Master Thesis

''The impact of firm-specific determinants on the capital structure of Dutch listed and non-listed companies''

UNIVERSITY OF TWENTE.

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Abstract

This research investigated to what extent can the firms-specific determinants explain a difference in the capital structure of Dutch listed and non-listed companies. The sample consists of 77 Dutch listed and 308 non-listed companies within the period 2015 to 2019. The data was collected from the Orbis database. Subsequently, eight hypotheses were formulated based on the capital structure theories. These hypotheses were tested by an ordinary least squares regression with interaction effect.

The results indicate that profitability, tangibility, liquidity, non-debt tax shields, firm size, growth, business risk, and listings status all have a significant effect on the capital structure of Dutch companies. Multiple significant differences were found between listed and non-listed companies. Listed companies are larger, have higher non-debt tax shields and have more business risk, while non-listed companies have more tangible assets and growth opportunities. Furthermore, listed companies are not more profitable or more liquid than non-listed companies. In addition, non-listed companies have significantly more total and short-term debt, while listed companies have slightly more long-term debt. Furthermore, differences in effect between listed and non-listed companies were found for the firm-specific determinants profitability, tangibility, liquidity, non-debt tax shields, and firm size. Finally, no significant differences were found between listed and non-listed companies for both growth opportunities and business risk. In addition, all differences remain robust in the robustness check.

Keywords: *Capital structure, Dutch listed companies, Dutch non-listed companies, firm-specific determinants, Pecking-order theory, Trade-off theory, Agency theory, Market-timing theory, Signaling theory.*

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Chapter 1

1. Introduction

Capital structure is a worldwide phenomenon that has been extensively researched in the financial literature. A company's capital structure is the mix of debt and equity financing (Brealey, Myers & Allen, 2017). For example, when a company is completely financed by common stock, all those cash flows belong to the stockholders. When it issues both debt and equity securities, it splits the cash flows into two streams, a relatively safe stream goes to the debtholders and a riskier stream that goes to the stockholders (Brealey et al., 2017).

Many researchers examined these capital structure decisions and most included large listed companies. However, small non-listed companies make up more than 90% of all existing companies and are the engine of growth in most economies (Degryse, Goeij, & Kappert, 2010). Subsequently, the capital structure decision of small businesses comes the closest to the standard study that considers the choice between debt and equity.

However, several theories have been introduced to explain this variation in debt ratios across companies. Existing theories suggest that companies select capital structure based on characteristics that determine the various costs and benefits associated with debt and equity financing (Titman & Wessels, 1998).

Modigliani and Miller (1958) were the first to question the cost of capital and created the well-known irrelevance theory. They suggest that, in a perfect capital market, without taxes and transaction costs, the financing decisions are irrelevant to firm value. According to Harris and Raviv (1991) who have examined different theoretical literature, the assumptions underlying the Modigliani and Miller theory are generally not fulfilled. But the theory was groundbreaking at the time and has been important to several scholars who based their new theory on it. Subsequently, these efforts led to the development of several theories of capital structure. Resulting in models such as the (static) trade-off theory, pecking order theory, agency theory, market-timing theory, and signaling theory.

The modified version of the pecking order theory by Myers and Majluf (1984) suggests that companies follow a specific hierarchy in financing. Companies prefer internal to external finance. When outside funds are necessary, it first issues debt, then possibly hybrid securities such as convertible bonds, and equity only as a last resort (De Jong, Kabir & Nguyen, 2008; Frank & Goyal, 2003). The trade-off theory developed by Kraus and Litzenberger (1973) suggests that the firm’s capital structure moves towards targets that involve the trade-off between bankruptcy-related costs and tax advantages (De Jong et al., 2008).

In addition to these two theories on capital structure, agency theory is often used in the existing literature. The agency theory states that there is a conflict of interest between the shareholders (principal) and the managers (agents), whereby the agent pursues other interests than the principal has in mind. In contrast to the previous three capital structure models, the market timing theory and signaling theory are less commonly used in research on capital structures. The market-timing theory states that management raises equity in hot

stock markets and issues debt in cold stock markets (Baker & Wurgler, 2002). The signaling theory states that the value of companies will rise with leverage as this increases the market's perception of value.

However, Köksal and Orman (2015) mentioned that both the trade-off theory and pecking order theory are not entirely satisfactory. Furthermore, they have played an important role in identifying many of the factors that determine the actual financing decisions of companies. Subsequently, Jõeveer (2013) mentioned that country-specific factors are the main determinants of variation in leverage for small non-listed companies, while firm-specific factors explain most of the variation in leverage for listed and large non-listed companies. In existing studies, companies are often divided into two groups, one group is active on the stock exchange and the other is not. Companies that are active on the stock exchange are often referred to as listed, quoted, or public companies. Companies that are not active on the stock exchange are often referred to as non-listed, unquoted, or private companies. However, during this research, we only use the terms listed and non-listed companies.

According to Schoubben and Van Hulle (2004) and Köksal and Orman (2015), there are differences in capital structure between listed and non-listed companies. Their results indicate that listed companies have less debt than non-listed companies. Brav (2009) examined both public and private companies in the United Kingdom and found that non-listed companies, compared to their listed companies rely almost exclusively on debt financing, tend to avoid external capital markets, and have higher leverage ratios. For example, non-listed companies had a debt ratio of 64%, while that for listed companies was a lot lower at 37%. As an explanation for this, he indicates that private equity is being more costly than public equity (Brav, 2009).

Unlike non-listed companies, publicly traded companies have lower information costs because they are more transparent and a high level of information available about these companies. Furthermore, listed companies have more financing alternatives, which gives them a better negotiating position regarding their financiers (Schoubben & Van Hulle, 2004; Köksal & Orman, 2015). This is confirmed by Brounen, De Jong, and Koedijk (2006), who also found out that private companies differ in many respects from publicly listed companies.

1.1 Research Objective and question

Many scientists have already analyzed existing capital structure theories. Comparable studies have mainly been conducted in large countries such as the UK with a well-developed economy. According to Frank and Goyal (2009), who researched the USA companies between 1950-2003, empirical evidence appears to be fairly consistent with some versions of the trade-off theory of capital structure. According to Degryse et al. (2010), the impacts of firm characteristics are mostly in line with the predictions of the pecking-order theory for Dutch SMEs. These studies focused on one country, while De Jong et al. (2008) focused on whether firm-specific determinants of leverage differ across countries for listed companies. Therefore, this paper aims to investigate whether the trade-off theory, pecking order theory, agency

theory, market-timing theory or signaling theory can explain the difference in the different capital structures between Dutch listed and non-listed companies. To investigate this, the following main research question has been formulated:

"To what extent can the firms-specific determinants, related to the relevant capital structure theories, explain a difference in the capital structure of Dutch listed and non-listed companies?"

1.2 Contributions

Recent research into the capital structure of Dutch companies is limited compared to other developed countries. In addition, little research has been done into the differences and similarities between Dutch listed and non-listed companies. One reason for this may be that it was perhaps more difficult to obtain data for non-listed companies at the time and that the traditional research mainly focusses on listed companies. Therefore, the main contribution of this research is that it is examined whether there is a difference in capital structure between listed and non-listed companies in the Netherlands. Unlike many previous studies where often only one type of company was examined. For example, Chen, Lensink, and Sterken (1999), De Haan and Hinloopen (2003), De Bie and De Haan (2007), De Jong and Van Dijk (2007), De Jong (2002), De Jong and Veld (2001), and de Jong et al. (2008) all investigated Dutch listed companies, while Degryse et al. (2010), and Hall, Hutchinson, and Michealas (2004) investigated Dutch SMEs. These two types of companies are therefore examined within one report. Thus, we check if there are any substantial differences in the capital structure choices between listed and non-listed companies in the Netherlands.

As a result, this research focuses on the period 2015 - 2019 on Dutch listed and non-listed companies. By working with more recent data than the existing literature, this research should contribute to a better understanding of the current Dutch capital structure of listed and non-listed companies.

1.3 Outline

To provide a complete answer to the research question, this research uses the following framework. Chapter 2 discuss the literature on the static trade-off theory, pecking order theory, agency theory, and alternative theories. This is followed by empirical evidence of firm-specific determinants and empirical evidence between the differences of listed and non-listed companies. Subsequently, hypotheses are formulated based on firm-specific determinants. Chapter 3 describes the methodology, which states which static tests are used. This is followed by an explanation of how the dependent, independent, and control are measured during this study and how other researchers measured this. Chapter 4 explains which data is used and why some companies are excluded from the sample. Chapter 5 describes the main results and the relevant robustness tests. Finally, chapter 6 draws conclusions and describes the limitations of this research. Hereafter, suggestions are given for further research.

Chapter 2

2. Literature Review

This chapter reviews the existing literature. First of all, we look at the theories about capital structure in the literature**.** Followed by empirical evidence of firm-specific determinants for listed and non-listed companies. Then we look at the differences between listed and non-listed companies. Finally, firm-specific determinants are examined to formulate the relevant hypothesis.

2.1 Capital structure theories

This section discusses the capital structure theories used in this research. First, the M&M theory is discussed as it is the basis of several capital structure theories. This is followed by the static trade-off theory, pecking order theory, agency theory, and alternative theories.

2.1.1 Modigliani and Miller theorem

How do companies finance their operations, how should companies finance their operations, and what factors influence these choices? These important questions about the capital structure of companies have occupied researchers for years (Frank & Goyal, 2008). The foundation and one of the first studies about the capital structure were created by Modigliani and Miller (1958). Modigliani and Miller (1958) proposed that, under absolutely perfect and efficient capital markets, without taxes and transaction costs, the financing decisions are irrelevant to a firm's value. As a result, Modigliani and Miller (1958) came up with their first proposition: *"the average cost of capital to any firm is completely independent of its capital structure and is equal to the capitalization rate of a pure equity stream of its class"* (p.268-269). To simplify their proposition, we use the example of value additivity. When you have a dollar in your left pocket and one in your right, your total wealth is two. Thus, you can slice the cash flow into as many parts as you like, the value of the part will always sum back to the value of the unsliced stream (Brealey et al., 2017). This is called the law of conservation of value. In addition to this, Brealey et al. (2017) further explain that firm value is determined on the left-hand side of the balance sheet and not by the proportions of debt and equity securities issued to buy the assets. So, this law implies that the choice of raising money is irrelevant, assuming perfect capital markets and providing that the choice does not affect the firm's investment and operating policies.

Besides the first proposition, Modigliani and Miller (1958) also created a second proposition; *"the expected yield of a share of stock is equal to the appropriate capitalization rate ρk for a pure equity stream in the class, plus a premium related to financial risk equal to the debt-to-equity ratio times the spread between ρk and r"* (p.271).

Summarizing, MM's proposition one says that financial leverage does not affect

shareholders' wealth, while proposition two says that the rate of return shareholders can expect to receive on their shares increases as the firm's debt to equity ratio increases.

2.1.2 Trade-off Theory

The trade-off theory, also called the static trade-off model, grew out of the discussion over the irrelevance proposition Modigliani and Miller (1958). As mentioned by Modigliani and Miller (1958), in a complete and perfect capital market the firm's market value is independent of its capital structure. In 1963, corporate income tax was added into the original irrelevance proposition (Modigliani & Miller, 1963; Frank & Goyal, 2008). This created a benefit for debt as it served to protect (shield) income from taxes. As a result, companies should be 100% financed by debt in order to pay as little income tax as possible. Kraus and Litzenberger (1973) developed the trade-off theory to prevent all companies from being fully funded from debt. This new theory includes tax shield benefits and cost of financial distress (bankruptcy costs) into their theory. Subsequently, bankruptcy costs can be divided into direct and indirect costs. Direct costs are, for example, the legal and administrative costs of a bankruptcy. The indirect costs are almost impossible to measure.

According to the trade-off theory, the theoretical optimum is reached when the present value of tax savings due to further borrowing is just offset by increases in the present value of costs of distress. Tax advantages to debt financing arise since interest charges are tax-deductible. Subsequently, financial leverage decreases the firm's corporate income tax liability and increases its after-tax operating earnings. For a graphical picture of the theoretical optimum see figure 2.1.

Companies that follow the trade-off theory, sets a target debt-to-value ratio and then gradually moves toward the target (Myers, 1984). This debt-to-value ratio is determined by balancing debt shields against the costs of bankruptcy. The trade-off theory recognizes that companies can have different target debt ratios. Companies with safe, tangible assets and a lot of taxable income should have a higher debt ratio. While companies with less profit and intangible assets rely more on equity. In other words, high-tech companies whose assets are risky and more tangible, use relatively little debt. Airlines, on the other hand, use a lot of debt, as their assets are tangible and safe. Besides, Frank and Goyal (2008) mentioned the main four predictions to reach optimal debt levels: (1) *"An increase in the costs of financial distress reduces the optimal debt level."* (2) *"An increase in non-debt tax shields reduces the optimal debt level."* (3) *"An increase in the personal tax rate on equity increases the optimal debt level."* (4) *"At the optimal capital structure, an increase in the marginal bondholder tax rate decreases the optimal level of debt."* (p.144).

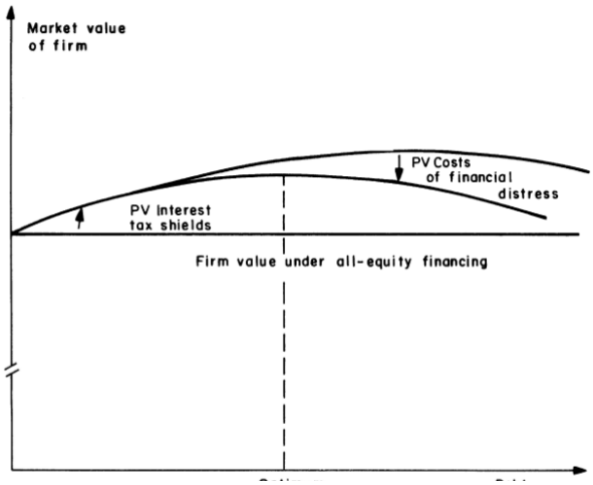

Figure 1 The static trade-off theory (Shyam-Sunder & Meyers, 1999, p. 220)

One of the problems for testing the trade-off theory is that the elements of the model are not directly observable, instead, proxies are used. For example, Bradley et al. (1984) found an unexpected sign on non-debt tax shields. It is unclear whether the problem is a defect in the theory or the proxy (Frank and Goyal, 2008). This trade-off model is therefore static but testing the theory with data requires additional assumptions to be made. Frank and Goyal (2008) mentioned that: ''*two aspects of static modeling are particularly important in tests of the theory, the role of retained earnings and the interpretation of mean reversion*'' (p. 145). The theory does not say anything about mean reversal. The model has a leverage solution, but there is no room in the model for the company to ever be anywhere but the solution. The model, therefore, does not contain a notion of target adjustment. Hence, we separate the static trade-off theory from the goal adjustment hypothesis (Frank & Goyal, 2008). As a result, scientists had distanced themselves from taxation and bankruptcy costs, but they will now come back to this. But only with the fact that companies last longer than a single period, which has led to the dynamic trade-off theory.

The dynamic trade-off theory was created by Fischer, Heinkel, and Zechner (1989). They found that even small recapitalization costs lead to wide swings in a firm's debt ratio over time. The results of empirical tests relating companies' debt ratio ranges to firm-specific features strongly support the theoretical model of relevant capital structure choice in a dynamic setting.

2.1.3 Pecking order Theory

The pecking order theory which comes from Myers (1984), is the second main capital structure theory. Myers (1984) was influenced by the earlier institutional literature, including Donaldson's book (1961). Described in Frank and Goyal (2008), the definition of the pecking order theory is according to Myers (1948): ''*A firm is said to follow a pecking order if it prefers internal to external financing and debt to equity if external financing is used* '' (p.150). This was motivated by the adverse selection model in Myers and Majluf (1984). However, the order stems from a variety of sources, including agency conflicts and taxes. Frank and Goyal (2008) question this definition. Does this mean that the firm uses all available sources of internal finance before using any debt or equity issues or that the firm will mostly use internal financing before using external financing? Most companies have some internal funds (cash and short-term investments), even when they attract external funds.

According to pecking order theory, positive-NPV projects are funded in a hierarchical order. Myers and Majluf (1984) argued that information asymmetry between managers and investors creates a preference ranking over financing sources. Information asymmetry also called adverse selection, is a term that indicates that the owner-manager of the firm knows the true value of the firm's assets and growth opportunities, where external investors can only guess these values. As a result, managers in an overvalued company will be happy to sell their equity, while the manager of an undervalued company will not (Frank & Goyal, 2008).

Hence, asymmetric information influences the choice between internal and external

financing and between issues of debt and equity securities (Brealey et al., 2017). This has resulted in the pecking order, in which positive-NPV projects are funded first with internal funds, when there is a shortage of retained earnings then debt financing will be used, and last equity should never be issued unless the debt has become unattainable for some reason. This in turn leads to the idea of a "debt capacity", which is to limit the amount of debt within the pecking order and to allow the use of equity capital. However, the literature does not provide a clear definition of the limited amount of debt.

Thus, for a firm in normal operations, equity will not be used, and the financing deficit will match the net debt issues. According to Goyal (2003) equity is subject to serious adverse selection problems while debt has only a minor adverse selection problem. This makes equity is riskier than debt. Both have an adverse selection risk premium, but that premium is large on equity. Therefore, an outside investor will demand a higher rate of return on equity than on debt. However, Frank and Goyal (2003) discovered that small companies depend mainly on equity financing. This statement contradicts the pecking order theory. According to pecking order theory, small firms experience more information asymmetry than large companies, causing an investor to avoid small companies' equity. This contrast is also known as the Pecking order puzzle. To make it clear, Leary and Roberts (2010) have summarized the pecking order theory in figure 2. First, a firm will use its internal resources (e.g., cash and liquid assets) to finance investment up to C. The amount of internal funds available for investment is described as C. When the investment is greater than C, one moves to external financing to fill up the financing deficit. According to Leary and Roberts (2010), debt finance will be used first to D. When the investment is even greater than point D, the firm turns to equity financing.

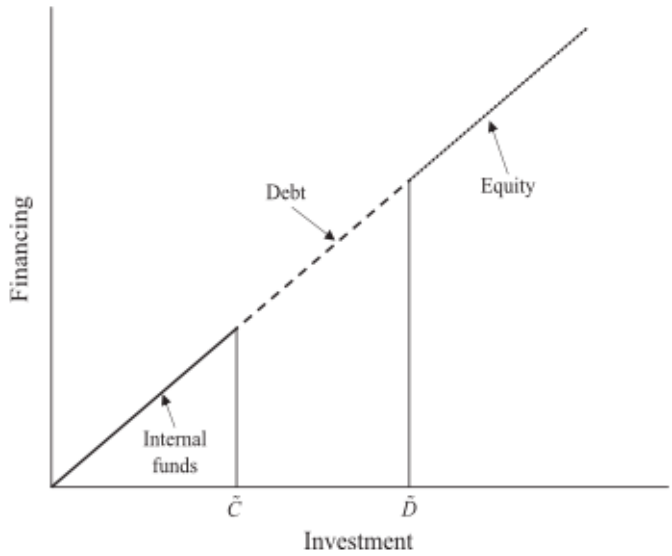

Figure 2: Financing hierarchy pecking order theory (leary & Roberts, 2010, p.334)

2.1.4 Agency theory

Jensen and Meckling (1976) introduced agency theory (AT) a few years after Kraus and Litzenberger (1973) introduced trade-off theory. Instead of using the capital structure to develop their theory, they used the ownership structure term. Since the capital structure ignores the relative amount of internal and external ownership, a third dimension is now added next to a company's debt and equity (Jensen and Meckling, 1976).

The agency theory states that there is a conflict of interest between the shareholders (principal) and the managers (agents), whereby the agent pursues other interests than the principal has in mind. The agency problems can arise between these three relationships: (1) owner-manager, (2) shareholders-manager, or (3) bondholders-shareholders. The second relationship refers to managers acting in their best interest instead of the shareholders. This means that they have incentives to grow the business, as this often leads to higher compensation for the manager himself (Jensen, 1986). The third relationship relates to the shifting of risks when there is a financial need. Shareholders can run away more easily than bondholders. Since bondholders take ownership of a company in case of financial difficulties, they strive for less risky investments. Unlike shareholders, who strive for higher capital gains (increased risk). According to Hand, Lloyd, and Rogow (1982), the main conflict in non-listed firm relationships is between internal and external providers of capital. This is mainly caused by information asymmetries resulting from a lack of publicly available detailed accounting information (McMahon et al., 1993). In contrast to non-listed companies, listed companies are much less affected by this. Since they have to publish their annual reports leading to a lower information asymmetry. These agency conflicts between the separation of ownership and control create agency costs. Agency costs can be defined as the sum of (1) monitoring expenditures by the principle, (2) bonding expenditures by the agent, and (3) residual loss (Jensen and Meckling, 1976).

Subsequently, three forms of agency problem received extra attention, namely (1) free cash flow problem, (2) underinvestment problem, and (3) assets substitution problem. Free cash flow problems are identified as one of the sources of agency problems between managers and shareholders. Managers of companies with high free cash flow and low growth potential tend to invest in marginal or even negative NPV projects. In addition, they use income-enhancing discretionary provisions to camouflage the effects of non-wealth-maximizing investments (Fuad Rahman & Mohd-Saleh, 2008).

According to Myers (1977), the underinvestment problem is when a company refuses to invest in low-risk assets. This is done to maximize their assets at the expense of the debt holders. Low-risk projects provide more security for the firm's debt holders since a steady stream of cash can be generated to pay off the lenders. However, it does not generate an excess return for the shareholders. As a result, the project is rejected, despite increasing the overall value of the company. Jensen and Meckling (1976) described the asset substitution as follow, the possibility that shareholders obtain benefits from bondholders when they undertake risky investment projects, as this greater risk is transferred to bondholders. Which would then lead to lower debt.

Finally, Brounen et al. (2006) found no empirical evidence has been found that agency problems are important in the choice of capital structure. This also emerged from the research by Chen et al. (1999), who indicated that factors based on agency costs and corporate considerations are relatively unimportant for Dutch companies

2.1.5 Alternative theories

In addition to the trade-off theory, pecking order theory, and agency theory, other theories are also often used in research on the capital structure of companies. Other well-known theories are the market-timing theory and signaling theory.

According to Baker and Wurgler (2002), equity market-timing theory refers to issuing shares at high prices and repurchasing at low prices. The intention is to exploit the temporary fluctuations in the cost of equity relative to the cost of other forms of capital. Their main finding was that companies with low leverage are companies that raised money when their market valuations were high while companies with high leverage companies do so when their market valuations were low. De Bie and De Haan (2007) mentioned that companies issue new shares when they are considered overvalued and that companies buy back their shares when they are considered undervalued. This is contradicted by Frank and Goyal (2009), who find that the market-timing theory does not directly explain the patterns they observe, implying that the applicability of the market timing theory is questionable. In addition, De Bie and De Haan (2007) did also not find persistent effects of market timing on capital structures of Dutch companies. As an explanation for this, they indicate that Dutch companies have a relatively strong preference for internal financing over external financing. When they do need external financing, they prefer bank loans to issue securities. When they eventually go to the public capital market, stocks are more often issued than bonds. This is due to the relative underdevelopment of the corporate bond market compared to the equity market (De Haan & Hinloopen, 2003). This theory is left out in some studies between listed and non-listed companies because no market values are known for non-listed companies. However, the market timing theory can provide valuable information about listed companies. That is why we have chosen to use the market-timing theory in this research.

Introduced by Ross (1977), the signaling effect is a capital structure theory based on asymmetric information. The Modigliani-Miller's irrelevance theory assumes that the market has complete information about the activities of companies. However, according to Ross (1977); '' *If managers possess inside information, then the choice of a managerial incentive schedule and of a financial structure signals information to the market, and in competitive equilibrium the inferences drawn from the signals will be validated'' (p. 23).* Therefore, the values of companies will rise with leverage, since increasing leverage increases the market's perception of value. Thus, the empirical prediction is that firm value (or profitability) and the debt-equity ratio is positively related. This theory is not often used in similar studies. However, this theory can also provide valuable information so it would be a shame to take it out.

2.2 Empirical evidence of firm-specific determinants

In this section, we will look at empirical evidence from studies of Dutch companies, but also from studies of foreign companies. Since a lot of research has been done into the determinants of capital structure in recent years, only the studies that focused on firm-level determinants of the capital structure are described below. This is done to investigate which firm-specific determinants have a significant impact on the debt ratios for listed and non-listed companies.

De Jong et al. (2008) analyzed the importance of firm-specific and country-specific factors in the leverage choice of listed companies from 42 countries. They found a significant impact of several firm-specific factors like profitability (negative), tangibility (positive), risk (negative), firm size (positive), and growth opportunities (negative) on cross-country capital structure. In addition, they found a limited significant result for liquidity, and for tax only 2 of the 10 coefficients were significantly positive. Subsequently, some firm-specific factors were not significantly related to leverage in every country. De Jong (2002) analyzed the relationships between non-debt tax shield, tangibility, business risk, tobin's Q, size, free cash flow, issue size, governance mechanisms and long-term debt for non-financial companies that are listed on the Amsterdam Exchanges. He found a positive relationship for tangibility and tobins Q, a negative relationship for non-debt tax shields, business risk and size, and no relationship for free cash flow and governance mechanisms.

Ozkan (2001) who analyzed listed UK companies between 1984 and 1996. Total debt ratio was used as dependent variable and for the independent variables: size, liquidity, non-debt tax shield, profitability and growth. He found a negative relationship for liquidity, profitability and growth. While he found a positive relationship for size and an inverse relationship exists between non-debt shields and corporate funding ratio. Chen (2004) studied Chinese-listed companies between 1995 and 2002. He used the total debt ratio and long-term debt ratio as dependent variables. He also used profitability, size, growth, asset's structure, risk and non-debt tax shields for the independent variables. He indicates that there is a negative relationship between profitability and debt and that there is a positive relationship for growth opportunities and tangibility. In addition, there is also a negative relationship between the size of a company and long-term liabilities.

Degryse et al. (2010), who have researched Dutch small and medium-sized enterprises (SMEs) from 2003 to 2005, suggest that the capital structure decision is consistent with the pecking-order theory following the firm-specific factors. They also use the following firm-specific determinants: size, tangibility, net debtors, profitability, growth, tax rate and depreciation. In addition, they concluded that Dutch SMEs are using their profits to lower their debt levels. As a result, growing companies are increasing their debt level as they need more funds. Subsequently, they indicated that profits reduce short-term debt in particular, while growth increases long-term debt. They did not formulate an explicit proposition for the relationship between the tax rate and leverage, because interest payments reduce taxable income, but other items can do the same. According to Titman and Wessels (1988), these non-debt tax shields could substitute for the tax shield of debt. Furthermore, they found that inter-

and intra- industry effects are important in explaining small companies' capital structure. Industries show different averages in debt, which is in line with the trade-off theory. Hall et al. (2004) studied Dutch SMEs in 1995. They used long-term debt and short-term debt as dependent variable. Just like the aforementioned studies, she also uses the same firm-specific determinants: profitability, growth. tangibility, size and age. They found no relationship for growth and age. In addition, they found a positive relationship for both tangibility and size with long-term debt and a positive relationship between profitability and short-term debt. Furthermore, they found a negative relationship for both tangibility and size with short-term debt.

Psillaki and Daskalakis (2008) investigate the capital structure determinants of Greek, French, Italian, and Portuguese SMEs. They compared the capital structures of SMEs across countries and differences in country characteristics, asset structure, size, profitability, risk, and growth. The results showed that SMEs in countries determine their capital structure in similar ways. They found that size is positively related to leverage and that there is a negative relationship between leverage and asset structure, profitability and risk. In addition, growth is not a statistically significant determinant of leverage for any of the four countries. López-Gracia and Sogorb-Mira (2008) examined 3.569 Spanish SMEs over a 10-year period dating from 1995 to 2004. They used the total debt ratio as a dependent variable and used effective tax rate, non-debt tax shield, risk, growth, profitability, size, cash flow and age as independent variables. The results indicate that non-debt tax shields, growth opportunities, age, cash flow and profitability have a negative relationship with the total debt ratio. Whereas only size and the interactive variable between growth opportunities and cash flow have a positive relationship with total debt ratio. No significant results were found for the effective tax rate and default risk.

2.3 Empirical evidence between listed and non-listed companies

This section looks at empirical differences between listed and non-listed companies. Schoubben and Van Hulle (2004) investigated both Belgian listed and non-listed companies. Schoubben and Van Hulle (2004) indicate that listed companies have a lower leverage effect than non-listed companies, even when controlled by other determinants of the capital structure. Unlike non-listed companies, size has a positive coefficient in both the fixed firm effect models and the no fixed firm effect models for listed companies. This indicates that size is relatively more important for listed companies than for non-listed companies. However, one of the main differences between listed and non-listed companies is the impact of growth on leverage. Listed companies with high growth do not directly result in higher debt. These results are positive but not significant, unlike non-listed companies. Schoubben and Van Hulle (2004) explain that listed companies have more alternative forms of financing. As a result, their financial structure is less dependent on the use of (bank) debts when the internally generated resources are exhausted. Moreover, there is also a difference for tangibility. Tangibility has a strong positive relationship with leverage for private companies. However,

this relationship does not seem to exist for public companies. This indicates that listed companies are less dependent on collateral value to obtain debt. An explanation for this may be that listed companies may have a smaller number to go bankrupt and that the information asymmetries are smaller than with non-listed companies. Therefore, collateral will be less of an issue when negotiating debt contracts. Overall, the evidence agrees with the pecking order perspective. In contrast to non-listed companies, listed companies have more financial flexibility. Thus, when their internal financial resources are exhausted, they are less dependent on debt.

Köksal and Orman (2015) analyzed manufacturing, non-manufacturing, small, large, publicly traded, and private firms in Turkey. Köksal and Orman (2015) indicated that whether a company is listed or non-listed has a significant impact on the company's capital structure. Their results indicate that there are many similarities but also differences between listed and non-listed firms in how determinants are related to debt ratios. When looking at firm-specific determinants, as with Schoubben and Van Hulle (2004), it emerges that the main difference is in the effect of growth and business risk on leverage. Firm growth is not correlated with leverage for non-listed firms, while growth has a positive relationship with short-term leverage for listed firms. This finding also supports the pecking-order theory. Business risk has a significant negative relationship with both long-term and total leverage for non-listed firms. On the other hand, listed companies have a small positive relationship between total leverage and business risk. It must be said that this relationship is only significant at the 10% level. Business risk, therefore, has little effect on the debt ratio of listed companies. Again, it is indicated that this may be due to the presence of alternative funding sources available and their well-known reputation. In addition, the coefficients of profitability are also remarkable. These are much higher for listed firms than for non-listed firms. Meaning that listed firms are better able to use their own profit in contrast to non-listed firms.

Farooqi-Lind (2006) investigated the capital structure of Swedish non-listed firms in the period 1997-1999 and compares these with listed firms. He found a number of differences in the capital structure of listed and non-listed companies. For example, he found differences in both the relationship of debt levels to the explanatory variables and the magnitude of the effect of these variables. Farooqi-Lind (2006) indicates that lower growth and higher asset tangibility are the two factors that explain why the debt of listed companies is so much lower than that of non-listed companies. Size is negatively related to the long-term debt of both listed and non-listed firms, with the relationship being more negative for listed firms. Profitability had no statistically significant results although the coefficients have the right sign. The effect of non-debt tax shields on the total and long-term debt of non-listed firms is negative. Tangibility has the most influence on the debt levels of firms. The results indicate that tangibility is more important for non-listed firms. Finally, no significant evidence is found for income variance.

2.4 Hypothesis formulation

According to Chen (2004), a lot of research has been done in recent years to explain the capital structure pattern. This is done to provide empirical evidence whether the theoretical models have explanatory power when applied to the real business world. Firm-level variables will be used to explore whether there are differences between capital structure between Dutch listed and non-listed companies. The used variables come from previous studies such as Chen (2004), Frank and Goyal (2009), De Jong et al. (2008), Salawu and Agboola (2008), Köksal and Orman (2015), Rajan and Zingales (1995), Dasilas and Papasyriopoulos (2015), Hall et al. (2008), Degryse et al. (2010) and Schoubben and Van Hulle (2004). Finally, an overview is given of all formulated hypotheses, see table 2.1.

2.4.1 Profitability

According to Frank and Goyal (2009), profitable firms face a lower expected cost of financial distress and therefore find interest tax shields more valuable. From this tax and bankruptcy costs perspective, the trade-off predicts that profitable firms use more debt. In addition, the benefits of tax shield debt will induce profitable companies to use more debt (Jensen & Meckling 1976; Harris & Raviv 1990). This is also suggested by the agency theory. Frank and Goyal (2009) mentioned that: *'' from the agency costs perspective predicts that the discipline provided by debt is more valuable for profitable firms as these firms are likely to have severe free cash flow problems''* (p. 7). However, the pecking order theory suggests that firms prefer internal finance over external funds. Firms will first use their retained earnings, then debt, and finally equity. Thus, it predicts that more profitable firms are less leveraged (Frank & Goyal, 2009; Chen, 2004). According to Psillaki and Daskalakis (2009), the pecking order theory is especially suitable for SMEs. SMEs do not typically aim for a target debt ratio, instead, their financing decisions follow the pecking order theory. Thus, preferring internal over external financing and debt over equity. The signaling theory expects a negative relationship between profitability and leverage. High profitability can serve as a signal of quality. As a result, profitable companies have less need to take on more debt. In this way, they can distinguish themselves from companies with a lower quality (Schoubben and Van Hulle, 2004). Since listed companies are generally more profitable, they will tend to take on less debt.

Many empirical studies indicate that profitability is negatively related to leverage. Titman and Wessels (1988), Harris and Raviv (1991), Rajan and Zingales (1995) all found that leverage is negatively related to the level of profitability for listed companies which supports the pecking-order theory. De Jong et al. (2008) also found a negative relationship between profitability and long-term debt for Dutch listed firms, while Chen et al. (1999) and Degryse et al. (2010) found a negative relationship between profitability and total debt for Dutch listed firms and non-listed firms. However, Michaelas et al. (1999) argued that SMEs prefer short-term debt, and that long-term debt will be reduced if internal funding is available. Degryse et al. (2010) and Hall et al. (2004), both found no relationship between long-term debt and profitability for non-listed companies. In addition, Hall et al. (2004) found a positive

relationship between profitability and short-term debt, while Degryse et al. (2010) found a negative relationship for between profitability and short-term debt non-listed companies.

However, Köksal and Orman (2015) mentioned that profitability has a stronger negative effect on leverage for listed companies than for non-listed companies. This would mean that listed companies (due to higher profitability) can increase the use of internal equity in their capital structures to a greater extent than non-listed companies (Köksal & Orman, 2015). Farooqi-Lind (2006) also indicated that Swedish listed companies have a greater negative relationship to profitability than non-listed firms. As an explanation for this, he indicated that listed firms are more concerned about the problem of 'free cash flow'. However, this difference was not statistically significant. In addition, Schouten and Van Hulle (2004) find no difference between Belgian listed and non-listed firms. Hypothesis 1 has been formulated to test whether profitability has a stronger negative effect on leverage for Dutch listed companies than for non-listed companies.

Hypothesis 1: *Profitability has a more negative effect on leverage for listed companies than for non-listed companies*

2.4.2 Tangibility

The trade-off theory predicts a positive relationship between tangibility and leverage. Frank and Goyal (2009) mentioned that tangible assets, such as property, plant, and equipment, are easier for investors to value than intangibles. Subsequently, Chen (2004) argued that tangible assets usually have less asset specificity. Therefore, increasingly used as collateral for debt in order to reduce the risk of the lender (Williamson, 1988). However, the pecking order predicts a negative relationship between tangibility and leverage. According to Harris and Raviv (1991), due to low information asymmetry associated with tangible assets makes the issuance of equity less costly. This means when companies don't have enough tangible assets to use as collateral, they will have to switch from debt to equity. The agency theory suggests that companies with a high level of debt tend to under-or sub-optimally invest in order to transfer capital from debtors to shareholders. Next to that, according to Degryse et al. (2010), collateral reduces agency problems with debtholders which leads to lower bankruptcy cost and credit risk, which is beneficial for the company. Therefore, the agency theory also expects a positive relationship between tangibility and leverage (Deesomsak, 2004).

Rajan and Zingales (1995) and Frank and Goyal (2002) found leverage to be positively related to the level of tangibility for listed firms. Michaelas et al. (1999) and Sogorb-Mira (2005) find a positive relationship between tangible assets and leverage for SMEs. In addition, De Jong et al. (2008) and De Jong (2002) also found a positive relationship between long-term debt and tangibility for Dutch listed firms. Therefore, a positive relationship is also expected during this study. Next to that, Hall et al. (2004) reported a small positive relationship on long-term debt but a negative for short-term debt for Dutch SMEs. This is confirmed by Degryse et al. (2010), who found a positive effect for total debt and long-term

debt, but also a negative effect for short-term debt. Thus, the effect on the total debt is mainly explained by long-term debt. In addition, Farooqi-Lind (2006) indicated that tangibility has the greatest economic impact on the total debt level and long-term debt of both listed and non-listed companies. Schoubben and Van Hulle (2004) indicate that tangibility has a strong positive relationship with leverage for non-listed companies, while this relationship does not seem to exist for listed companies. This is confirmed by Köksal and Orman (2015), who indicate that for both listed and non-listed companies there is a negative relationship between short-term leverage and tangibility, while there is a positive relationship between long-term leverage and tangibility for listed and non-listed companies. However, there is a significant positive relationship between tangibility and total leverage for non-listed companies, whereas this does not exist for listed companies. Farooqi-Lind (2006) results indicated that the effect is significantly higher for non-listed firms' long-term debt and the difference between listed and non-listed firms is significant. In addition, Farooqi-Lind (2006) mentioned that non-listed companies face a higher risk of bankruptcy, which again makes tangibility very important for their ability to obtain long-term debt financing. Therefore, you can say that non-listed companies are more dependent on the collateral value to obtain debt. Hypothesis 2 has been drawn up to test whether tangibility has a more positive effect on leverage for non-listed companies than for listed companies.

Hypothesis 2: *Tangibility has a more positive effect on leverage for non-listed companies than for listed companies*

2.4.3 Firm Size

The trade-off theory predicts that large firms are more leveraged. According to Frank and Goyal (2009), large companies face a lower default risk and relatively lower bankruptcy cost, because larger firms are more diversified (Chen, 2004; Deesomsak et al., 2004). The pecking order theory also predicts a positive relationship between firm size and leverage. According to Haan and Hinloopen (2003), large companies have a higher leverage effect, because they are better known and more active than small companies. This should reduce the problem of taking debt. Hence, more information is available about larger companies, resulting in less information asymmetry between insiders and outsiders. Which results in more access to finance, thus reducing the cost of borrowing. (Cole, 2013). This is also mentioned by De Jong et al. (2008), which states that smaller firms are expected to be financed less by debt because of the relatively larger information asymmetry problem. With regard to the agency perspective, older companies with a better reputation in the debt markets face lower debt-related agency costs. Besides, larger companies have lower agency costs of debt due to the fact that they have relatively lower monitoring costs than smaller firms (Deesomsak et al., 2004). However, Jensen and Meckling (1976) mentioned that agency costs go up when companies get bigger due to the fact that the cost of monitoring becomes more difficult. Because of these contradictory statements, the agency theory does not really provide a clear

direction as to whether the relationship between firm size and leverage could be positive or negative.

Salawu and Agboola (2008) found a positive relationship between leverage and company size in all their used models (OLS, random effects, and fixed effects). Hall et al. (2004) found a positive effect between long-term debt and size but between short-term debt and size a negative effect for Dutch SMEs. However, De Jong et al. (2008) and Degryse et al. (2010) all denote a positive impact of size on leverage for Dutch listed and non-listed companies.

The empirical evidence shows that long-term debt is positively related to the size of the company, but short-term debt is negatively related to the size of the company (Hall et al., (2004). This may be because the transaction costs to obtain long-term debt are higher for smaller companies than for large companies. Therefore, you could argue that smaller companies use more short-term debt (Degryse et al., 2010). Subsequently, Rajan and Zingales (1995) mentioned that size may be an inverse proxy for the probability of bankruptcy. This suggests that larger companies can borrow money more easily than smaller companies (Cole, 2013). Next to that, the results of Köksal and Orman (2015) show that the coefficients between size and leverage are twice as high for listed firms than for non-listed firms. This would mean that size has a much more positive effect on listed firms than on non-listed firms. This is confirmed by Schoubben and Van Hulle (2004), who indicate that size is a relatively more important determinant of capital structure for listed companies. Hypothesis 3 has been drawn up to test whether size has a more positive effect on leverage for listed companies than for non-listed companies.

Hypothesis 3: *Firm size has a more positive effect on leverage for listed companies than for non-listed companies*

2.4.4 Business risk

Firms with more volatility of earnings face higher expected costs of financial distress and should use less debt (De Jong et al., 2008). So, firms that experience a greater risk of financial distress tend to borrow less than firms with a lower risk of financial distress. Next to that, according to Frank and Goyal (2009), there is a possibility that due to volatile cash flows, the tax shields are not fully utilized and that risks are detrimental for stakeholder co-investment. Therefore, the trade-off theory predicts a negative relationship between business risk and leverage. In addition, the pecking order also expects a negative relationship between risk and leverage. According to Psillaki and Daskalakis (2009); ''*firms with high volatility on earnings try to accumulate cash to avoid underinvestment issues in the future*'' (p. 326). However, from an agency theory perspective, a positive relationship is expected between risk and leverage. According to Moradi and Paulet (2019), shareholders are unwilling to put their money into a company with a high risk of default and bankruptcy when profit volatility is high. As a result, they try to pass the risk burden to the lenders' shoulders. However, the signaling theory predicts a negative relationship between risk and leverage. Business risk increases the

asymmetric information, which increases the need for quality identification and discipline (Schoubben & Van Hulle, 2004).

Most empirical data support the trade-off theory. De Jong et al., (2008), Frank and Goyal (2009), and De Jong (2002) found a negative relationship between risk and leverage for listed companies. Psillaki and Daskalakis (2009) also found a negative relationship between risk and leverage for SMEs. However, Moradi and Paulet (2019) findings are consistent with those of Fama and French (2002) which indicate that riskier companies borrow more. As a result, shareholders prefer not to engage in risky activities by purchasing more equity and intend to put the risk burden on the lenders. This evidence in turn supports the agency theory. However, we expect a negative relationship between business risk and leverage for listed and non-listed companies as most of the evidence and the trade-off theory expect a negative relationship.

Köksal and Orman (2015) found evidence of a negative relationship between business risk and short-term, long-term, and total leverage for non-listed firms. They only found a small positive significant relationship between total debt and business risk at the 10% level for listed companies. This is confirmed by Schoubben and Van Hulle (2004). They also found that risk has a negative relationship with short-term and total leverage for non-listed companies, but the coefficient is no longer significant for listed companies. This would mean that business risk has less influence on listed companies than on non-listed companies. This is most likely because listed firms have a better reputation and probably more alternative sources of financing than non-listed firms. Therefore, the following hypothesis 4 has been formulated:

Hypothesis 4: *Business risk has a more negative effect on leverage for non-listed companies than for listed companies*

2.4.5 Non-debt tax shield

According to Modigliani and Miller (1958), companies with positive taxable income have an incentive to spend more debt as interest payments on debt are tax-deductible. Hence, the main incentive to borrow is to take advantage of interest rate tax shields. However, DeAngelo and Masulis (1980) were probably the first to introduce the concept of a non-debt shield. Examples of this are depreciation deductions, depletion allowance, and investment tax credits. Therefore, these shields can be considered as substitutes for the corporate tax benefits of debt financing. Köksal and Orman (2015) suggest that firms with higher amounts of non-debt tax shields will choose to have lower levels of debt. This is confirmed by López-Gracia and Sogorb-Mira (2008), who argued that firms try to reduce their tax burden by using non-debt tax shields instead of debt, therefore avoiding distress costs or any other adjustment costs. Subsequently, it can be assumed that companies with large non-debt tax shields include less debt in their capital structure. Therefore, the trade-off theory predicts a negative relationship between leverage and non-debt tax shields. Next to that, DeAngelo and Masulis (1980) suggest that marginal corporate savings from an additional unit of debt decrease with

increasing non-debt tax shields, due to the fact that the probability of bankruptcy increases with leverage (Salawu & Agboola, 2008). However, it should be noted that non-debt tax shield can also be a proxy for other things. For example, companies with higher depreciation ratios also have more tangible assets and relatively fewer growth options in their investment options (Barclay and Smith, 1995).

According to Salawu and Agboola (2008), the non-debt tax shield for listed companies is positively related to both total debt and short-term. However, they indicate that a non-debt tax shield is negatively correlated with long-term debt. This could mean that tax deductions for depreciation, losses, and investment tax credits are substitutes for the tax benefits of debt financing. Subsequently, Degryse et al. (2010) found a positive effect on short-term debt and a negative effect between long-term debt and depreciation for Dutch SMEs. De Jong (2002) also found a negative relationship between non-debt tax shields and long-term debt for Dutch listed companies. In contrast to De Jong and Van Dijk (2007), who found no evidence between non-debt tax shields and long-term debt for Dutch listed companies. As a result, a negative relationship between non-debt tax shield and leverage is also expected during this study. In addition, Farooqi-Lind (2006) argued that listed companies have the ability to raise funds in the stock market, making it logical to assume that the negative relationship between their debt ratios and the level of non-debt shields should be stronger than that for non-listed companies. Hypothesis 3 has been formulated to test this.

Hypothesis 5*: Non-debt tax shield has a more negative effect on leverage for listed companies than for non-listed companies*

2.4.6 Liquidity

According to De Deesomsak (2004), managers can manipulate cash in favor of the shareholders. This is against the interests of the debt holders and increasing the agency costs of debt. Therefore, agency theory expects a negative relationship between debt and liquidity. However, the trade-off theory predicts a positive relationship between liquidity and leverage. Ozkan (2001) mentioned that companies with higher liquidity ratios support a relatively higher debt ratio because they are better able to meet short-term obligations when they threaten to fail. On the other hand, Ozkan (2001) mentioned that firms use their liquid assets to finance their investment. This supports the pecking order theory, which predicts a negative relationship between liquidity and leverage. Ozkan (2001) found a negative relationship between total debt and liquidity for listed firms, while Cole (2013) also found a negative relationship between total debt and liquidity for non-listed firms which supports the pecking order theory. This is confirmed by De Jong et al. (2008), who also found a significant negative relationship between liquidity and long-term debt for Dutch listed companies. This indicates that companies are using cash and cash equivalents as internal funding sources. This is in line with the pecking order since companies use their internal sources first instead of debt.

Both agency and pecking order theory expect a negative relationship between liquidity

and leverage. In contrast, the trade-off theory expects a positive relationship. However, all the empirical evidence shows that there is a negative relationship between liquidity and long-term and total leverage. This supports the agency and pecking order theory. The main reason for this is that companies use their liquid assets to finance their investment instead of debt. In addition, ELbekpashy and ELgiziry (2017) found a significant negative relationship with the total and short-term debt for both non-listed SMEs and for listed SMEs. Since the results for both listed and non-listed companies are negative and no differences between listed and non-listed companies were found, we also expect a negative relationship in this study. The following hypothesis has been formulated to test this:

Hypothesis 6: *Liquidity is negatively related to leverage for both listed and non-listed companies*

2.4.7 Growth opportunities

The trade-off model predicts a negative relationship between growth opportunities and leverage. Growth increases the costs of financial distress, which in turn lowers the free cash flow (Frank & Goyal, 2009). Unlike the trade-off model, the pecking order theory predicts a positive relationship between growth opportunities and leverage. According to De Jong (1999), firms with growth opportunities are more likely to raise new funds than are firms without growth possibilities. Köksal and Orman (2015) mentioned that internal funds for high-growth companies are unlikely to be enough to support future investments, forcing them to take on more debt. Next to that, Frank and Goyal (2009) argued that companies with more investments and steady profitability should build up more debt over time. From the agency perspective, firms with more investment opportunities have less leverage because they have stronger incentives to avoid under-investment and asset substitution that can arise from stockholder-bondholder agency conflicts (Salawu & Agboola, 2008; López-Gracia & Sogorb-Mira, 2008). As stated by Schoubben and Van Hulle (2004), growth can serve as an alternative quality signal. This would suggest from a signaling perspective that there is less need for leverage.

The empirical evidence is mixed. Degryse et al. (2010) found a positive relationship between total debt and growth as well as for long-term debt and growth, while no evidence was found between short-term debt and growth for Dutch SMEs. However, Hall et al. (2004) found no significant relationships for Dutch SMEs and De Jong et al. (2008) found also no relationship, while De Jong (2002) found a positive relationship for Dutch listed companies. According to Schoubben and Van Hulle (2004), there is a positive relationship between growth and leverage for non-listed firms and there is no significant relationship between growth and leverage for Belgian listed firms. Köksal and Orman (2015) indicated just the opposite. They found a small positive relationship between short-term leverage and growth for listed firms and found no significant relationship between leverage and growth for Turkish non-listed firms.

The outcomes of the capital structure theories generally expect a negative relationship between growth and leverage. For example, the trade-off, agency and signaling theory expect a negative relationship, while the pecking order expects a positive relationship. The empirical evidence indicates that a predominantly positive relationship is found, while sometimes no relationship is found between growth and leverage. This positive relationship is in line with the requirements of the pecking order theory. As a result, you can expect that companies with high growth potential will need to raise more new funds than companies with no growth potential. Internal resources for high-growth companies are unlikely to be sufficient to support these future investments. Schoubben and Van Hulle (2004) indicate that there are differences between the Belgian listed and non-listed companies with regard to growth. It is therefore expected that non-listed companies with high growth opportunities will assume more debt than listed companies. One reason for this may be that listed companies are less dependent on debt and have alternative forms of financing (Schoubben & Van Hulle, 2004). Non-listed companies often do not have the option of this alternative financing, for example issuing shares, which means they have to take on debt (Farooqi-Lind, 2006). Therefore, the following hypothesis has been formulated:

Hypothesis 7: *Growth has a more positive effect on leverage for non-listed companies than for listed companies*

2.4.8 Stock listing

From the perspective of the trade-off theory, listed companies would assume more debt compared to non-listed companies. When companies are listed on the stock exchange, this increases the transparency of the company. This in turn leads to lower expected bankruptcy costs (Schoubben & Van Hulle, 2004). Based on pecking order theory, the use of equity capital would be less attractive for non-listed companies. Information symmetries are larger in non-listed companies, which means that the costs of equity are higher compared to the costs of debt. This means that these non-listed companies are less likely to turn to external financing sources, even if the investment opportunities are greater than the internal funds (Jõeveer, 2013). A big difference between non-listed and listed companies is their ownership structure. This means the degree to which control is valued by their shareholders (Brav, 2009). Where conflicts of interest exist, agency problems can arise. Therefore, companies controlled by a major shareholder should be reluctant to use equity financing. This could put the controlling shareholder at risk of losing control of the company. Non-listed firms are often owned by a few shareholders, while a listed company is held by many atomic shareholders without any control over the company. As a result, the cost of issuing equity (giving away control) would be higher for private companies than for public companies. According to Brav (2009), staying in control is probably also one of the main reasons why non-listed companies remain private. Hence, they will turn to take up debt instead of equity. However, the signaling theory predicts the opposite. The signaling theory suggests that non-listed held companies do not feel the

need to signal their quality to the external stock market by controlling high levels of debt. As a result, non-listed companies would be better off bearing less debt than their listed counterparts.

The empirical evidence of Schoubben and Van Hulle (2004) seems to indicate that, as in the case of total leverage, listed companies use relatively less (short-term) debt. This is confirmed by Brav (2009), who found a negative relationship between stock listing and leverage. These results are also found by Jõeveer (2013), who also indicates that non-listed companies use more leverage (including trade credit) than listed companies in the UK.

The outcomes of the capital structure theories have been mixed. Trade-off and signaling theory expect listed companies to have more debt than non-listed companies, while pecking order and agency theory expect the opposite. However, all empirical evidence indicates that non-listed firms have more debt than listed firms. This may be because there is more information available about listed companies, so less information asymmetries, compared to their non-listed counterparts. Therefore, listed companies generally have easier access to alternative forms of financing such as issuing shares. To test this, the following hypothesis has been formulated:

Hypothesis 8: *Non-listed firms are more leveraged than listed companies*

Table 2.1 Hypotheses overview

Hypothesis 1: *Profitability has a more negative effect on leverage for listed companies than for non-listed companies*
Hypothesis 2: *Tangibility has a more positive effect on leverage for non-listed companies than for listed companies*
Hypothesis 3: *Firm size has a more positive effect on leverage for listed companies than for non-listed companies*
Hypothesis 4: *Business risk has a more negative effect on leverage for non-listed companies than for listed companies*
Hypothesis 5: *Non-debt tax shield has a more negative effect on leverage for listed companies than for non-listed companies*
Hypothesis 6: *Liquidity is negatively related to leverage for both listed and non-listed companies*
Hypothesis 7: *Growth has a more positive effect on leverage for non-listed companies than for listed companies*
Hypothesis 8: *Non-listed companies are more leveraged than listed companies*

Chapter 3

3. Methodology

This chapter explains and discusses the research method. It describes which methods will be used to test the different hypotheses. This is done based on comparable papers on capital structure. Followed by an explanation of the measurement of the variables explained. Finally, the data that will be used during this research is displayed.

3.1 Univariate analysis

Univariate analysis is the simplest form of analyzing data. Its main purpose is to describe, summarize and find patterns of the research data. Patterns can be found by looking at, for example, the mean, mode, median, range, variance, maximum, minimum, quartiles, and standard deviation. Unlike regression, it doesn't deal with causes or relationships. The univariate analysis clearly shows the skewness and kurtosis of the data. If necessary, this can still be adjusted.

3.2 Bivariate analysis

The bivariate analysis involves the analysis of two variables to determining the empirical relationship between them. Unlike univariate analysis, bivariate analysis can be descriptive or inferential. For example, a correlation matrix can be created to show the relationship, the direction (positive or negative), and strength (1 or -1) between two variables. High correlations can indicate collinearity and multicollinearity. A rule of thumb for multicollinearity is when the correlation is >0.8, severe multicollinearity may exist. Multicollinearity refers to the extent to which a variable can be explained by the other variables in the analysis. When multicollinearity increases, interpretation of the variate becomes more difficult. This is because their mutual relationships make it more difficult to determine the effect of a single variable (Hair et al., 2014).

3.3 Regression models

Hair et al., (2014) indicate that regression analysis is the most widely used and versatile dependence technique in business decision making and is also the foundation for business forecasting models. Multiple regression analysis can be used to analyze the relationship between a single dependent variable and several independent variables. In this case the determinants of capital structure.

3.3.1 Ordinary Least Squares (OLS)

Ordinary least squares (OLS) is one of the most used regressions in capital structure research. It is a widely used method in the existing literature to test the determinants of the capital structure. For example, De Jong et al. (2008), Chen et al. (1999), De Bie & De Haan (2007),

Degryse et al. (2010) all used Ordinary Least Squares (OLS) in their research to analyze the capital structure of Dutch firms. Salawu and Agboola (2008), Chen (2004), Köksal and Orman (2015), Deesomsak et al. (2004), Frank & Goyal (2003), and Rajan & Zingales (1995), all used OLS regression in their international research on determinants of capital structure.

Hence, OLS is one of the most common regressions in studies. OLS estimates the relationship between one or more independent variables and a dependent variable. The relationship is then estimated by minimizing the sum of the squares in the difference between the observed and predicted values of the dependent variable. Which is then configured in a straight line. However, OLS has problems with endogeneity which is one of the assumptions. Endogenous variables have values determined by other variables in the data. Having endogenous regressors in a model will cause OLS estimators to fail. Hence, one of the assumptions is that there is no correlation between a predictor variable and the error term. The Hausman test could be used to detect endogenous regressors (predictor variables) in a regression model (Glen, 2017). The other assumptions are no homoscedasticity (error term is required to have equal variance), multicollinearity, and the data should be normally distributed. However, if the sample size is greater than N>200, the negative result of the Kolmogorov-Smirnov and Shapiro-Wilk tests of normality can be ignored based on the Central Limit Theorem. Neither test is suitable for larger samples.

When homoscedasticity is present, pooled OLS provides consistent and efficient parameter estimates for use on panel data. Homoscedasticity means that the error term is the same for all values of the independent variables (Woolridge, 2012).

3.3.2 Fixed and random effects

Two commonly used models in capital structure research are the fixed effects model (FEM) and random effects model (REM). Many researchers used these models in addition to their OLS regression models. The literature describes that these two models apply fixed and random effects to regression models to control time and individual differences. This is only done for studies with data from more than one unit in multiple period studies, also called 'panel data' (Mátyás & Sevestre, 2008). By adding fixed or random effects to the regression models, it controls for a variety of observations that are unobserved, time- and company-specific heterogeneity and characteristic that varies across district but is constant over time. These effects could bias the estimates for the OLS regression analysis (Mátyás & Sevestre, 2008).

The FEM, for example, controls for all time-invariant differences between the individuals, so the estimated coefficients of the FEM cannot be biased because of omitted time-invariant characteristics. REM assumes that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables.

According to Bell, Fairbrother, and Jones (2018), an advantage of the REM over FEM is that allowing for complex data structures that span more than two levels. A disadvantage of FEM models is that they can say nothing about relationships with independent variables that do not change over time but only about deviations from the mean over time. Therefore, FEM

models “throw away important and useful information about the relationship between the explanatory and the explained variables”. Therefore, Bell, Fairbrother, and Jones (2018) argue that in most research scenarios, a well-specified REM provides everything that FEM provides and more.

In panel data analysis (an analysis of data over time), the Hausman test is used to determine whether the FEM is being used or the REM. In fact, it checks whether there is a relationship between error terms and independent variables. However, Bell et al. (2018) argue that the Hausmann test is (mis)used as a test of whether FE or RE models “should” be used, it is really a test of whether there is a contextual effect, or whether the between and within effects are different. Subsequently, the null hypothesis prefers REM, and the alternative hypothesis prefers FEM. So, if the p-value is <0.05, the null hypothesis is rejected and the alternative hypothesis is chosen. When the p-value > 0.05 it will be the opposite. In FEM, the parameters can be fixed or non-random and the assumption is that the individual-specific effects are correlated with the independent variables. With REM this is the other way around, here are all or some parameters considered as random variables and the assumption is that the individual-specific effects are uncorrelated with the independent variables.

Summarizing, use FEM whenever we are interested in analyzing the impact of variables that vary over time and use REM when you have reason to believe that differences across entities have some influence on your dependent variable.

3.3.3 General methods of moments model

A less commonly used model in capital structure research is the generalized method of moments (GMM). This mode has been used for example by Fan, Titman, and Twite (2012); Gonzalez and González (2008); Ozkan (2001), and Dasilas and Papasyriopoulos (2015). According to Ozkan (2001), the GMM ''*deploys additional instruments obtained by utilizing the orthogonality conditions that exist between the lagged values of the dependent variable and disturbances*'' (p. 183). An advantage of GMM is that variables can be correlated and conditionally endogeneity and a disadvantage are that GMM is limited to panel data with short time series and a large number of observations.

3.3.4 Two-stage least squares model

The two-stage least squares (2SLS) regression is another static technique that is sometimes used in capital structure research. For example, De Jong (2002) used the method in his research for Dutch listed companies. Standard linear regression models assume that errors in the dependent variable are not correlated with the independent variable (s). When this is not the case, linear regression with ordinary least squares (OLS) is no longer the optimal model estimate. The 2SLS can offer a solution for this. The 2SLS uses instrumental variables that are uncorrelated with the error terms to compute estimated values of the problematic predictor (s) (the first stage) and then uses those computed values to estimate a linear regression model of the dependent variable (the second stage).

3.3.5 Selection of model

During this research, we will investigate whether there are differences between Dutch listed and non-listed companies. That is why we will look at which methods have been applied in existing studies. In almost all studies into capital structure, the OLS regression is applied for both types of research into listed and non-listed companies. Chen et al. (1999), De Bie and De Haan (2007), and De Jong et al. (2008) used this method for Dutch listed companies and Degryse et al. (2010) and Hall et al. (2004) for Dutch non-listed companies. In addition, Brav (2009) and Jõeveer (2013) also used the OLS (pooled) regression in their research on both listed and non-listed companies. Unlike Köksal and Orman (2015) and Schoubben and Van Hulle (2004), they all used the fixed effect panel data model. Studies on the use of the GMM and 2SLS provide little evidence that these are better than, for example, the OLS. However, the OLS regression model is the primary model in this study. At least if the data meets the above-mentioned assumptions. In addition, the OLS regression is quite straightforward and easy to implement as well as interpret.

3.4 Empirical research model

The selection of the variables is mainly determined by the results of the earlier empirical research. In order to test the hypotheses, the basic regression can be specified as follows:

$$Leverage_{i,t} = \alpha + \beta_1 Prof * Listed_{i,t-1} + \beta_2 Tang * Listed_{i,t-1} + \beta_3 Growth*Listed_{i,t-1} + \beta_4 Size*Listed_{i,t-1} + \beta_5 NDTS*Listed_{i,t-1} + \beta_6 Liquid*Listed_{i,t-1} + \beta_7 Risk*Listed_{i,t-1} + \beta_8 Indus_i + \beta_9 Year_i + \varepsilon_{i,t}$$

Like Farooqi-Lind (2006) and Dasilas and Papasyriopoulos (2015), an OLS regression with interaction effect is used. I let the listing variable interact with the explanatory variables. In this way, the OLS regression tests immediately whether there are significant differences between listed and non-listed companies. As a robustness check, a separate regression is performed for listed and non-listed companies, just like Köksal and Orman (2014), Schoubben and Van Hulle (2004) and Farooqi-Lind (2006).

Leverage stands for the dependent variable, α denotes the intercept also known as constant, β are the regression coefficients, and ε is the error term, which represents measurement errors in the independent variables. I denote a firm, t is the time in years, and t-1 means the variable is lagged one year. This is done to avoid potential reverse causality. Therefore, the explanatory variables are lagged one period. This means, for example, that the independent is studied with data from 2014, while the dependent variable is studied with data from 2015. This isolates the potential reverse causality between independent and control variables and provides a more robust test of the theory (Deesomsak et al., 2004).

3.5 Measurement of variables

This section describes the measurement of the variables used during this study. First, the dependent variable leverage is described. This is followed by the independent firm-specific variables and the control variables. The definition and measurement of the variables have been summarized in Table 3.1.

3.5.1 Dependent variables

In the existing literature, researchers use leverage as a proxy for capital structure. As with Degryse et al. (2010), Köksal and Orman (2014), ELbekpashy and ELgiziry, (2017), Micheals et al. (1999), and Salawu and Agboola (2008), leverage is measured in 3 ways; total debt, long-term debt, and short-term debt. However, different ways are used to measure these debt ratios. For example, Psillaki and Daskalakis (2009), Rajan and Zingales (1995), Brav (2009), and Michealas et al. (1999) use total, current (short-term liabilities) and non-current liabilities (long-term liabilities). They then divide this by the total assets to calculate the total debt ratio, long-term debt ratio, and short-term debt ratio. However, by using liabilities, they also include non-interest-bearing in their formula on top of the interest-bearing debt. Thus, the liabilities are higher than interest bearing debt. Examples of non-interest-bearing debt are leasing contracts, trade credit (accounts payable, accounts receivable) and other liabilities. Therefore, it is important to remember that, for example, short-term debt does not equal short-term liabilities (current liabilities) and that long-term debt does not equal long-term liabilities (non-current liabilities). Degryse et al. (2010), for example, removes trade credit for the short-term debt ratio since it does not bear an explicit interest rate and is influenced by completely different determinants. For the same reason, De Jong et al. (2008) only uses long-term debt ratio. However, Bevan and Danbolt (2002) indicate that trade credit and equivalent account for more than 62 percent of total liabilities. This indicates the importance of trade credit in research on capital structures. However, due to a lack of data on interest-bearing debt for non-listed companies, we are forced to use liabilities for a good comparison between listed and non-listed companies. As a result, we use the following formula to measure the total debt ratio: non-current plus current liabilities divided by total assets. To calculate the long-term debt ratio and short-term debt ratio, we divide the non-current liabilities by total assets and the current liabilities by total assets.

Finally, the total debt, the long-term debt, and the short-term debt are based on book value. It does not make sense to include market values of listed companies, as there would be no basis for a proper comparison between listed and non-listed companies. Since market values are not known for non-listed firms.

3.5.2 Independent variables

The independent variable profitability (PROFIT) is measured in several ways in the literature. Rajan and Zingales (1995) used the following formula: earnings before interest, taxes, and depreciation (EBITDA)/total assets. Degryse et al. (2010) and Deesomsak et al. (2004) used earnings before interest, taxes, and depreciation (EBITD)/total assets. De Jong et al., (2008)

and Chen et al. (1999) used during their research is operating income, also called EBIT, / book value of total assets. During this research, the formula of De Jong et al. (2008) and Chen et al. (1999) will be used.

Tangibility (TANG) can be calculated as follows: net fixed assets/book value of total assets (De Jong et al., 2008; Rajan & Zingales, 1995). Chen (2004) and Chen et al. (1999) included inventory in the formula. In this case, the formula is used without inventory. Unlike real estate and equipment, inventories are short-term assets and are therefore expected to be poor collateral (Degryse et al., 2010). For this reason, the formula of Degryse et al. (2010) will used; tangible fixed assets/totals assets.

Firm size (SIZE) can be measured by a natural logarithm of total sales (De Jong et al., 2008; Chen et al., 1999; Rajan & Zingales, 1995) or by a natural logarithm of total assets (Chen, 2004; Degryse et al., 2010; Deesomsak et al., 2004; De Haan & Hinloopen, 2003). In our case, the formula natural logarithm of total assets is used.

Many studies calculate growth opportunities (GROWTH) in different ways. According to De Jong and Veld (2001), empirical studies generally measure growth opportunities by Tobin's Q. Deesomsak et al. (2004) defined growth opportunity as the book value of total assets less the book value of equity plus the market value of equity divided by the book value of total assets and Chen et al. (1999) defined growth opportunity as the percentage change of sales year over year. However, according to Adam and Goyal (2008), the market-to-book asset ratio is the most reliable and commonly used proxy for growth opportunities. De Jong et al. (2008), Myers (1977), Rajan and Zingales (1995), and Frank and Goyal (2009) also all used the market to book ratio, they calculated it as follows; the market value of total assets over book value of total assets. However, non-listed companies are also used during this research. These companies have no known market values, so this formula does not apply. Therefore, the formula of Degryse et al. (2010) and Hall et al. (2004) is used; (Total assets (t) - total assets (t-1)) / total assets (t-1).

De Haan and Hinloopen (2003) defined liquidity (LIQUID) as liquid assets over total assets, where De Jong et al. (2008) and Deesomsak et al. (2004) describes it as total current assets divided by total current liabilities. The second formula is better known as the current ratio and is used during this research.

Previous studies often use earning volatility as a proxy for Business Risk (De Jong et al., 2008; Chen et al., 1999; Deesomsak et al., 2004; Frank & Goyal, 2009). Frank and Goyal (2009) used the variance of stock returns to measure Business risk. The following methods are all slightly different, Chen et al. (1999) used the absolute value of the first difference of percentage change of operating income, Chen (2004) also used an absolute value of the first difference of percentage change of operating income, and Deesomsak et al. (2004) used the absolute difference between the annual percentage change in earnings before interest and taxes and the average of this change over the sample period. Psillaki and Daskalakis (2009) used the squared deviation of each year's earnings before taxes from the period average. While De Jong et al. (2008), Moradi and Paulet (2019), Köksal and Orman (2015), Michaelas (1999), and Titman and Wessels, (1998) used the standard deviation of operating income over

the book value of total assets during the sample period. De Jong (2002) measured business risk as the standard deviation of the change in operating income over a five-year period for Dutch listed firms. This research uses the method of De Jong et al. (2008), Moradi and Paulet (2019), Michaelas (1999), and Titman and Wessels, (1998). This means that each firm in the sample only has one value for business risk. Therefore, another business risk measure is used during this study to check for robustness. For example, Iqbal and Kume (2014) used the coefficient of variation in sales over five-years a on rolling basis (standard deviation of sales/average of sales). However, for the second method, we use the formula of Köksal and Orman (2015). Köksal and Orman (2015) defined business risk as the standard deviation of operating income over total assets over the past 3 years (including the current year) on a rolling basis.

The non-debt tax shield (NDTS) is measured by the ratio of depreciation to total assets (Salawu & Agboola, 2008; Titman & Wessels, 1998). Van Dijk (1999) indicated a high correlation between depreciation and fixed assets. However, this should not be a problem as Fama and French (2002), Sogorb-Mira (2005) and Degryse et al. (2010) still used depreciation in their empirical research.

Finally, Stock listing checks whether a company is listed on the Amsterdam Euronext. It will receive a "1" if the company is listed on the Amsterdam Euronext, where "0" is the indicating that a company is non-listed.

3.5.3 Control variables

Industry membership could be an important determinant of firms' capital structure (Harris & Raviv, 1991). According to Frank and Goyal (2009), industry reflects several otherwise omitted factors common to all firms. For example, the degree of competition and supply and demand conditions may differ from industry to industry. Degryse et al. (2010)., discovered that in addition to firm-specific effects, inter-and intra-industry effects are also important in explaining small firms' capital structure. This means that there may be differences between industries with regard to average debt levels. According to Köksal and Orman (2015), the empirical outcomes on industry are quite different. Like Chen (2004), we also use dummy group variables in his research to control for any group-specific effect that may not be captured by the explanatory variables. Therefore, to control for industry-specific effects on firms' capital structure choice, industry dummies are included in this research. A dummy variable is a non-metrically measured variable transformed into a metric variable by assigning a 1 or a 0 to a subject, depending on whether it possesses a particular characteristic (Hair et al., 2014).

Companies are classified based on NACE rev. 2 section codes. NACE rev. 2 is the statistical classification of economic activities in the European Community. The companies are divided into 4 equivalent reclassified industry groups based on the work of Smirnova and Zavertiaeva (2017): (1) transportation, commodities and trade, (2) manufacturing, (3) construction and real estate, and (4) other service. The manufacturing industry will serve as the reference category within the regression models. Furthermore, the financial group is not

used during this research. The reason for this is discussed in section 4.1 data. See Appendix I for a complete overview of all industry groups in the Statistical Classification of Economic Activities in the European Community and the reclassified industry groups. Finally, based on the work of Dasilas and Papasyriopoulos (2015), a year dummy is added to check for time. 2014 will be the reference category.

Table 3.1 Variable overview

Variables	Abbreviation	Measurement	Reference
Dependent			
Total debt ratio	TD	(Non-current + current liabilities) / total assets	Dasilas and Papasyriopoulos (2015); Psillaki and Daskalakis (2009); Rajan and Zingales (1995)
Long-term debt ratio	LTD	Non-current liabilities / total assets	Dasilas and Papasyriopoulos (2015); Psillaki and Daskalakis (2009); Rajan and Zingales (1995)
Short-term debt ratio	STD	Current liabilities / total assets	Dasilas and Papasyriopoulos (2015); Psillaki and Daskalakis (2009); Rajan and Zingales (1995)
Independent			
Profitability	PROFIT	Operating income (EBIT) / total assets	De Jong et al. (2008); Chen (1999)
Tangibility	TANG	Fixed tangible assets / total assets	Degryse et al. (2010)
Firm Size	SIZE	Natural logarithm of total assets	Chen (2004); Degryse et al. (2010); Deesomsak et al., (2004); De Haan and Hinloopen, (2003)
Growth opportunities	GROWTH	(Total assets (t) – total assets (t-1)) / total assets (t-1)	Degryse et al. (2010); Hall et al. (2004);
Liquidity	LIQUID	Total current assets / total current liabilities	De Jong et al. (2008); Deesomsak et al. (2004);
Business Risk	RISK1	Standard deviation of operating income (EBIT) / total assets during the sample period	De Jong et al. (2008); Titman and Wessels (1998)
Business Risk	RISK2	Standard deviation of operating income(EBIT)/ total assets over the past 3 years (including the current year)	Köksal and Orman (2015)
Non-debt taks shield	NDTS	Depreciation / total assets	Degryse et al. (2010) ; Salawu and Agboola (2008); Frank and Goyal (2009)
Stock listing	LIST	'1" for listed firms and "0" for non-listed firms	Brav (2009); Schoubben and Van Hulle, (2004); Farooqi-Lind (2006)
Control			
Industries	IND	Dummy variable per industry, 1 for the specific industry, and 0 for otherwise	De Jong et al. (2008); Degryse et al. (2012)
Year	YEAR	Dummy variable per year, 1 for the specific year, and 0 for otherwise	Dasilas and Papasyriopoulos (2015)

Chapter 4

4. Sample and Data

In this chapter, sample and data collection are discussed in Section 4.1 and 4.2, which are used to investigate the effect of determinants on capital structure for Dutch listed and non-listed companies.

4.1 Sample

When looking at existing and comparable studies, different timeframes are often used. Degryse et al. (2010) used a time frame of 3 years (2003-2005), De Jong et al. (2008) 5 years (1997-2001), Jõeveer (2013) 8 years (1995-2002), Schoubben and Van Hulle (2004) 11 years (1992-2002), Brav (2009) 11 years (1993-2003) and Köksal and Orman (2015) 14 years (1996-2009). However, a period of five years (2015 till 2019) has been chosen for this research, which is in line with the work of De Jong et al. (2008). In addition, we also need data from other years for the lagged independent variables.

During this period, the data for the dependent, independent, and control variables are collected from Bureau van Dijk: Orbis. Orbis contains information on more than 375 million companies and entities around the world, 40 million of which are detailed financial information. It not only contains data on listed companies but also data on non-listed companies. Since data from both types of companies are used in this study, the data is based on book values and not on market values as these are not known for non-listed companies (Degryse et al., 2010). It is therefore not useful to include market values of listed companies in the data, as we cannot compare them with non-listed companies.

First of all, the companies in Orbis were selected on listed and non-listed (private) companies with more than 10 employees and with data over 5 years. This resulted in the initial sample. Therefore, the initial sample consists of 99 listed and 15.146 non-listed companies. However, after subtracting the companies operating in the financial sector, the final sample consists of 77 listed and 6.687 non-listed firms. So, 8.481 companies were removed because they are active in the financial and insurance sector. However, this means that non-listed companies are over-represented in the data. To prevent this, we look at the research of (Farooqi-Lind, 2006). Farooqi-Lind (2006) also had to refine the sample in order to be able to make a more detailed comparison of the capital structure between listed and non-listed companies. The data set of Farooqi-Lind (2006) initially consisted of 99% non-listed companies. However, to match the dataset more closely, it eventually consisted of 80% non-listed companies and 20% listed companies. Farooqi-Lind (2006) did this by matching the median size (given by the total assets) of the listed and non-listed companies. As a result, the median of the assets of all non-listed companies is comparable to the median of the assets of the listed companies. This is also done during this research, resulting in 308 non-listed companies (80%) and 77 listed companies (20%). For an overview of the sample, see table 4.1.

Table 4.1 Overview sample Dutch firms

Dutch Firms	Listed	Non-listed	Total
Initial sample	99	15.146	15.245
Finance and insurance	22	8.459	8.481
Total before matching sample	77	6.687	6.764
Total after matching sample	77	308	385

4.2 Data

As with Vermoesen et al. (2013) and Dasilas and Papasyriopoulos (2015), micro-enterprises are excluded from the sample. Micro-enterprises are firms that employ fewer than 10 people and whose annual turnover or annual balance sheet total does not exceed € 2 million. However, Orbis's database did not include these companies. In addition, only large and very large non-listed companies are used for a better comparison with listed companies. Companies in Orbis' database are considered to be very large when they match at least one of the following conditions: operating revenue> = 100 million EUR (130 million USD), total assets> = 200 million EUR (260 million USD) or employees > = 1,000. For large companies this is an operating revenue> = 10 million EUR (13 million USD, total assets> = 20 million EUR (26 million USD) or employees> = 150 (Orbis, 2021).

Finally, all financial firms such as banks and insurance companies are removed from the sample. This is common in capital structure research and is mainly done for two reasons. According to Salawu and Agboola (2008), financial firms tend to have different financial characteristics and use of leverage than other companies. In addition, their debt-like obligations are not strictly comparable to non-financial corporations (Rajan & Zingales, 1995). Degryse et al. (2010) reported that financial institutions are subject to regulatory capital requirements and may therefore have a different capital structure. This is confirmed by De Jong (2002), who indicates that non-financial firms differ from financial firms due to regulation and the nature of the activities. In addition, as with Köksal and Orman (2015), the data is winsorized at 5%. This is done to minimize the effects of outliers in the data on our results. This means that the most extreme tails of the distribution are replaced with the most extreme value that has not been removed. To further improve the quality of the date, companies with missing values are removed. However, if a company misses one value, this does not mean that this company is immediately removed from the dataset. It can therefore happen that a company does not have complete data for all 5 years. It would be a shame to waste 4 years of valuable data. Finally, see table 4.2 for an overview of number observations per industry.

Table 4.2 number of observations per industry

	Non-listed		Listed		
Reclassified groups	Number	Percentage	Number	Percentage	Total
Transportation, commodities and trade	606	93.2%	44	6.8%	650
Manufacturing	197	55.3%	159	44.7%	356
Construction and real estate	159	82.4%	34	17.6%	193
Other service	560	85.5%	95	14.5%	655
Total	1522	82.1%	332	17.9%	1854

Chapter 5

5 Results

The results are presented in this chapter. First of all, section 5.1 presents the descriptive statistics. Second, section 5.2 describes the Pearson correlation's matrix. Hereafter, section 5.3 describes the regression models. Finally, section 5.4 looks at the robustness tests.

5.1 Descriptive statistics

First of all, all metric variables are winsorized at the 5% level to remove the extreme outliers. This means that the top 2.5% and the bottom 2.5% of tails are adjusted. However, this is not done with the variables stock listing, industry dummies, and year dummies. These variables get a 0 or a 1, so it does not contain extreme outliers. In addition, companies with a debt ratio higher than 1 were excluded. These companies would have more liabilities than assets, which then results in a negative equity value. This means that these companies are in financial difficulties. As a result, they have been removed from the sample because they contain outliers.

To make a good comparison between listed and non-listed companies, the intention was that the median of the total assets of the non-listed companies should be comparable with the listed companies. Unfortunately, this was not possible, as large non-listed companies in the Netherlands did not have sufficient data available in Orbis. However, it was still decided to choose the largest possible non-listed companies and try to distribute the sample as well as possible. The sample consists of a maximum of 1522 firm-years observations for non-listed companies and 332 for listed companies. All firm-year observations together are up to 1854. Listed companies represent 18% of the total firm observations and non-listed companies 82%. As a result, the 20/80 rule is as good as achieved. In addition, some variables have a lower N, which indicates that not all data was available for all firm years. However, it was a shame to take out an entire firm-year when it missed for example profitability. As a result, there are differences in the number of observations.

First, the descriptive results are discussed and compared with academic papers. Hereafter, we look at whether our results differ between listed and non-listed companies. Table 5.1 gives a complete overview of the descriptive results and table 5.2 tests whether the mean and median differ significantly between listed and non-listed companies.

Table 5.1 shows that Dutch non-listed companies have a total debt average of 59,27%, a long-term debt average of 23,74% and for short-term debt an average of 37,99%. This means that non-listed companies are more financed with short-term debt than long-term debt. Degryse et al. (2010) found a total debt average of 49,2%, a long-term debt average of 30,8%, and a short-term debt average of 18,4% for Dutch SMEs. In addition, Hall et al. (2004) again found completely different ratios, they found a short-term debt average of 46.32% and for long-term 2.06% for Dutch SMEs. Schoubben and Van Hulle (2004) found an average total debt of 65% and short-term debt of 47% for Belgian non-listed companies. The difference can

perhaps be explained by the fact that the largest possible non-listed companies have been chosen in the sample. In addition, this may also be because the data comes from a newer time frame.

Dutch listed companies have a total debt average of 54,24%, a long-term debt average of 24,05%, and a short-term debt average of 29,85%. This also means that listed companies are financed more with short-term debt than with long-term debt. However, the differences between these debts are a lot smaller than with non-listed companies. The total debt average corresponds to that of van Schoubben and Van Hulle (2004), which is an average of 56% for Belgian listed companies. Chen (2004) found a slightly lower average for Chinese listed companies, namely 46%. While Rajan and Zingales (1995) indicate that the average total book debt level in the G-7 countries was 66%, including the US with 58%. According to Booth et al. (2001), the average total book debt level was 51% in developing countries, which is also in line with our average. For long-term debt, De Jong et al. (2008) found an average of 9,1% for Dutch listed companies. It must be said that the long-term debt ratio was calculated differently. De Jong (2002) found a long-term debt ratio of 13,2% for Dutch listed firms, while Booth et al. (2001) found an average of 22% for long-term book debt in developing countries. In addition, Rajan and Zingales (1995) found a long-term debt ratio in market values of 23% for the US and 28% for Canada, which is more in line with our average. For short-term debt, Schoubben and Van Hulle (2004) found an average of 39% for Belgian listed companies. This is 10% higher than our average.

The total debt average of all companies (listed+non-listed) is 58,34%, long-term debt (23,8%) and short-term debt (36,54%), see table 5.2. Jõeveer (2013) researched listed and non-listed companies with eight years of data (1995–2002) for nine countries. He found that for Bulgaria a broad leverage (defined as total liabilities to total assets) 54%, Czech Republic 59%, Estonia 61%, Poland 63%, Latvia 64%, Lithuania 56%, Romania 68%, and Slovakia 57%. These averages correspond to our average. Subsequently, Köksal and Orman (2015) found a long-term debt average of 6,81% and short-term debt of 20,37% for listed and non-listed Turkish companies. These averages do not entirely correspond, but this does indicate that the short-term debt is also higher than the long-term debt there. However, their sample consisted of only 2% Turkish listed companies. Furthermore, the averages of the entire sample are mainly influenced by the figures of the non-listed companies. Since 80% of the sample consists of non-listed companies. This must be considered when interpreting the figures.

Now we are going to discuss the independent variables. Starting with profitability, non-listed companies have a profitability average of 7,02% and listed companies 3,64%. When we compare this with other studies on Dutch companies, we see that they found a much higher profitability. Degryse et al. (2010) found an average profitability of 15.3% for non-listed companies, while De Jong et al. (2008) found an average profitability of 10.1% for Dutch listed companies. What also stands out is that is the median, we see that this is higher for listed companies (6.12%) than for non-listed companies (5.61%). The numbers are much closer together than the averages. This means for listed companies that the data for profitability is somewhat left-skewed. Non-listed companies have an average tangibility of 35.12% and listed

companies 17.63%. Degryse et al. (2010) found a much higher average (48,7%) for Dutch non-listed companies. De Jong et al. (2008) also found a higher mean for tangibility (26,5%) for Dutch listed companies. For liquidity, we found an average ratio of 1.70 for non-listed companies and 1.88 for listed companies. The liquidity ratio (current ratio) is positive if the value of the formula is above 1. In that case, there are more assets that can be liquidated in the short term than short-term debts that must be repaid. De Jong et al. (2008) found a higher average liquidity ratio of 2.58 for Dutch listed companies. In addition, Ozkan (2001) found an average of 1.64 for UK firms which is comparable to our average of 1.74 for all firms. Non-listed companies have an average non-debt tax shield of 4.1%, this is 4.5% for listed companies. Degryse et al. (2010) found a much higher mean for non-listed companies (17.9%). De Jong (2002) found an average of 2.6% for Dutch listed companies. This is closer to our average. For size, two units of measurement are included in table 5.1. First, the results of the natural logarithm are showed and then the raw data. To make a comparison with other academic papers, we use the data from the natural logarithm. The average size of non-listed companies is 11.46 and for listed companies 13.07. Degryse et al. (2010) found an average size of 6.05 for non-listed companies and De Jong et al. (2008) an average of 5.78 for listed companies. However, it should be noted that De Jong et al. (2008) used a natural logarithm of total sales.

By the variable growth, we see that non-listed companies have an average of 13,11% and listed companies 7.66%. This implies that non-listed companies are growing at an average annual rate of 13.11%, while listed companies are only growing at 7.66%. Comparing with Degryse et al. (2010) and Hall et al. (2004), they found an average of 13,3% and 12,5% for non-listed firms. This is almost the same as our average for non-listed companies. Schoubben and Van Hulle (2004) found an average of 11.71% for Belgian listed companies, which is higher than our average. Furthermore, the median is much lower than the average for both non-listed and listed companies. This was also found by Schoubben and Van Hulle (2004) for listed companies. This means that for listed and non-listed companies the data for growth is somewhat right-skewed. For risk1, we found an average of 3.85% for non-listed companies and 7.83% for listed companies. De Jong et al. (2008) found an average risk of 7,2% for listed companies. This corresponds to our average. For risk2, we found an average of 2.95% for non-listed companies and 5.5% for listed companies. Schoubben and Van Hulle (2004) calculated it in the same way and found a comparable average of 4.37% for non-listed companies and 4.73% for listed companies.

Now that the descriptive results have been discussed, we will examine whether these differences are significant. The results of this can be seen in table 5.2. Like Farooqi-Lind (2006) and Schoubben and Van Hulle (2004), we use the student's t-test and the Mann-Whitney U test to test whether the differences in means are significant. The non-parametric Mann-Whitney U test is normally used on data that is not normally distributed. However, in some variables, we saw that there was a difference between mean and median. As a result, it was decided to also perform this test. To test the median, the Independent-Samples Median Test was used. This test compares the medians across groups using the Median Test for k samples.

Table 5.2 shows that the total debt average differs significantly at the 1% significance level. This means that non-listed companies (59,27%) are more debt-funded than listed companies (54,24%). We do not see any difference in long-term debt in the Student's t-test. However, when we check this with the Mann-Whitney U test, it does indicate a significant difference. It must be said that this is only at the 5% significance level. There is also a very significant difference in median. This means that listed companies (24,05%) are more long-term debt-funded than non-listed companies (23,74%). On the other hand, all tests indicate a significant difference in short-term debt at the 1% level. Non-listed companies (37,99%) use much more short-term debt than listed companies (29,85%). In general, this implies that non-listed companies are more leveraged than listed companies. This is also found by Schoubben and Van Hulle (2004). They also found that non-listed companies have more total and short-term debt than listed companies.

Now we will look at whether there are significant differences in the independent variables. Profitability is significantly higher for non-listed companies (7,02%) than for listed companies (3,64%). This means that non-listed companies are more profitable than listed companies. However, when we look at the median, this is higher for listed companies (6,12%) than for non-listed companies (5,61%). Now we see that this difference is no longer significant. This means that there is no difference between listed and non-listed companies in terms of profitability. Schoubben and Van Hulle (2004) found just the opposite. They found no significant difference in the mean, but in the median. Non-listed companies (35,12%) have significantly higher tangibility assets than listed companies (17,63%). This significant difference is also confirmed by the median test. From this, we can conclude that non-listed companies have a higher tangibility than listed companies. In contrast, Schoubben and Van Hulle (2004) found no difference in tangibility between listed and non-listed companies. Liquidity is the only independent variable where there is no difference between listed (1.8782) and non-listed companies (1.7040). In addition, no significant difference was found in the median test. Listed companies (4,52%) have significantly higher non-debt tax shields than non-listed (4,1%) companies. These results were also found by Schoubben and Van Hulle (2004). Schoubben and Van Hulle (2004) mentioned that this is consistent with the Trade-off theory. This significant difference is also confirmed by the median test. The difference in means for size between listed (13.0725) and non-listed companies (11.4635) is significant. This means that listed companies are significantly larger than non-listed companies. This is consistent with the results of Schoubben and Van Hulle (2004). In addition, Menédez Reguejo (2002) mentioned that small companies are more levered than large companies. Subsequently, Titman and Wessels (1988) stated that small companies have more short-term debt. These claims are consistent with our data and the median test. Looking at the variable growth, we see that there is also a significant difference in averages between listed (7,66%) and non-listed companies (13,11%). Even if we compare the medians with each other, it remains significant at the 1% level. This means that non-listed companies have more growth opportunities than listed companies. Schoubben and Van Hulle (2004) found the opposite, they found that the

average is twice as high for Belgian listed companies than for non-listed companies. Finally, both the averages for risk 1 and risk 2 are significantly different between non-listed (3,85%, 2,95%) and listed companies (7,83%, 5,5%). However, there is no significant difference in the median between listed and non-listed companies for risk 2. Schoubben and Van Hulle (2004) found no difference in the mean and median for risk between listed and non-listed companies. In general, you can conclude that listed companies have more business risk than non-listed companies.

Table 5.1 Descriptive statistics

	Non-listed						Listed						All firms					
Variable	**Mean**	**STD**	**Median**	**Minimum**	**Maximum**	**N**	**Mean**	**STD**	**Median**	**Minimum**	**Maximum**	**N**	**Mean**	**STD**	**Median**	**Minimum**	**Maximum**	**N**
Dependent variable																		
TOTAL DEBT	.5927	.2272	.6169	.1298	1	1405	.5424	.1692	.5301	.1639	.9711	321	.5834	.2184	.5954	.1298	1	1726
LONG-TERM DEBT	.2374	.2288	.1685	.0009	.8381	1455	.2405	.16374	.2215	.0120	.6624	321	.2380	.2185	.1819	.0009	.8381	1776
SHORT-TERM DEBT	.3799	.2452	.3422	.0203	.9016	1522	.2985	.1653	.2867	.0333	.6957	332	.3654	.23450	.3239	.0203	.9016	1854
Independent variable																		
PROFITABILITY	.0702	.0728	.0561	-.0804	.2827	1454	.0364	.1123	.0612	-.3156	.2314	332	.0639	.0826	.0568	-.3156	.2827	1786
TANGIBILITY	.3512	.3134	.2713	.0008	.9596	1495	.1763	.1753	.1117	.0007	.6775	317	.3206	.3014	.2444	.0007	.9596	1812
LIQUIDITY	1.7040	1.3813	1.31	.135	6.582	1520	1.8782	1.8264	1.3785	.244	9.569	332	1.7353	1.4720	1.3175	.135	9.569	1852
NON-DEBT TAKS SHIELDS	.0410	.0387	.0324	.0003	.1594	1136	.0452	.0351	.0391	.0003	.1644	316	.0419	.0380	.0341	.0003	.1644	1452
SIZE	11.4635	.9790	11.2286	9.6540	13.9299	1522	13.0725	2.5046	13.4683	7.1025	17.4066	332	11.7517	1.5126	11.3724	7.1025	17.4066	1854
SIZE (in millions*)	362.6536	3230.3660	75.6714	2.1693	62058	1522	4453.4906	9113.3529	776.1060	.3220	46504	332	1170.3288	5238.1512	88.5028	.3220	62058	1854
GROWTH	.1311	.2718	.0697	-.2709	1.2411	1520	.0766	.2449	.0361	-.3088	1.1074	332	.1213	.2679	.0624	-.3088	1.2411	1852
RISK1	.0385	.0421	.0244	.0012	.2026	1479	.0783	.1266	.0317	.0048	.6057	332	.0458	.0679	.0255	.0012	.6057	1811
RISK2	.0295	.0337	.0191	.0007	.1583	1372	.0550	.0958	.0204	.0015	.4877	332	.0345	.0529	.0193	.0007	.4877	1704

Note: Descriptive statistics of the variables. N represents the number of firm-year observations and size presented as the natural logarithm of total assets. Size in millions is the raw data of size. Definitions of the variables can be found in table 3.1

Table 5.2 Univariate test of differences

Variable				Student's t-test		Mann-Whitney U test		Independent-Samples Median Test	
Dependent variable		**Non-listed firms**	**Listed firms**	**T-value**	**P-values**	**Z-value**	**P-values**	**Chi-Square**	**P-values**
TOTAL DEBT	Mean	.5927	.5424	4.486	<.001***	-4.747	<.001***		
	Median	.6169	.5301					29.636	<.001***
LONG-TERM DEBT	Mean	.2374	.2405	-.285	.776	-2.908	.004**		
	Median	.1685	.2215					7.362	.007***
SHORT-TERM DEBT	Mean	.3799	.2985	7.385	<.001***	-4.758	<.001***		
	Median	.3422	.2867					16.470	<.001***
Independent variable									
PROFITABILITY	Mean	.0702	.0364	5.239	<.001***	-2.002	.045**		
	Median	.0561	.0612					1.632	.201
TANGIBILITY	Mean	.3512	.1763	13.712	<.001***	-8.311	<.001***		
	Median	.2713	.1117					32.362	<.001***
LIQUIDITY	Mean	1.7040	1.8782	-1.638	.102	-1.178	.239		
	Median	1.310	1.3785					1.061	.303
NON-DEBT TAKS SHIELDS	Mean	.0410	.0452	-1.834	.67*	-3.377	<.001***		
	Median	.0324	.0391					9.712	.002***
SIZE	Mean	11.4635	13.0725	-11.514	<.001***	-12.779	<.001***		
	Median	11.2286	13.4683					92.758	.000***
GROWTH	Mean	.1311	.0766	3.603	<.001***	-4.468	<.001***		
	Median	.0697	.0361					16.474	<.001***
RISK1	Mean	.0385	.0783	-5.651	<.001***	-4.302	<.001***		
	Median	.0244	.0317					14.724	<.001***
RISK2	Mean	.0295	.0550	-4.777	<.001***	-3.263	<.001***		
	Median	.0191	.0204					.842	.359

Note: Descriptive statistics of the variables. N represents the number of firm-year observations and size presented as the natural logarithm of total assets. Definitions of the variables can be found in table 3.1

5.2 Pearson's correlation matrix

The Pearson's correlation matrix is used for the bivariate analysis. Subsequently, a correlation matrix is created for the entire sample (non-listed + listed firms), see table 5.3. In addition, a separate correlation matrix has also been created for both non-listed and listed companies, see table 5.4. The upper right part of the matrix represents the correlation results for the non-listed firms while the lower-left part contains those for the listed firms. The correlation values are between -1 and +1 and indicate the strength of the relationship. Table 5.3 shows the 1 value, these have been removed from table 5.4 to show a clear separation of values between listed and non-listed companies. Only the most important correlation will be discussed from table 5.3. When we look at table 5.4, we mainly mention the differences in correlation between listed and non-listed companies.

As expected, in table 5.3 we see a strong correlation for total debt with long-term debt (.450**) and short-term debt (.564**). This is expected since both variables are parts of the total debt calculation. In addition, there is a strong negative correlation between long-term debt and short-term debt (-.455**). It is worth noting that the correlations between profitability with total debt (-.200**) and long-term debt (-.221**) are negative and highly significant. Subsequently, this disappears with short-term debt (-.014). In addition, tangibility has a strong correlation with both long-term debt (.489**) and short-term debt (-.376). As expected, there is a moderate negative correlation for liquidity with total debt (-.484**) and short-term debt (-.344). There is also this correlation with long-term debt (-.138**), but less strongly. Finally, we see a very strong correlation between risk1 and risk2 (.791**). This is expected, as they should both measure the same.

In table 5.4 is the correlation between total debt and long-term debt (.554**) for listed companies stronger than for non-listed companies (.442**). In addition, with non-listed companies, we see that growth (.102**), risk1 (-.073**), and risk2 (-.123**) are significantly correlated with total debt, this is not the case with listed companies. We also see that the correlation between size with risk1 (-.548**) and risk2 (-.488**) is much stronger for listed companies than for non-listed companies where the correlation is only for risk1 (-.194 **) and risk2 is (-129**). It can also be seen that the correlation between liquidity and total debt, long-term debt, and short-term debt is stronger for non-listed companies than for listed companies. For example, the correlation between liquidity and long-term debt for non-listed companies is (-.149**), while the significance disappears for listed companies (-.095). Finally, we see major differences between listed and non-listed companies lies in the correlations of profitability and liquidity with risk1 and risk2. For example, there is a negative correlation between profitability with risk1 (-.481**) and risk 2 (-.401**) for listed companies. Non-listed companies even have a positive correlation between profitability and risk1 (.180**) and risk2 (.211**). Subsequently, the correlation is for listed firms between liquidity with risk1 (.349 **) and risk2 (.321**). While this is for non-listed companies at risk1 (.128**) and risk2 (.184**).

In both tables, we mainly see many weak, moderately strong, and strong significant correlations. In addition, there is even a very strong correlation. These high correlations can

cause multicollinearity problems. A VIF test is used to determine whether there are multicollinearity problems. However, this will be discussed in the next section.

Table 5.3 Pearson's correlation matrix full sample

Correlations for the full sample												
	Total debt	Long-term debt	Short-term debt	LIST	PROFIT	TANG	LIQUID	NDTS	SIZE	GROWTH	RISK1	RISK2
Total debt	1											
Long-term debt	.450**	1										
Short-term debt	.564**	-.455**	1									
LIST	-.090**	0,005	-.133**	1								
PROFIT	-.200**	-.221**	-0,014	-.159**	1							
TANG	.069**	.489**	-.376**	-.221**	-0,043	1						
LIQUID	-.484**	-.138**	-.344**	0,045	.084**	-.259**	1					
NDTS	0,040	.143**	-.070**	0,046	-0,022	.284**	-.121**	1				
SIZE	-0,018	.119**	-.173**	.408**	0,030	-.052*	-.120**	-.105**	1			
GROWTH	.103**	0,014	.105**	-.078**	0,036	-.051*	-0,024	-.083**	-.198**	1		
RISK1	-.078**	-0,040	-0,017	.226**	-.184**	-.151**	.219**	.164**	-.280**	-0,031	1	
RISK2	-.097**	-0,035	-0,030	.191**	-.130**	-.111**	.236**	.244**	-.245**	-0,046	.791**	1

*Note: ** Correlation is significant at the 0,01 level (2-tailed). * Correlation is significant at the 0,05 level (2-tailed).*

Table 5.4 Pearson's correlation matrix listed and non-listed companies

Correlations for non-listed sample (top right) and listed sample (bottom left)											
	Total debt	Long-term debt	Short-term debt	PROFIT	TANG	LIQUID	NDTS	SIZE	GROWTH	RISK1	RISK2
Total debt		.442**	.564**	-.245**	0,036	-.520**	0,033	0,009	.102**	-.073**	-.123**
Long-term debt	.554**		-.464**	-.238**	.526**	-.149**	.164**	.127**	0,005	-.068*	-0,050
Short-term debt	.531**	-.392**		-0,051	-.445**	-.363**	-.092**	-.163**	.112**	.059*	-0,013
PROFIT	-.164**	-.212**	0,022		-.112**	.273**	.077*	-.157**	.077**	.180**	.211**
TANG	.221**	.276**	-0,063	.133*		-.281**	.295**	.070**	-.083**	-.160**	-.121**
LIQUID	-.347**	-0,095	-.296**	-.296**	-.185**		-.119**	-.062*	-.058*	.128**	.184**
NDTS	0,102	0,030	0,097	-.260**	.385**	-.132*		-.114**	-0,056	.168**	.193**
SIZE	0,067	.214**	-.135*	.397**	0,088	-.295**	-.234**		-.241**	-.194**	-.129**
GROWTH	0,068	0,089	-0,020	-.118*	0,026	.123*	-.177**	-.133*		-0,028	-0,028
RISK1	-0,069	-0,011	-0,076	-.481**	-0,084	.349**	.222**	-.548**	-0,003		.761**
RISK2	-0,024	-0,018	0,013	-.401**	-0,017	.321**	.382**	-.488**	-0,057	.793**	

*Note: ** Correlation is significant at the 0,01 level (2-tailed). * Correlation is significant at the 0,05 level (2-tailed).*

5.3 Ordinary least squares regression

To test the hypotheses, several OLS regressions with interaction effects are used. The interaction effect indicates whether there is a significant difference between listed and non-listed companies. The OLS regressions are shown in table 5.5.

The independent variable '' listing status '' is combined with the other independent variables. The category ''0'' in the variable is the reference category. In the results of the regression analysis, the influence of group 1 (listed) on Y is always compared with the influence of the reference category (0; non-listed) on Y (De Vocht, 2020). Suppose the F-value and the associated p-value for the interaction are significant, this will mean that the effect of one independent variable on the dependent variable is different for levels of the second independent variable. In addition, the unstandardized coefficients and the standard error are reported in the tables.

Looking at the assumptions of the OLS regression models, it can be said that it satisfies everything. According to de Henseler (2019), the Central Limit Theorem applies when the sample is greater than 200. As a result, normality is met. The VIF values remain largely below the limit of 5. The VIF values are shown in Appendix II.

The first part of table 5.5 are the coefficients of the non-listed firms. However, the aim of this study is whether these coefficients differ between listed and non-listed companies. Therefore, the interaction effects are most important. However, the direction of these coefficients is discussed to see whether they correspond with previous studies.

Profitability has a negative effect on total debt (-.757***, -.779***) and long-term debt (-.964***, -.966***), while no significant effect is found on short-term debt. This implies that as companies become more profitable, they use these profits to finance their operations rather than long-term debt. This is not the case with short-term debt. The negative effect is in line with the pecking order theory, which suggests that firms prefer to use internal financing over external financing. Degryse et al. (2010) found a significant negative effect on the total and short-term debt of non-listed companies. However, Hall et al. (2004) found a positive effect on short-term debt for non-listed companies.

Tangibility has a negative effect on total (-.110***, -.118***) and short-term debt (-.474***, -.483***), while it has a positive effect on the long-term debt (.364***,369***). This indicates that non-listed companies are using their tangible assets as collateral to acquire more long-term debt. This is in line with the trade-off theory and agency theory. However, collateral is not required to obtain short-term debt such as trade credit. This can also be seen by the fact that it has a negative effect on short-term debt. The negative effect of total debt is mainly caused by short-term debt. Subsequently, our coefficients are in line with the results of Degryse et al. (2010). They also found a very strong positive effect on long-term debt (.546 **) and a negative effect on short-term debt (-.195**). Subsequently, hall et al. (2004) also found a positive effect on long-term debt and a negative effect on short-term for non-listed companies.

Liquidity has a negative effect on total debt (-.083***, -.085***) and short-term debt (-.098***, -.098***) and a small positive effect on long-term debt (.019***, .19***). In

contrast to De Jong et al. (2008), they found a small negative effect on long-term debt (-.001**) for Dutch listed companies. In addition, Cole (2013) also found a negative relationship between total debt and liquidity for US non-listed companies. Furthermore, the negative effect implies that firms use their liquid assets to finance their investment, which is in line with the pecking order theory. However, the positive effect on the long-term debt is in line with the trade-off theory. The trade-off theory expects that firms with higher liquidity ratios might support a relatively higher debt ratio. However, Degryse et al. (2010) also found that liquidity had a positive effect on debt.

Non-debt tax shields have only a significant effect on total debt (.245*) in model 1. However, this is at the 10% significant level. The effect on long-term debt is stronger and more significant (.327**, .348**). The effect on short-term debt is also positive (.082, .020), but the significance disappears. Degryse et al. (2010) found the opposite for long-term debt (-0.287**), but also a positive effect on short-term debt 0.357**). However, Moradi and Paulet (2019) also found a positive effect. They indicated that a plausible explanation could be that the pre-tax income is large enough for the European company to fully utilize both non-debt tax shields and tax shields.

Firm size has little effect on total debt (-.010**, -.009). However, size does have a highly significant effect on long-term (.028***, .026***) and short-term debt (-.034***, -.031***). This is consistent with the results of Hall et al. (2004). However, Degryse et al. (2010) found a positive effect on all three measures of leverage. This positive effect implies that large non-listed companies take on more long-term debt than smaller companies. This is in line with the pecking order theory and trade-off theory. These imply that large companies face a lower default risk and relatively lower bankruptcy cost, making it easier for them to borrow. However, with short-term debt, this is just the opposite. Here, large non-listed companies have less short-term debt than smaller companies. This may be because larger companies are more liquid, which means they have enough internal funds to finance their short-term investments.

Growth has a positive effect on total debt (.102***, .098***) and long-term debt (.091***, .079***). This is consistent with Degryse et al. (2010). In addition, they also found no significant relationship with short-term debt. This means that when there are insufficient resources for future investments, non-listed companies take on long-term debt instead of short-term debt. In addition, these results are in line with the pecking order theory. This theory implies that companies with a lot of growth potential probably have insufficient internal resources to support future investments. Furthermore, the positive effect on total debt is mainly caused by long-term debt.

Risk1 had a significant positive effect on long-term debt (.400**), while no further significant effects were found. This positive effect of risk1 on long-term debt is in line with the agency theory. This theory implied that shareholders are reluctant to put money into risky companies and then try to pass the risk burden to the lenders' shoulders. In addition, this also means that riskier companies are taking on more long-term debt to finance their operations.

For risk2, no significant relationships were found at all. This means that risk2 has no

effect whatsoever on debt for non-listed companies.

Finally, listing has a negative effect on total debt (-.320***, -.337***) and short-term debt (-.415***, -.443***), while it has a small significant positive effect on long-term debt (.179*, 174*). This confirms the results from table 5.2, which indicate that non-listed companies have more total and short-term debt, while listed companies have slightly more long-term debt. This was also found by Schoubben and Van Hulle (2004). This allows us to confirm hypothesis 8 and state that non-listed companies generally are more leveraged than listed companies. This is in line with the expectations of the pecking order theory. Non-listed firms do not have the option of approaching equity markets and depend mainly on bank debt.

Now we will look at the coefficients of the interaction effects. The interaction effect can be interpreted by adding the coefficient of the non-listed companies (upper part of the table) plus the interaction coefficients, this then becomes the coefficient of the listed companies. This makes it possible to see whether the independent variable has a stronger or weaker effect for listed or non-listed companies and whether this difference is significant.

In the interaction model, profitability has only a significant effect on long-term debt (.294**, .280**). This means that the coefficient of profitability on long-term debt is significantly higher for listed companies. However, this remains negative. Therefore, the impact of profitability is weaker for listed companies than for non-listed companies. This suggest that non-listed companies use their profits to a greater extend to finance their operations than listed companies. Furthermore, no significant effects were found for total debt and short-term debt. This means that the effect of profitability on these debts does not differ significantly between non-listed and listed companies. Therefore, Hypothesis 1 is rejected.

With tangibility we see a significant positive interaction effect for total (.324***, .342***) and short-term debt (.277***, .296***). This implies that the effect of tangibility on total debt is even positive for listed companies, while this is negative for non-listed companies. For long-term debt, no significant difference was found between non-listed and listed companies. In addition, the effect of tangibility on short-term debt is weaker for listed companies but it remains negative. Subsequently, the positive coefficient for total debt arises from the fact that the coefficient for short-term debt is much less strong. Based on short-term debt, tangibility has a stronger negative effect on non-listed companies than listed companies. This suggests that non-listed companies with tangible assets take on less short-term debt than listed companies. An explanation for this may be, as stated by Degryse et al. (2010), that the costs of long-term debt are lower as banks charge (relative) higher interest rates for short-term debt. The results are exact the opposite of what hypothesis 2 implies, therefore hypothesis 2 is rejected.

The interaction effect with liquidity is positive for total (.040***, .038***) and short-term debt (.059***, .057***), while this is negative for long-term debt (-.029***, -.030***). This means the coefficients of liquidity on the total debt ratio and short-term debt for listed companies are significantly higher than for non-listed companies. The opposite is true for long-term debt. However, almost all coefficients are significantly negative. As a result, we can state

that liquidity has a negative effect on debt. This confirms hypothesis 6, which implies that liquidity has a negative effect on both listed and non-listed companies. Furthermore, the impact of liquidity on total debt and short-term debt is weaker for listed companies than for non-listed companies. This suggests that non-listed companies are better able to reduce their total and short-term debt with their liquidity ratio than listed companies. For long-term debt, the coefficients for listed companies are negative, while this is positive for non-listed companies. This means that non-listed companies use their liquidity ratio to take on more long-term debt, while listed companies use it to lower their long-term debt. However, for all three debts, the impact of liquidity is weaker for listed than for non-listed companies.

The coefficients of non-debt tax shields on both total (-.826**, -.993***) and long-term debt (-1.177***, -1.256***) are significantly lower for listed firms than for non-listed firms. No significant effect was found for short-term debt. These negative coefficients indicate that the impact of non-debt tax shield is highly negative for listed companies, while it is positive for non-listed companies. This negative effect of listed companies has much more impact on debt than the positive effect of non-listed companies. This allows us to confirm hypothesis 5 which implies that non-debt tax shield has a more negative effect on leverage for listed companies than for non-listed companies. This confirms that listed companies could raise funds in the stock market, making it logical to assume that the negative relationship between their debt ratios and the level of non-debt shields should be stronger than that for non-listed companies.

The interaction effect of size is positive for both total (.013*, .013*) and short-term debt (.013*, .014*). This shows that the differences are relatively small and that this is only significant at the 10% significance level. It indicates that the coefficient of size on the total debt ratio and short-term debt for listed companies are significantly higher than for non-listed companies. This means that size has a positive effect on total debt for listed companies, while this was negative for non-listed companies. However, this negative effect of size on non-listed companies is stronger than the positive effect on listed companies. In addition, the negative effect on short-term debt is less strong for listed companies than for non-listed companies. Furthermore, no significant effect was found for long-term debt, which means that there are no significant differences in the effect of size on long-term debt between listed and non-listed companies. Due to the mixed results, we cannot confirm hypothesis 3

Furthermore, no significant effect was found for the interaction variables growth, risk1, and risk2. This indicates that the coefficients of listed companies are not significantly higher or lower than those of non-listed companies, which means that the impact of these independent variables does not differ between listed and non-listed companies. This allows us to reject both hypothesis 4 and hypothesis 7.

The explanation power in this study is lower for total and long-term debt than that of Farooqi-Lind (2006). Farooqi-Lind (2006) found an R2 of .71 for total debt, .69 for long-term debt, and .42 for short-term debt. Only with short-term debt is our R2 higher (.522, .531) However, Degryse et al. (2010) have a lower R squared for total debt (.202) and short-term debt (.156), but a higher R squared for long-term debt (.422). However, it should be noted

that Degryse et al. (2010) did not use an interaction effect. In addition, the models containing the variable risk2 explain more of the variance than the models with risk1.

Table 5.5 OLS regression results including the interaction effect

Dependent	Total debt		Long-term debt		Short-term debt	
Independent	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
(Constant)	.909***	.892***	-.230***	-.205***	1.108***	1.068***
	(.071)	(.072)	(.073)	(.075)	(.066)	(.067)
PROFIT	-.757***	-.779***	-.964***	-.966***	-.035	-.023
	(.082)	(.085)	(.082)	(.086)	(.074)	(.076)
TANG	-.110***	-.118***	.364***	.369***	-.474***	-.483***
	(.019)	(.019)	(.020)	(.020)	(.018)	(.018)
LIQUID	-.083***	-.085***	.019***	.019***	-.098***	-.098***
	(.004)	(.004)	(.004)	(.004)	(.004)	(.004)
NDTS	.245*	.230	.327**	.348**	.082	.020
	(.144)	(.150)	(.147)	(.154)	(.133)	(.139)
SIZE	-.010**	-.009	.028***	.026***	-.034***	-.031***
	(.006)	(.006)	(.006)	(.006)	(.005)	(.005)
GROWTH	.102***	.098***	.091***	.079***	-.002	.007
	(.022)	(.024)	(.023)	(.024)	(.021)	(.022)
RISK1	.137		.400**		.053	
	(.176)		(.174)		(.155)	
RISK2		.076		.189		.108
		(.193)		(.194)		(.173)
LISTING	-.320***	-.337***	.179*	.174*	-.415***	-.443***
	(.100)	(.098)	(.105)	(.103)	(.095)	(.092)
PROFIT*LIST	.141	.205	.294**	.280**	.035	.099
	(.136)	(.134)	(.141)	(.139)	(.127)	(.124)
TANG*LIST	.324***	.342***	.024	.015	.277***	.296***
	(.065)	(.065)	(.068)	(.068)	(.062)	(.061)
LIQUID*LIST	.040***	.038***	-.029***	-.030***	.059***	.057***
	(.009)	(.009)	(.009)	(.009)	(.008)	(.008)
NDTS*LIST	-.826**	-.993***	-1.177***	-1.256***	.231	.173
	(.361)	(.376)	(.378)	(.394)	(.343)	(.354)
SIZE*LIST	.013*	.013*	-.007	-.006	.013*	.014*
	(.007)	(.007)	(.008)	(.008)	(.007)	(.007)
GROWTH*LIST	-.010	.012	-.028	-.012	-.012	-.003
	(.051)	(.052)	(.054)	(.055)	(.048)	(.048)
RISK1*LIST	-.112		-.265		-.241	
	(.220)		(.222)		(.193)	
RISK2*LIST		.286		-.014		.018
		(.279)		(.288)		(.236)
Industry dummy	Included	Included	Included	Included	Included	Included
Year dummy	Included	Included	Included	Included	Included	Included
F-statistic	39.050***	39.364***	36.144***	35.328***	69.330***	68.835***
R square	.393	.404	.368	.373	.522	.531
Adjusted R2	.383	.394	.358	.362	.514	.523
N	1352	1301	1387	1332	1420	1363

*Note: This table reports the unstandardized coefficients (Std. error is presented in parentheses). *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

5.4 Robustness check

This section contains a robustness check. This is done to see if the claims from the previous OLS regressions can be confirmed. Like Farooqi-Lind (2006) and Schoubben and Van Hulle (2004), we run separate regressions for both listed and non-listed companies in addition to the interaction model. This makes the coefficients easier to see and interpret for listed and non-listed companies. In addition, we also perform a regression without the risk variables. As seen at the bottom left of the correlation matrix 5.4, risk1 and risk2 have a strong correlation with profitability and size for listed companies. Therefore, the risk variables are omitted to see if the coefficients change. However, the coefficients from the regression without the risk variables remain almost the same as the coefficients with risk variables. Therefore, only the coefficients of the regressions with the risk variables are reported. The separate regressions are shown in Table 5.6.

As mentioned earlier, there is a significant difference in the effect of profitability on long-term debt between listed and non-listed companies. The coefficients of profitability are for listed companies (-.695***, -.701***) and for non-listed companies (-.959***, -.957***). This also indicates that profitability has a stronger negative effect on non-listed companies than on listed companies for long-term debt. Furthermore, profitability has a significant negative effect on total debt for both listed and non-listed companies. In addition, it has no significant effect on short-term debt for listed and non-listed companies. This corresponds to the results of the interaction model.

The difference in tangibility is also confirmed for total debt and short-term debt. The effect of tangibility on total debt is for listed companies (.180***, .193***) and for non-listed (-.117***, -.126***) while the effect of tangibility on short-term debt for listed companies (-.158***, -.154***) and for non-listed companies (-.470***, -.480***). However, as mentioned earlier, the positive effect of total debt for listed companies is mainly caused by the weaker negative effect for short-term debt. In addition, it can also be seen that the effect on long-term debt is also stronger for non-listed companies than for listed companies. However, this difference was not found to be significant in the interaction model. Overall, this means that the impact of tangibility on debt is stronger for non-listed companies than for listed companies.

As indicated earlier, the effect of liquidity on total, long-term and short-term debt is different for listed and non-listed companies. The coefficients for listed companies are for total debt (-.047***, -.051***), long-term debt (-.016**, -.016**) and short-term debt (-.037***, -.041***). This is for non-listed companies for total debt (-.082***, -.084***), long-term debt (0.19***, .019***) and short-term debt (-. 097***, -098***). The effects are all negative except on long-term debt for non-listed companies. Furthermore, all coefficients are stronger for non-listed companies. This means that the impact of liquidity on debt is stronger for non-listed companies than for listed companies. However, no hypothesis has been formulated for this.

As mentioned in the interaction model, the coefficients of non-debt tax shields for listed companies are significantly lower than those of non-listed companies. This is also

confirmed in the separate regressions. The coefficients of non-debt tax shield on total debt are for listed companies (-.482, -.690**) and for non-listed companies (.245*, .228). The effect on long-term debt is for listed companies (-.744**, -822***) and for non-listed companies (.341**, .358**). This shows that non-debt tax shields have a negative effect on listed companies and have a positive effect on non-listed companies. However, the coefficients are stronger for listed companies. This means that the impact of non-debt tax shields is stronger for listed companies than for non-listed companies.

The interaction model already indicated that the effect of size differs significantly between listed and non-listed companies on total and short-term debt. Size has no significant effect on total debt for listed companies, while it has a small significant effect (-.010*) for non-listed companies. This is because the positive effect on long-term debt is almost as great as the negative effect on short-term debt, therefore, it has no significant effect on total debt. The coefficients for listed companies on short-term debt are significantly negative (-.20***, -.17***), this is also the case for non-listed companies (-.34***, -.31***). This indicates that the impact of size on total debt and short-term debt is stronger for non-listed companies than for listed companies. Furthermore, the effects on long-term debt are significantly positive for both listed and non-listed companies. The coefficients for listed companies (.019***, .019***) are lower than for non-listed companies (.028***, .027***). However, this small difference did not appear to be significant in the interaction model.

When we look at growth, we see differences in long-term debt. This was not reflected in the results in the interaction model. It can be seen that growth has a significant positive effect (.089***, 0.077***) on long-term debt for non-listed companies, while there is no significant relationship between growth and long-term debt for listed companies (.059, .064). However, it is not significantly different according to the interaction model.

Finally, no significant differences were found for the risk variables in the interaction model. However, risk1 has a significant positive effect on long-term debt for non-listed companies (.387**), while this is not significant for listed companies (.086). For short-term debt, the opposite is found. Here risk1 has a significant negative effect for listed companies (-.188*), while this is not the case for non-listed companies (.057). For risk2, no significant relationship was found.

The univariate test results of table 5.2 and the listing variable in table 5.5 showed that non-listed companies are more debt-financed than listed companies. In table 5.7 we test whether this significant difference is robust. We follow the example of Schoubben and Van Hulle (2004) by performing a separate regression with no interaction effect. In table 5.7 that listed has a significant negative effect on total debt (-.070***, -.074***) and on short-term debt (-.104***, -113***). However, there is a small positive effect on long-term debt (.001, .008), but this is not significant. Therefore, the effect on long-term debt does not remain robust.

Table 5.6 OLS regressions separately for listed and non-listed companies

Dependent	**Total debt**						**Long-term debt**						**Short term debt**					
	Listed			Non-listed			Listed			Non-listed			Listed			Non-listed		
Independent	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16	Model 17	Model 18
(Constant)	.633***	.595***	.630***	.876***	.853***	.873***	.031	.035	.051	-.261***	-.236***	-.239***	.669***	.610***	.622***	1.110***	1.067***	1.114***
	(.071)	(.067)	(.065)	(.073)	(.075)	(.073)	(.068)	(.064)	(.062)	(.077)	(.078)	(.076)	(.071)	(.068)	(.065)	(.068)	(.068)	(.066)
PROFIT	-.629***	-.586***	-.626***	-.744***	-.763***	-.721***	-.695***	-.701***	-.721***	-.959***	-.957***	-.921***	.012	.083	.071	-.035	-.023	-.031
	(.100)	(.095)	(.093)	(.084)	(.087)	(.082)	(.096)	(.092)	(.090)	(.085)	(.089)	(.084)	(.100)	(.096)	(.094)	(.075)	(.078)	(.074)
TANG	.180***	.193***	.181***	-.117***	-.126***	-.121***	.301***	.304***	.298***	.353***	.357***	.345***	-.158***	-.154***	-.155***	-.470***	-.480***	-.473***
	(.059)	(.058)	(.058)	(.020)	(.020)	(.019)	(.056)	(.056)	(.056)	(.021)	(.021)	(.020)	(.058)	(.059)	(.058)	(.018)	(.018)	(.018)
LIQUID	-.047***	-.051***	-.047***	-.082***	-.084***	-.082***	-.016**	-.016**	-.014**	.019***	.019***	.020***	-.037***	-.041***	-.040***	-.097***	-.098***	-.097***
	(.007)	(.007)	(.007)	(.004)	(.004)	(.004)	(.007)	(.007)	(.006)	(.004)	(.004)	(.004)	(.007)	(.007)	(.006)	(.004)	(.004)	(.004)
NDTS	-.482	-.690**	-.485	.245*	.228	.264*	-.744**	-.822***	-.724**	.341**	.358**	.422***	.303	.196	.260	.073	.012	.078
	(.313)	(.327)	(.311)	(.147)	(.154)	(.145)	(.300)	(.315)	(.299)	(.153)	(.160)	(.150)	(.313)	(.328)	(.313)	(.136)	(.141)	(.134)
SIZE	.001	.004	.001	-.010*	-.008	-.010*	.019***	.019***	.017***	.028***	.027***	.027***	-.020***	-.017***	-.018***	-.034***	-.031***	-.034***
	(.004)	(.004)	(.004)	(.006)	(.006)	(.006)	(.004)	(.004)	(.004)	(.006)	(.006)	(.006)	(.004)	(.004)	(.004)	(.005)	(.006)	(.005)
GROWTH	.088**	.105**	.089***	.099***	.094***	.098***	.059	.064	.056	.089***	.077***	.082***	-.013	.002	-.004	-.001	.008	.003
	(.043)	(.043)	(.042)	(.023)	(.024)	(.023)	(.041)	(.041)	(.041)	(.024)	(.025)	(.024)	(.041)	(.042)	(.041)	(.021)	(.022)	(.021)
RISK1	-.011			.117			.086			.387**			-.188*			.057		
	(.119)			(.180)			(.114)			(.180)			(.110)			(.157)		
RISK 2		.362*			.051			.174			.163			.102			.114	
		(.184)			(.198)			(.177)			(.202)			(.155)			(.176)	
Industy dummy	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
Year dummy	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included	Included
F-statistic	8.099***	8.483***	8.751***	51.758***	51.889***	55.235***	9.152***	9.192***	9.826***	48.426***	46.840***	51.910***	5.071***	4.853***	5.203***	97.909***	97.709***	105.913***
R square	.280	.289	.280	.413	.426	.410	.305	.306	.304	.389	.394	.387	.193	.187	.185	.556	.569	.556
Adjusted R2	.245	.255	.248	.405	.418	.402	.272	.273	.273	.381	.385	.379	.155	.148	.150	.550	.563	.551
N	307	307	307	1045	994	1048	307	307	307	1080	1025	1085	311	311	311	1109	1052	1114

*Note: This table reports the unstandardized coefficients (Std. error is presented in parentheses). *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Table 5.7 Impact of stock listing on leverage

Dependent	Total debt		Long-term debt		Short-term debt	
Independent	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
(Constant)	.776***	.758***	-.197***	-.178***	.987***	.941***
	(.048)	(.047)	(.050)	(.049)	(.046)	(.045)
PROFIT	-.664***	-.690***	-.778***	-.793***	-.027	-.016
	(.061)	(.062)	(.062)	(.063)	(.057)	(.058)
TANG	-.070***	-.072***	.357***	.363***	-.435***	-.438***
	(.018)	(.018)	(.018)	(.019)	(.017)	(.017)
LIQUID	-.074***	-.075***	.012***	.012***	-.084***	-.084***
	(.004)	(.004)	(.004)	(.004)	(.003)	(.003)
NDTS	.114	.056	.177	.163	.111	.018
	(.131)	(.139)	(.134)	(.141)	(.124)	(.130)
SIZE	.000	.001	.027***	.025***	-.025***	-.022***
	(.004)	(.004)	(.004)	(.004)	(.003)	(.003)
GROWTH	.115***	.113***	.084***	.073***	.008	.018
	(.020)	(.021)	(.021)	(.022)	(.019)	(.020)
RISK1	.049		.093		-.045	
	(.098)		(.101)		(.089)	
RISK2		.146		-.002		.173
		(.133)		(.136)		(.114)
LISTING	-.070***	-.074***	.001	.008	-.104***	-.113***
	(.015)	(.014)	(.015)	(.015)	(.014)	(.014)
Industy dummy	Included	Included	Included	Included	Included	Included
Year dummy	Included	Included	Included	Included	Included	Included
F-statistic	51.994***	51.926***	50.352***	49.467***	91.817***	91.069***
R square	.369	.377	.355	.361	.495	.504
Adjusted R2	.362	.370	.348	.353	.490	.498
N	1352	1301	1387	1332	1420	1363

*Note: This table reports the unstandardized coefficients (Std. error is presented in parentheses). *** Correlation indicates significance at the 0.01 level. ** Correlation indicates significance at the 0.05 level. * Correlation indicates significance at the 0.1 level.*

Chapter 6

6.0 Conclusion

This chapter describes the main findings, limitations, and suggestions for further research. The conclusions are based on the empirical research from the previous chapter. This should answer the main research question as best as possible. Subsequently, all limitations that have come to light during this research are described. Finally, suggestions for further research are presented.

6.1 Main findings

This study tests the effect of firm-specific determinants on debt and whether this differs between Dutch listed and non-listed companies. In addition, it is tested whether there is a difference in the amount of debt between listed and non-listed companies in the period between 2015-2019. To test this, the following main question was formulated; " *To what extent can the firms-specific determinants, related to the relevant capital structure theories, explain a difference in the capital structure of Dutch listed and non-listed companies?".*

The direction of the firm-specific determinants corresponds to the theory. The firm-specific determinants such as profitability, tangibility, liquidity, non-debt tax shields, firm size, growth, business risk, and listing have all a significant effect on the capital structure of Dutch companies. Listed companies are larger, have higher non-debt tax shields and have more business risk, while non-listed companies have more tangible assets and growth opportunities. Furthermore, listed companies are not more profitable or more liquid than non-listed companies. In addition, these firm-specific determinants explain more variance (R2) for non-listed companies than for listed companies.

In answer to the main question, the results indeed show significant differences in the effect of firm-specific determinants between listed and non-listed companies. Contrary to expectations, profitability has a significantly stronger negative effect on long-term debt for non-listed companies than for listed companies. This indicates that non-listed companies use their profits more to finance their operations than listed companies. For total debt and short-term debt, no significant differences were found between listed and non-listed companies. The effect of tangibility differs between total debt and short-term debt. For example, tangibility has a positive effect on total debt for listed companies, while this has a negative effect on non-listed companies. This is mainly caused by the weaker effect of tangibility on short-term debt for listed companies. The effect on short-term debt was negative for both listed and non-listed companies. However, it had a significantly stronger effect for non-listed firms. Liquidity has a significantly stronger negative effect on total debt and short-term debt for non-listed companies. Almost all effects of liquidity on debt are significantly negative. There is only a small significant positive effect on long-term debt for non-listed companies, while this is negative for listed companies. This difference is also significant. The effect of non-

debt tax shields on total and long-term debt differs significantly between listed and non-listed companies. Non-debt tax shield has a negative effect on debt for listed companies while it has a positive effect for non-listed companies. For firm size, there are minor differences between listed and non-listed companies. These differences are only significant at the 10% level. The results indicate that the size has a stronger negative impact on total and short-term debt for non-listed companies than for listed companies. However, in the robustness test, size had no significant effect on total debt for listed companies. Growth has a significant positive effect on debt for both listed and non-listed companies. However, there are no significant differences between listed and non-listed companies. Despite the fact we calculated business risk in two different ways, we do not see any significant effect in the interaction model. This means that the impact of business risk does not differ significantly between listed and non-listed companies. In the robustness test for risk1, there is only a low significant effect in model 10 and model 13. For risk2, no significant relationship was found at all. Finally, the results indicate that non-listed companies have significantly more total and short-term debt than listed companies. Listed companies have slightly more long-term debt. However, this is a very small difference, but it was significant at the Mann Whitney U test, median test, and interaction model. No significant impact of listing on long-term debt was found in the robustness test. However, we can conclude that non-listed companies are more debt-financed than listed companies.

6.2 Limitations and recommendations for future research

Several limitations can be made when reflecting on this research. First of all, with the calculation of the variables. Initially, we only wanted to use interest-bearing debt to calculate the dependent variables. This information was available for listed companies, but almost not for non-listed companies. That is why we had to switch to current liabilities and non-current liabilities. As explained earlier, this also includes non-interest-bearing debt such as trade credit. However, this is a common method in capital structure research. In addition, EBITDA was also barely available for non-listed companies. As a result, we switched from EBITDA to EBIT to calculate profitability. This must be considered when interpreting the results.

Second, to match the sample like Farooqi-Lind (2006), our sample also consists of 77 listed companies (20%) and 308 (80%) non-listed companies. However, it has been decided that the median of the non-listed companies does not have to be the same as that of listed companies. If we had done this, we would have missed too much data. In addition, only large and very non-listed companies are used for a better comparison with listed companies. Small non-listed companies may show different results. This should be considered when interpreting the results.

For further research, the impact of Covid-19 on the capital structure of Dutch companies can be investigated. Perhaps the pandemic affected the capital structure of non-listed companies more than listed companies, allowing non-listed companies to be even more leveraged. Furthermore, only Dutch companies listed on the Euronext Amsterdam were used.

As a result, only 77 listed companies remained in the sample, excluding the financial companies. If we only included Dutch listed companies, it would have been larger. However, you will get companies that do not originate from the Netherlands. Since many companies are also located in the Netherlands for tax benefits.

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Appendices

Appendix I - NACE Rev. 2 & Reclassification groups

Broad Structure of NACE Rev. 2

Section	Title	Divisions
A	Agriculture, forestry and fishing	01 – 03
B	Mining and quarrying	05 – 09
C	Manufacturing	10 – 33
D	Electricity, gas, steam and air conditioning supply	35
E	Water supply; sewerage, waste management and remediation activities	36 – 39
F	Construction	41 – 43
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	45 – 47
H	Transportation and storage	49 – 53
I	Accommodation and food service activities	55 – 56
J	Information and communication	58 – 63
K	Financial and insurance activities	64 – 66
L	Real estate activities	68
M	Professional, scientific and technical activities	69 – 75
N	Administrative and support service activities	77 – 82
O	Public administration and defence; compulsory social security	84
P	Education	85
Q	Human health and social work activities	86 – 88
R	Arts, entertainment and recreation	90 – 93
S	Other service activities	94 – 96
T	Activities of households as employers; u0ndifferentiated goods- and services-producing activities of households for own use	97 – 98
U	Activities of extraterritorial organisations and bodies	99

NACE Rev 2. Classification	Reclassification groups
A - Agriculture, forestry and fishing B - Mining and quarrying G - Wholesale and retail trade; repair of motor vehicles and motorcycles H - Transportation and storage	Transportation, commodities and trade (1)
C – Manufacturing	Manufacturing (2)
F - Construction L - Real estate activities	Construction and real estate (3)
I – Accommodation and food service activities J - Information and communication M - Professional, scientific and technical activities N - Administrative and support service activities R - Arts, entertainment and recreation S - Other service activities	Other service (4)

Appendix II - VIF-values

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	TANG	.744	1.344
	LIQUID	.836	1.196
	NDTS	.793	1.261
	SIZE	.630	1.588
	GROWTH	.949	1.054
	RISK1	.457	2.187
	RISK2	.474	2.108
	Listing status	.547	1.829
	Dum_indus_1	.458	2.183
	Dum_indus_3	.653	1.531
	Dum_indus_4	.471	2.124
	Dum_year15	.587	1.704
	Dum_year16	.553	1.809
	Dum_year17	.548	1.823
	Dum_year18	.541	1.850

a. Dependent Variable: PROFIT

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	LIQUID	.856	1.168
	NDTS	.878	1.140
	SIZE	.630	1.587
	GROWTH	.940	1.064
	RISK1	.446	2.244
	RISK2	.475	2.103
	Listing status	.570	1.754
	Dum_indus_1	.457	2.190
	Dum_indus_3	.668	1.497
	Dum_indus_4	.472	2.121
	Dum_year15	.587	1.704
	Dum_year16	.553	1.809
	Dum_year17	.548	1.824
	Dum_year18	.540	1.851
	PROFIT	.907	1.103

a. Dependent Variable: TANG

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	NDTS	.796	1.256
	SIZE	.630	1.587
	GROWTH	.945	1.058
	RISK1	.451	2.219
	RISK2	.475	2.105
	Listing status	.543	1.841
	Dum_indus_1	.462	2.165
	Dum_indus_3	.652	1.533
	Dum_indus_4	.474	2.110
	Dum_year15	.588	1.701
	Dum_year16	.554	1.805
	Dum_year17	.550	1.817
	Dum_year18	.542	1.847
	PROFIT	.932	1.073
	TANG	.783	1.277

a. Dependent Variable: LIQUID

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	SIZE	.634	1.577
	GROWTH	.942	1.062
	RISK1	.445	2.245
	RISK2	.494	2.026
	Listing status	.548	1.825
	Dum_indus_1	.457	2.187
	Dum_indus_3	.661	1.512
	Dum_indus_4	.470	2.127
	Dum_year15	.587	1.702
	Dum_year16	.553	1.807
	Dum_year17	.549	1.821
	Dum_year18	.540	1.851
	PROFIT	.908	1.101
	TANG	.825	1.213
	LIQUID	.818	1.222

a. Dependent Variable: NDTS

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	GROWTH	.960	1.041
	RISK1	.469	2.133
	RISK2	.474	2.110
	Listing status	.726	1.377
	Dum_indus_1	.457	2.188
	Dum_indus_3	.650	1.538
	Dum_indus_4	.472	2.118
	Dum_year15	.587	1.704
	Dum_year16	.553	1.808
	Dum_year17	.549	1.823
	Dum_year18	.542	1.846
	PROFIT	.905	1.105
	TANG	.744	1.345
	LIQUID	.813	1.230
	NDTS	.796	1.256

a. Dependent Variable: SIZE

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	RISK1	.445	2.246
	RISK2	.477	2.098
	Listing status	.539	1.856
	Dum_indus_1	.457	2.189
	Dum_indus_3	.650	1.538
	Dum_indus_4	.470	2.130
	Dum_year15	.587	1.704
	Dum_year16	.553	1.809
	Dum_year17	.550	1.818
	Dum_year18	.541	1.850
	PROFIT	.914	1.094
	TANG	.743	1.345
	LIQUID	.817	1.224
	NDTS	.792	1.262
	SIZE	.643	1.555

a. Dependent Variable: GROWTH

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	RISK2	.801	1.249
	Listing status	.561	1.782
	Dum_indus_1	.458	2.182
	Dum_indus_3	.652	1.534
	Dum_indus_4	.473	2.116
	Dum_year15	.587	1.704
	Dum_year16	.553	1.809
	Dum_year17	.548	1.824
	Dum_year18	.540	1.852
	PROFIT	.929	1.076
	TANG	.743	1.346
	LIQUID	.822	1.217
	NDTS	.790	1.265
	SIZE	.662	1.510
	GROWTH	.939	1.065

a. Dependent Variable: RISK1

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	Listing status	.539	1.856
	Dum_indus_1	.457	2.188
	Dum_indus_3	.653	1.533
	Dum_indus_4	.473	2.116
	Dum_year15	.587	1.702
	Dum_year16	.553	1.808
	Dum_year17	.548	1.824
	Dum_year18	.540	1.851
	PROFIT	.907	1.102
	TANG	.746	1.341
	LIQUID	.815	1.227
	NDTS	.824	1.213
	SIZE	.630	1.587
	GROWTH	.946	1.057
	RISK1	.753	1.327

a. Dependent Variable: RISK2

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	Dum_indus_1	.507	1.971
	Dum_indus_3	.670	1.493
	Dum_indus_4	.497	2.011
	Dum_year15	.587	1.704
	Dum_year16	.554	1.806
	Dum_year17	.549	1.822
	Dum_year18	.542	1.844
	PROFIT	.918	1.089
	TANG	.786	1.272
	LIQUID	.819	1.222
	NDTS	.804	1.244
	SIZE	.848	1.179
	GROWTH	.939	1.065
	RISK1	.464	2.156
	RISK2	.473	2.113

a. Dependent Variable: Listing status