias selection and endogeneity problems, macroeconomic variables such as GDP were added to the study models in addition to using the GMM method for the robustness check.

According to the results in table 5, the effect of the dependent (explained) variable and independent (explanatory) variable in the first model (adjusted R-squared) is 0.936, which means that this model explains 93.6% of the changes that occur in the explained variable. The second model (adjusted R-

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squared) shows that the explanatory variable's impact on the explained variable has a value of 0.916; that is, the effects that occur on the dependent variable are explained by 91.6%. However, the variables not mentioned in the study show an impact of 8.4%. The findings of the third model (adjusted R-squared) suggest that the independent variable influences the dependent variable by 93.3%.

| Variable | Model 1 (DTAR) | Model 2 (EMR) | Model 3 (LTDR) |
|---|---|---|---|
| ROA | -0.142***<br>(0.028) | -1.349***<br>(0.205) | -0.161***<br>(0.019) |
| FSE | -0.007<br>(0.021) | 0.871***<br>(0.106) | 0.079***<br>(0.020) |
| GRO | 0.010<br>(0.023) | 0.261*<br>(0.140) | 0.036**<br>(0.018) |
| LIQ | -0.013***<br>(0.004) | -0.076***<br>(0.019) | 0.004<br>(0.005) |
| C | 0.730<br>(0.443) | -15.194***<br>(2.247) | -1.497***<br>(0.410) |
| R-sq. | 0.950 | 0.935 | 0.948 |
| Adj. R-sq. | 0.936 | 0.916 | 0.933 |
| F-stat. | 67.998 | 50.584 | 64.718 |
| Prob. | 0.000 | 0.000 | 0.000 |
| Model selection test | 161.772*** | 202.914*** | 205.224*** |
| Heteroskedasticity Test | 85.084*** | 73.285*** | 40.939*** |
| Normality test (Jarque-Bera) | 126.973*** | 6287.767*** | 21.435*** |

*Notes: *** Significant at 1% level; ** Significant at 5% level; and * Significant at 10% level.*

*Table 5. Regression analysis (GLS)*

*(Source: EViews version 12 data processing)*

The results of all three models indicate that return on assets has a significant negative effect on each of the debt-to-assets ratios, the equity multiplier ratio, and the long-term debt ratio, which are measured by -0.142, -1.349, and -0.161, respectively. If all other variables remain constant in value, the return on assets results indicate a 1% increase, leading to a decrease in each of the debt-to-asset ratios by -14.2% and the equity multiplier by -134.9%. and a long-term debt ratio of -16.1%. Companies should consider this result as it reduces the cost of borrowing and in turn increases their profit margins. This result is similar to the results of the study [41] & [12]. Therefore, H1 is accepted, which indicates a significant relationship between profitability and capital financing that is measured by (DTAR, EMR, and LTDR).

Nevertheless, the result of the firm size hypothesis is statistically insignificant with a negative debt-to-assets. This result shows that no matter what changes in the size of the company, the debt-to-equity does not change. However, firm size in both the second and third models shows a meaningful and favorable correlation with both the equity multiplier and long-term loan ratio with values of 0.871 and 0.079. This result indicates that if firm size increases by 1%, it leads to an increase in each of the equity multiplier and long-term debt ratios by 87.1% and 07.9%, respectively. These results are similar to the research of [15]. Hence, H2 is accepted in the case of EMR and LTDR.

The results presented in the first model of Table 5 also show that growth in German firms has no meaningful but positive effect on the debt-to-asset ratio. This result shows that any change in growth does not affect the debt-to-asset ratio. That is, the growth in companies must not lead to increased debt ratios. This opportunity is not taken into account by companies. This finding is opposite to the results of

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the study [43]. At the same time, in models two and three, growth has a significant and positive effect on both the equity multiplier and the long-term loan ratio. The value of this correlation is registered at 0.261 and 0.036, respectively. A 1% increase in growth would lead to a 26.1% increase in the equity multiplier and a 3.6% increase in long-term debt. This result also indicates the acceptance of (H3), which describes the significant impact of growth on capital finance in the case of EMR and LTDR.

The result of the liquidity assumption in model 1 has a statistically significant negative effect with a value of -0.013 on the debt-to-asset ratio. Meanwhile, in the second model, liquidity hurts the equity multiplier coefficient with a value of -0.076. That is, increasing the liquidity ratio by 1%, will lead to a decrease in each of the debt-to-assets ratio and the equity multiplier ratio by -01.3% and -07.6% one by one. In contrast, the liquidity results indicate that there is no statistically meaningful relationship with the long-term loan ratio. That is, changes in corporate liquidity do not cause changes in long-term debt. That is the same result with the study [15]. However, according to [42], there is a favorable association between liquidity and capital financing. This result also indicates the acceptance of (H4), which describes the significant impact of growth on capital finance in the case of DTAR and EMR.

Furthermore, GMM is used in this research as a robustness test. It is implemented to make sure a constant assumption of correlation between the dependent variable's lag and residuals. The results of the GMM method are presented in Table 6. Even though the GLS coefficient of effects is consistent with the major GMM findings, the GLS finds greater importance of independent factors and has a higher adjusted R-squared. Therefore, it seems that the GLS results offer a more compelling explanation and are more suited to address the research concerns in this investigation.

| Variable | Model 1 (DTAR) | Model 2 (EMR) | Model 3 (LTDR) |
|---|---|---|---|
| DTAR(-1) | 0.334***<br>(0.110) | | |
| EMR(-1) | | 0.2918**<br>(0.140) | |
| LTDR(-1) | | | 0.363***<br>(0.090) |
| ROA | -0.207***<br>(0.045) | -1.921***<br>(0.493) | -0.154***<br>(0.028) |
| FSE | 0.036<br>(0.036) | 0.373<br>(0.292) | 0.049**<br>(0.022) |
| GRO | 0.036<br>(0.053) | 1.114***<br>(0.332) | 0.067***<br>(0.020) |
| LIQ | -0.017***<br>(0.006) | -0.143***<br>(0.031) | -0.005<br>(0.004) |
| GDP | -0.001<br>(0.001) | -0.033***<br>(0.011) | -0.002***<br>(0.001) |
| C | -0.374<br>(0.769) | -5.385<br>(6.065) | -0.919**<br>(0.473) |
| R-sq. | 0.951 | 0.928 | 0.942 |
| Adj. R-sq. | 0.930 | 0.899 | 0.919 |

*Notes: *** Significant at 1% level; ** Significant at 5% level; and * Significant at 10% level.*

*Table 6. Regression analysis (GMM)*

*(Source: EViews version 12 data processing)*

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# 4 Conclusion

This article examines the factors that affect the capital financing of German non-financial companies that were listed between 2017 and 2021 on the German Stock Exchange. Through the use of quantitative descriptive methodology and panel data regression analysis, the results show how strongly company-specific factors impact financial structure choices.

The outcomes reveal that more productive companies use less financing via debt due to achieving more profitability, which has a significant negative impact on all three financial structure indicators in this investigation. On the other side, business size illustrates a favourable link with the equity multiplier and long-term debt ratio, demonstrating that larger companies use greater amounts of long-term debt. Growth indicates that growing businesses use equity and long-term capital because it has statistically minor impacts on the debt-to-assets ratio but large beneficial impacts on the equity multiplier and long-term debt ratio. At the same time, liquidity has an adverse effect on the equity multiplier and debt-to-assets ratio, but it has no effect on long-term debt levels. This indicates that firms with more liquidity use less short-term debt while keeping their long-term debt levels steady.

The significance of profitability, company size, growth, and liquidity as factors in creating the best capital structure regulations is highlighted by the above results, which have significant consequences for business managers and legislators. By managing financial risk and stability with the support of a knowledge of these variables, companies may improve their sustainability and financial success. Therefore, for an appropriate corporate policy and effective risk management, business managers need to carefully consider profitability, firm size, growth, and liquidity.

The findings of this study provide useful information on how to maximize capital structures in different financial settings and might serve as a reference for businesses operating in Europe. The results may also assist companies in making prudent financing choices that strike a balance between risk and expansion prospects. The findings of this study might also serve as a guide for policymakers as they establish financial regulations and laws that would make it easier for non-financial businesses to get funding and allocate capital efficiently.

# Conflicts of Interest

The authors declare no conflicts of interest.

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