Firm Characteristics and Capital Structure: Exploring the Determinants of Financing Choices in European Markets

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ABSTRACT,
This thesis examines the relationship between firm characteristics and capital structure using a dataset of 218 firms listed on the STOXX EUROPE 600 INDEX during the period of 2014-2019. Three measures of capital structure, namely total debt (TD), long-term debt (LTD), and short-term debt (STD), are utilized as dependent variables, while eight firm characteristic measures (including profitability (PROF), size (SZ), growth opportunity (GROW), asset tangibility (TANG), non-debt tax shield (NDTS), volatility (VOL), liquidity (LIQ), and age (AGE) are considered as independent variables. The findings demonstrate that firm characteristics such as size, profitability, tangibility, NDTS, volatility, and liquidity significantly influence the choice of capital structure, determining whether firms finance through debt or equity. However, growth opportunities do not emerge as a significant predictor of leverage ratios across the models or quantiles examined. Furthermore, the analysis reveals that age does not impact the capital structure variables of firms listed on the STOXX EUROPE 600 INDEX.

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1. INTRODUCTION

The availability of capital is essential to the success of any firm. Therefore, a company's capital structure is an important factor for financial managers to consider when making investment decisions. The primary role of financial management is to reduce the cost of capital in order to increase the firm's value and extend the wealth of its shareholders. As firms typically have debt and equity in their capital structures, it is the responsibility of the financial management to find the best possible capital structure to finance and increase the value of the firm for its shareholders. In this regard, finance and accounting literature and theory have devoted considerable attention to the study of capital structure. These theories have been implemented not only to define the ideal mix of capital but also to identify the factors that affect the capital structure and to guide firm decisions that result in the optimal capital structure.

The study of capital structure started with the proposal of Modigliani and Miller's (1958) capital structure irrelevance theory. Their "irrelevance theory" states that, under the ideal conditions of perfect and frictionless capital markets, a firm's capital structure has no bearing on the company's value. However, the fact is that there are frictions in the market. As a result, Modigliani and Miller (1963) re-evaluated their original hypothesis and proposed that tax advantages are an important element that affects the firm's capital structure decisions. This prompted several studies on the variables impacting a firm's decision to finance its capital structure through debt or equity. In this regard, Miller (1977) identified three tax rates that impact the overall value of the firm, which helped revive some of the principles of the capital structure irrelevance proposition. That includes the corporation tax rate, dividend tax, and interest income tax.

Moreover, M'ng, Rahman, and Sannacy (2017) investigated the factors that influence firms' capital structure in Malaysia, Singapore, and Thailand, while Wellalage and Locke (2013) investigated the relationship between corporate governance and capital structure in New Zealand's largest listed companies. Here, Wellalage and Locke (2013) collected data over a period of eight years for forty companies trading on the NZX50 Stock Exchange and used conditional quantile regression to analyze the observations. Contrary to expectations, this study finds that firm-specific characteristics, rather than corporate governance variables, have a significant impact on predicting firm leverage levels. Based on these findings, it is clear that financial policies should be tailored to the specific needs of publicly traded companies in terms of firm type and company characteristics, as well as their corresponding borrowing needs. Furthermore, capital structure research from the UK was conducted by Fattouh, Harris, and Scaramozzino (2008), whereas research from the US was conducted by Rajan and Zingales (1995). Researchers in this field concluded that the capital structure of a firm is affected by a wide range of factors, including the company's age and size, as well as its tangibility, profitability, liquidity, risk, growth, and NDTS. This was in line with the findings of Saksonova (2006).

Accordingly, the choice of capital structure is one of the most important decisions an organization makes since it can result in a positive or negative outcome that cannot be reversed because companies' investments require a large amount of funds. As a result, the choice must be adequately prepared and made after thoroughly considering various circumstances around the company. Most financial managers have demonstrated failure when some have succeeded in determining the capital structure mix to pursue.

Therefore, the decision about capital structure is one of the most difficult issues organizations deal with. According to Gill, Biger, Pai, and Bhutani (2009), the factors that determine capital structure have been a topic of discussion and the subject of several studies throughout the years and are still among the most important unresolved problems in the area of corporate finance. This is due to the fact that these earlier studies' findings have been inconsistent, divisive, and subject to further research (Morri & Beretta, 2008). This creates a gap in the research field of capital structure.

This study uses Quantile regression analysis on a sample of 218 firms listed on the STOXX EUROPE 600 INDEX between 2014 and 2019 to learn more about how the characteristics of a firm affect its capital structure. Despite the abundance of empirical data on the effect of firm characteristics on capital structure, firms listed on the STOXX EUROPE 600 INDEX have never been the subject of a study. Therefore, the study's findings and results will provide important insight for financial managers of firms listed on the STOXX EUROPE 600 INDEX to better comprehend the relationship between firm characteristics and debt. Findings from the research will assist financial managers in making the best possible decision regarding capital structure. The study will also look at the theories developed by other scholars and test them using hypotheses. This sort of study gives us a full understanding of how the different characteristics of a firm affect its capital structure. Therefore, I put forward the following research questions.

Research question: *To what extent do firm characteristics impact the capital structure of STOXX EUROPE 600 INDEX listed companies?*

2. LITERATURE REVIEW

2.1 Definition of Capital structure

Since MM first began publishing its findings in 1958, capital structure has been a central topic of discussion in the academic world. Capital structure is concerned with mixing debt and equity to finance the firm. Finding the optimal mix between debt and equity is important because of its significant impact on a firm's operations and investment activities. Therefore, capital structure is an interesting issue that has been studied at both the academic and corporate levels. As a result, several definitions have been proposed for "Capital Structure," and they all have the commonality of outlining the various securities that makeup capital and the relative weights assigned to each. Capital structure consists of a variety of long-term funding sources, including retained earnings, equity shares, preference shares, debentures, and long-term loans.

According to one description provided by Gangeni (2006), the field of research known as "capital structure" seeks to shed light on the diverse array of securities and funding mechanisms through which firms fund their actual investments. Making investments is necessary for the company's survival and development. For these investments, companies can use internal (retained earnings and public share issuance) or external (loans and bonds) funding. In their seminal study on the subject, Parmasivan and Subramanian (2009) defined "capital structure" as the way a company's equity capital, preference share capital, and debt capital work together. Capital structure refers to a company's long-term financing, which is often made up of debt and equity, and the choice of an appropriate capital structure is a crucial decision for the company's financial management to make because of its direct impact on the company's value. It is the proportion of long-term debt to equity that is maintained, as described by Gitman and Zutter (2012). While a company's long-term financing mix of debt, preferred stock, and common stock

equity may change slightly over time, most companies strive to maintain a capital structure that is relatively constant over time.

According to Ehrhardt & Brigham (2011), the capital structure's primary function is to include the best possible distribution of debt and equity. The target capital structure, the average debt maturity, and the specific financing methods chosen by a company at any given moment all contribute to its capital structure decision. Therefore, management's capital structure choices should aim to increase the firm's value, like operational ones.

2.2 Optimal Capital Structure

The optimal capital structure is attained at the point that the cost of the firm's capital structure is minimized to increase its intrinsic worth. According to Parmasivan and Subramanian (2009), an organization's optimal capital structure is one that allows it to maximize its value through a mix of debt and equity financing. Similar sentiments are voiced by Hsieh (1993), who argues that a firm should select a debt-equity ratio that optimizes the value of the business. In addition, he suggests that there are a plethora of interacting decision factors and very complicated decision-making processes involved in identifying the optimal capital structure. Moreover, Hawawini & Viallet (1999) suggested that the optimal capital structure is the mix of long-term financing options that maximize shareholder value by minimizing the weighted average cost of capital (WACC) (Hawawini & Viallet, 1999).

Additionally, research by Lasher (2016), Moyer, McGuigan, and Kretlow (2003), and others has shown that increased debt financing is associated with higher earnings per share (EPS) and return on equity (ROE). In any case, this does not necessarily maximize shareholder value; therefore, the key is to determine the ideal combination of debt and equity to maximize the share price.

In light of the foregoing, "optimal capital structure" can be defined as the optimum or correct combination of debt and equity" that maximizes market value while minimizing a company's cost of capital (in this case, the weighted average cost of capital, or WACC) (i.e., shareholder wealth). A company's stock price will rise with a decreased cost of capital.

2.3 Components of Capital Structure

Companies can raise money through debt or through issuing shares to the public (equity). Since debt and equity carry expenses, a business must make a calculated decision between the two to achieve the lowest possible overall cost structure. Due to this, the ratio of debt to equity may be used as a metric for capital structure. In terms of a company's finances, Glen and Singh (1999) note how crucial it is to strike a balance between debt and equity. A company's profitability and level of risk are both affected by its capital structure, which is measured by the ratio of its total debt to its book value of its total assets (Bos & Fetherston, 1993). Thus, capital structure refers to the mix of debt and equity financing that allows businesses to reduce their total financing expense (cost of capital).

2.3.1 Equity Financing

Sibilkov (2009) believes that equity is preferable to debt in order to minimize the risks associated with debt. Consequently, there is no set deadline for repaying the equity financing. Buyers of the company's stock anticipate recouping their money via dividends and other future gains. Furthermore, the shareholders are entitled to a portion of the company's earnings, either in the form of dividend payments or potential capital appreciation. In the event of a loss, shareholders will only be liable for the amount they initially put into the company (Sibilkov, 2009).

Internal and external equity are the two types of equity (Myers, 1984). The term "internal equity" is used to describe a company's distributable reserves, which include retained earnings. Once the income statement reveals the amount of profit that is distributable, the company must next select what part of that profit will be distributed as dividends to the company's ordinary shareholders. The remaining balance reflects retained earnings, which will be added to the company's distributable reserves. This sum is known as "retained profits" and is used to fund the company's ongoing operations. By contrast, external equity consists of funds raised from parties outside the company through the issuance of additional shares.

Preference share capital and ordinary share capital are the two most common types. When a company's retained earnings (internal equity) are insufficient for a particular investment opportunity, it must seek additional funding by issuing equity to the public (Graham & Harvey, 2001). However, when a company raises too much capital through stock issuance, it may signal to the market that it does not have enough cash on hand or reserves, which might cause the share price of the company to be undervalued, as stated by Baker and Wurgler (2002) Therefore, firm share prices may decline when investments are funded by external equity. Hence, it is preferable to accumulate reserves so that a more significant proportion of capital requirements may be met from internal sources.

2.3.2 Debt Financing

According to Scott, J. H. (1977), debt is a key component of firms' capital structures since it serves as a source of funding for capital expenditures through borrowing. It stands for any instrument that establishes terms between a lender and a borrower, such as a note, certificate, bond, debenture, mortgage, or lease.

Debt financing is defined primarily by the requirement to repay the principal and interest to the lenders throughout the agreed-upon repayment period. The interest rate that must be paid on the borrowed capital, combined with a payment plan, will be laid out in the contract between the lender and the borrower. The borrower's ability to get credit in the future and stay afloat financially are both affected by the borrower's credit rating, which will suffer if the borrower fails to meet the terms of the contract. Nevertheless, a company has a duty toward the debt providers even if it is experiencing financial difficulties and cannot make the planned payments (Shah & Hijazi, 2004).

Moreover, short-term debt is different from long-term debt since it matures at a later date. Trade receivables, short-term loans, and inventory financing are all examples of the types of debt a company takes on to meet its daily cash flow needs and are hence considered short-term. The time frame for repaying these loans is often shorter than a year. Companies typically get long-term financing when investing in long-term assets like buildings, equipment, or machinery. Funds are borrowed for more than a year, and repayments are spread over many years (Scott, J. H., 1977).

2.4 Cost of Capital

Capital, as stated before, is made up of two parts: debt and equity. Debt financing involves a company borrowing money from a lender for a certain period of time in exchange for a guarantee to repay the loan plus interest, and lenders are rewarded with interest payments for their services. Equity financing allows investors to become part-owners of a business in exchange for a return on their investment in the form of a dividend or other distribution of the company's earnings. A company's "cost of capital" is the sum of all its financing-related costs.

2.4.1 Interest (cost of debt)

Borrowing money from banks or the general public through bonds (debentures) at a predetermined interest rate is a method the firm may use to raise debt (Wakida, 2011).

The cost of debt is a helpful metric since it provides insight into the overall interest rate paid by the firm in exchange for issuing bonds, loans, and other kinds of debt financing. Since riskier businesses often have a higher cost of debt, this metric can also provide investors with a sense of the company's relative level of risk.

The cost of debt is less than the cost of other sources of financing because lenders want lower returns than other donors of long-term capital since they take the least risk. As an additional perk, firms may save money on their debt because interest payments are tax-deductible.

2.4.2 Dividends (cost of equity)

Since investors become partial owners of the firm upon providing equity capital, they are also granted a claim to the firm's future dividends, the amount of which is not known in advance (Wakida, 2011). Alternatively, the retained earnings strategy is also a method by which companies might raise money.

In this regard, the opportunity cost of retained earnings for stockholders is the dividend yield they would have received instead. On the other hand, external equity's cost is the minimum return rate the shareholders demand on the funds they supply by purchasing additional shares. As a result, the share price remains stable on the market (Wakida, 2011).

Unlike debt capital, which the company must return at some point, the money invested in the form of equity does not have a set expiration date. It is thus considered a permanent addition to the company's resources. Common stock equity (which comprises common stock and retained profits) and preferred stock are the primary forms of equity capital. Common stock is the most costly equity type for most companies, followed by retained profits and preferred stock. Furthermore, if a company dramatically increases its leverage, it may see its cost of debt climb as lenders become concerned about the company's capacity to repay its loans. Gitman and Zutter (2012) argue that the cost of equity is always higher than that of debt since the claims of ordinary shareholders are riskier than those of lenders.

2.5 Theories of Capital Structure

Various theories have been put out in the literature to investigate the factors that influence capital structure, with a particular emphasis on those most likely to impact borrowing decisions significantly. Despite the extensive research that has been done on the topic, the factors that determine capital structure and the effect they have on capital structure choices are still up for discussion. The purpose of this study is to provide a quick overview of the most important theories surrounding capital structure as well as previous empirical investigations on the factors that influence it.

2.5.1 Modigliani & Miller (M&M)

For the first time, Nobel laureates Merton Miller and Franco Modigliani formally proved their now-famous M&M irrelevance argument in a paper they published in 1958. This irrelevance theory states that a company's financial structure does not affect its value. In their first hypothesis, Modigliani and Miller argue that the profitability of a company's assets, instead of its capital structure, determines its value over time. The MM's first claim rests mostly on capital market assumptions whereby bankruptcy costs, transaction costs, information asymmetry, and taxes do not exist. The second proposition of MM, which similarly relies on the assumption of a perfect capital market, is that if shareholders take on more risk, the company should compensate them with a more significant return on their investment (measured by a higher D/E ratio). Due to capital market imperfections, Modigliani and Miller have been criticized. Depending on the specifics of the investment, the company may consider many types of funding. However, despite the fact that the M&M capital structure irrelevance theory is based on unrealistic assumptions, it may be used as a jumping-off point in a search for the variables that affect the leverage strategies of firms. For this reason, verifying the ideas of M&M has been essential to a number of influential theories, including pecking order, the theory of agency cost, and the trade-off theory (Gul. S. et al., 2012).

2.5.2 The Pecking Order Theory

Originally proposed by Donaldson in 1961, the pecking order theory underwent significant revisions by Myers and Maljuf in 1984. The theory holds that internal corporate management has a more complete understanding of the firm's investment potential than external market participants. This disparity in knowledge prompts managers to seek funding in a certain order (the pecking order).

Initial capital is obtained via retained earnings, then through debt, then convertible debt and preference shares, and finally through new issues of equity. In this regard, Myers (1984) argues that if a company is in need of external financing, it will issue the most conservative security (debt market) before considering more risky options like convertible bonds. The company resorts to the equity market and issues external equity as a last resort. Hence, the company will issue common shares only if no other options exist. This is due to the fact that issuing external equity sends a negative signal to the market that supporting equity is overestimated (Myers & Majluf, 1984). However, if you issue debt, it suggests you haven't put enough value in your stock. This disagreement "causes an interplay between investment and financial choice" (Gajurel, 2005, p. 19).

In particular, if a company follows the pecking order theory, it will keep its debt levels low so that it can take advantage of investment opportunities without issuing more shares. These firms would have a cushion of cash on hand and unused credit lines to quickly respond to investment opportunities as they arise.

2.5.3 The Trade-off Theory

Capital structure theories place significant emphasis on financial distress. Modigliani and Miller first proposed the idea of a tax deduction for debt in 1963. According to Modigliani and Miller (1963), the allure of debt declines when one's interest income is subject to individual taxation. When a company is unable to meet its debt commitments, it is said to be in financial distress. In addition, the likelihood of default on debt grows when a company uses more debt than equity to fund its operations and future developments (Kraus & Litzenberger, 1973).

Financial distress significantly impacts the company's investment strategy, R&D, marketing, and training budgets, among other things (Warner, 1977). All of these choices, made in response to financial stress, will have a detrimental effect on the value of the business, causing its value to fall and, in turn, the wealth of its shareholders to decrease (Arnold, 2008).

Moreover, there are direct and indirect costs associated with financial distress. A bankruptcy filing charge, an administrative fee, and legal expenses are all examples of direct costs (Warner, 1977). The financial distress of a company leads to the incurrence of indirect costs as a result of the company's choice of action. As indicated before, they include changes to investment strategy, including delaying positive NPV investments or completely passing on investment opportunities, drastically reducing

employee training and education, and cutting back on R&D and marketing efforts (Arnold, 2008).

According to the trade-off theory, the leverage ratio of a company is significantly affected by the interest tax shield and the cost of bankruptcy (financial distress). According to this theory, the value of a geared firm is the same as the value of an ungeared firm plus the present value of the interest tax shield less the present value of the financial costs (Berk & DeMarzo, 2007). Accordingly, the business seeks the optimal debt ratio, which trades off tax advantages against the expense of potential bankruptcy and agency conflict (Gajurel, 2005). In addition, the trade-off theory states that firms with higher earnings will have greater leverage and higher taxable income to offset those gains (Barclay & Smith, 2005). However, research by Rajan and Zingales (1995) suggests that this approach isn't always helpful in explaining why productive firms have low debt ratios. Bevan and Danbolt (2002) add to the chorus of critics by noting that the trade-off theory has its own set of drawbacks. There is a substantial negative relationship between profitability and debt ratios in capital structure, and this is supported by empirical research like that conducted by Kester (1986) and Titman and Wessels (1988). Therefore, the trade-off theory is insufficient for finding the optimal capital structure because of its limitations and drawbacks.

In summary, to determine the optimal mix of debt and equity financing for a given business, the trade-off theory of capital structure suggests considering the costs and advantages of each. The primary idea behind this approach is to balance the advantages of borrowed funds with the costs. It explains how firms are typically funded via a combination of equity and debt. The cost of financial distress and agency costs are the primary topics covered by the trade-off theory of capital structure. It describes the tax advantages of debt financing, the bankruptcy costs of debt, and the non-bankruptcy expenses of debt financing.

2.5.4 The Agency Theory

The rise in agency costs may be traced back to the diffusion of authority and the ensuing development of conflicts of interest among the many types of agents. Free cash flows are a source of conflict between management and stockholders. According to Jensen (1986) and Williamson (1988), debt is a discipline used to ensure that managers prioritize equity holders' interests when making decisions. Thus, in organizations with good cash flow and profitability, growing debts may be used to decrease the range of options for managers until the company's resources are not wasted due to their individual goals.

Moreover, the managers may not get the full advantage of their efforts, which is another competing issue. This is the case when management has a small percentage of the company's ownership. These inefficiencies are mitigated when the manager's stock bonus is high. Therefore, rather than issuing shares, it is proper to issue more debt to prevent the manager's ownership stake from declining (Huang, 2006).

Stulz (1990), in agreement with Jensen, argues that paying down debt reduces managers' free cash flow. Yet he also claims that fewer investment opportunities mean less potential for profit. Consequently, debt-free businesses have more investment options and more liquidity than similarly thriving competitors.

Additionally, potential bankruptcy costs and agency costs related to bondholder investment monitoring are two other costs of debt. Until the marginal cost of equity equals the marginal cost of debt, the optimum capital structure is reached, and the firm's value is maximized via "trading off" the costs and advantages of various financing options. Meyers (1984) and Fama & French's (2002) "Pecking Order" theory is the opposing theory to the "agency cost" theory, in which a company's debt is seen as the cumulative result of previous investment and capital decisions. As mentioned before, the "Pecking Order" theory states that businesses with a positive net present value on their investments will first use internal funds to finance new investments, and only if those funds run out will they turn to external sources of funding, such as safe debt, risky debt, and equity. As a result, the firm's financial structure results from previous cash flows and investment possibilities, and financing projects using internally produced capital may be the cheapest source.

Furthermore, shareholder-creditor conflicts have consequences, including higher interest rates from creditors, more expenses associated with monitoring, and reduced investment. Accordingly, the outcome of this conflict proves that excessive use of leverage always has negative results (Jensen & Meckling, 1976).

2.5.5 The Signaling Theory

M &M presupposes symmetric knowledge, which is the idea that managers and investors know the same thing about a company's future. However, managers seem to have superior knowledge compared to external investors. This is known as asymmetric information, and Ehrhardt and Brigham (2011) claim it significantly impacts the optimal capital structure.

According to the theory of "signaling," the management of a firm uses their financial decisions to send signals to investors in an effort to disrupt these information asymmetries. Financial communication policy relies heavily on these signals. The assumption here is that management will only issue debt or equity if there are insufficient internal resources to fund the planned investments or if the risk is not proportionate with the expected rewards (Gangeni, 2006). The focus here will be on determining what patterns exist concerning the quality, quantity, and reliability of the information available. If the managers believe the stock price is below its real value, they will not issue any new shares (given their inside information). As a result, the market typically interprets a stock issue as a negative signal, causing the stock price to drop.

2.5.6 The Market Timing Theory

One alternative capital structure theory is the market timing theory developed by Baker and Wurgler (2002). Since the market timing theory is relatively novel, only a limited number of empirical tests have been performed to date (Danso & Adomako, 2014). According to the market timing theory of capital structure, companies issue new stock once the stock price is seen as overpriced (high price) and repurchase their shares when there is undervaluation (low price) (Luigi & Sorin, 2009; Baker & Wurgler, 2002). Thus, changes in the stock market will impact the company's capital structure choices.

There is growing evidence from the equity market that the issuance of equity is a key part of actual corporate finance policy, according to Baker and Wurgler (2002). The most essential factor they discovered was that low-leverage companies raised capital when their market values were high (as determined by the market-to-book ratio), whereas high-leverage companies did the opposite.

Equity market timing comes in two different forms. The first one is a more up-to-date version of Myers and Majluf (1984), which includes rational managers and investors. After a favorable information release, managers are anticipated to issue equity directly, therefore reducing the management-stockholder asymmetry problem. The decrease in information asymmetries correlates with a rise in the share price. As a result, companies generate their own timing opportunities (Luigi & Sorin, 2009). In addition, inversely correlated with the market-to-book ratio,

adverse selection's severity varies among businesses or over time (Baker & Wurgler, 2002).

In the second version, managers and investors are assumed to be acting irrationally (Baker & Wurgler, 2002). There is a time-varying mispricing of the company's shares due to irrational behavior. When managers view the price of the stock to be excessively low, they issue new shares; when they think the price to be absurdly high, they buy back existing shares (Baker & Wurgler, 2002; Luigi & Sorin, 2009). One crucial fact to keep in mind about the second version of market timing is that it is independent of the market being inefficient. It doesn't need management to be able to accurately estimate stock returns (Luigi & Sorin, 2009). Simply put, this theory rests on the premise that managers think they can predict market fluctuations.

Additionally, managers admitted attempting to time the equity market in research by Graham and Harvey (2001), and most who have contemplated issuing common stock stated that "the amount by which our stock is undervalued or overpriced" was a significant factor in their decision. Although this study and the findings provided by Luigi and Sorin (2009) lend credence to the premise of the aforementioned market timing theory—that managers have the ability to time the market—it makes no clear distinction between the mispricing and the dynamic asymmetric information versions of market timing.

Furthermore, Baker and Wurgler (2002) used in their study the market-to-book ratio to measure the market timing opportunities perceived by managers. They found that low-leverage firms include those that raised funds once their valuations were high, and high-leverage firms include those that raised funds while their valuations were low. Additionally, their finding also demonstrates that traditional theories of capital structure are unable to fully account for the findings, which reveal that changes in market values have major impacts on capital structure that endure for at least a decade. Although there is no "optimal" capital structure according to Market Timing Theory, managers often base their capital structure decisions based on Equity Market Timing techniques.

2.5.7 The Life Stage Theory

Organizational life stage theory holds that, like living creatures, businesses go through a series of phases that begin with birth and finish with maturity before finally dying.

Different phases of a company's life cycle are characterized by varying degrees of information asymmetry, as stated by Utami & Inanga (2012). Well-established firms have lower levels of information asymmetry than startups. This is due to the fact that established, older companies are more carefully watched by analysts and are better known to investors. To paraphrase the theory's central tenet: capital structure affects a company's survival at different stages. High levels of debt relative to equity are thought to characterize the birth and growth phases. Debt levels fall when businesses reach maturity, only to climb again as they enter the decline phase.

In order to examine the correlation between capital and company value, Chowdhury and Chowdhury (2010) used share price as a benchmark for value and examined a variety of ratios for capital structure decision-making in Bangladesh. This discovery raises the intriguing possibility that the optimal mix of debt and equity is essential for maximizing shareholder value while the cost of capital should be kept to a minimum. It is also clear that a company may boost its market value by adjusting the mix of capital it uses at different stages in its life cycle. However, this may have important policy implications for financial managers, who may then employ debt to shape the best possible capital structure in order to maximize shareholder value.

3. FIRM CHARACTERISTICS & HYPOTHESIS

Research on capital structures has focused on identifying the factors that explain organizations' financing behaviors and decisions. Several factors have arisen to better explain capital structures as a consequence of these theoretical and empirical studies.

Harris and Raviv (1991) and Brigham and Daves (2004) agree that fixed assets, non-debt tax shields, investment possibilities, and business size positively correlate with a firm's degree of leverage. In a similar vein, factors like market volatility, advertising expenditures, bankruptcy risk, profitability, and uniqueness of the product all contribute to lower leverage (Rajan & Zingales, 1995). Profitability, asset tangibility, no-debt tax shield, liquidity, volatility, growth opportunity, age, and size are some of the most common firm characteristics that have been examined before (Booth, Aivazian, Demirgüc-Kunt, Maksimovic, 2001; Vasiliou, Eriotis, Daskalakis, 2005; Baral, 2004, Chen, & Hammes, 2004). Consequently, these considerations are part of the scope of this research and will be discussed below.

3.1 Profitability

Myers and Majluf's (1984) Pecking Order theory is most directly testable through the relationship between profitability and debt. According to this theory, firms pursue a funding hierarchy. Myers and Majluf (1984) argue that organizations would be better off using internal rather than external funding and that this preference would be justified if the company were profitable enough to have access to sufficient amounts of internal capital. In this case, profitable companies would use their retained earnings as their primary source of funding, resulting in less leverage. In addition, it is expensive to issue security over which outside investors have limited knowledge in an environment that is characterized by information asymmetry. However, compared to equity, debt is less affected by information asymmetry since debt holders have a greater claim on corporate assets and get regular streams of interest payments. Still, based on the Pecking Order theory, internal funds are the most cost-effective way to finance projects. Therefore, companies prioritize internal funds over debt and equity when deciding on a financing strategy. Hence, profitability is negatively correlated with debt, according to this theory. Studies utilizing data from major companies back this theory up (Schoubben & Hulle, 2004; Titman & Wessels, 1988; Van Dijk, 1997; Fama & French, 2002; Rajan & Zingales, 1995). In this regard, Schoubben and Hulle (2004) claim that prosperous companies may be less likely to take on debt in an effort to re-establish their profitability as a sign of high quality. Titman and Wessels (1988) and Rajan and Zingales (1995) find that higher levels of leverage are associated with lower levels of profitability

On the other hand, profitable companies have easier access to the debt market, as lenders are more likely to lend to them. Consequently, organizations that are doing well financially would be in a better position to reap the tax advantages that come with carrying a larger amount of debt. In accordance with the principles of trade-off theory, this may encourage them to increase their use of leverage. If this holds, then optimal leverage will positively affect profitability. Similarly, Jensen's (1986) agency cost theory also confirms the positive correlation between debt and profitability by arguing that debt levels should be increased as profits rise because it stifles free cash flow and decreases the likelihood that management will initiate value-

destructive investment projects. The following hypothesis is proposed in light of these theories:

H0: There is a negative relationship between profitability and leverage

H1: There is a positive relationship between profitability and leverage

3.2 Size

A company's capital structure is thought to be heavily influenced by its size. Nevertheless, there are divergent views on how debt financing relates to the size of a firm. Warner (1977), Ang et al. (1982), Titman and Wessels (1988), and Pettit and Singer (1985) all argue that, from a financial distress standpoint, larger firms seem to have greater diversification and are less prone to bankruptcy. In addition, Warner (1977) and Ang et al. (1982) also show that smaller firms' bankruptcy costs are disproportionately high. In this regard, size may be an inverse proxy for the probability of bankruptcy.

Furthermore, there is more information asymmetry and lower marginal corporation tax rates in smaller firms. Thus, smaller businesses are disincentivized to use debt to fund their capital structure (Michaelas, Chittenden, & Poutziouris, 1999). Moreover, Cassar (2004) claimed that large firms might desire higher loans than smaller firms because of their greater market access. On top of that, the high price of external borrowings may deter smaller firms from taking on greater debt. This is consistent with the trade-off theory, which suggests a positive correlation between size and leverage and a negative relationship with the likelihood of bankruptcy. Likewise, this forecast is compatible with the free cash flow theory of Jensen (1986) and Easterbrook (1986) if diversification also leads to more consistent cash flows.

Meanwhile, some further contend that the conflict between shareholders and lenders causes smaller businesses to carry more short-term debt than long-term debt (Michaelas et al., 1999; Titman & Wessels, 1988; Stohs & Mauer, 1996). For instance, Deloof and Verschueren (1998) found that size has a positive correlation with debt, but this correlation breaks down when just short-term debt is analyzed. Finally, Bevan and Danbolt (2002) found in their study that the connection changes depending on the kind of debt. If the debt is long-term, the correlation should be positive, but if it is short-term, it should be negative. In this analysis, the size of a company is determined by its net sales and total assets.

On the contrary, Rajan and Zingales (1995) proposed that a company's size may be used as a stand-in for the degree of information asymmetry between the company's management and the capital markets. Since analysts keep a closer eye on publicly traded companies, it stands to reason that larger businesses will be in a better position to issue equity that is more responsive to market information. Thus, bigger enterprises are expected to show a greater preference for equity over debt, as predicted by the pecking order theory of capital structure.

Based on these assertions, the following hypotheses are constructed:

Hypothesis 2A:
H0: There is a positive relationship between size and total debt
H1: There is a negative relationship between size and total debt
Hypothesis 2B:
H0: There is a positive relationship between size and long-term debt
H1: There is a negative relationship between size and long-term debt
Hypothesis 2C:
H0: There is a positive relationship between size and short-term debt
H1: There is a negative relationship between size and short-term debt

3.3 Growth Opportunity

Previous research has shown contradictory outcomes for firm growth prospects and debt levels. It seems to reason that a company with good growth opportunities would seek out more debt to fund its future investments. However, according to Jensen and Meckling (1976) and Myers (1977), companies with growth potential are more vulnerable to agency problems between managers and debtholders. For instance, Myers (1977) argues that managers may fail to invest sufficiently in many value-creating initiatives (underinvestment) since equity holders may not benefit from all investments if interest payments are large. For this reason, the trade-off model predicts that businesses with more investment opportunities would utilize less leverage.

On the contrary, according to the pecking order theory (Myers & Maljuf, 1984), growth should positively affect leverage. Companies with significant growth opportunities are more likely to attract new investors (De Jong, 1999). Since debt is favored over equity, a positive correlation between growth and debt is expected.

Multiple studies (Pepur, urak, & Poposki, 2016; Choi, Yoo, Kim, & Kim, 2014) demonstrate a negative association between growth prospects and leverage, lending credence to the trade-off theory notion. On the other hand, both Shah and Jam-e-Kausar (2012) and Achy (2009) find a positive relationship between growth prospects and firm leverage level, suggesting that a firm with high growth prospects will be more likely to seek financing from outside the firm, in line with predictions made by the pecking order theory.

Some studies contradict these theories by concluding that a company's growth prospects are not a good predictor of its leverage. Through an examination of eight years' worth of data for forty companies traded on the NZX50 Stock Exchange, Wellalage and Locke (2013) investigate the connection between company characteristics and debt ratio. Based on the findings of conditional quantile regression, expansion is a weak predictor of leverage in businesses. A similar conclusion was reached by Wellalage and Locke (2014) for companies trading on the Colombo Stock Exchange; they found that growth was an insignificant predictor other than at the mid-quantile. Based on these theories, the following hypotheses are formulated:

H0: There is a negative relationship between growth opportunity and leverage
H1: There is a positive relationship between growth opportunity and leverage

3.4 Asset Tangibility

Company finance decisions may be influenced by the kind of assets the company has. For instance, lenders have an easier time placing a value on tangible assets than intangible ones because of the greater information asymmetry around the latter. Additionally, intangible assets such as goodwill are likely to swiftly dissipate in the face of probable bankruptcy, substantially reducing a firm's net value and speeding up the possibility of bankruptcy. Thus, it may be argued that a company's ability to raise financing would improve if its assets consisted of a larger proportion of tangible assets. Consequently, companies that have invested heavily in tangible fixed assets are in a better position to get debt financing since these assets may be liquidated in the event of bankruptcy to satisfy creditors' claims that the loan would be repaid in full (Jensen & Meckling, 1976; Myers, 1977; Scott, 1976; Harris & Raviv, 1990; Heshmati, 2001). To that end, Myers and Majluf (1984) claim that leverage is positively related to the collateral value of assets. In addition, it has been suggested

that increased collateral value reduces debt agency costs (Jensen & Meckling, 1976; Myers, 1977). Stockholders of levered enterprises, according to Galai and Masulis (1976), Jensen and Meckling (1976), and Myers (1977), are prone to overinvest, leading to the typical shareholder-bondholder conflict.

Nevertheless, if the debt is backed by collateral, the borrower must use the money only for the intended purposes. As assets are liquidated, they are able to provide a greater percentage of their original value to creditors, increasing the recovery rate. In other words, the debt capacity should rise in line with the share of tangible assets in the balance sheet since such a guarantee does not exist until collateralized assets are there. As a result, the trade-off theory suggests that the more tangible assets there are, the higher the level of leverage.

On the other hand, Grossman and Hart (1982) claim that businesses with less collateral assets have greater agency costs because their managers consume more benefits than necessary. As creditors keep a closer eye on heavily leveraged corporations, their managers will have less opportunity to indulge in lavish perks. Companies with less collateralizable assets may incur more expenses in managing this agency conflict. Therefore, it's possible that companies with a low collateral value of assets would increase their leverage in an effort to discipline their management. As a result, management and shareholder interests may be brought into harmony via the use of increased debt levels, but the expropriation of private advantages by managers would be constrained by a rise in bankruptcy costs brought on by increased leverage. This agency model (Jensen, 1986) suggests that there is an inverse correlation between the tangibility of assets and leverage.

Generally, according to the data obtained from developed countries, there is a positive relationship between asset structure and debt ratios (Rajan & Zingales, 1995; Titman & Wessels, 1988). Although Nivorozhkin (2004) found this variable to be statistically insignificant, Campbell and Jerzemowska (2009), on the contrary, discovered a negative association for Polish companies. Regarding this, Bevan and Danbolt (2002) state that different debt measures have different associations with different asset structures. They discovered a positive relationship between the structure of assets and long-term debt and a negative relationship between the structure of assets and short-term debt. This hypothesis looks plausible for a country like Poland with mostly short-term debt.

Finally, according to the pecking order theory (Myers & Maljuf, 1984), firms with more tangible assets will be less vulnerable to asymmetric information concerns and, thus, less inclined to issue debt. This line of reasoning indicates a negative correlation.

Regarding these theories, the following hypothesis is formulated:

Hypothesis 4A:
H0: There is a positive relationship between asset tangibility and leverage
H1: There is a negative relationship between asset tangibility and leverage
Hypothesis 4B:
H0: There is a positive relationship between asset tangibility and long-term leverage
H1: There is a negative relationship between asset tangibility and long-term leverage
Hypothesis 4C:
H0: There is a positive relationship between asset tangibility and short-term leverage
H1: There is a negative relationship between asset tangibility and short-term leverage

3.5 Non-Debt Tax Shield

According to Modigliani and Miller (1958), interest tax deductions are a major incentive for debt. Of course, this assumes that the firm has sufficient taxable revenue to cover its debt obligations. Therefore, to take advantage of the tax benefits related to interest payments on debt, Modigliani and Miller (1963) argue that corporations should seek debt financing for all their funding needs. They were conforming to the static trade-off theory of a positive correlation between the effective tax rate and leverage.

Non-debt tax shields may be used in place of debt tax shields, as noted by DeAngelo and Masulis (1980). Any tax deductions a company may claim against its taxable income other than interest payments on its debts, such as those for depreciation of fixed assets or research and development expenditures, are considered non-debt tax shields.

Depreciation expenditure gives firms a buffer against the effects of leverage (Onofrei, Tudose, Durdureanu, & Anton, 2015). You may get the same tax advantages through depreciation as you would from using debt, but at a lower cost. High depreciation as a non-debt tax shield is associated with lower debt levels in a company's capital structure, as confirmed by M'ng, Rahman, and Sannacy (2017). As such, the trade-off theory paradigm hypothesizes a negative link between leverage and non-debt tax shielding. This is in accordance with the findings of Byoun (2008), who argues that as non-debt tax shields increase, the need for the tax advantages provided by debt financing should decrease, implying an inverse relation between non-debt tax shields and leverage.

On the other hand, Scott (1977) and Moore (1986) suggest that companies with large non-debt tax shelters should also have large collateral assets that could be utilized to secure debt. As has been discussed, the risks associated with secured debt are reduced in comparison to those associated with unsecured debt. Accordingly, one may theoretically argue for a possible correlation between leverage and non-debt shield.

In point of fact, the empirical findings are inconsistent. For instance, Gajdka (2002) and Shenoy and Koch (1996) verified the negative relationship between the non-debt tax shield and debt, while Campbell and Jerzemowska (2009) and Gardner and Trzcinka (1992) discovered a positive relationship between the variables. However, Choi, Yoo, Kim, and Kim (2014) used the quantile regression method to analyze the capital structures of 43 South Korean construction firms listed on the South Korean Stock Exchange and found that NDTS was an unsuitable metric to use.

Regarding these empirical findings, the following hypothesis is formulated:

H0: There is a negative relationship between NDTS and leverage
H1: There is a positive relationship between NDTS and leverage

3.6 Volatility

A higher degree of cash flow volatility enhances the significance of the underinvestment issue of Myers (1977) type. There are two significant concerns. To begin with, according to DeAngelo and Masulis (1980), investors will have little success relying on publicly accessible information to predict results for firms with unpredictability in earnings. As a result, the market will see the firm as a "lemon," and lenders will charge more to offer finance. The interest on debt therefore rises.
Second, companies with more unpredictable cash flows keep their leverage low so they do not have to sell more risky shares or cash in on profitable investments when cash flow is low. In this way, the pecking order model hypothesizes that as the

company's debt increases, its cash flow volatility will also increase.

The trade-off model can make the exact same prediction, but it does so in a slightly different way. So, there is a negative link between leverage and cash flow volatility since more fluctuating cash flows lead to a higher chance of default.

Additionally, the relationship between volatility and capital structure is not clearly answered by empirical findings. According to Bradley, Jarrell, and Kim (1984), earnings volatility is adversely connected to leverage. While according to Titman and Wessels (1984), Auerbatch (1985), and Ferri and Jones (1979), there is no relation between earnings volatility and leverage.

With reference to this empirical evidence, the following hypothesis is proposed:

H0: There is a negative relationship between volatility and leverage
H1: There is a positive relationship between volatility and leverage

3.7 Liquidity

The phrase "corporate liquidity" refers to a company's capacity to meet its short-term financial commitments. Even though a company is generating a lot of money, it may not be able to distribute any of that money to shareholders in the form of dividends. Yanti and Dwirandra's (2019) study finds a positive and statistically significant correlation between liquidity and capital structure. If a business can meet its financial commitments on time, it is said to be in liquid condition and has a good chance of growth. In addition, a corporation with sufficient liquidity may raise extra capital and keep its capital structure unchanged (Memon et al., 2013). Furthermore, Al-Najjar and Taylor (2008), in their study of Jordanian enterprises, also suggested a positive association between firm leverage level and liquidity, which is consistent with predictions made by trade-off theory. They stated that there is a positive correlation between a company's liquidity and its ability to borrow funds from external sources since a more financially stable company may provide greater security and collateral assets to debt financiers.

On the other hand, the pecking order theory suggests that firms with high liquidity do not include as much debt in their capital structure. This is supported by the findings of several studies, including those by Onofrei, Tudose, Durdureanu, and Anton (2015), Shah and Jam-e-Kausar (2012), Ahmed Sheikh and Wang (2011), and Lipson and Mortal (2009). The use of debt in the capital structure raises liabilities, leaving behind a smaller amount of liquid assets after all other expenses have been paid. Given the inverse correlation between leverage and liquidity, it stands to reason that firms fund their capital structure according to the pecking order of financing options. Ozkan (2001) proposed that friction between equity investors and loan financiers might encourage enterprises with strong liquidity to employ less leverage in their capital structure. The greater the degree of liquidity, the greater the wealth with which equity holders may manipulate liquid assets against debt financiers.

In accordance with these findings, the following hypothesis is proposed:

H0: There is a negative relationship between liquidity and leverage
H1: There is a positive relationship between liquidity and leverage

3.8 Age

The number of years that have passed since the company was incorporated is one factor that might have a major impact on the capitalization strategy. The reputations of older companies have been established over long periods of time, making them more recognizable to market players. As of yet, there is no clear theoretical explanation for how a company's age impacts its capital-structure decisions. Several empirical studies have shown an age-related correlation to capital structure, including those by Dewaelheyns and Van Hulle (2010), Sakai, Uesugi, and Watanabe (2010), and Ezeoha and Botha (2012). Their results provide credence to hypotheses from static trade-off theory and agency cost theory, both of which hypothesize that there is a positive link between age and leverage.

Long-standing businesses have developed relationships with lenders that preserve records of their financial performance and reputation, allowing them to have access to more capital. In contrast, many studies demonstrate an inverse relationship between age and leverage level, which aligns with the pecking-order theory (Manos & Ah-Hen, 2003; Hall, Hutchinson, & Michaelas, 2000). The pecking order theory argues that when a company has been around for a while, it has had time to build up a sizable cash reserve to use in its day-to-day operations, meaning it is less likely to resort to debt financing to maintain operations. This prediction is consistent with research by Michaelas, Chittenden, and Poutziouris (1999) and Petersen and Rajan (1994). In addition, with OLS regression, Ahmed, Ahmed, and Ahmed (2010) examined what factors influence the capital structure of Pakistani insurance firms. In their research, the age of the company was shown to be inversely related to leverage. Nonetheless, research conducted by Sbeti and Moosa (2012) and Moosa, Li, and Naughton (2011) utilizing extreme bound analysis reaches the opposite conclusion, finding that age is a weak and unimportant predictor in predicting capital structure.

In this regard, the following hypothesis is constructed:

H0: There is a negative relationship between age and leverage
H1: There is a positive relationship between age and leverage

4. DATA AND METHODOLOGY

4.1 Data and Sample

Using data from the Orbis database, the current study examines the determinants that influence the capital structure of non-financial companies listed on the STOXX EUROPE 600 INDEX from 2014 to 2019. The Orbis database includes helpful data on the STOXX EUROPE 600 INDEX's component firms' major accounts from their financial statements. Moreover, it enables the computation of a wide range of variables that are generally important to analyzing firms included in stock market indexes.

Initially, 484 companies were included by the database, all of which were part of the STOXX EUROPE 600 INDEX. Orbis is a database that contains financial information from companies, such as their balance sheets and income statements. As a starting remark, the key funding providers—banks and other financial institutions—have been left out of this analysis. That is because banks and other financial institutions have a unique capital structure. Second, companies that did not offer data for the key variables between 2014 and 2019 were also excluded. There are 218 companies in the final sample, creating a representative panel. Prior empirical research (Ramlall, 2009; Rajan & Zingales, 1995) has demonstrated that characteristics like business size, tangibility, liquidity, profitability, NDTS, age, risk, and growth rate impact a firm's capital structure. Consequently, the majority of the variables in this study are drawn from the existing literature, allowing the findings to be compared to those of previous empirical studies.

Table 1 contains a listing of variables and the values used as proxies. In this analysis, the book values are used as the standard for all variables.

4.1.1 Capital structure variables

This research will focus on the debt ratio as the dependent variable because it measures how much debt a company has in relation to its total assets. If the proportion is large, the firm has to rely heavily on borrowing to fund its operations, whereas a low percentage indicates the opposite. As the ratio rises, so does the firm's likelihood of payment failure, financial distress, and, ultimately, insolvency.

In this regard, creditors would rather see a low debt ratio since it increases the likelihood that they would suffer less losses in the case of liquidation. On the other side, it is anticipated that investors would have greater leverage due to the increase in predicted profits. According to Shah and Hijazi (2004), a larger proportion of a company's overall debt is comprised of short-term loans since it is more difficult for smaller firms to access the capital market due to technical challenges and costs. Overall, the debt ratio is used to illustrate the degree of leverage being utilized by a firm.

In this research paper, the total debt consists of long- and short-term obligations. The term "total assets" refers to both long-term and short-term assets. A company's debt ratio is found by dividing its total debt by the total value of all its assets.

Although the traditional definition of capital structure only includes long-term leverage, short-term debt was determined to be included in this research since both long- and short-term debt capital are used by firms in the STOXX EUROPE 600 INDEX.

4.1.2 Firm Characteristics variables

Various firm characteristics determine a firm's capital structure, including its profitability, size, growth opportunity, asset tangibility, non-debt tax shield, volatility, and liquidity. Based on the premise of this study, these factors were thought to be important, and their inclusion has been backed up by previous empirical research. Descriptive statistics for these independent variables are shown in Table 2 (Appendix A).

Earnings before interest, taxes, depreciation, and amortization (EBITDA) are used to calculate profitability (Michaelas et al., 1999; Fama & French, 2002). The year-over-year percentage increase in sales quantifies the growth opportunity. The ratio of fixed to total assets is used to determine asset tangibility. Depreciation is used as a measure for the non-debt tax shield (Titman & Wessels, 1988). Non-debt tax shields reduce taxable income and may compensate for debt's tax advantages. Even though Titman and Wessels (1988) suggested a non-debt tax shield that would use depreciation as a proxy, they were unable to find evidence of any significant effects. Using depreciation as a stand-in for the non-debt tax shield presents a challenge since it may also be used as a proxy for fixed assets. According to Van Dijk (1997), there is a significant relationship (i.e., 0.495) between depreciation and fixed assets. Since depreciation has a robust negative correlation with leverage, he concludes that a firm's collateral value (for which depreciation might also be a proxy) is unlikely to affect leverage positively. Many other empirical studies, however, do make use of depreciation (e.g., Fama and French, 2002; Sogorb-Mira, 2005).

Additionally, the square root of earnings before interest, taxes, depreciation, and amortization (EBITDA) determines volatility, while the ratio of current assets to current liabilities measures liquidity.

Since the data set comprises observations across a number of years, in this study, panel data analysis is used to check the hypotheses about the effect of firm characteristics on capital structure. The dataset is uneven since some companies are represented for two years while others are present for all four years.

4.1.3 Control variables

Literature suggests that company size and age are the most useful control variables because of their outsized impact on firms. In this context, the firm's size is seen as crucial in determining how it interacts with its external environment (Farooq & Jibran, 2017). Many authors have written about the size and leverage of the company, which has sparked a heated debate. There are a variety of reasons to believe that larger companies are better able to take advantage of the benefits of increased leverage. According to Shewu (2012), larger firms are more inclined to utilize economies of scale and have more leverage. Nevertheless, they have more capital and can invest it.

Additionally, a company's longevity in business may significantly impact its foundation (Kartiningsih et al., 2020). The age represents the firm's age at the time of the study; as a company matures, it may take advantage of economies of scale, allowing it to manufacture the product at a reduced cost. However, as mentioned by Chinaemerem & Anthony (2012), established firms need to update their processes to remain competitive in the modern market. Especially in times of high uncertainty and rapid change, the age of a company has a profound impact on the risks taken and the decision-making of its management.

Size and age are employed as control variables in this study. A firm's size is quantified by its log of total assets, while its age is determined by subtracting its corporation year from the year of observation.

Table 1 Definitions, abbreviations and formulas of variables

Variable	Abbreviation	Formula
Total Debt Ratio at Book Value	TD	$TD = \frac{(ShortTermDebt + LongTermDebt)}{TotalAssets}$
Long-term Debt Ratio at Book Value	LTD	$LD = \frac{LongTermDebt}{TotalAssets}$
Short-term Debt Ratio at Book Value	STD	$STD = \frac{ShortTermDebt}{TotalAssets}$
Profitability	PROF	$PROF = \frac{EDITDA}{TotalAssets}$
Growth opportunity	GROW	$GROW = \frac{(SalesT - SalesT - 1)}{SalesT - 1}$
Asset tangibility	TANG	$TANG = \frac{TotalFixedAssets}{TotalAssets}$
Non-debt tax shield	NDTS	$NDTS = \frac{AnnualDepreciation}{TotalAssets}$
Volatility	VOL	$VOL = \sqrt{EBITDA}$
Liquidity	LIQ	$LIQ = \frac{CurrentAssets}{CurrenLiabilities}$
Size	SZ	$SZ = Ln(Total\ Assets)$
Age	AGE	$AGE = ObservationYear - YearOfCorporation$

Footnote: The table provides the definitions and formulas for the variables used in the analysis.

5. RESULTS

5.1 Outliers

Analytical findings may be compromised by the presence of outliers, which are extreme values that must be detected and controlled. In order to find outliers, the Z-score at a 90% confidence interval was used. After outliers were detected, variables are winsorized at the 10% level at both ends of their distribution. Every single observation that is more than the 95th percentile is given the same value as the 95th percentile, and every single observation that is less than the 5th percentile is given the same value as the 5th percentile (Kettaneh et al., 2005).

5.2 Descriptive Statistics

Table 2 (Appendix A) reports the descriptive statistics for the sample data, with 1302 observations for every variable. The values of the mean of TD, LTD, and STD are 0.2442, 0.2077, and 0.0354, respectively. Their standard deviations are 0.1331, 0.1222, and 0.0315, with a low value range between minimum and maximum. This shows the low use of debt financing in the capital structure of the firms listed on the STOXX EUROPE 600 INDEX. It also reveals that when debt is used, it is mostly long-term debt (LTD).

The sample's mean PROF is 0.1212, with a standard deviation of 0.0581 and a minimum and maximum value of -0.0593 and 0.2895, respectively. The negative minimum value of the PROF indicates that some companies listed on the STOXX EUROPE 600 INDEX are not profitable. However, the positive mean value indicates that most of the companies are profitable. The mean value of SZ is 16.3650, with a maximum of 19.65 and a minimum of 11.78, suggesting that the listed companies are large firms. However, looking at the GROW variables with a mean of 0.0178, a maximum of 0.3807, and a minimum of 0.1394, it can be indicated that these large firms do not have high growth opportunities. With respect to tangibility, with a mean of 0.2523, the table shows that most firms in this sample have intangible assets. Regarding NDTS, the mean of the sample for this variable is 0.0402, with a maximum of 0.0998 and a minimum of 0.0001, respectively. In addition, the value of the mean of VOL is 0.3924, with a minimum-maximum range of 0.0030–1.0688, indicating that the firms are, in general, not unpredictable.

5.3 Test of Normality

The Kolmogorov-Smirnov and Shapiro-Wilk tests were used to determine the normality of residuals. In this study, both numerical and graphical displays are presented. Table 3 (Appendix B) shows that the P-values for the Kolmogorov-Smirnov and Shapiro-Wilk tests are both 0.001, which is less than the 0.05 significance level. It suggests that the null hypothesis has been rejected and the alternative hypothesis has been accepted. This indicates that the residuals and normal distribution assumptions are not satisfied. When residuals are not normally distributed, the normal Q-Q plot and the histogram (Fig. 1-8, Appendix B) simultaneously yield the same outcome.

5.4 Test of Heteroskedasticity (Breusch-Pagen Test)

The Breusch-Pagan test concept was employed to identify the heteroskedasticity problem with the residuals since, in SPSS, the Breusch-Pagan test cannot be performed. In order to control the validity of the outcomes, there are also graphical methods employed to identify the heteroskedasticity problem. The Breusch-Pagan test for homoskedasticity assumes that the residual values are not increasing as the values of the independent variables increase. Consequently, independent variables have no effect on residual values. In this regard, the residues are saved in SPSS using linear regression of each dependent variable separately from the independent variables. The ZRES are squared to eliminate negative indications and provide more uniform values. Following that, the ZRES are used as the dependent variable in a new linear regression analysis against the independent variables. In the ANOVA test of this linear regression analysis, heteroskedasticity in the data of this study can be determined. For homoscedasticity, the ANOVA p-value must be greater than 0.05. The results in Table 4 (Appendix C) show that the p-value is less than 0.05, indicating that heteroskedasticity exists in the data. The graphic model (Fig. 9 Appendix C) supports the same conclusion that residuals do not have the same size for all fitted values.

5.5 Test of Multicollinearity

High levels of correlation between explanatory variables might cause a multicollinearity issue, leading to inaccurate estimation of the regression findings. The multicollinearity issue was identified using the Variance Inflation (VIF) method. A variable does not present a significant multicollinearity concern for an estimate if its VIF value is less than four (Hair et al., 2014). According to Table 5 (Appendix D), there is no multicollinearity issue with the study's data because the VIF values measured between the dependent variables (TD, LTD and STD) and the independent variables are all less than four.

Furthermore, Table 6 (Appendix A) shows the results of the correlation analysis among all variables. The magnitude and direction of an association between two variables can be determined from their respective correlation values. Correlations below 0.35 are considered low, while those between 0.36 and 0.67 are considered moderate. Further, correlations between 0.68 and 1.0 are considered high, and those above 0.90 are considered extremely high (Taylor, 1990). As can be seen from Table 6 (Appendix A), the correlation between LTD and TD is 0.9627, which is extremely high. In addition, the correlation between VOL and SZ is 0.7699, which can be considered high. These correlations can lead to multicollinearity issues in the results of the analyses.

For this reason, these variables will not be used together in the same model in a OLS regression analysis. The rest of the correlations are weak to moderate. Thus, the analysis indicates that multicollinearity does not exist among the rest of the variables.

5.6 Correlation Analysis

The Pearson correlation coefficients for the variables are presented in Table 6. The correlations in Table 6 (Appendix A) are considered only for those that had a significance level of 5% or higher. The correlations that are significant at the 0.01 and 0.05 levels are highlighted by one and two stars, respectively, while three stars are used for correlations significant at the 0.001 level and below.

Table 6 (Appendix A) shows that there is a negative correlation between PROF and TD, LTD, and STD, with values of -0.0797**, -0.0621*, and -0.0779**, respectively. This negative relationship is consistent with the findings of several studies, such as Myers and Majluf (1984), Schoubben and Hulle (2004), Titman and Wessels (1988), Van Dijk (1997), Fama and French (2002), and Rajan and Zingales (1995). In contrast, SZ has a positive correlation with TD, LTD, and STD, with values of 0.2053**, 0.1798**, and 0.1820**, respectively. This finding is consistent with the results of prior studies such as Cassar (2004), Jensen (1986), and Easterbrook (1986). However, SZ has a negative correlation with PROF, with a coefficient of -0.3139**.

Furthermore, GROW is positively correlated with PROF, with a value of 0.1161**, and negatively correlated with SZ, with a coefficient of -0.1186**. The correlation between GROW and

TD, LTD, and STD is not significant, which aligns with Wellalage and Locke's findings (2013).

TANG and NDTS exhibit a positive correlation with TD, LTD, and SZ with values of 0.2039**, 0.2319**, 0.1858**, 0.0632*, 0.0792**, and 0.1294**, respectively. The positive correlation between TANG, TD, and LTD is consistent with the findings of Rajan & Zingales (1995), Titman & Wessels (1988), Scott (1976), Harris & Raviv (1990), Heshmati (2001), and Grossman and Hart (1982). Similarly, the positive correlation between NDTS, TD, and LTD is in line with the findings of DeAngelo and Masulis (1980), Onofrei et al. (2015), Modigliani and Miller (1958), Scott (1977), and Moore (1986). TANG and NDTS, however, exhibit a negative correlation with GROW, with values of -0.1516** and -0.1030**, respectively. On the other hand, the positive correlation between TANG and NDTS, with a value of 0.3654**, is consistent with the findings of Campbell and Jerzemowska (2009) and Gardner and Trzcinka (1992).

Furthermore, VOL has a positive correlation with STD, SZ, TANG, and NDTS, with values of 0.1315**, 0.7699**, 0.1087**, and 0.2150**, respectively. The positive correlation of Vol with STD is consistent with the findings of DeAngelo and Masulis (1980) and Myers and Maljuf (1984). However, VOL negatively correlates with PROF and GROW, with values of -0.1873** and -0.1628**, respectively.

Furthermore, LIQ and AGE appear to have a negative correlation with TD and LTD, with values of -0.3228**, -0.2487**, -0.1273**, and -0.1329**. The negative correlation of LIQ with TD and LTD is in keeping with the results of Myers and Maljuf (1984), Onofrei et al. (2015), Shah and Jam-e-Kausar (2012), Ahmed Sheikh and Wang (2011), Lipson and Mortal (2009), and Ozkan (2009). (2001). The positive correlation of AGE with TD and LTD is similar to the findings of Myers and Maljuf (1984), Manos and Ah-Hen (2003), Hall et al. (2000), Michaelas et al. (1999), Petersen and Rajan (1994), and Ahmed, Ahmed, and Ahmed (1994). (2010).

In addition, LIQ appears to have a negative correlation with SZ of -0.3684**, while AGE appears to have a positive correlation with SZ of 0.1227**. LIQ also has a negative relationship with TANG and VOL, with values of -0.0725** and -0.2363**, respectively. Age negatively correlates with GROW with a value of -0.0838**.

5.7 Model

As stated before, the data in this study violates the normality assumption and shows heteroskedasticity, making ordinary least square regression inappropriate due to biased and inefficient estimates. However, quantile regression, which produces estimates for all conditional quantiles of a response variable's distribution, is more effective, especially for skewed data, unequal variance, and outliers. This method was introduced by Koenker and Bassett in 1978 and transforms a conditional distribution function into a conditional quantile function by dividing it into segments. Ramdani and Witteloostuijn (2010) argued that quantile regression is a superior alternative to classical linear regression analysis.

The most commonly used method for linear regression analysis is OLS (Ordinary Least Squares), where a parametric function is used to model a conditional distribution function of a random sample (y1,...yn). Here are xi, the independent variables; β, the corresponding estimates; and m, the conditional mean. The objective is to minimize the difference between the predicted and observed values of the dependent variable (y) by minimizing the sum of squared errors (SSE) between the predicted values and the actual values of the dependent variable. The resulting coefficients provide estimates of the relationship between the independent variables and the dependent variable.

However, OLS assumes that the residuals of the model are normally distributed and have constant variance (homoscedasticity). Violation of these assumptions can lead to biased and inefficient estimates. In addition, OLS is sensitive to outliers and skewed data. As stated before, the data in this study violated the normality assumption and showed heteroskedasticity, making ordinary least square regression inappropriate due to biased and inefficient estimates.

The quantile regression model is similar to linear regression, but instead of estimating the conditional mean of the dependent variable given the independent variables, quantile regression estimates the conditional quantiles of the dependent variable distribution. The model equation for the τth quantile of the dependent variable can be written as:

$$Q(\tau \mid X) = X\beta\tau$$

where $Q(\tau \mid X)$ is the τth quantile of the dependent variable, X is the matrix of independent variables, βτ is the vector of coefficients corresponding to the τth quantile, and τ is the quantile level of interest.

The objective of quantile regression is to estimate the values of βτ that minimize the sum of the absolute deviations between the observed and predicted values of the dependent variable for a given quantile level. This can be expressed as:

$$\text{minimize } \sum_i^{Hi}(\tau - I(y_i < X_i\beta\tau))|y_i - X_i\beta\tau|$$

Where H^i is the weighting function, I is the indicator function, and y_i is the observed value of the dependent variable for observation i.

The result of quantile regression is a set of coefficients, βτ, one for each quantile level of interest. These coefficients represent the change in the dependent variable associated with a one-unit change in the corresponding independent variable at the specified quantile level.

Quantile regression is more robust to outliers, skewed data, and unequal variance than OLS. It can provide a more nuanced analysis of the relationship between the independent and dependent variables. However, it can be more computationally intensive than OLS and may require more data to achieve accurate estimates.

5.8 Results Regression Analysis

5.8.1 Summary of the main results

This section addresses the study's hypotheses, which investigate the impact of firm characteristics on a firm's capital structure using quantile regression. The relationship between total debt, long-term debt, short-term debt, and firm characteristics measures were examined at 0.25, 0.5, and 0.75 quantiles. The β (unstandardized beta coefficient) of the independent variables (TD, LTD, and STD) and the dependent variables (PROF, GROW, TANG, NDTS, VOL, LIQ, SZ, and AGE) are presented in Tables 7, 8, and 9. The adjusted r-square is used to determine the amount of data explained by each regression analysis. In addition, only significant values are examined as non-significant values provide no evidence to support the hypotheses, and for further illustration, quantiles are visualized (Fig. 10-18, Appendix E)

Table 7 presents the results of Models 1 and 3, which show the relationship between TD and the control variables. SZ has a negative effect on TD in quantile 0.5 in Model 1, whereas it has a positive effect on TD in quantiles 0.25 and 0.75 and throughout all the quantiles in Model 3. AGE has a significant relationship with TD throughout all the quantiles in Models 1 and 3, but the

effect of AGE is null. The quantile regression results in Models 2 and 3 of Table 7 demonstrate that PROF has a significant negative effect on TD only in quantile 0.25 of Model 2. Furthermore, TANG appears to have a significant positive impact on TD in all quantiles in both Model 2 and Model 3.

Conversely, NDTS seems to have a significant positive impact on TD only in quantile 0.25 in both Models 2 and 3. VOL has a significant negative impact on TD in quantiles 0.5 and 0.75 in Model 2 and throughout all quantiles in Model 3. Additionally, LIQ has a significant negative impact on TD throughout all quantiles in both Model 2 and Model 3. Overall, the adjusted R2 values show that most (12%) of the variation of TD is explained by Model 3 quantile 0.25, whereas Model 1 quantile 0.75 explains the least (2.3%) of the variation of TD.

The results of LTD and the control variables are presented in Table 8, Models 1 and 3, indicating a significant positive correlation between SZ and AGE with LTD throughout all the quantiles, respectively. The effect of AGE on LTD appears to be null, which is consistent with its effect on TD. Additionally, the results show that PROF only has a significant negative effect on LTD in Model 2 quantile 0.25. In contrast, TANG has a significant positive effect on LTD across all quantiles of Models 2 and 3. NDTS has a significant positive effect on Model 2 and 3 in quantiles 0.25 and 0.5 but a significant adverse effect on LTD in Model 2 quantile 0.75. VOL has a significant negative impact on LTD in Model 2 quantiles 0.5 and 0.75 and in Model 3 across all three quantiles. Similarly, LIQ has a negative effect in both Models 2 and 3 across all quantiles. The adjusted R2 values indicate that Model 3 quantile 0.25 explains most of the variation in LTD, while Model 1 quantile 0.75 explains the least amount of variation.

Table 9 displays in Model 1 the results of the control variables AGE and SZ on STD. SZ has a significant positive effect on STD in all quantiles of Model 1, while in Model 3, it only has a significant positive effect in quantiles 0.25 and 0.5. AGE has a significant null effect on STD, the same as on TD and LTD, in Models 1 and 3 in quantiles 0.25 and 0.5. Additionally, PROF has only a significant positive effect on STD in Models 2 and 3 in quantile 0.75. In contrast, TANG has a negative effect on STD in the same Models and the same quantile. VOL has a significant positive effect on STD in Model 2 quantiles 0.25 and 0.5. LIQ shows a significant negative effect on STD in Models 2 and 3 throughout all quantiles. Overall, the adjusted R2 values indicate that most (10.4%) of the variation in STD is explained by Models 2 and 3 in quantile 0.75, whereas the least (0.7%) of the variation is explained by Model 1 in quantile 0.75.

Table 7 Quantile Regression Results: Total Debt (TD)

	Total Debt (TD)								
	Model 1			**Model 2**			**Model 3**		
	Quantile 0.25	**Quantile 0.5**	**Quantile 0.75**	**Quantile 0.25**	**Quantile 0.5**	**Quantile 0.75**	**Quantile 0.25**	**Quantile 0.5**	**Quantile 0.75**
PROF				-0.173**	-0.029	-0.009	-0.036	0.078	0.032
				(-2.259)	(-0.326)	(-0.095)	(-0.462)	(0.871)	(0.338)
GROW				0.044	0.028	0.035	0.010	-0.007	0.024
				(1.568)	(0.867)	(0.969)	(0.378)	(-0.213)	(0.713)
TANG				0.063***	0.093***	0.163***	0.039*	0.064***	0.131***
				(3.049)	(3.880)	(6.149)	(1.906)	(2.653)	(5.105)
NDTS				0.928***	0.323	-0.100	0.776***	0.082	-0.121
				(4.485)	(1.357)	(-0.381)	(3.830)	(0.348)	(-0.481)
VOL				0.016	-0.029**	-0.056***	-0.076***	-0.106***	-0.107***
				(1.507)	(-2.348)	(-4.151)	(-4.860)	(-5.820)	(-5.503)
LIQ				-0.058***	-0.071***	-0.087***	-0.043***	-0.057***	-0.070***
				(-8.970)	(-9.619)	(-10.553)	(-6.559)	(-7.463)	(-8.639)
SIZE	0.026***	-0.022***	0.016***				0.032***	0.032***	0.021***
	(9.928)	(7.263)	(4.620)				(7.565)	(6.551)	(3.974)
AGE	0.000***	0.000***	0.000***				0.000***	0.000***	0.000***
	(-5.230)	(-4.878)	(-3.783)				(-5.537)	(-3.439)	(-4.986)
Intercept	-0.247***	-0.103**	0.080	0.191***	0.312***	0.429***	-0.292***	-0.185**	0.117
	(-5.805)	(-2.034)	(1.383)	(13.898)	(19.662)	(24.460)	(-4.256)	(-2.306)	(1.374)
Adj.R^2	0.065 (6.5%)	0.036 (3.6%)	0.023 (2.3%)	0.082 (8.2%)	0.072 (7.2%)	0.088 (8.8%)	0.120 (12%)	0.098 (9.8%)	0.114 (11.4%)
No. of Obs.	1302	1302	1302	1302	1302	1302	1302	1302	1302

Footnote: For the variable definitions see table. The table presents the results of the quantile regression analysis for the Total Debt (TD) variable using three models (Model 1 to Model 3) at different quantiles (0.25, 0.5, and 0.75). The coefficients represent the unstandardized beta (β) values, indicating the degree of change in the dependent variable Total Debt (TD) for a 1-unit change in the respective independent variables (PROF, GROW, TANG, NDTS, VOL, LIQ, SIZE, AGE). The analysis uncludes a sample of 218 firms listed on STOXX EUROPE 600 INDEX during the period of 2014-2019. The *, ** and *** indicate statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors are used. The intercepts are reported, and the Adj-R2 is the value of adjusted-R2 for the regression. Numbers in parentheses are asymptotic t-values.

Table 8 Quantile Regression Results: Long-term Debt (LTD)

Long term debt (LTD)									
	Model 1			Model 2			Model 3		
	Quantile 0.25	**Quantile 0.5**	**Quantile 0.75**	**Quantile 0.25**	**Quantile 0.5**	**Quantile 0.75**	**Quantile 0.25**	**Quantile 0.5**	**Quantile 0.75**
PROF				-0.137**	-0.107	-0.071	-0.081	-0.034	0.103
				(-2.053)	(-1.299)	(0.779)	(-1.193)	(-0.415)	(1.113)
GROW				0.029	0.038	0.027	0.012	0.007	0.001
				(1.091)	(1.270)	(0.799)	(0.487)	(0.246)	(0.040)
TANG				0.083***	0.115***	0.162***	0.039*	0.081***	0.134***
				(4.198)	(5.141)	(6.544)	(2.129)	(3.649)	(5.391)
NDTS				0.975***	0.459**	-0.297	0.913***	0.367*	-0.179
				(4.957)	(2.071)	(-1.207)	(5.117)	(1.694)	(-0.734)
VOL				0.004	-0.039***	-0.063***	-0.080***	-0.115***	-0.115***
				(0.436)	(-3.409)	(-4.946)	(-5.771)	(-6.844)	(-6.073)
LIQ				-0.043***	-0.050***	-0.067***	-0.025***	-0.035***	-0.049***
				(-6.965)	(-7.236)	(-8.771)	(-4.291)	(-4.929)	(-6.166)
SIZE	0.023***	0.018***	0.012***				0.030***	0.034***	0.024***
	(8.922)	(6.752)	(3.578)				(8.098)	(7.563)	(4.728)
AGE	0.000***	0.000***	0.000***				0.000***	0.000***	0.000***
	(-4.514)	(-4.687)	(-3.503)				(-5.359)	(-3.701)	(-4.432)
Intercept	-0.229***	-0.079*	0.100*	0.137***	0.245***	0.360***	-0.292***	-0.282**	-0.19
	(-5.495)	(-1.793)	(1.763)	(10.496)	(16.646)	(21.957)	(-4.256)	(-3.846)	(-0.225)
Adj.R^2	0.065 (6.5%)	0.032 (3.2%)	0.018 (1.8%)	0.081 (8.1%)	0.051 (5.1%)	0.071 (7.1%)	0.118 (11.8%)	0.083 (8.3%)	0.092 (9.2%)
No. of Obs.	1302	1302	1302	1302	1302	1302	1302	1302	1302

Footnote: For the variable definitions see table. The table presents the results of the quantile regression analysis for the Long-term Debt (LTD) variable using three models (Model 1 to Model 3) at different quantiles (0.25, 0.5, and 0.75). The coefficients represent the unstandardized beta (β) values, indicating the degree of change in the dependent variable Long-term Debt (LTD) for a 1-unit change in the respective independent variables (PROF, GROW, TANG, NDTS, VOL, LIQ, SIZE, AGE). The analysis uncludes a sample of 218 firms listed on STOXX EUROPE 600 INDEX during the period of 2014-2019. The *, ** and *** indicate statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors are used. The intercepts are reported, and the Adj-R2 is the value of adjusted-R2 for the regression. Numbers in parentheses are asymptotic t-values.

Table 9 Quantile Regression Results: Short-term Debt (STD)

Short term debt (LTD)									
	Model 1			Model 2			Model 3		
	Quantile 0.25	**Quantile 0.5**	**Quantile 0.75**	**Quantile 0.25**	**Quantile 0.5**	**Quantile 0.75**	**Quantile 0.25**	**Quantile 0.5**	**Quantile 0.75**
PROF				-0.010	0.012	0.068***	-0.004	-0.012	0.069***
				(-0.813)	(0.678)	(2.709)	(-0.339)	(0.618)	(2.693)
GROW				0.006	0.004	-0.008	0.002	0.002	-0.009
				(1.198)	(0.630)	(-0.903)	(0.452)	(0.265)	(-1.013)
TANG				0.001	-0.001	-0.013*	0.004	-0.007	-0.014**
				(0.322)	(-0.106)	(-1.942)	(-1.020)	(-1.352)	(-1.987)
NDTS				0.016	-0.031	-0.068	0.029	-0.008	-0.070
				(0.469)	(-0.627)	(-1.001)	(0.848)	(-0.167)	(-1.033)
VOL				0.012***	0.007***	-0.002	0.002	-0.003	-0.001
				(7.012)	(2.743)	(-0.523)	(0.875)	(-0.721)	(-0.226)
LIQ				-0.006***	-0.016***	-0.026***	-0.006***	-0.013***	-0.027***
				(-6.085)	(-10.456)	(-12.473)	(-5.339)	(-8.160)	(-12.181)
SIZE	0.005***	0.007***	0.003***				0.003***	0.003***	0.000
	(11.789)	(11.267)	(2.749)				(4.920)	(3.338)	(-0.110)
AGE	<0.000***	<0.000**	<0.000				< 0.000*	< 0.000**	< 0.000
	(-3.242)	(-2.541)	(-0.987)				(-1.770)	(-2.159)	(-0.223)
Intercept	-0.060***	-0.082***	0.006	0.017***	0.048***	0.086***	-0.035***	-0.006	0.089***
	(-9.475)	(-8.281)	(0.361)	(7.524)	(14.626)	(19.021)	(-3.078)	(-0.335)	(3.881)
Adj.R^2	0.071 (7.1%)	0.055 (5.5%)	0.007 (0.7%)	0.078 (7.8%)	0.093 (9.3%)	0.104 (10.4%)	0.090 (9%)	0.099 (9.9%)	0.104 (10.4%)
No. of Obs.	1302	1302	1302	1302	1302	1302	1302	1302	1302

Footnote: For the variable definitions see table. The table presents the results of the quantile regression analysis for the Short-term Debt (STD) variable using three models (Model 1 to Model 3) at different quantiles (0.25, 0.5, and 0.75). The coefficients represent the unstandardized beta (β) values, indicating the degree of change in the dependent

variable Short-term Debt (STD) for a 1-unit change in the respective independent variables (PROF, GROW, TANG, NDTS, VOL, LIQ, SIZE, AGE). The analysis uncludes a sample of 218 firms listed on STOXX EUROPE 600 INDEX during the period of 2014-2019. The *, ** and *** indicate statistical significance at the 1%, 5% and 10% level, respectively. Robust standard errors are used. The intercepts are reported, and the Adj-R2 is the value of adjusted-R2 for the regression. Numbers in parentheses are asymptotic t-values.

5.8.2 Discussion of The Results: The Hypothesis

In this section, the results of the quantile regression model will be evaluated and discussed to determine which hypothesis will be accepted and which will be rejected.

Hypothesis 1:

H0: There is a negative relationship between profitability and leverage
H1: There is a positive relationship between profitability and leverage

The findings of the quantile regression analysis on PROF reveal a complex relationship between PROF and TD, LTD, and STD that depends on the specific quantile analyzed. In quantile 0.25 of Model 2, PROF has a significant negative effect on TD and LTD, which aligns with Myer and Majluf's (1984) Pecking Order theory. Conversely, in quantiles 0.75 of Model 2 and Model 3, the results show a significant positive effect of PROF on STD, supporting the trade-off theory. Jensen's (1986) agency cost theory also confirms the positive correlation between debt and profitability by arguing that as profits rise, debt levels should be increased to mitigate free cash flow problems and promote more disciplined management, thereby explaining the positive effect of TD on profitability in some quantiles.

Based on these results, neither H0 nor H1 can be rejected outright. According to Myer and Majluf's (1984) Pecking Order theory, profitable firms are less likely to take on debt, supporting hypothesis H0. However, the trade-off theory suggests that profitable firms may be more likely to take on debt to benefit from the tax advantages associated with debt financing, which would support hypothesis H1. Additionally, Jensen's (1986) agency cost theory argues that debt can help mitigate free cash flow problems and promote more disciplined management, supporting hypothesis H1.

Hypothesis 2A:
H0: There is a positive relationship between size and total debt
H1: There is a negative relationship between size and total debt
Hypothesis 2B:
H0: There is a positive relationship between size and long-term debt
H1: There is a negative relationship between size and long-term debt
Hypothesis 2C:
H0: There is a positive relationship between size and short-term debt
H1: There is a negative relationship between size and short-term debt

The quantile regression analysis on Size (SZ) reveals a significant and positive relationship between SZ and TD throughout all quantiles, which aligns with the trade-off theory. This theory posits that there is a positive correlation between size and leverage and a negative relationship with the likelihood of bankruptcy. Supporting this theory are studies conducted by Warner (1977), Ang et al. (1982), Titman and Wessels (1988), and Pettit and Singer (1985). As a result, Hypothesis 2A's H0 is rejected in favor of H1.

Table 7 Model 1 shows a positive correlation between SZ and LTD, further supporting the notion that size is an important determinant of a company's capital structure. Therefore, we accept H0 for Hypothesis 2B.

In Table 8 Model 1, SZ has a significant positive effect on STD in all quantiles. Meanwhile, in Model 3, it only has a significant positive effect in quantiles 0.25 and 0.5. This finding is consistent with Jensen's agency cost theory, which predicts a positive correlation between debt and profitability. The theory suggests that debt can mitigate free cash flow problems and promote more disciplined management. Large firms may prefer higher loans due to their greater market access, as noted by Cassar (2004). As a result, we accept H0 and reject H1 for Model 1 throughout all the quantiles and Model 3 in quantiles 0.25 and 0.5.

Hypothesis 3
H0: There is a negative relationship between growth opportunity and leverage
H1: There is a positive relationship between growth opportunity and leverage

The analysis of GROW reveals no significant relationship with TD, LTD, or STD, which is consistent with the conclusions drawn by Wellalage and Locke (2013, 2014). Their research indicates that growth prospects are not a strong predictor of a company's leverage, and expansion is a weak indicator of leverage in businesses. As a result, none of the hypotheses can be accepted or rejected.

Hypothesis 4A:
H0: There is a positive relationship between asset tangibility and leverage
H1: There is a negative relationship between asset tangibility and leverage
Hypothesis 4B:
H0: There is a positive relationship between asset tangibility and long-term leverage
H1: There is a negative relationship between asset tangibility and long-term leverage
Hypothesis 4C:
H0: There is a positive relationship between asset tangibility and short-term leverage
H1: There is a negative relationship between asset tangibility and short-term leverage

The findings from the quantile regression analysis on tangibility (TANG) reveal some interesting insights into the relationship between asset tangibility and leverage. Firstly, TANG has a significant positive impact on total debt (TD) and long-term debt (LTD) across all quantiles in both Model 2 and Model 3, which supports H0 from Hypotheses 4A and 4B. This finding is consistent with the trade-off theory, which posits that companies with higher collateral value are more likely to obtain debt financing and have higher debt capacity.

However, the negative effect of TANG on short-term debt (STD) in Models 2 and 3 in quantile 0.75 contradicts H0 from Hypothesis 4C, which predicts a positive relationship between asset tangibility and short-term leverage. This result suggests that the inverse relationship between tangibility and leverage predicted by the agency model may be more relevant for short-

term debt, where agency conflicts are more likely to occur. Therefore, H1 is accepted in Hypothesis 4C, and H0 is rejected.

Overall, these findings suggest that the relationship between asset tangibility and leverage may vary depending on the type of debt being considered. In particular, the positive association between tangibility and long-term debt supports the trade-off theory, while the negative association with short-term debt supports the agency model. However, the direction of the relationship for total debt remains positive, indicating that firms with more tangible assets are generally more likely to have higher levels of debt financing.

Hypothesis 5

H0: There is a negative relationship between NDTS and leverage
H1: There is a positive relationship between NDTS and leverage

The results of the quantile regression analysis on non-debt tax shield (NDTS) reveal that the connection between NDTS and leverage is not straightforward. Specifically, the analysis shows that NDTS has a significant positive impact on TD only in quantile 0.25 in both Models 2 and 3, while it has a significant positive effect on LTD in Model 2 and 3 in quantiles 0.25 and 0.5. These findings support the static trade-off theory of Modigliani and Miller (1963), as well as the conclusions of Campbell and Jerzemowska (2009) and Gardner and Trzcinka (1992).

However, the results also indicate that NDTS has a negative effect on LTD in Model 2 quantile 0.75, which aligns with the trade-off theory and the findings of Byoun (2008), Gajdka (2002), and Shenoy and Koch (1996). It is worth noting that empirical evidence on the relationship between NDTS and leverage is inconsistent. While some studies have found a negative association between non-debt tax shields and debt, others have reported a positive correlation between the two variables. For example, Choi, Yoo, Kim, and Kim (2014) used quantile regression to investigate the capital structures of 43 South Korean construction firms listed on the South Korean Stock Exchange and found that NDTS was not an appropriate metric to use. This finding is consistent with the insignificant effect of NDTS on STD.

Based on these findings, neither H0 nor H1 can be fully supported. The analysis suggests that the relationship between NDTS and leverage is complex and depends on the specific quantile and type of debt under consideration. More research is necessary to gain a full understanding of the relationship between NDTS and leverage.

Hypothesis 6:

H0: There is a negative relationship between volatility and leverage
H1: There is a positive relationship between volatility and leverage

The findings from the quantile regression analysis on volatility (VOL) suggest more likely a negative relationship between VOL and leverage, supporting hypothesis H0. The significant negative impact of VOL on TD and LTD in Models 2 and 3 across different quantiles aligns with the predictions of the pecking order model and the trade-off model. According to the pecking order model, companies with unpredictable cash flows prefer to keep leverage low to avoid selling risky shares or profitable investments when cash flow is low. The trade-off model suggests that higher cash flow volatility increases the likelihood of default, leading to a negative relationship between leverage and volatility.

However, the positive effect of VOL on STD in Model 2 quantiles 0.25 and 0.5 supports hypothesis H1 and rejects hypothesis H0. This conflicting finding highlights that the relationship between leverage and VOL is complex and depends on the specific quantile and type of debt under consideration. In addition, the empirical evidence on the relationship between earnings volatility and leverage is inconsistent, with some studies reporting a negative relationship while others find no relationship. Therefore, future research should examine other factors that may impact this relationship.

In conclusion, based on the available evidence, there is a negative relationship between volatility and TD and LTD, and H0 is accepted. However, H1 is accepted based on the positive effect of VOL on STD in Model 2 quantiles 0.25 and 0.5, and the inconclusive empirical evidence highlights the need for further research.

Hypothesis 7:

H0: There is a negative relationship between age and leverage
H1: There is a positive relationship between age and leverage

The quantile regression results revealed that age has a significant but null effect on TD and LTD in Model 1 and Model 3 across all quantiles. Moreover, age has a significant but null effect on STD in Model 1 and Model 3 in quantiles 0.25 and 0.5.

The relationship between age and leverage has been studied before, with some research indicating a positive relationship while others found an inverse relationship. Nevertheless, the findings from the current study's quantile regression analysis suggest that there is a null relationship between age and leverage.

Therefore, while the hypothesis that age and leverage have a negative relationship (H0) cannot be entirely rejected, as some studies have supported it, the hypothesis that age and leverage have a positive relationship (H1) is not supported by this study's findings.

6. CONCLUSION

A company's decision on its capital structure is of paramount importance as it affects its ability to generate returns for various stakeholders and manage the challenging business environment. To investigate the determinants that influence the capital structure of non-financial companies listed on the STOXX EUROPE 600 INDEX from 2014 to 2019, this study used the Orbis database and a panel of 218 companies. The researchers employed quantile regression to analyze the relationship between total debt, long-term debt, short-term debt, and firm characteristic measures at 0.25, 0.5, and 0.75 quantiles. Conventional methods like ordinary least squares are unsuitable for the data because it is non-normal and heteroscedastic. The quantile regression method enables a thorough analysis and interpretation of information over the sample distribution. The results indicated that the sign and magnitude of independent variable coefficients changed significantly throughout the distribution of the leverage ratio.

The study found that characteristics of firms, such as size, age, profitability, tangibility, NDTS, volatility, and liquidity, played a crucial role in determining their decision to finance their capital structure through debt or equity. However, growth opportunities were not a significant predictor of the firm's leverage ratio in any of the models or quantiles. In conclusion, the profitability of the firms listed on the STOXX EUROPE 600 INDEX had a significant negative impact on the lower levels of total debt and long-term debt, while it had a positive effect on the higher levels of short-term debt. Tangibility and NDTS had a positive effect on all levels of total debt and long-term debt, but tangibility had a significantly negative impact on the higher levels of short-term debt. Volatility and liquidity had a significant adverse effect on

the high and low levels of total debt and long-term debt. However, the effect of volatility was significantly positive on the lower levels of short-term debt. Size had a positive effect on the low and high levels of all types of debt but had a negative effect on the 0.5 level of total debt. Age did not affect the capital structure variables of firms listed on the STOXX EUROPE 600 INDEX.

6.1 Practical and Academic Contribution

This thesis has made a significant contribution to the general field of corporate finance by investigating the impact of firm characteristics on the capital structure of non-financial companies listed on the STOXX EUROPE 600 INDEX.

The results of this thesis, which are presented by testing the relationship between firm characteristics and capital structure variables, provide a contribution to the academic world. However, these findings might be extended by including more variables to test the extent to which firm characteristics impact firm capital structure. From a practical standpoint, the results of this study can help companies listed on the index make better-informed decisions regarding their capital structure, given the significant impact of firm characteristics on the decision to finance capital structure by debt or equity. Therefore, companies can use this information to adjust their financing decisions based on their specific firm characteristics. Additionally, the study shows that conventional methods like ordinary least squares are not always suitable for analyzing data due to non-normality and heteroskedasticity, and the use of quantile regression enables deeper analysis and interpretation of data over the sample distribution. From an academic perspective, this study adds to the existing literature on the determinants of capital structure decisions by examining the relationship between firm characteristics and the different types of debt (long-term debt, short-term debt, and total debt). The study found that growth opportunities did not significantly predict the leverage ratio of firms, whereas other firm characteristics did.

Overall, this study provides valuable insights into the factors that shape the capital structure decisions of non-financial companies listed on the STOXX EUROPE 600 INDEX, both from practical and academic perspectives. It offers a framework for future research on this topic and emphasizes the importance of using appropriate statistical methods to analyze data.

6.2 Limitations & Recommendations for Future Research

While this study makes significant contributions to the existing literature on capital structure decisions, there are several limitations that must be considered when interpreting the findings. Firstly, the study's sample only includes non-financial companies listed on the STOXX EUROPE 600 INDEX, which may limit the generalizability of the results to other markets or types of firms. Therefore, one should exercise caution when applying the findings to other contexts, as the determinants of capital structure may vary across markets or sectors. Future studies may consider examining the determinants of capital structure in other markets or sectors to improve the generalizability of the findings.

Secondly, another potential limitation of this study is its reliance on publicly available data. Although the STOXX EUROPE 600 INDEX is a significant index, the data may not fully represent the entire population of non-financial companies in Europe. Furthermore, some critical variables that may affect the capital structure decisions of firms, such as the availability of credit, regulatory factors, and market conditions, were not included in this study. Thus, future research could consider incorporating these factors into the analysis to provide a more comprehensive understanding of the factors that impact capital structure decisions.

Thirdly, while the study's independent variables were chosen based on previous literature, other factors that were not considered may influence capital structure decisions. For instance, market sentiment, the regulatory environment, or cultural factors may also play a role in determining capital structure. Therefore, future research may consider examining additional variables that may impact capital structure decisions.

Fourthly, while this study used quantile regression analysis, which is robust to the presence of outliers, heteroskedasticity, and non-normality, other statistical techniques, such as panel data analysis or dynamic models, may provide additional insights into the determinants of capital structure. Hence, future research may consider employing other methods to explore the relationship between firm characteristics and capital structure.

Lastly, the study's time frame only covers the period from 2014 to 2019, which may not reflect the current state of the market or the impact of recent events such as the COVID-19 pandemic. Therefore, future research may consider examining the determinants of capital structure using more recent data or during periods of economic turbulence to investigate whether the relationships found in this study hold during such periods.

In conclusion, this study makes valuable contributions to the existing literature on capital structure decisions by examining the impact of firm characteristics on the financing decisions of non-financial companies listed on the STOXX EUROPE 600 INDEX. However, the limitations mentioned above suggest that one should exercise caution when generalizing the results to other markets or contexts. Furthermore, further research is required to improve our understanding of the determinants of capital structure decisions.

7. REFERENCES

Achy, L. (2009). Corporate capital structure choices in Mena: empirical evidence from non-listed firms in Morocco. *Middle East Development Journal*, *1*(02), 255-273.

Ahmed, N., Ahmed, Z., & Ahmed, I. (2010). Determinants of capital structure; A case of life insurance sector of Pakistan. European Journal of Economics, Finance and Administrative Sciences, 7(28), 83–104

Al-Najjar, B., & Taylor, P. (2008). The relationship between capital structure and ownership structure: New evidence from Jordanian panel data. *Managerial Finance*, *34*(12), 919-933.

Ang, J. S., Chua, J. H., & McConnell, J. J. (1982). The administrative costs of corporate bankruptcy: A note. *The Journal of finance*, *37*(1), 219-226.

Arnold, J. M. (2008). Do tax structures affect aggregate economic growth?: Empirical evidence from a panel of OECD countries.

Auerbach, A. J. (1985). The theory of excess burden and optimal taxation. In *Handbook of public economics* (Vol. 1, pp. 61-127). Elsevier.

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *The journal of finance*, *57*(1), 1-32.

Barclay, M. J., & Smith, C. W. (2005). The capital structure puzzle: The evidence revisited. *Journal of applied corporate finance*, *17*(1), 8-17.

Berk, J. B., & DeMarzo, P. M. (2007). *Corporate finance*. Pearson Education.

Bevan, A. A., & Danbolt, J. (2002). Capital structure and its determinants in the UK-a decompositional analysis. *Applied financial economics*, *12*(3), 159-170.

Bos, T., & Fetherston, T. A. (1993). A note on mutual fund historical performance as a decision criterion. *The Mid-Atlantic Journal of Business*, *29*(3), 331.

Bradley, M. D., Jarrell, G. A., & Kim, E. H. (1984). On the Existence of an Optimal Capital Structure: Theory and Evidence. *Journal of Finance*, *39*(3), 857. https://doi.org/10.2307/2327950

Brigham, E. F., & Ehrhardt, M. C. (2011). Financial Management: Theory and Practice. *South-Western Pub.*

Brigham, E. F., & Ehrhardt, M. C. (2011b). *Financial Management: T*heory and Practice. *South-Western Pub.*

Byoun, S. (2008). How and when do firms adjust their capital structures toward targets?. *The Journal of Finance*, *63*(6), 3069-3096.

Campbell, K., Jerzemowska, M., & Najman, K. (2009). Corporate governance challenges in Poland: Evidence from "comply or explain" disclosures. *Corporate Governance: The international journal of business in society*, *9*(5), 623-634.

Cassar, G. (2004). The financing of business start-ups. *Journal of business venturing*, *19*(2), 261-283.

Chinaemerem, O. C., & Anthony, O. (2012). Impact of capital structure on the financial performance of Nigerian firms. *Oman Chapter of Arabian Journal of Business and Management Review*, *34*(969), 1-19.

Choi, J. K., Yoo, S. K., Kim, J. H., & Kim, J. J. (2014). Capital structure determinants among construction companies in South Korea: A quantile regression approach. *Journal of Asian Architecture and Building Engineering*, *13*(1), 93-100.

Chowdhury, A., & Chowdhury, S. P. (2010). Impact of capital structure on firm's value: Evidence from Bangladesh. *Business & Economic Horizons*, *3*(3).

Ćurak, M., Pepur, S., & Poposki, K. (2017). Determinants of non-performing loans – evidence from Southeastern European banking systems. *Banks and Bank Systems*, 8(1). https://www.businessperspectives.org/index.php/component/zoo/determinants-of-non-performing-loans-evidence-from-southeastern-european-banking-systems

Danso, A., & Adomako, S. (2014). The financing behaviour of firms and financial crisis. *Managerial finance*, *40*(12), 1159-1174.

De Jong, A. (1999). An empirical analysis of capital structure decisions in Dutch firms.

DeAngelo, H., & Masulis, R. W. (1980). Optimal capital structure under corporate and personal taxation. *Journal of financial economics*, *8*(1), 3-29.

Deloof, M., & Verschueren, I. (1998). De determinanten van de kapitaalstructuur van Belgische ondernemingen.

Dewaelheyns, N., & Van Hulle, C. (2010). Internal capital markets and capital structure: Bank versus internal debt. *European Financial Management* , *16* (3), 345-373.

Donaldson Jr, R. J. (1961). Radar reflectivity profiles in thunderstorms. *Journal of Atmospheric Sciences*, *18*(3), 292-305.

Easterbrook, F. H., & Fischel, D. R. (1986). Close corporations and agency costs. *Stanford Law Review*, 271-301.

Ezeoha, A., & Botha, F. (2012). Firm age, collateral value, and access to debt financing in an emerging economy: evidence from South Africa. *South African Journal of Economic and Management Sciences*, *15*(1), 55-71.

Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order predictions about dividends and debt. *Review of financial studies*, 1-33.

Farooq, U., & Jibran, A. Q. (2017). Firm size as moderator to non-linear leverage-performance relation: An emerging market review. *Binus Business Review*, *8*(2), 99-106.

Fattouh, B., Harris, L., & Scaramozzino, P. (2008). Non-linearity in the determinants of capital structure: evidence from UK firms. *Empirical Economics*, *34*, 417-438.

Ferri, M. G., & Jones, W. (1979). Determinants of Financial Structure: a New Methodological Approach. *Journal of Finance*, *34*(3), 631–644. https://doi.org/10.1111/j.1540-6261.1979.tb02130.x

Gajdka, J., & Szymański, M. K. (2021). Capital Structure of Companies Listed at the Warsaw Stock Exchange and the COVID-19 Pandemic Effect on Their Risk. *Finanse I Prawo Finansowe*, *4*(32), 153–166. https://doi.org/10.18778/2391-6478.4.32.10

Gajurel, D. (2005). Capital Structure Management in Nepalese Enterprises. *Social Science Research Network*. https://doi.org/10.2139/ssrn.778106

Galai, D., & Masulis, R. W. (1976). The option pricing model and the risk factor of stock. *Journal of Financial economics*, *3*(1-2), 53-81.

Gangeni, C. (2006). The relationship between capital structure and the financial performance of the team *(Doctoral dissertation, GIBS).*

Gardner, J., & Trzcinka, C. (1992). ALL-EQUITY FIRMS AND THE BALANCING THEORY OF CAPITAL STRUCTURE. *Journal of Financial Research*, *15*(1), 77–90. https://doi.org/10.1111/j.1475-6803.1992.tb00788.x

Gill, A., Biger, N., Pai, C., & Bhutani, S. (2009). The determinants of capital structure in the service industry: evidence from United States. *The Open Business Journal*, *2*(1).

Gitman, L. J., & Zutter, C. J. (2012). Principles of Managerial Finance. *Pearson College Division.*

Glen, M. D., Singh, A., & Matthias, M. (1999). How Intensive Is Competition in the Emerging Markets? An Analysis of Corporate Rates of Return from Nine Emerging Markets. *International Monetary Fund.*

Graham, J. R., & Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of financial economics*, *60*(2-3), 187-243.

Grossman, S. J., & Hart, O. D. (1982). Corporate financial structure and managerial incentives. In *The economics of information and uncertainty* (pp. 107-140). University of Chicago Press.

Gul, S., & CHO, H. R. (2019). Capital structure and default risk: Evidence from Korean stock market. *The Journal of Asian Finance, Economics and Business*, *6*(2), 15-24.

Hall, G., Hutchinson, P., & Michaelas, N. (2000). Industry effects on the determinants of unquoted SMEs' capital structure. *International journal of the economics of business*, *7*(3), 297-312.

Harris, M., & Raviv, A. (1990). Capital structure and the informational role of debt. *The journal of finance*, *45*(2), 321-349.

Hawawini, G., & Viallet, C. (2010). Finance for Executives: Managing for Value Creation. *Cengage Learning.*

Heshmati, A. (2001). On the growth of micro and small firms: evidence from Sweden. *Small business economics*, *17*, 213-228.

Hsieh, C. T. (1993). Some potential applications of artificial neural systems in. *Journal of Systems Management*, *44*(4), 12.

Huang, G. (2006). The determinants of capital structure: Evidence from China. *China economic review*, *17*(1), 14-36.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American economic review*, *76*(2), 323-329.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, *3*(4), 305-360.

Kartiningsih, D., & Daryanto, W. M. (2020). The effect of firm characteristics to profitability of food and beverage companies listed in Indonesia stock exchange. *International Journal of Business, Economics and Law*, *22*(1), 69-76.

Kester, J. J., & Fennema, O. R. (1986). Edible films and coatings: a review. *Food technology (USA)*.

Kettaneh, N., Berglund, A., & Wold, S. (2005). PCA and PLS with very large data sets. *Computational Statistics & Data Analysis*, *48*(1), 69–85. https://doi.org/10.1016/j.csda.2003.11.027

Koenker, R., & Bassett Jr, G. (1978). Regression quantiles. *Econometrica: journal of the Econometric Society*, 33-50.

Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The journal of finance*, *28*(4), 911-922.

Lasher, W. R. (2016). Practical Financial Management. *Cengage Learning.*

Lipson, M. L., & Mortal, S. (2009). Liquidity and capital structure. *Journal of financial markets*, *12*(4), 611-644.

Luigi, P., & Sorin, V. (2009). A review of the capital structure theories. *Annals of Faculty of Economics*, *3*(1), 315-320.

M'ng, J. C. P., Rahman, M., & Sannacy, S. (2017). The determinants of capital structure: Evidence from public listed companies in Malaysia, Singapore and Thailand. *Cogent Economics & Finance*, *5*(1), 1418609.

Manos, R., & Ah-Hen, C. (2003). Evidence on the determinants of capital structure of non-financial corporates in Mauritius. *Journal of African business*, *4*(2), 129-154.

Memon, P. A., Rus, R., & Ghazali, Z. (2015). Dynamism of Capital Structure: Evidence from Pakistan. *Journal of International Business and Economics*, 3(1). https://doi.org/10.15640/jibe.v3n1a7

Michaelas, N., Chittenden, F., & Poutziouris, P. (1999). Financial policy and capital structure choice in UK SMEs: Empirical evidence from company panel data. *Small business economics*, *12*, 113-130.

Miller, M. H. (1977). Debt and Taxes. *Journal of Finance*, 261-275 old. 1977.

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review*, *48*(3), 261-297.

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

Moore, W. T. (1986). Asset composition, bankruptcy costs, and the firms choice of capital structure. *Quarterly Review of Economics and Business*, *26*(4), 51-61.

Moosa, I., Li, L., & Naughton, T. (2011). Robust and fragile firm-specific determinants of the capital structure of Chinese firms. *Applied Financial Economics*, *21*(18), 1331-1343.

Moyer, R. C., McGuigan, J. R., & Kretlow, W. J. (2003). Contemporary Financial Management. *Thomson South-Western.*

Myers, S. C. (1984). Finance theory and financial strategy. *Interfaces*, *14*(1), 126-137.

Myers, S. C. (1984). The Capital Structure Puzzle. *Journal of Finance*, *39*(3), 574–592. https://doi.org/10.1111/j.1540-6261.1984.tb03646.x

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of financial economics*, *13*(2), 187-221.

Nivorozhkin, E. (2004). The dynamics of capital structure in transition economies. *Economics of Planning*, *37*, 25-45.

Onofrei, M., Tudose, M. B., Durdureanu, C., & Anton, S. G. (2015). Determinant factors of firm leverage: An empirical analysis at Iasi county level. *Procedia Economics and Finance*, *20*, 460-466.

Ozkan, A. (2001). Determinants of capital structure and adjustment to long run target: evidence from UK company panel data. *Journal of business finance & accounting*, *28*(1-2), 175-198.

Paramasivan, C. (2009). Financial Management. *New Age International.*

Petersen, M. A., & Rajan, R. G. (1994). The benefits of lending relationships: Evidence from small business data. *The journal of finance*, *49*(1), 3-37.

Pettit, R. R., & Singer, R. F. (1985). Small business finance: a research agenda. *Financial management*, 47-60.

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.

Ramdani, D., & Witteloostuijn, A. V. (2010). The impact of board independence and CEO duality on firm performance: A quantile regression analysis for Indonesia, Malaysia, South Korea and Thailand. *British Journal of Management*, *21*(3), 607-627.

Ramlall, Indranarain. 2009. "Determinant of Capital Structure Among Non- Quoted Mauritian Firms Under Specificity of Leverage: Looking for a Modified Pecking Order Theory". *International Research Journal of Finance and Economics*. 31 (31), pp: 83-92

Sakai, K., Uesugi, I., & Watanabe, T. (2010). Firm age and the evolution of borrowing costs: Evidence from Japanese small firms. *Journal of Banking & Finance*, *34*(8), 1970-1981.

Saksonova, S. (2006). The analysis of company's capital and evaluation of factors, which influence creation of the optimal capital structure. *Journal of Business Economics and Management*, *7*(3), 147-153.

Sbeti, W. M., & Moosa, I. (2012). Firm-specific factors as determinants of capital structure in the absence of taxes. *Applied Financial Economics*, *22*(3), 209-213.

Schoubben, F., & Van Hulle, C. (2004). The determinants of leverage: differences between quoted and unquoted firms. *Tijdschrift voor Economie en Management*, *49*(4), 589-622.

Scott Jr, J. H. (1976). A theory of optimal capital structure. *The bell journal of economics*, 33-54.

Scott, J. H. (1977). Bankruptcy, secured debt, and optimal capital structure. *The journal of finance*, *32*(1), 1-19.

Shah, A., Hijazi, T., & Javed, A. Y. (2004). The determinants of capital structure of stock exchange-listed non-financial firms in Pakistan [with comments]. *The Pakistan Development Review*, 605-618.

Shah, S. Z. A., & Jam-e-Kausar. (2012). Determinants of capital structure of leasing companies in Pakistan. *Applied Financial Economics*, *22*(22), 1841-1853.

Shehu, Usman, & Hassan. (2012). Determinants of Capital Structure in the Nigerian Listed Insurance Firms. *Chinese Business Review*, *11*(07). https://doi.org/10.17265/1537-1506/2012.07.007

Sheikh, N. A., & Wang, Z. (2011). Determinants of capital structure: An empirical study of firms in manufacturing industry of Pakistan. *Managerial finance*, *37*(2), 117-133.

Shenoy, C., & Koch, P. D. (1996). The firm's leverage-cash flow relationship. *Journal of Empirical Finance*, *2*(4), 307-331.

Sibilkov, V. (2009). Asset liquidity and capital structure. *Journal of financial and quantitative analysis*, *44*(5), 1173-1196.

Sogorb-Mira, F. (2005). How SME uniqueness affects capital structure: Evidence from a 1994–1998 Spanish data panel. *Small business economics*, *25*, 447-457.

Stohs, M. H., & Mauer, D. C. (1996). The determinants of corporate debt maturity structure. *Journal of business*, 279-312.

Stulz, R. (1990). Managerial discretion and optimal financing policies. *Journal of financial Economics*, *26*(1), 3-27.

Taylor, R. (1990). Interpretation of the correlation coefficient: a basic review. *Journal of diagnostic medical sonography*, *6*(1), 35-39.

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of finance*, *43*(1), 1-19.

Utami, S. R., & Inanga, E. L. (2012). The relationship between capital structure and the life cycle of firms in the manufacturing sector of Indonesia. *International Research Journal of Finance and Economics*, *88*, 69-91.

Van Dijk, T. A. (Ed.). (1997). *Discourse as structure and process* (Vol. 1). Sage.

Wakida, N. R. (2011). Capital Structure and Financial Performance: A Case of Selected Medium Sized Entreprises in Kampala. *Master. Makerere University*.

Warner, J. B. (1977). Bankruptcy, absolute priority, and the pricing of risky debt claims. *Journal of financial economics*, *4*(3), 239-276.

Wellalage, N. H., & Locke, S. (2013). Capital structure and its determinants in New Zealand firms. *Journal of Business Economics and Management*, *14*(5), 852-866.

Wellalage, N. H., & Locke, S. (2014). The capital structure of Sri Lankan companies: A quantile regression analysis. *Journal of Asia-Pacific Business*, *15*(3), 211-230.

Williamson, O. E. (1988). Corporate finance and corporate governance. *The journal of finance*, *43*(3), 567-591.

Yanti, N. M. Y. W. A., & Dwirandra, A. A. N. B. (2019). The effect of profitability in income smoothing practice with good corporate governance and dividend of payout ratio as a moderation variable. *International research journal of management, IT and social sciences*, *6*(2), 12-21.

8. APPENDIX A

Table 2 Descriptive statistics

	Mean	Median	Std. Deviation	Minimum	Maximum	No. of Obs.
TD	0.2442	0.2337	0.1331	0.0000	0.6659	1302
LTD	0.2077	0.1948	0.1222	0.0000	0.5953	1302
STD	0.0354	0.0281	0.0315	0.0000	0.1332	1302
PROF	0.1212	0.1151	0.0581	-0.0593	0.2895	1302
SZ	16.3650	16.3659	1.5294	11.7800	19.6500	1302
GROW	0.0178	-0.0001	0.1394	-0.3696	0.3807	1302
TANG	0.2523	0.2100	0.1986	0.0001	0.8624	1302
NDTS	0.0402	0.0366	0.0225	0.0001	0.0998	1302
VOL	0.3924	0.2026	0.3876	0.0030	1.0698	1302
LIQ	1.3522	1.2257	0.6231	0.0618	2.9557	1302
AGE	68.09	54.50	51.84	4	222	1302

Footnote: This table presents the descriptive of different variables of capital structure and firm performance. The mean, median, standard deviation, minimum, maximum and the number of observations of these variables are shown in this table. For the variable definitions see table 1.

Table 6 Correlation matrix

	TD	LTD	STD	PROF	SZ	GROW	TANG	NDTS	VOL	LIQ	AGE
TD	1										
	0.9627**	1									
LTD	(0.000)										
	0.4426**	0.1986**	1								
STD	(0.000)	(0.0000)									
	-0.0797**	-0.0621*	-0.0779**	1							
PROF	(0.0040)	(0.0251)	(0.0049)								
	0.2053**	0.1798**	0.1820**	-0.3139**	1						
SZ	(0.000)	(0.0000)	(0.0000)	(0.0000)							
	-0.0124	-0.0136	-0.0128	0.1161**	-0.1186**	1					
GROW	(0.6540)	(0.6241)	(0.6434)	(0.0000)	(0.0000)						
	0.2039**	0.2319**	-0.0243	0.0022	0.1858**	-0.1516**	1				
TANG	(0.0000)	(0.0000)	(0.3819)	(0.9356)	(0.0000)	(0.0000)					
	0.0632*	0.0792**	-0.0194	0.3696**	0.1294**	-0.1030**	0.3654**	1			
NDTS	(0.0226)	(0.0042)	(0.4843)	(0.0000)	(0.0000)	(0.0002)	(0.0000)				
	0.0502	0.0242	0.1315**	-0.1873**	0.7699**	-0.1628**	0.1087**	0.2150**	1		
VOL	(0.0701)	(0.3821)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0000)			
	-0.3228**	-0.2487**	-0.3680**	0.2591**	-0.3684**	0.0231	-0.0725**	-0.0286	-0.2363**	1	
LIQ	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.4052)	(0.0089)	(0.3032)	(0.0000)		
	-0.1273**	-0.1329**	-0.0357	0.0056	0.1227**	-0.0838**	0.0071	0.0073	0.0135	0.0472	1
AGE	(0.000)	(0.0000)	(0.1982)	(0.8392)	(0.0000)	(0.0025)	(0.7972)	(0.7915)	(0.6267)	(0.0889)	

Footnote: This table presents the Pearson correlation outputs of the firm characteristics and capital structure variables for the sample of 218 firms listen on STOXX EUROPE 600 INDEX for the period of 2014-2019. For the variable definitions see table 1. P-values are reported in parentheses and * indicates $p<0.01$ ** indicates $p<0.05$ and *** indicates $p<0.001$ (two-tailed).

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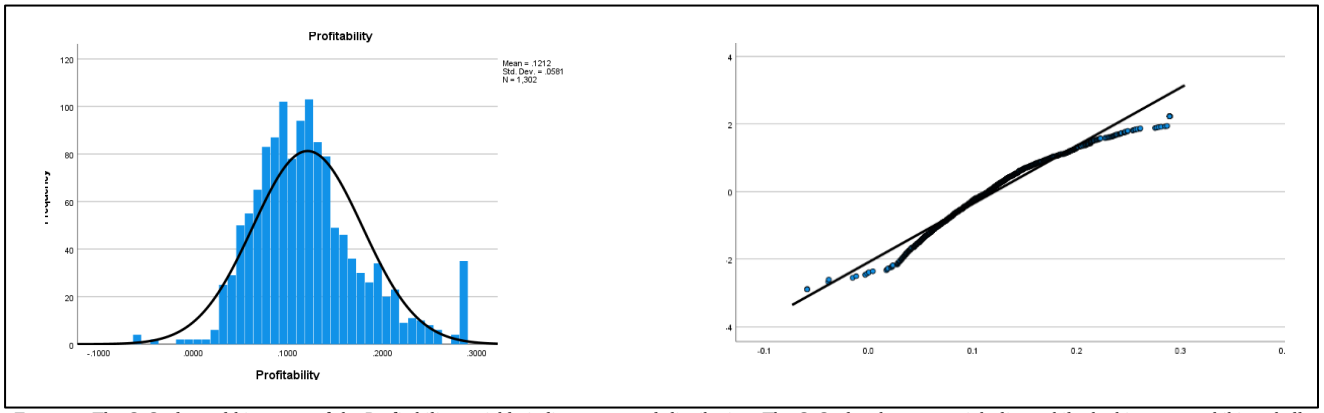
9. APPENDIX B

Table 3 Test of Normality

Variables	Kolmogrov-Smirnov Test	Shapiro- Wilk Test
TD	<0.001	<0.001
LTD	<0.001	<0.001
STD	<0.001	<0.001
PROF	<0.001	<0.001
SZ	<0.001	<0.001
GROW	<0.001	<0.001
TANG	<0.001	<0.001
NDTS	<0.001	<0.001
VOL	<0.001	<0.001
LIQ	<0.001	<0.001
AGE	<0.001	<0.001

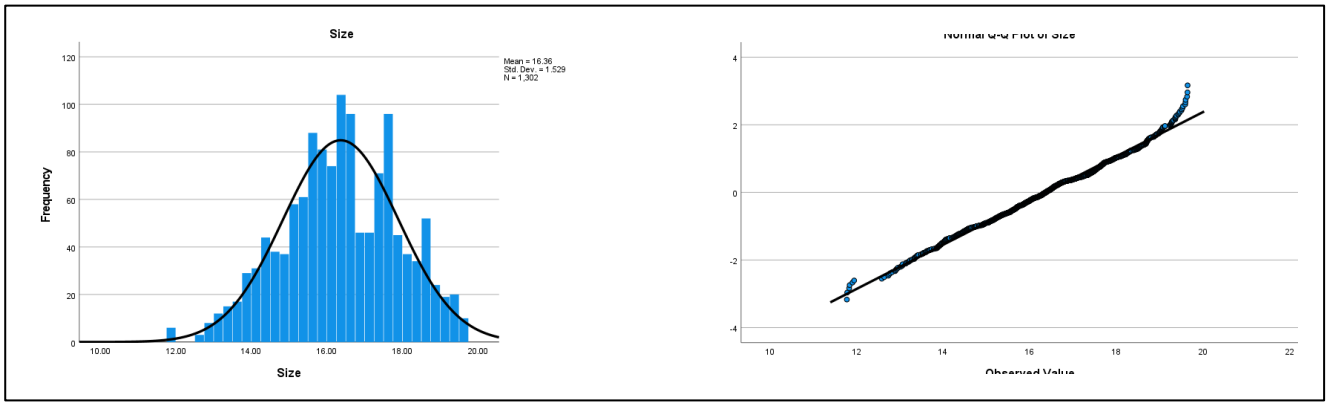
Footnote: The table presents the results of statistical tests conducted on various variables using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The p-values for each variable indicate the level of significance for the tests, with values less than 0.001 (p<0.001) indicating strong evidence to reject the null hypothesis of normality. The variables examined include TD, LTD, STD, PROF, SZ, GROW, TANG, NDTS, VOL, LIQ, and AGE. For the variable definitions see table 1.

Figure 1 normal Q-Q plot and the histogram: Profitability (PROF)



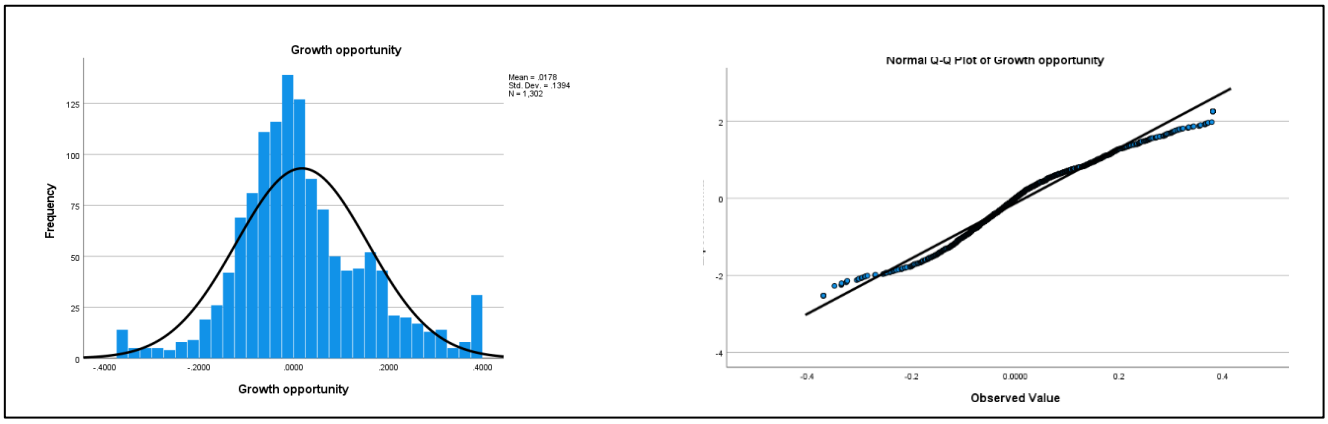
Footnote: The Q-Q plot and histogram of the Profitability variable indicate a normal distribution. The Q-Q plot shows a straight line, while the histogram exhibits a bell-shaped pattern, confirming normality.

Figure 2 normal Q-Q plot and the histogram: Size (SZ)



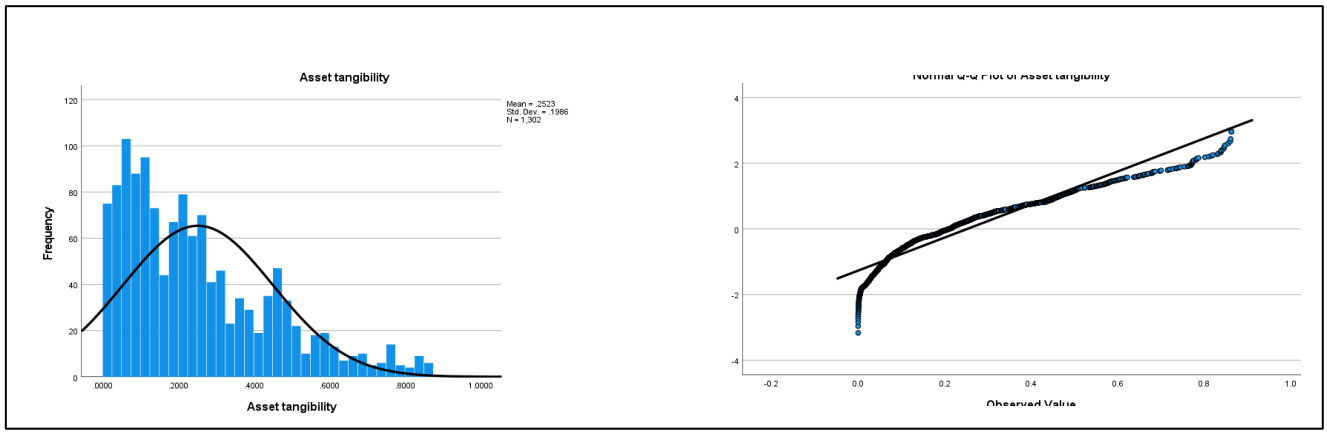
Footnote: The Q-Q plot and histogram of the Size variable indicate a normal distribution. The Q-Q plot shows a straight line, while the histogram exhibits a bell-shaped pattern, confirming normality.

Figure 3 normal Q-Q plot and the histogram: Growth Opportunity (GROW)



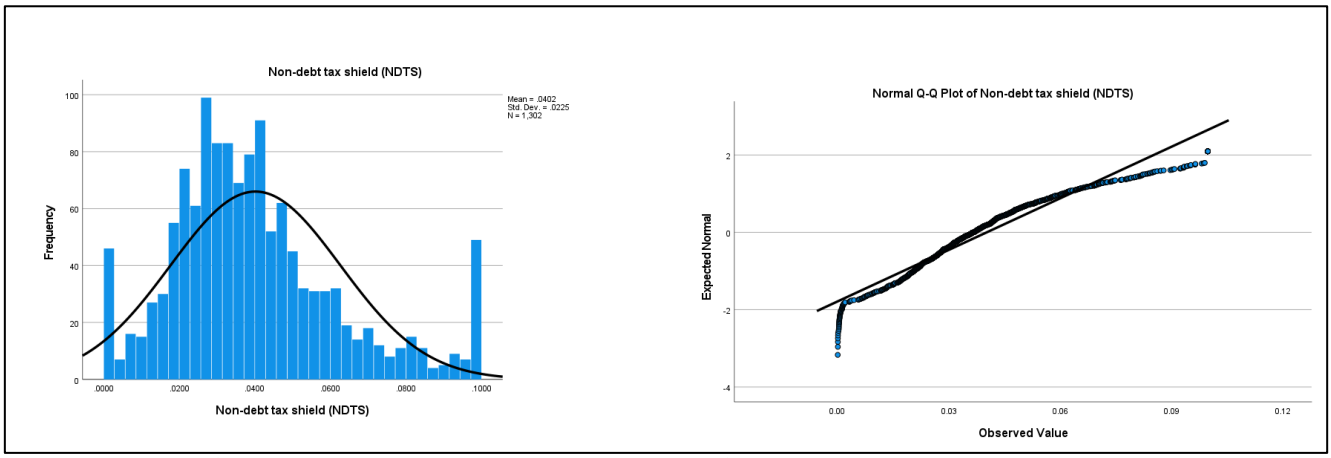
Footnote: The histogram and the Q-Q plot of the Size variable indicate a normal distribution. The Q-Q plot shows a straight line, while the histogram exhibits a bell-shaped pattern, confirming normality.

Figure 4 normal Q-Q plot and the histogram: Asset Tangibility (TANG)



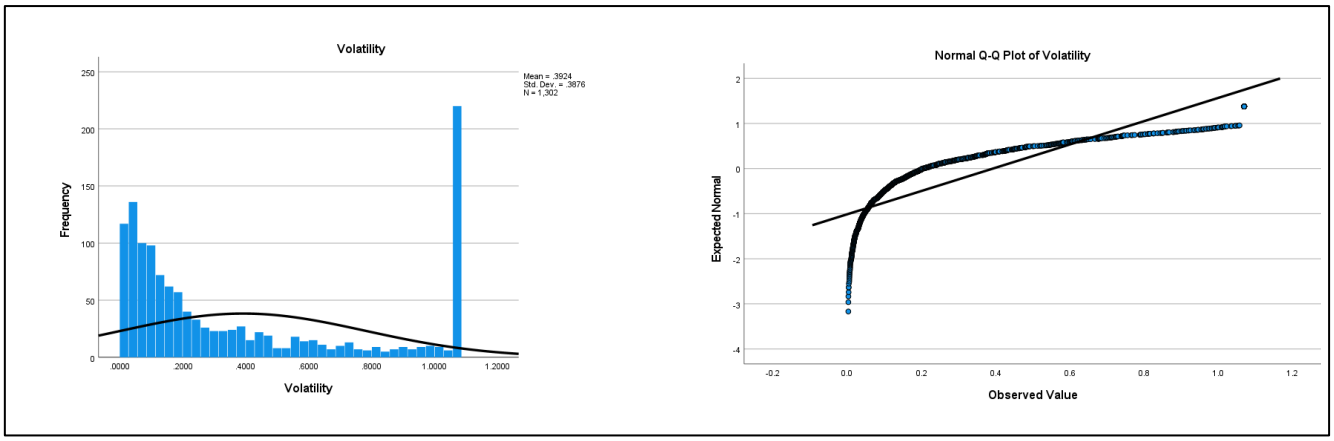
Footnote: The histogram of the Tangibility variable shows a right-skewed distribution, with a concentration of observations towards lower values and a tail extending towards higher values. The Q-Q plot indicates departures from normality, as it does not exhibit a straight line alignment. These visual representations highlight the non-normal distribution and right-skewness of the Tangibility variable.

Figure 5 normal Q-Q plot and the histogram: Non-debt tax shield (NDTS



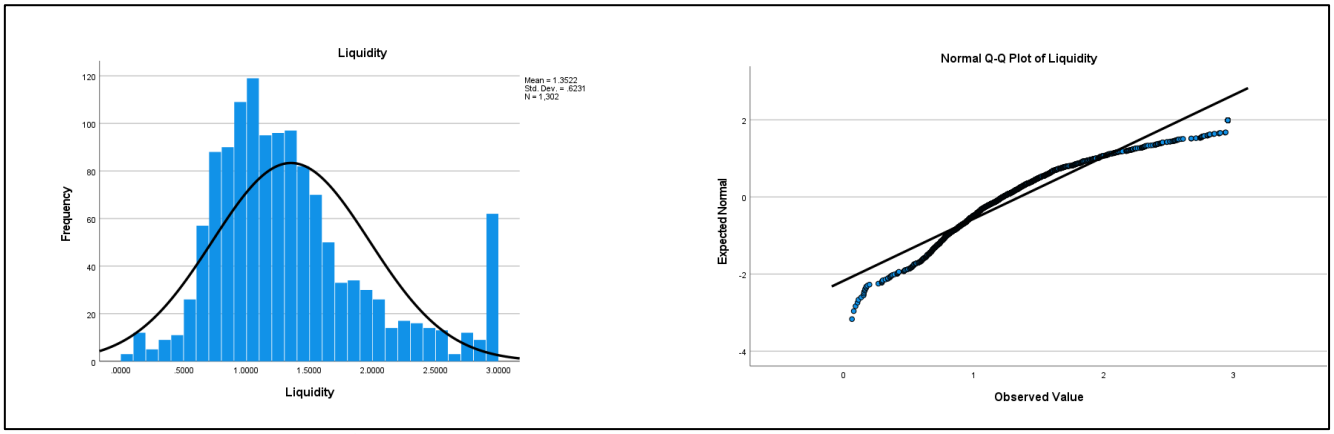
Footnote: The Q-Q plot of Non-debt Tax Shield exhibits non-linearity, indicating deviations from a normal distribution. The histogram also shows a slight right-skewness, suggesting a concentration of observations towards lower values with a tail extending towards higher values. These visual representations suggest departures from normality and a slight right-skewed distribution for the Non-debt Tax Shield variable.

Figure 6 normal Q-Q plot and the histogram: Volatility (VOL)



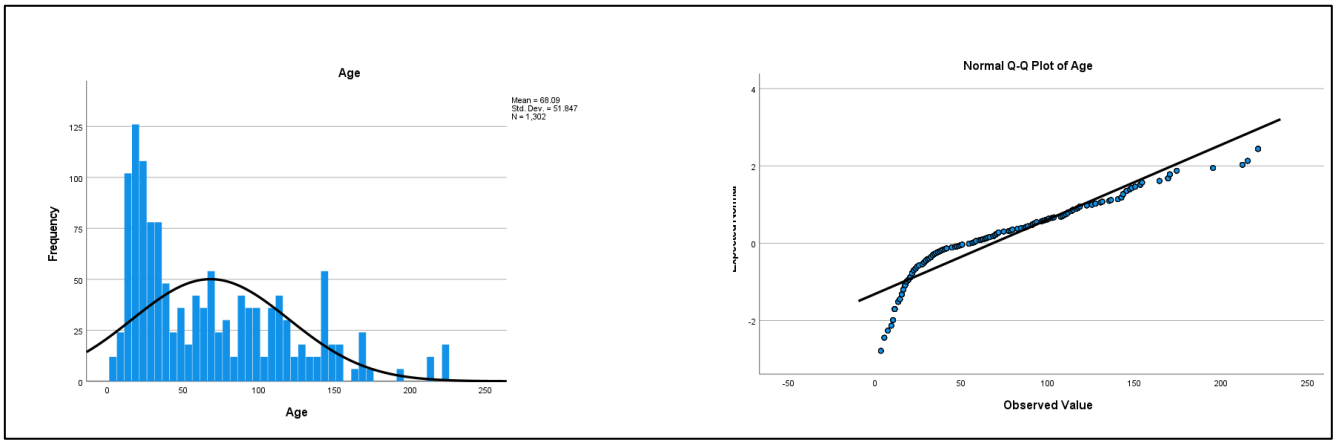
Footnote: The Q-Q plot of Volatility exhibits non-linearity, indicating deviations from a normal distribution. The histogram also shows a slight right-skewness, suggesting a concentration of observations towards lower values with a tail extending towards higher values. These visual representations suggest departures from normality and a slight right-skewed distribution for the Volatility variable.

Figure 7 normal Q-Q plot and the histogram: Liquidity (LIQ)



Footnote: The histogram and the Q-Q plot of the Liquidity variable indicate a normal distribution. The Q-Q plot shows a straight line, while the histogram exhibits a bell-shaped pattern, confirming normality.

Figure 8 normal Q-Q plot and the histogram: AGE



Footnote: The Q-Q plot of Age exhibits non-linearity, indicating deviations from a normal distribution. The histogram also shows a slight right-skewness, suggesting a concentration of observations towards lower values with a tail extending towards higher values. These visual representations suggest departures from normality and a slight right-skewed distribution for the Age variable.

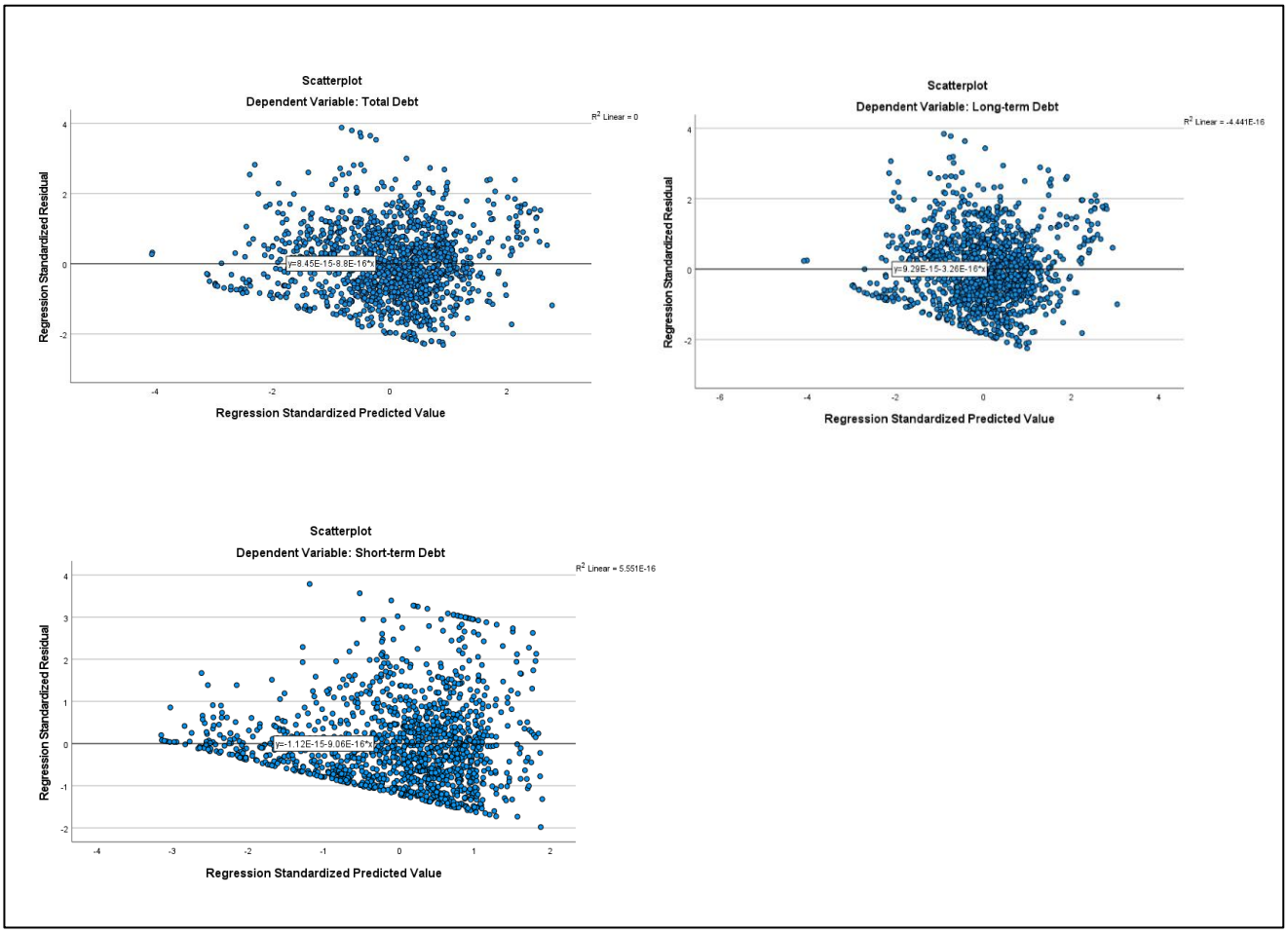
10. APPENDIX C

Table 4 Test of Heteroskedasticity (Breusch-Pagan test)

Variables	ANOVA p-value
TD	<0.001
LTD	<0.001
STD	<0.001

Footnote: The table displays the p-values obtained from the Breusch-Pagan test for heteroscedasticity. The test is used to determine if there is a significant difference in the variances of the residuals across different levels of the independent variables. In this table, the variables TD, LTD, and STD are examined, and their corresponding ANOVA p-values are shown. A p-value less than 0.05 suggests evidence of heteroscedasticity, indicating that the variance of the residuals is not constant across the range of the independent variables. Conversely, a p-value greater than or equal to 0.05 suggests no significant evidence of heteroscedasticity. For the variable definitions see table 1.

Figure 9 Scatterplot: TD, LTD and STD



Footnote: The scatterplot visually tests for heteroskedasticity by examining the relationship between the variables. It helps identify any unequal variances in the residuals or error terms. The scatterplot illustrates the dispersion of data points, with the x-axis representing the independent variable and the y-axis representing the dependent variable. The relatively low variability observed in the data points suggests the presence of consistent or homoskedastic patterns in the relationship between the variables.

11. APPENDIXES D

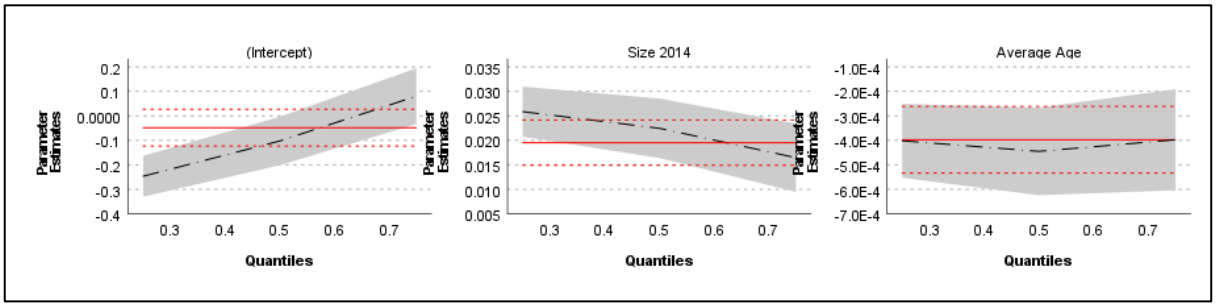
Table 5 Test of Multicollinearity

Variables	VIF values TD	VIF values TD	VIF values STD
PROF	1.455	1.455	1.455
SZ	3.061	3.061	3.061
GROW	1.077	1.077	1.077
TANG	1.230	1.230	1.230
NDTS	1.513	1.513	1.513
VOL	2.692	2.692	2.692
LIQ	1.213	1.213	1.213
AGE	1.057	1.057	1.057

Footnote: The table presents the Variance Inflation Factor (VIF) values, which are used to assess multicollinearity among the variables. Multicollinearity occurs when there is a high correlation between independent variables, leading to instability in the regression model. In this table, the VIF values for each variable (TD, STD, PROF, SZ, GROW, TANG, NDTS, VOL, LIQ, and AGE) are provided. Generally, a VIF value above 4 or 10 indicates a high degree of multicollinearity, while values below these thresholds are considered acceptable. The VIF values shown here suggest that multicollinearity is not a significant concern among the variables examined. For the variable definitions see table 1.

12. APPENDIX E

Figure 10 Model 1 Total Debt (TD)



Model 2 figure 2

Figure 11 Model 2 Total Debt (TD)

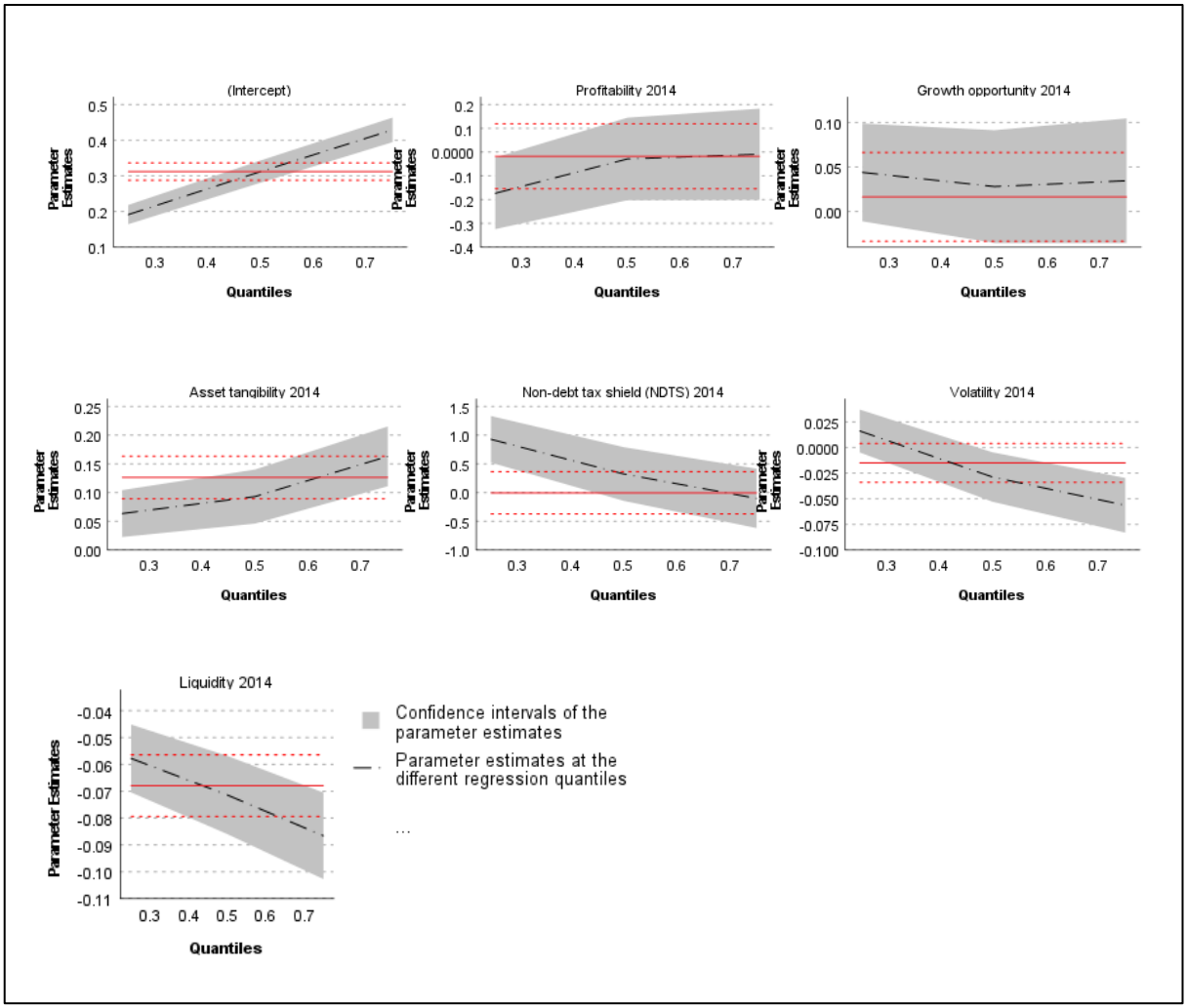


Figure 12 Model 3 Total Debt (TD)

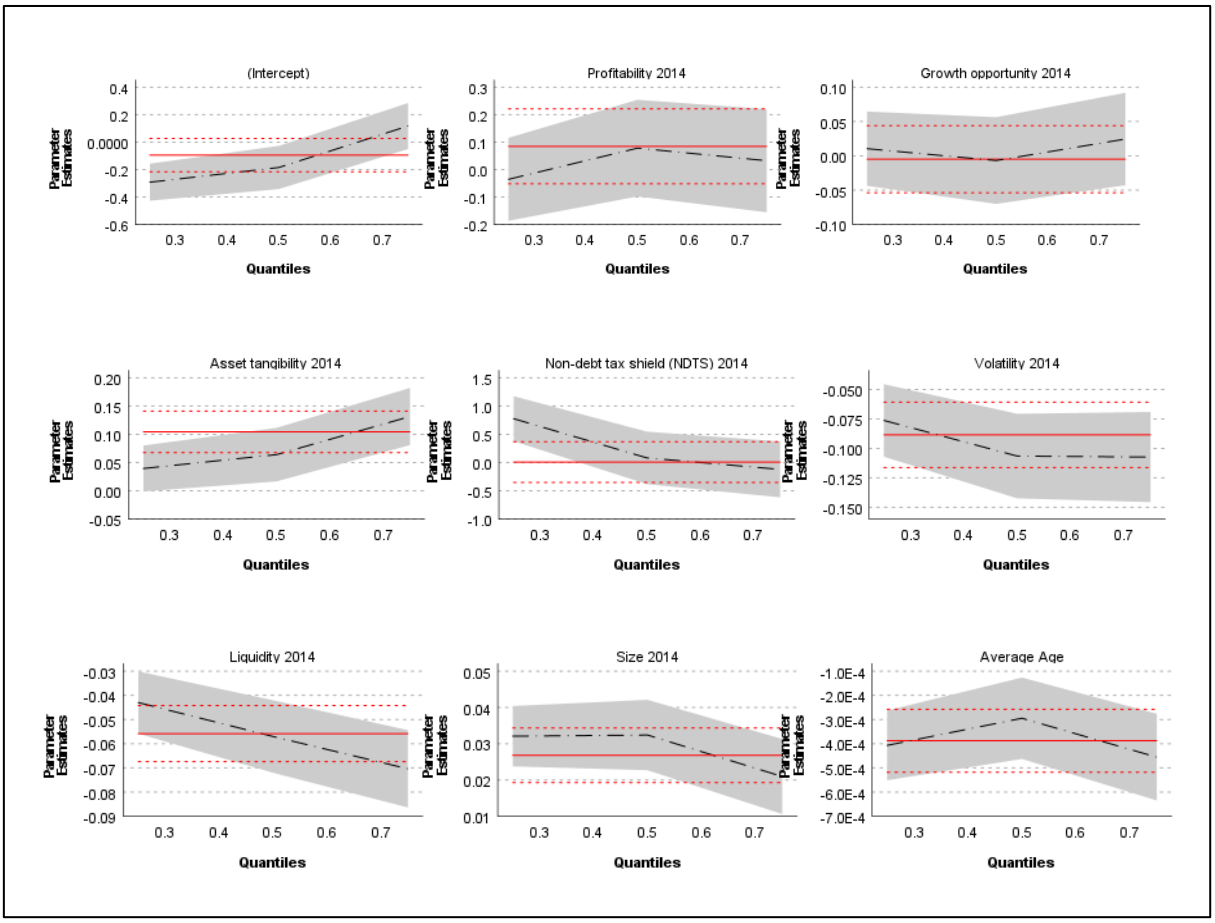


Figure 13 Model 1 Long-term Debt (LTD)

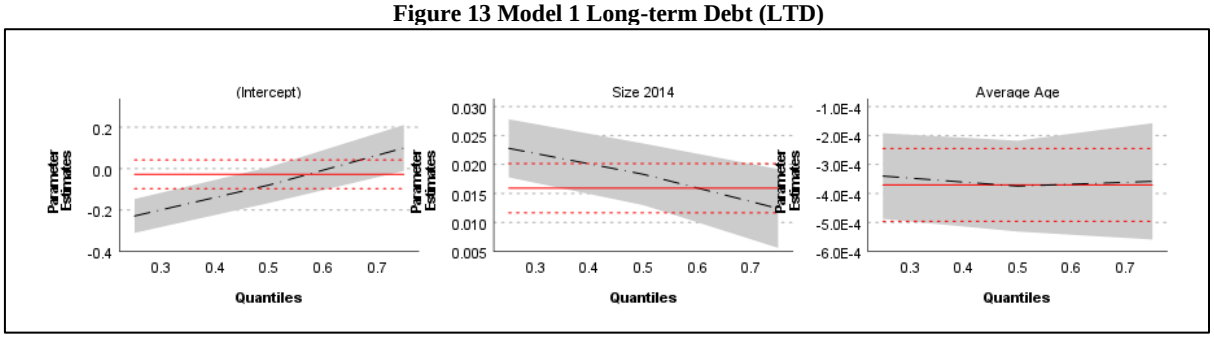


Figure 14 Model 2 Long-term Debt (LTD)

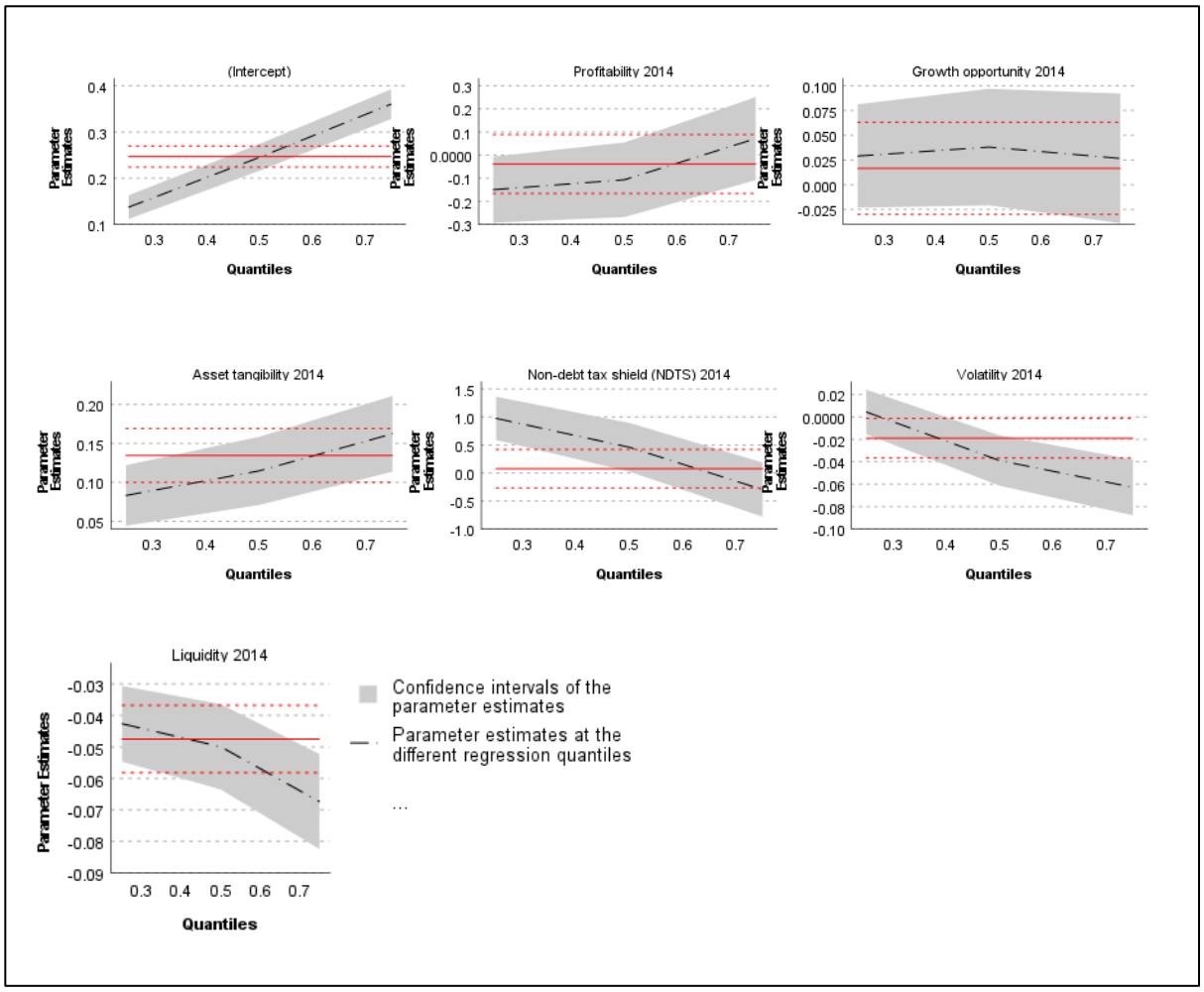


Figure 15 Model 3 Long-term Debt (LTD)

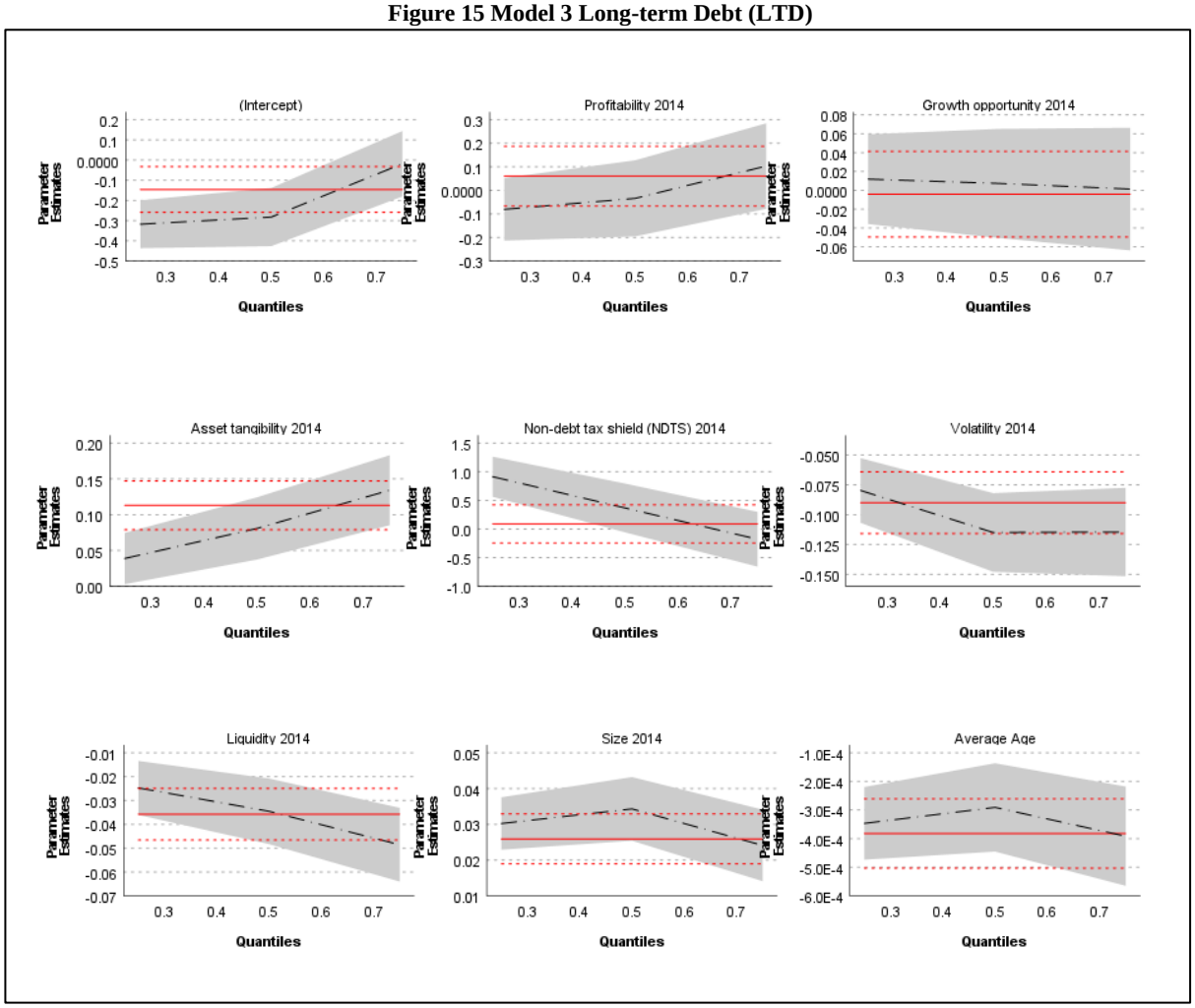


Figure 16 Model 1 Short-term Debt (STD)

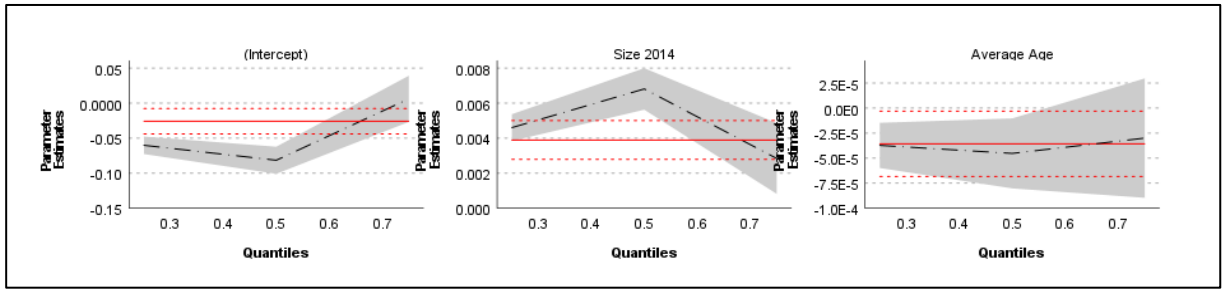


Figure 17 Model 2 Short-term Debt (STD)

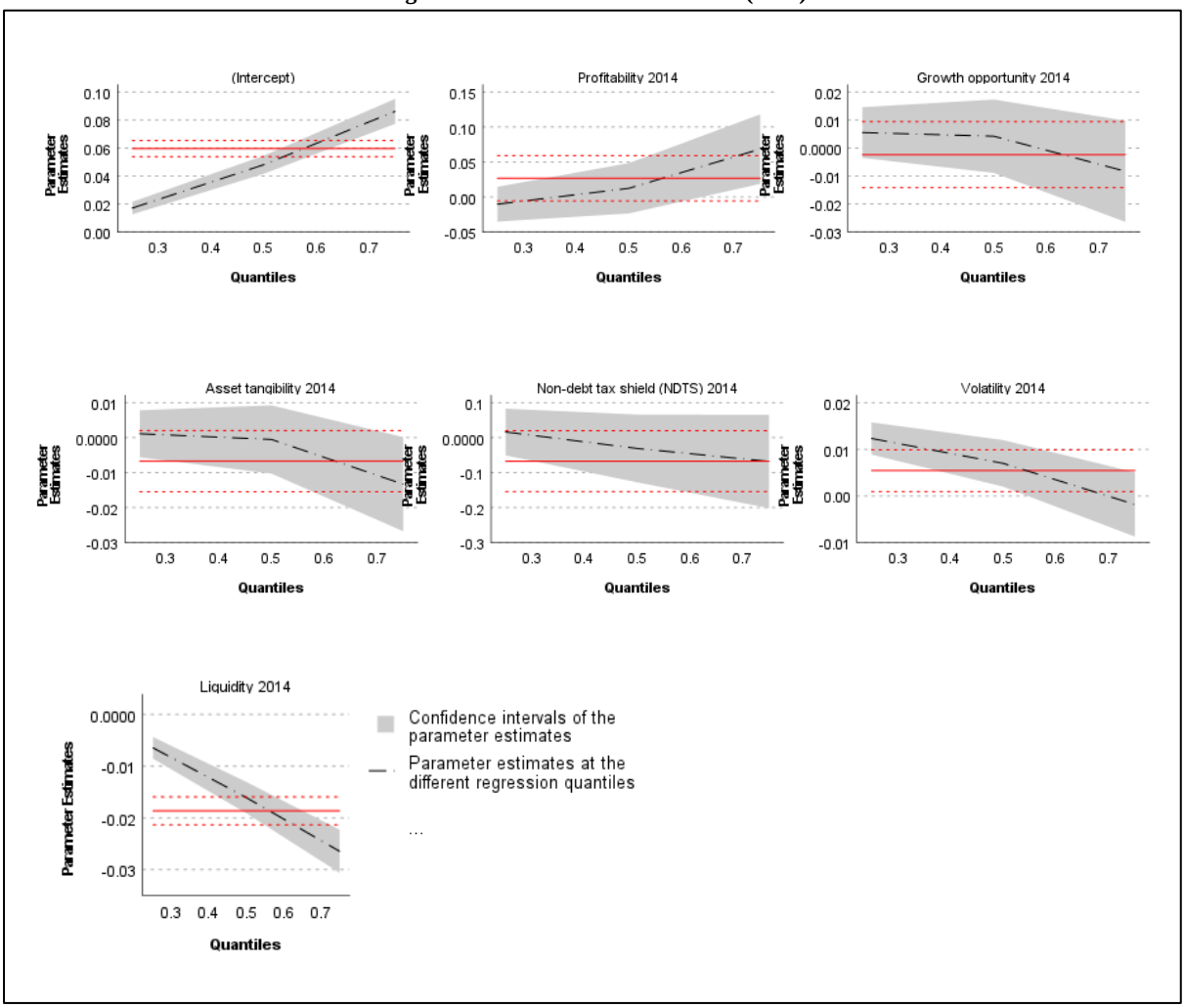


Figure 18 Model 3 Short-term Debt (STD)