Master Thesis

The effect of corporate governance mechanisms on capital structure of Dutch listed firms

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Abstract

In this study, the relation between corporate governance mechanisms and capital structure of Dutch listed firms is examined. Corporate governance mechanisms are divided into board- and ownership structure variables. These consist of board size, board independence, ownership concentration, family ownership and institutional ownership. Based on a sample of 106 Dutch listed firms, an ordinary least squares (OLS) regression analysis is conducted. The results do not show support for all hypotheses. No significant relations are found in this study. The results remain the same after robustness checks have been made. Future research should include a larger sample to assess the reliability, validity and significance of these results. This study mainly contributes to the scarce research which has been conducted in a Dutch context on this topic. Especially after implementation of the new governance code which was updated lastly in 2016.

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1.   Introduction

Capital structure is a widely-studied subject in the financial literature. The capital structure is how a firm finances its operations and growth using an optimal structure of debt and equity in order to increase firm value. One of the first theories on capital structure is that of Modigliani and Miller (1958) where they claim that in a frictionless world, capital structure is irrelevant to increase firm value.

After the adoption of the irrelevance theory, several theories on determinants of capital structure and other related theories have been studied and evolved. Mainstream theories are the trade-off theory, pecking order theory, agency theory and the market-timing theory. The tradeoff theory reflects the balance (tradeoff) between the use of tax shield benefits of debt and the cost of financial distress that increases proportionally as the level of debt increases (Kraus and Litzenberger, 1973; Myers, 1977). The pecking order theory constitutes that managers adapt a financing policy where they prefer internal funds over external funds, and in which debt financing comes before equity financing since there are higher information costs associated with equity (Myers, 1984). The agency theory reflects the relation between managers (agents) and shareholders (principals). It assumes that managers will not always act in such a way that it reflects the best solution for the shareholder, but they will rather act in self-interest. It separates between ownership and control, which results in conflicts between managers and shareholders, and eventually to agency costs (Jensen and Meckling, 1976). The market-timing theory, developed by Baker and Wurgler (2002), claims that the market timing of financing is important, and not the form of financing since firms will choose the form of financing that is of most value at that point in time, either debt or equity (Baker & Wurgler, 2002).

Several factors can influence the debt-to-equity ratio (Frank & Goyal, 2009). Some examples are firm-specific factors like firm size, growth opportunities, profitability and tangibility (Rajan & Zingales, 1995; Titman & Wessels, 1988; Frank & Goyal, 2009; Chen & Jiang, 2001; Degryse, Goeij, & Kappert, 2012) which mainly represent the trade-off and pecking order theories. But also, country-specific factors (De Jong, Kabir, & Nguyen, 2008; Psillaki & Daskalakis, 2009) and macroeconomic factors (Iqbal & Kume, 2014; Alves & Francisco, 2014; Hoang, Gurău, Lahiani, and Seran, 2017), like crises, can influence the way a company is classifying debt and equity. Additionally, corporate governance mechanisms include several factors which can influence a firm's leverage.

Deriving from the agency cost theory, the relationship between the principal (e.g. a shareholder of a firm) and the agent (e.g. a manager of a firm) can influence the capital structure decisions which are being made within the firm. Misalignments between the interests of the principal and agent may occur since an agent will not always act in the principals' best interest (Jensen & Meckling, 1976). To handle these situations, corporate governance mechanisms can be used to monitor and discipline the

relationship (Detthamrong, Chancharat, and Vithenssonthi, 2017). Corporate Governance is "a framework to build an environment of accountability, trust and transparency." (Detthamrong et al., 2017, p. 691). Jiraporn, Kim, Kim, and Kitsabunnarat (2012) study the effects of corporate governance quality on capital structure. They find that the level of governance a firm uses, consequently affects the performance and capital structure. Weak governance may lead to higher debt ratios and lower firm performance. Suggesting bad relationships between the manager (agent) and shareholders (principal). Continuously, Wen, Rwegasira and Bilderbeek (2002) find that when managers face stronger corporate governance, they tend to pursue lower debt ratios, indicating negative effects. On the contrary, other studies (Brailsford, Oliver, and Pua, 2002; Bruslerie & Latrous, 2012) also investigate the effects of corporate governance on capital structure. Continuously, they find positive impacts of corporate governance on capital structure. Thus, corporate governance mechanisms can affect a firm's capital structure.

1.1. Research gap

Current literature on corporate governance and its effect on capital structure in the Netherlands is quite limited. To the best of my knowledge, I only find that De Jong (2001) empirically investigates this relationship. His dataset stems from 1992-1997 and he finds that corporate governance mechanisms hardly influence leverage. Internationally, quite some literature exists (e.g. Berger, Ofek, & Yermack, 1997; Bruslerie & Latrous, 2012; Wen et al., 2002; Jiraporn et al., 2012). The Netherlands is particularly interesting because the Netherlands uses a two-tier board structure, making it unique compared with e.g. the U.S. and interesting for research (Postma, van Ees, and Sterken, 2001). Also, like De Jong (2001) says, in the Netherlands, many firms have one or more large blockholdings (indicating concentrated ownership). Continuously, Kabir, Cantrijn, and Jeunink (1997) find that with concentrated ownership, more effective monitoring of managers is expected, and effective monitoring can affect leverage (Wen et al., 2002). This argument already questions the findings of De Jong (2001). However, beginning 21st century, the Netherlands has undergone some major changes in the corporate governance context. In 1997, the Peters Committee, which was a committee that focuses on self-regulation through transparency and monitoring for publicly listed firms, issued a list of 40 recommendations for corporate governance practices in the Netherlands. These recommendations were designed "*to increase the effectiveness of management, supervision and accountability to investors in Dutch corporations*" (De Jong, De Jong, Mertens, & Wasley, 2005, p. 474). In 2003, these recommendations were implemented into a corporate governance code of conduct for listed companies in the Netherlands and became first effective in 2004. The code focuses on self-regulating through transparency and monitoring within firms. Throughout the years, the code has been revised twice. Once in 2009, and once in 2016. In 2009, "*more emphasis was placed on the way in which directors, supervisory directors, and shareholders exercise their duties in practice.*" (Ba, 2017, p. 13). In 2016, the changes in the code had an emphasis

on wealth-creation in the long-term. Additionally, a cultural aspect of good governance was introduced. The changes in the corporate governance code for Dutch companies may as well impact the effect on leverage. Arping and Sautner (2010) study the direct changes of the implementation of the 2003 corporate governance code on leverage. They find that, following the passage of the reform, Dutch firms significantly reduced their leverage. This suggests that the governance environment may have changed after the first implementation, as well as for the revisions in 2009 and 2016. Since the effects of corporate governance on leverage have not been studied after these contextual changes in the Netherlands, it is particularly relevant and interesting to study the relations in the new environment. A new dataset will then include the 2009 and 2016 reformations of the corporate governance code. Studying the effects in this new environment may provide new insights into the corporate governance literature. Furthermore, after the study of De Jong (2001), the Netherlands has gone through a severe economic crisis. Both the financial crisis of 2008 and the European Sovereign debt crisis may have affected capital structures and possibly its determinants (Moradi & Paulet, 2019).

1.2. Research question

The changes in both contexts may have resulted in changing corporate finance strategies. Especially with regards to corporate governance and capital structure. This study investigates whether the new environment will provide new insights into the relation between corporate governance and capital structure in the Netherlands. The previous mentioned research gap leads to the main research question:

"How does corporate governance influence the capital structure for Dutch listed firms?"

1.3. Contribution

My empirical contribution lays in investigating the effects of corporate governance on capital structure for Dutch listed firms in the new environment with data from 2017-2018, which is the latest data available. The new environment may have resulted in changing corporate finance strategies which, in contrary to the findings of the De Jong (2001), might do show a disciplinary role of leverage in Dutch firms. This will be realized by answering the research question and comparing the findings with those of De Jong (2001). The practical contribution lays in the sense that managers of Dutch firms can understand the relation between different corporate governance mechanisms and the level of leverage which is used, consequently.

This thesis continues as follows, first, the literature on capital structure and corporate governance mechanisms is explained and discussed. Consequently, hypotheses are formulated. Second, the method of analysis to answer the research question is explained and discussed along with the used data. Third, the results of analysis are presented and discussed. Lastly, a conclusion of this paper is given together with areas for future research.

2.   Literature review

In this chapter, I will review and explain the literature on capital structure and corporate governance mechanisms. I will first discuss capital structure and its related theories. Secondly, I review the corporate governance theories and its founded effects on capital structure. I review the literature internationally and, in the Netherlands, specifically. Lastly, I identify the hypotheses which will be tested to answer my research question.

2.1. Capital structure theories

2.1.1. Modigliani and Miller

Capital structure theories mostly start with Modigliani and Miller (1958)'s irrelevance theory which includes two propositions. In their work, Modigliani and Miller (1958) claim with proposition I that, in an optimal and frictionless world, firm value is non-dependent (irrelevant) on its capital structure. This world would consist of a situation where firms are in a perfect (efficient) market and have I) no taxes; II) equal cost of debt; III) no transaction costs; IV) no costs of financial distress; and V) no agency costs (Modigliani & Miller, 1958). According to proposition I, if you consider two equal operating companies where e.g. company A is fully funded with equity, and company B is funded with a combination of debt and equity, an investor would not care in which company he puts his money in since the value and return of both companies is the same (Modigliani & Miller, 1958). In proposition II, still in a frictionless world, Modigliani and Miller (1958) say that a higher leverage ratio leads to a higher cost of equity. While taking into account the weights of both debt and equity, equity investors would require a higher return for the increased risk of financial distress. This increased required return on equity has been offset since the proportion of debt to equity has increased and thus the weighted average cost of capital (WACC) remains the same as well as the firm value, following the same assumptions of a frictionless world. This finding might seem meaningless because of the unrealistic assumptions but it is important for capital structure theories because it shows that when an assumption of the frictionless world is violated, the value of a firm can change based on the determinant of the capital structure.

In Modigliani and Miller (1963)'s 'corrected' theory, when taxes are introduced, this situation of equal WACC with different proportions and cost of equity would not exist. With taxes, interest payments (cost of debt) on leverage are tax-deductible. As a result, tax shield benefits appear since interest payments lower the tax amount which need to be paid, resulting in a higher net income and thus increasing firm value. Dividend payments (cost of equity) are not tax-deductible and do therefore not have a tax shield. To maximize the tax shield benefit, a firm would need to increase its leverage to 100% which reflects the highest firm value regarding the assumptions of proposition II (Modigliani & Miller, 1963). However, since Modigliani and Miller's 'corrected' theory does not take away all frictions, other researches did not (completely) agree with Modigliani and Miller's findings. As a result, several theories

on capital structure have been developed and tried to explain capital structure decisions. Hence, there are three popular and mainstream capital structure theories which have extensively been discussed in the literature and are considered as capable in explaining capital structure decisions under certain conditions (van Benthem, 2016; De Jong et al., 2008). These capital structure theories are the trade-off-, pecking order- and agency cost theory.

In the following sub-chapters, a closer look will be taken into these and other extended capital structure theories. Whether it is the trade-off, pecking order, or agency cost theory, there is still a debate about how firms choose their capital structure (Flannery & Rangan, 2006). On the question "*How do firms choose their capital structure?*" we still do not have an answer (Myers, 1984, p. 575).

2.1.2. Trade-off theory

The trade-off theory is developed by Kraus and Litzenberger (1973) and is considered one of the mainstream theories on capital structure. The trade-off theory builds on the work of Modigliani & Miller (1963) and takes both tax shield benefits and the direct and indirect cost of deadweight bankruptcy (financial distress) into account. Tax shields benefits appear when a firm needs to pay taxes on the profits they make, and firms can increase this benefit by increasing its leverage since interest expenses are tax-deductible. On the other hand, cost of financial distress, which is the cost of debt, reflects the risk a firm faces of occurring financial distress. The risk of financial distress and its related costs were omitted in Modigliani and Miller's (1963) frictionless world. When a firm increases its leverage, the risk of financial distress increases as well. To cover the increased risk, providers of debt capital require a higher interest rate.

Combining these variables, it would show that there is a limit until when the cost of debt is outweighed by its related tax shield benefit. Figure 1 gives a good graphical explanation of this relationship. According to the static trade-off theory, a firm would need to find and follow the right balance between debt and equity and subsequently make use of the tax-shield benefits which, when reached, results in a maximized firm value and the lowest weighted average cost of capital (Kraus and Litzenberger, 1973; Myers, 1977). Although the direction of the model is equal for all firms, the proportion of increased cost that rises with an increased debt to equity ratio may differ. This means that certain firms may have lower costs of financial distress and can therefore take on higher leverage, thus resulting in a higher tax benefit (Shyam-Sunder & Myers, 1999). One condition under which a firm could take on higher leverage with lower costs of debt is when it has a certain level of assets that can be used as collateral to cover the risk of debt. Following the trade-off theory, firms will increase their levels of leverage when they have high levels of tangible assets, which are often used as collateral (Frank & Goyal, 2009). However, depending on the type of collateral, assets may be more or less liquid. As a result, the type of collateral affects the ability of incurring leverage with lower or higher costs because less liquid assets may need to be sold at

a discount in an event of financial distress. Intangible assets are an example of this situation and the trade-off theory predicts a negative relation between intangible assets and leverage. The value of intangible assets cannot always be reproduced by other firms. Especially when firms are from a different industry and when the intangible asset is industry related (Stallkamp, 2015).
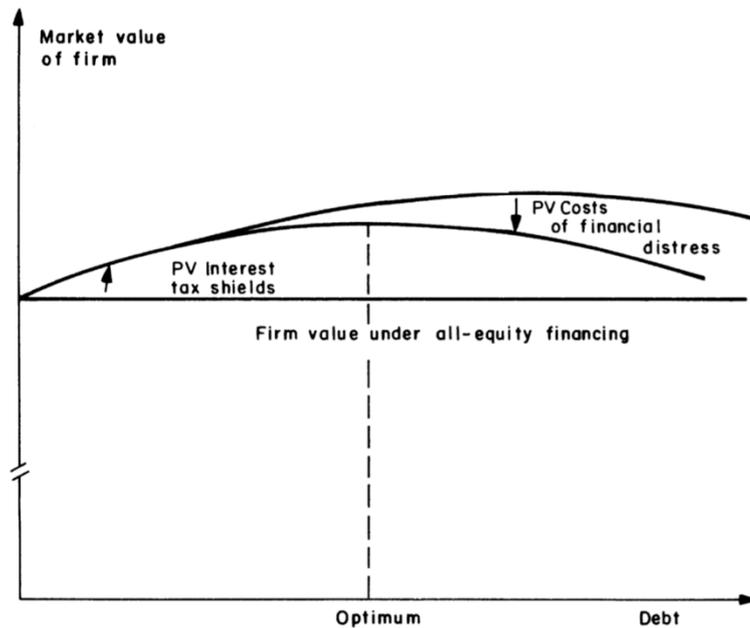
Figure 1: The static trade-off theory - An optimal amount of debt (Shyam-Sunder & Meyers, 1999, p. 220)

Working on Kraus and Litzenberger's theory, Meyers (1984) agrees on the static trade-off theory, but also argues that "*Firms can not immediately offset the random events that bump them away from the optimum, so there should be some cross-sectional dispersion of actual debt ratios across a sample of firms having the same target ratio.*" (Meyers, 1984, p. 577). Meaning that firms set a target ratio of debt-to-equity and try to move forward towards that target but that it is not always possible to reach this target leverage ratio due to certain unexpected events. As a result, one may argue that the theory is no longer static, but dynamic. Frank & Goyal (2011) break Meyer's definition apart and explain both the static and dynamic trade-off theories whereas, Hovakimian et al., (2001) argue that firms change over time and thus the target ratio changes as a result, still incurring a static target ratio.

2.1.3. Pecking order theory

The pecking order theory, constituted by Myers (1984), builds on the literature from Donaldson (1961) and argues that firms follow the safest form of financing for new investments in a particular order. It is a consequence of information asymmetry between managers (insiders) and shareholders/investors (outsiders) (Myers, 1984). Specifically, it says that managers prefer possible new investment financing in the following order: 1) retained earnings, which are internal funds, and which do not require to provide information to outsiders; 2) debt, which is a form of external capital, and thus requires to issue information to outsiders. Issues of debt can be regular, hybrid or convertible sorts of debt; and 3) equity,

which requires to share a significant amount of information with outsiders. In order to obtain the equity financing, investors want to know what they invest in and thus, information is required. Myers (1984) and Myers and Majluf (1984) argue that the most common motivation for the pecking order is based on asymmetric information and adverse selection. Frank and Goyal (2005) explain this as "*The key idea is that the owner-manager of the firm knows the true value of the firm's assets and growth opportunities. Outside investors can only guess these values.*" (Frank & Goyal, 2005, p. 20). Managers are likely to sell equity when the firm is overvalued, while they would not when the firm is undervalued (Frank & Goyal, 2005). Since outside investors do not have a clear sight on what happens in the firm, they might require higher equity rates to offset the risk of their guesses. It increases the cost of equity and therefore equity has the highest information cost. Thus, according to the pecking order theory, firms that follow this theory would have a higher expected level of debt than equity.

2.1.4. Market-timing theory

The market-timing theory of Baker and Wurgler (2002) claim that the capital structure of firms depends on fluctuations of the firms' stock price in the market. They assume that throughout the years, firms try to 'time the market' which implies that firms try to issue equity in times of high market values (stock prices). The high and low market values depend on when the management thinks whether the stock is over- or undervalued consequently. Fluctuations in the stock market values are therefore an important indicator and thus, the capital structure should be the cumulative outcome and long-term effect of all the attempts of timing the equity market (Baker & Wurgler, 2002). Results from Baker and Wurglers' (2002) investigation show that firm with high leverage ratios have issued equity when the stock was undervalued and firms with low leverage ratios show to have issued equity when their stock value was overvalued.

Baker and Wurgler (2002) were the pioneers of investigating the market-timing effect on capital structure. Since then, several authors have investigated the effect as well. Although isolating timing attempts on a firm's IPO, Alti (2006) investigates the market-timing theory and subsequently with Baker and Wurgler (2002), finds that firms prefer to issue equity in hot markets, resulting in lower leverage ratios. However, Alti (2006) also finds that the results completely vanish only a year after the event occurred, thus implying a short-term impact of market-timing.

2.1.5. Agency costs theory

The agency costs theory, constituted by Jensen and Meckling (1976), builds on the idea that there is a conflict in the relation between the agent and principal which may result in costs. An agency relationship is considered to be a contract between the principal, and the agent, who performs service on behalf of the principal following the contract (Jensen & Meckling, 1976). In small companies, agency problems often do not exist since there is no separation between the management and ownership. For a

corporation, there may be a relationship (contract) between managers (agent) and shareholders (principal & ownership). Under such a contract, the managers are expected to act in the shareholders' best interest. However, "*If both parties to the relationship are utility maximizers, there is good reason to believe that the agent will not always acts in the best interest of the principal*" (Jensen & Meckling, 1976, p. 5). Managers may have control on a substantial amount of free cash flow which are generated by the company's operations. Usually, the free cash flows are paid out to the shareholders in forms of dividends. However, by paying dividends, the resources which are under the manager's control reduce, and thereby the manager's power (Jensen, 1986). Managers want to grow their firm since growth increases the resources under the manager's control, and it often relates to an increase in their compensation (Jensen, 1986). An example of agency costs is overinvestment where managers invest in projects which cause the firm to grow beyond the optimal size. In order to grow, managers may use the firm's free cash flow to invest in these projects, even when they are risky and have a low NPV. This is prejudicial for the shareholders since they bear the risk and as a result, an agency conflict arises. Continuously, shareholders expect a return on their ownership. Since managers act as an agent for shareholders, they promise to payout in a form of dividends. However, this promise is weak because it can easily be changed in the future. This also comes at the risk of the shareholders since they are not sure of a constant dividend payout. Again, managers do not act in the shareholders' best interest, and an agency conflict arises.

Since a manager will not always act in the shareholders' best interest, the first type of agency costs arises: monitoring expenditures. Since the agents' interest differs from that of the principal, the agent might need to be monitored to maintain the alignment of interest. As a result of the divergence of interest, the principal need to pay monitoring costs which can help reduce the deviant activities of the agent. One form of monitoring is debt. Shareholders often insist on occurring debt in order to finance new investment projects since it reduces the available free cash flow which could have been used for risky and low NPV investment projects. When interest payments are not being paid, the debtholder can file for bankruptcy. This forces the manager to insist on high NPV projects. The second cost of agency are bonding costs by the agent. Bonding costs are originally occurred by the agent "*to guarantee that he will not take certain actions which would harm the principal*" (Jensen & Meckling, 1976, p. 5). An example is that the agent may come up with an own contractual agreement including legal repercussions which are in favor of the principal in case that the agent acts in this self-interest at the expense of the principal. Although both the monitoring and bonding expenditures are of existence to minimize the interest divergence of the principal and agent, it is not uncommon that this happens in agency relationships (Jensen & Meckling, 1976). Residual loss, which is the third and last form of agency cost, represents the actual loss in dollars compensated with the loss in welfare for the principal as a result of the differences in interest (Jensen & Meckling, 1976). To reduce these costs, and thus its earlier

mentioned conflicts, corporate governance mechanisms can be used (Detthamrong et al., 2017; Dalton, Hitt, Certo, & Dalton, 2007).

2.3. Corporate Governance

Corporate Governance is "*a framework to build an environment of accountability, trust and transparency.*" (Detthamrong et al., 2017, p. 691), or "*the way in which suppliers of finance to corporations assure themselves of getting a return on their investment*" (Shleifer & Vishny, 1997, p. 737). Corporate governance deals with the agency conflict of separation between interests of managers and owners. The owners can 'assure themselves of getting a return on their investment' by applying good governance practices. When good corporate governance practices are existent in the firm, the separation between ownership and control will decrease. Like explained in section 2.5.1, debt is often used as a disciplining device to ensure that managers do not overinvest in risky or negative NPV projects. Negative NPV projects have a higher chance to result in lower or negative returns on investments for shareholders, since there is a lower dividend payout. When good governance practices can mitigate this divergence, it will be a substitute for leverage, and thus, impact a firm's capital structure. This is in line with Chang, Chou and Huang (2014) who argue that not only firm-specific factors, but also corporate governance practices determine the level of leverage. Jiraporn et al. (2012) mention that corporate governance "*exists to provide checks and balances between shareholders and management and thus to mitigate agency problems*" (Jiraporn et al., 2012, p. 208). Hence, it is expected that corporate governance is able to mitigate the agency conflicts. However, reviewing previous literature delivers different result. For example, Kieschnick and Moussawi (2018), who study a set of American firms between 1996 and 2016, find that levels of debt decrease when managers have more power and when the firm gets older. These findings suggest that poor governance leads to lower levels of leverage. However, the results do also not provide evidence which suggest an increase in leverage when managers have less power along with the aging of the firm. This is in contrast with Nadarajah, Ali, Liu and Huang (2019), who study a sample of 1207 non-financial Australian firms during the 2001-2013 period. They find that better corporate governance practices lead to a decrease of leverage. Consequently, Jiraporn et al. (2012) also study the effects of corporate governance quality on capital structure. They find that the level of governance a firm wields consequently affects the firm's performance and capital structure. Weak governance leads to higher debt ratios, whereas strong governance leads to lower debt ratios. This is consistent with the findings of Wen et al. (2002). For a sample of Chinese listed firms, they find that when managers face strong governance, they tend to pursue lower debt ratios. However, it is not discussed whether weak governance in turn result in higher debt ratios. Hence, the quality of governance makes a distinction between higher or lower levels of leverage within a firm.

Other than capital structure, corporate governance has also been studied in relation with subjects as firm performance (Duffhues & Kabir, 2008; Bhagat & Bolton, 2019), mergers & acquisitions (Drobetz & Momtaz, 2019), yield spread (Saad, Haniff, & Ali, 2019; Atanassov & Mandell, 2018), succession of family-owned firms (Yeh, 2017), and even different cultures (Hayat & Hassan, 2017; Imamah et al., 2019).

2.4. Corporate Governance in the Netherlands

The current Dutch corporate governance system has first been established in 1971 after the Verdam committee issued a proposal for a Dutch company law indicating that shareholders should have more control of the firm. The situation of separation between ownership and control was no longer acceptable because of inadequate control of the management's activities and its ability to violate the interests of other stakeholders such as shareholders, debtholders and employees (De Jong et al., 2005). The proposal indicated a two-tier board structure consisting of a management and supervisory board which would give the shareholders more control. It is often called the structure-regime and applies for companies that meet certain conditions of number of employees and equity values. Under the structure-regime, not shareholders, but the members themselves elect new members of the supervisory board. This is called co-optation. The supervisory board is responsible to oversee and control major decisions of the management board, which is elected by them as well. Under these responsibilities are, among other things, approving annual accounts, providing advice, supervising policies and implementation of long-term strategies. Continuously, the supervisory board consents to the dividend policy which is set by the management board and applies for approval of the shareholders (De Jong et al., 2005). If Dutch registered firms have more than 50% of their employees working abroad, they may apply to be exempted and a structure-regime is then not required.

The supervisory board is a board that consists of independent directors. These independent directors are mostly 'outsiders' of the company that are specialists in the field. Sometimes, old members of the management board may participate in the supervisory board as well. Supervisory board members do usually not receive or hold shares of the company and instead, receive a fixed payment. The Dutch law requires that the board follows the shareholders' interests, but after all, the board is set on its own and has the ability to deviate from this (De Jong et al., 2005). The management board is responsible for managing all company operations and must work on implementing its strategy, achieving its goals, and following its policies. The board members are elected by the supervisory board and do not have to be 'outsiders'.

Like earlier explained, the Netherlands has implemented a corporate governance code in 2003 which has been revised in both 2009 and 2016. Important subjects of the new codes are the rules of

independency for the supervisory board. The code states that the board must be as diversified as possible and should consist of a minimum of 3 directors who may only be appointed for a maximum of 3 periods. Although there is no maximum, the board usually varies from 3 to 9 directors (Ba, 2017). The code further identifies several independence criteria. These criteria indicate that members cannot have been an employee or member of the management board in the five years prior to nomination. Additionally, members should not have more than 10 percent in stockholdings of the company.

In beginning 2013, a new law named the 'flex-wet' has been introduced in the Netherlands. Its purpose was to simplify the company law in the Netherlands by implementing less restrictions. Since then, firms can choose or apply for a one-tier board structure and it is receiving increasing attention (Grondhuis & de Kuiver, 2017).

2.5. Corporate Governance mechanisms & hypotheses

A corporate governance system consists of several mechanisms. In relation with the effect on capital structure, and the scope of this research, the main mechanisms which will be studied are board- and ownership structure. In this chapter, along with findings of previous researchers, I explain and critically discuss how each mechanism can impact capital structure. Consequently, the hypotheses which should answer my research question are made.

2.5.1. Board structure

Researchers investigating the effect of board structure on capital structure mainly devote this mechanism into board size, board independence and CEO duality (e.g. Detthamrong et al., 2017; Berger et al., 1997; Wen et al., 2002; De Jong, 2001). This study specifically investigates the relation of corporate governance on capital structure for Dutch listed firms. In the Netherlands, firms have a two-tier board structure. This structure does not allow the CEO to also hold a position in the supervisory board. Therefore, CEO duality is not relevant for this study and only board size and board independence will be discussed.

Board size

Board size has been identified as an important determinant of capital structure in several theoretical (e.g. Lipton & Lorsch, 1992; Jensen, 1993) and empirical studies (e.g. Berger et al., 1997). In the literature, it is assumed that a bigger board will be able to better follow along with managers and face pressure to pursue lower levels of leverage. Berger et al. (1997), who studies a sample of listed companies in the U.S., substantiates this argument by finding results that indicate lower levels of leverage as board size is bigger. Consistently, Abor (2007), who study a sample of listed companies in Ghana, find matching results between board size and leverage. On the other hand, Jensen (1986), Ferreira (2012) and Wen et

al. (2002) find contradicting results which indicate a positive relation between board size and capital structure. Detthamrong et al. (2017) does not find any significant results. The significant results suggest that a bigger board rather follows a strategy of higher levels of debt in order to increase firm value. Larger boards may experience difficulties in monitoring due to communication and coordination issues, this is consistent with the agency theory (Ba, 2017). As a result, debt will still be used as a disciplinary device. In the Netherlands, there is a different board structure compared with e.g. the U.S., but this will not make a difference on the effect of board size.

According to the literature, bigger boards want to increase firm value. Increasing firm value can often be acquired by participating in new NPV projects. Financing can be done by many different methods, but mainly by equity or debt financing. With equity financing, shareholders will lose a part of their stake. With debt financing, risk for bankruptcy increases and managers may not do everything in their best interest. To avoid agency conflicts, bigger board may therefore use debt a disciplinary device. Based on this literature, I hypothesize that board size has a positive impact on leverage for Dutch firms.

Hypothesis 1: Board size has a positive impact on leverage

Board independence

Board independence indicates in what degree a board is independently operating the company. In the Netherlands, the board independence is constituted by the members in the supervisory board. The supervisory board consists of 'outsiders' who do not have a direct relation with the company. However, in the Netherlands, the supervisory board is by law required to act in the firm's best interest (De Jong et al., 2005). Consistent with the agency theory, more independency of the board may result in better monitoring of the management. As a result, agency conflicts reduce, and thus, leverage levels may decline when leverage is used as a monitoring device. Internationally, there are some researchers that investigate the effect of board independence on leverage levels. First, Berger et al. (1997) studies the impact of the composition of outside directors on leverage in American firms. They expect to find a positive relation because boards with more outside directors monitor CEOs more actively, causing these managers to adopt higher leverage levels, but do not have significant results. Detthamrong et al. (2017) builds on the study of Berger et al. (1997) and expects to find a positive result as well. In their analysis, they find a contradicting negative, but insignificant result. For a study of listed firms in China, Wen et al. (2002) hypothesized a negative relation between board independency and leverage because top managers face more rigorous monitoring by outside directors, saying that this causes lower levels of leverage. They do find significant results that are in line with the agency theory. More independent boards have a negative impact on leverage, suggesting that independency leads to better monitoring.

The theory of independent board members indicates that independent management will lead to lower levels of leverage since debt is not needed as a monitoring device when monitoring itself is good enough

already. Therefore, in this thesis, I expect to find that board independence has a negative impact on leverage.

Hypothesis 2: Board independence has a negative impact on leverage

2.5.2. Ownership structure

Ownership structure represents how concentrated firms are (e.g. owned by majority shareholders who own more than 40% of the firm), or by what type of shareholders (ownership identity) the firm is owned (e.g. own directors, institutional investors or family-owned). Previous literature that investigates the effect of the different ownership types mainly study ownership concentration, managerial share ownership, institutional share ownership, and family share ownership. Consistent with the previous literature, I will study the same variables to identify the effect of these corporate governance mechanisms on leverage in Dutch firms.

Ownership concentration (OC)

Previous literature has found that ownership concentration has an effect on the level of leverage within firms. Ownership concentration identifies how concentrated the shares of a firm are being held. This could for example be highly concentrated, when only a few shareholders already own the majority of all shares (e.g. 40%), or not concentrated at all, when there are no owners that own a high percentage of the firms' shares, such that the firm is considered to be widely held. When the ownership of a firm is concentrated, it is likely that this has an impact on the capital structure. Large shareholders own a bigger portion of the firm, and thus, bear more risk than other shareholders. Shleifer and Vishny (1986) argue that large shareholders have more interest and power in monitoring their investments than smaller shareholders. These could be strategic interests that are in contrast to the interests of other, smaller shareholders. In line with the agency theory, debt can be used as a disciplinary device to reduce agency conflicts. With more power, large shareholders may therefore force management to induce higher levels of leverage, or even appoint managers to do so (Brailsford et al., 2002).

Reviewing previous findings on the relation between ownership concentration and leverage delivers some interesting results. Brailsford et al. (2002) study a sample of Australian listed firms between 1989-1995. In their study, they find a positive relation between ownership concentration (external block ownership) and leverage, which is in line with the previous mentioned literature. Their findings suggest that debt is being used as a disciplinary device to monitor management. Moreover, Pindado and De La Torre (2012) study a sample of European listed companies between 1990-1999. In their study, they find a significant and positive relation between ownership concentration and leverage. Consistently, Margaritis and Psillaki (2010) find matching results between ownership concentration and leverage while studying a sample of French listed firms between 2002-2005.

A partly contradicting result is that of Bruslerie and Latrous (2012). In their study, they use a sample of French listed firms between 1998-2009. They distinguish between controlling minority shareholders and controlling majority shareholders. They find that at low levels of controlling shareholders' ownership, there is a positive relation between controlling shareholders and leverage. Suggesting that these shareholders increase debt to increase their relative proportion of equity ownership. This tend to increase until a certain point. When controlling shareholders' ownership have reached this point, they tend to decrease the level of debt in order to expropriate bigger wealth from their ownership stakes. These results suggest that ownership concentration has a substitutional effect of leverage. In this regard, Claessens, Djankov, Fan, and Lang (2002) argue that larger shareholder can use their power and voting rights to expropriate wealth at the cost of smaller shareholders.

Furthermore, while studying a sample of UK firms between 1988-1992, Short et al. (2002) finds a significant and positive relation between ownership concentration and leverage. Consistent with the findings of Bruselerie and Latrous (2012), they suggest that this is caused by the substitution effect. Moreover, Santos, Moreira, and Vieira (2014) study a sample of firms from 12 Western European countries between 2002-2006. They analyze the concentration of blockholders and its effect on leverage. Consistent with Bruslerie and Latrous (2012), they find that ownership concentration in the hands of a main blockholder has a significant and negative impact on leverage. A presence of more large shareholders (blockholders) shows a significant positive effect on the leverage ratio. Among their sample, Dutch firms are also included. Their results are in line with the substitution effect of governance and suggest that larger blockholders (more concentrated ownership) are risk adverse.

In the literature, there is a big presence which shows that ownership concentration positively affects the leverage of a firm. Evidence for negative effects are barely present, and only when certain types of measurements are used. Higher concentrated ownership firms are owned by shareholders that have big portions of ownership, causing them to bear more risk than smaller shareholders. Following the agency theory, these shareholders will want to use debt as a monitoring device to avoid that managers participate in negative NPV projects. Additionally, these shareholders will prefer debt financing over equity financing for new NPV projects, so they do not lose their big portion of ownership per share. Theory predicts therefore that ownership concentration positively influences leverage. Based on this literature, I hypothesize that ownership concentration has a positive effect on leverage

Hypothesis 3: ownership concentration has a positive impact on leverage

2.5.3. Ownership identity

Earlier, I have decomposed ownership structure into ownership concentration and ownership identity. While ownership concentration identifies the *size or volume* of ownership structure, it can also be identified as different *identities* of ownership. Different ownership identities have shown to impact

capital structure in other studies (e.g. Santos et al., 2014; Michaely & Vincent, 2012). In the next sub-chapters, I explain and discuss the different identities of ownership which I will use in my study. These are institutional share ownership and family share ownership. Unlike many other studies, I do not study managerial share ownership. Managerial share ownership identifies the percentage of ordinary shares that is held by all executive and non-executive directors. Because of the two-tier board system in the Netherlands, all major decisions of the management board must be controlled and accepted by the supervisory board. The supervisory board is independent and must act in the shareholders' interest. Thus, whether the executives do, or do not own a high percentage of shares, I expect that managerial share ownership is not that prominent among Dutch companies.

Institutional share ownership (ISO)

Several researchers find that institutional ownership is related to a firms' capital structure (e.g. Santos et al., 2014; Moh'd, Perry, & Rimbey, 1998; Michaely & Vincent, 2012). Other than capital structure, institutional ownership may also be related to e.g. Mergers & Acquisitions (Andriosopoulos & Yang, 2015) or monitoring benefits (Demiralp et al., 2011). In the literature, there exist three hypotheses that claim an effect of institutional ownership in relation with capital structure. These are constituted by Pound (1988). The first hypothesis is the efficient monitoring hypothesis. One could expect that, due to its existence and volume, institutional investors have more expertise and resources and thus, have a better ability to monitor the management of a firm rather than smaller investors. In line with the agency theory, efficient monitoring of institutional investors can be considered as a substitute of debt. Thus, expected lower levels of debt.

Santos et al. (2014) also study the effect of institutional investors on capital structure. In their sample with data from 12 Western European countries, they find that the presence of institutional investors in the ownership of a firm leads to a decrease in leverage. They argue that institutional investors are considered as a monitoring substitute for debt. Continuously, in an earlier study from Moh'd et al. (1998), the results are consistent with those of Santos et al. (2014). In their paper, they study a sample of U.S. firms between 1972-1989 and find that institutional investors ownership has a negative impact on leverage. In a more recent study from Michaely and Vincent (2012), the same results are found. In their paper, the authors also study a sample of U.S. firms while the time period ranges from 1979-2009. The shareholdings of institutional investors are negatively related to leverage. Their results also suggest a substitutional effect between the presence of institutional ownership and leverage as a monitoring device.

On the other hand, Sun et al. (2016), do not find a negative relationship between institutional holdings and leverage. Their results indicate a positive relationship and suggest that these holdings (mostly banks)

force the management to use more debt. Most likely convertible bonds which are then bought by these investors.

Based on the agency theory and the presented results from earlier studies, it is expected that institutional ownership negatively influences leverage. The theory indicates that institutions are better able to monitor management, which means that debt is no longer necessary, and thus, decreases when firms are increasingly owned by institutions. Therefore, I hypothesize that the presence of institutional holdings negatively influences leverage.

Hypothesis 4: Institutional ownership has a negative impact on leverage

Family share ownership (FSO)

In a study of Faccio and Lang (2002), they find that, for a sample of 13 Western European countries, 44.29% of the firms are family controlled. Additionally, these firms are interesting because of its unique traits and business models (Santos et al., 2014). This indicates the presence and also the importance to take into account the family ownership and study its effects on capital structure. Following the agency theory, it is expected that there are less or no agency conflicts because the separation of interests between ownership and control barely exists or are expected to be minimal in family-owned firms (Santos et al., 2014; Jensen & Meckling, 1976). Santos et al. (2014) list some arguments why family firms would use lower levels of debt. First, founding families are usually large and have undiversified investors that want to pass the company on to the next generation, suggesting that family-controlled firms would use less debt to decrease the risk of bankruptcy. Second, family firms are considered to have long-term goals. Debt financing is harmful for long-term performance and often places too much emphasis on short-term goals. Family firms prefer internal financing over debt financing which follows the pecking order theory. Thus, according to these arguments, one can assume that family owned firms prefer lower levels of debt.

Santos et al. (2014) study the relationship between family ownership and leverage for a sample of 12 Western European countries. Their results indicate a negative relation suggesting that family firms are risk adverse and want to reduce the risk of bankruptcy. Consistently, Pindado, and De La Torre (2012) also find that family ownership leads to a decrease in leverage for a sample of European countries, reasoning that stakeholders (family members) use large stakes of their personal wealth, which is why they use less debt. Schmid (2013) finds a negative relation between family ownership and leverage for a sample of German firms between 1995-2009. Suggesting that the results are constituted because of a lack of outside monitoring. Other studies that find similar negative results are those of Faccio and Lang (2002) and Ellul (2011).

However, some studies also find positive relations between family ownership and leverage. An example is that of King and Santor (2008), who argue that debt is used to decrease the risk of a hostile takeover

and thus indicates a positive relation since highly leveraged firms are more exposed to bankruptcy, and thus, less attractive for takeovers. Another and more straightforward example is that family ownership will be diluted when equity financing is used to support new investments. Thus, when internal financing is not sufficient, family firms may increase their leverage to obtain financing for new investments (Schmid, 2013). Moreover, Anderson, Mansi, and Reeb (2003), argue that founding family firms are able to influence agency conflicts by placing one of their members in the CEO position. By holding this position, the family firm can more closely align with the debt-provider's interest, suggesting a reduction in the agency cost of debt compared with non-family firms. This is in line with Ali, chen, and Radhakrishman (2007), who argue that reducing information asymmetries will result in lower cost of capital.

Moreover, Lukens (2016), investigate the relation between family ownership and leverage and hypothesizes a positive relation. They argue that the risk of takeover outweighs the negative aspects of debt financing, and thus, use higher levels of debt. This argument is in line with that of King and Santor (2008).

However, the above-mentioned studies do not tell whether the findings were found at high, or low concentrated family firms. Bruslerie and Latrous (2012) study ownership structure in France and argue that highly concentrated family firms will use different levels of leverage than lower concentrated family firms. They argue that highly concentrated family firms (shareholders) are exposed to higher risks since they have bigger stakes of ownership. For this reason, they will want to have better control by for example debt. Furthermore, Kabir et al. (1997) find that Dutch firms make increasingly use of other antitakeover defenses when firms are characterized by lower ownership concentration.

However, Kabir et al. (1997), mentions other takeover defense devices than debt. This suggests that there is no need for leverage to work as a disciplinary device at the lower ownership concentration. In line with the argument that smaller shareholders are risk adverse, one can suggest that at lower concentrated firms, these shareholders prefer lower levels of debt. Higher concentrated shareholders, or highly concentrated family firms, however, are more connected to the argument that their ownership stake will be diluted when equity financing is used. Therefore, they prefer debt, and thus, have higher levels of leverage. In line with the literature, the following hypothesis is made:

Hypothesis 5: Family ownership has a non-linear effect on leverage

Table 1: Overview of all hypotheses

Hypothesis 1: Board size has a positive impact on leverage
Hypothesis 2: Board independence has a negative impact on leverage
Hypothesis 3: Ownership concentration has a positive impact on leverage
Hypothesis 4: Institutional ownership has a negative impact on leverage
Hypothesis 5: Family ownership has a non-linear effect on leverage
This table shows all hypotheses formulated in section 2.5.

3.   Method

In this chapter, first, the research methodology is explained and discussed. Methodologies used by other papers investigating similar subjects are discussed and the chosen model is justified. Second, the dependent and independent variables are explained along with the control variables. Finally, robustness tests are explained and discussed.

3.1. Research methodology

In this paper, I study how corporate governance influences the capital structure of Dutch listed firms. I have earlier identified several corporate governance mechanisms which possibly impact the capital structure for which the hypotheses have been made. Reviewing the literature that investigates a similar subject and that uses similar mechanisms in the analysis can help justifying the research methodology. Most empirical papers studying the effects of different corporate governance mechanisms on capital structure for listed firms use regression techniques. Ordinary least square (OLS) regression analysis is most often used on this subject. Detthamrong et al. (2017), Wen et al. (2002), and Berger et al. (1997) measure the effects of both the ownership- and board structure mechanisms on capital structure by using an OLS regression. Brailsford et al. (2002), Lin et al. (2013), Paligorova and Xu (2012), and Sun et al. (2016) use an OLS regression technique while investigating only the effect of ownership structure on capital structure.

3.1.1. OLS regression

An OLS regression investigates the effect of one or more independent variables (x) on the dependent variable (y). It does so, like its name says, by squaring and minimizing the sum of the residuals, which is the difference between values of the observed dependent variable and the value predicted in the model (Wooldridge, 2010). OLS-regressions are often used in cross-sectional or temporal research designs. In order to produce consistent results with the OLS-regression, four assumptions must be met. First, the independent variables must be exogenous, not indicating a correlation with the error terms. Second, there should not be homoscedasticity among the error terms. Third, there should not be autocorrelation among the error terms. And fourth, the data should be normally distributed. Any violations of these assumptions lead to inconsistent results of the OLS-regression. Pitfalls easily occur when the population under investigation (N), is relatively small, or when there are many omitted values in the independent variables (Wooldridge, 2010). A disadvantage of the OLS regression model is that it cannot tackle endogeneity problems. To fix this issue, one can use lagged independent variables. An advantage, however, is that the OLS regression model is fast and easy to compute and implement.

3.1.2. Pooled OLS-regression

Deviating from a standard OLS-regression, one can also run a pooled OLS-regression. This method is often used when a cross-sectional and a temporal research design are combined (Wooldridge, 2010). In this paper, multiple firms (cross-sectional units, i) are studied over different time periods (temporal, t). Therefore, the data could be considered to be panel data. Podesta (2002) argues that the pooled-OLS regressions is most suitable for this kind of panel data analysis. However, as will be explained later, the independent variables will have lagged-values to deal with the causality and endogeneity concerns. And since only two years of data are used (2017 & 2018), the independent variables will come from only 2017 values and the dependent variables will come from only 2018 values. This makes it not an appropriate model for this research. The pooled-OLS regressions solves some problems of the traditional method. Namely, first, it fixes the small number of observations by taking the product of the cross-sectional units and the number of years. Second, it increases the variability. Third, it captures the variation of both the cross-sectional units and time, simultaneously (Podesta, 2002). However, the pooled-OLS regression analysis is not without drawbacks. According to Janoski and Hicks (1994), it tends to create five complications which are further explained by Podesta (2002). Summarized, the complications indicate heteroskedasticity and causal heterogeneity problems which can be resolved by several statistical techniques which are explained later on.

3.1.3. Other methodologies

In contrary to the earlier mentioned studies, Bruslerie and Latrous (2012) use a fixed effects model to test whether ownership concentration has an impact on debt ratios. They test the relation for a sample of French non-financial firms between 1998-2009. In order to capture the heterogeneity of ownership structure, firms-specific effects are included. These can be either random- or fixed-effects, which is determined by running a Hausman test. Their results indicate a fixed-effect and consequently use a firm fixed-effects model. Unlike a Pooled-OLS regression model, a fixed effects model handles the unobserved heterogeneity term. With a fixed effects model, the parameters are either non-random or fixed quantities. This implies that the variables are constant across individuals. Besides that, a fixed effect model handles and controls for any missing or omitted variables, which makes it a useful model for long-term panel data. A pooled OLS-regression would treat all observations as it is one big cross section, whereas a fixed effects model thinks about observations being different per unit (for example cities, or firms). A fixed effects model clears the unobserved heterogeneity problem by marking the averages of the dependent and independent variables.

3.1.4. Model justification

In this paper, I investigate both the cross-sectional and temporal effect of corporate governance mechanisms on capital structure. The variables and its effect on capital structure are studied over two

different years (2017 & 2018), indicating that the data is (short-term) panel data. Consistent with Bruslerie & Latrous (2012), it could therefore be argued that a fixed-effects model should be included in the analysis to deliver sufficient results. However, following Lukens (2016), it is expected that the ownership and board structure variables are quite stable for Dutch listed firms. These characteristics tend to change slowly throughout the years. Therefore, it does not offer variation which should or can be investigated. Thus, a firm fixed-effect is not expected to offer variation in results and will therefore not be used in the standard model, but rather as a robustness check. However, consistent with Brailsford et al. (2002), Wen et al. (2002), Lin et al. (2013), Sun et al. (2016) and Berger et al. (1997), an OLS-regression analysis will be used to study the hypotheses. While running the analysis, the normality assumptions of regressions errors are checked continuously. To address the reverse causality problem, prevent autocorrelation and address the endogeneity problem, the independent and control variables are lagged one year, which is in line with Deesomsak, Paudyal, and Pescetto (2004) who study the determinants of capital structure including several corporate governance mechanisms. This causes that the independent and control variables are studied with data from 2017, while the dependent variable is studied with data from 2018. Moreover, consistent with Santos et al. (2014), Maragaritis and Psillaki (2010), and Moradi and Paulet (2019), the independent variables are winsorized at 5, and 95 percent level, and the model is tested for multicollinearity by performing a variance inflation factors (VIF) test.

Hence, following the work of the previous mentioned studies, in this paper, the main model takes the following form:

$$(1) \quad LEV_{i,t} = \alpha + \beta_1\, BD\_SIZE_{i,t-1} + \beta_2\, BD\_IND_{i,t-1} + \beta_3\, OWN\_OC_{i,t-1} + \beta_4\, OWN\_ISO_{i,t-1} + \beta_5\, OWN\_FAM_{i,t-1} + \beta_6\, Z_{i,t-1} + \mu_{i,t}$$

Where:

$LEV_{i,t}$	is the dependent variable leverage of firm *i* in year *t*.
α	is the constant
β_{1-5}	are the regression coefficients of the independent variables
$Z_{i,t-1}$	is the vector of the set of control variables for firm *i* in year *t-1* which are SIZE, TANG and ROA
$\mu_{i,t}$	is the error term of firm *i* in year *t*

The main model will be used to test hypothesis 1-4. To test hypothesis 5, model (2) will be used:

$$(2) \quad LEV_{i,t} = \alpha + \beta_1\, OWN\_FAM_{i,t-1} + \beta_2\, OWN\_FAM\textasciicircum2_{i,t-1} + \beta_3\, Z_{i,t-1} + \mu_{i,t}$$

3.2. Measurement of variables

In this chapter, the measurements of each variable are explained and discussed. The variables consist of dependent, independent and control variables. An overview of all variables and its related measurements is given in table 2.

3.2.1. Dependent variables

The objective of this thesis is to study the effect of corporate governance mechanisms on a firm's leverage. Thus, the dependent variable is leverage. In the literature, several measures of leverage have been used. Berger et al. (1997) distinguish leverage into book- and market values. The book value of leverage is measured as the ratio of total debt (book value) to total assets (book value). Whereas the market value of leverage is measured as total debt (book value) divided by total debt (book value) plus common equity (market value). Moreover, Brailsford et al. (2002) define leverage as the ratio of the book values of debt to the market value of equity. A more recent study from Sun et al. (2016) defines leverage as the book value of debt over the market value of debt. Bruslerie and Latrous (2012) define leverage as the ratio of book value of total debt divided by total assets. Hence, many different measures for leverage have been used in the literature, where they use either market- or book values. In the Netherlands, de Jong (2001) measures leverage as the book values of long-term debt divided by the book value of total assets. Among other reasons, de Jong (2001) states that Dutch CFO's use the book values to determine their capital structure.

Consistent with Detthamrong et al. (2017), de Jong (2001), and Berger et al. (1997), in this paper, leverage will be measured by dividing the book values of long-term debt by the book value of total assets. Another argument for using book values is that market values are more volatile across time and across firms (Wei, 2014), making it harder to produce consistent results. Furthermore, "calculating the market value is highly dependent on the analyst, increases the complexity of the datasheet, reduces the reliability of the data and is difficult to defend." (Moradi and Paulet, 2019, p. 154).

Other measures for leverage that will be used for robustness checks are short-term debt (STD) which is calculated by dividing the total short-term liabilities by the total assets, and total debt (TD), which is calculated by dividing the total liabilities by the total assets. Just like the long-term debt measure, both measures are measured in book values.

3.2.2. Independent variables

The corporate governance mechanisms which will be studied are the independent variables and have been identified in the literature review. These are board size, board independence, ownership concentration, institutional share ownership, and family share ownership.

Board size (BD_SIZE)

Berger et al. (1997), Detthamrong et al. (2017), and Wen et al. (2002) study board size in relation with its effect on capital structure. In their papers, they consider board size as the number of all directors in the firms. In the Netherlands, firms use a two-tier board system. Therefore, board size is measured as the sum of all members on the supervisory and management board.

Board independence (BD_IND)

Berger et al. (1997), Detthamrong et al. (2017), and Wen et al. (2002) also study board independence. Their measures mainly consist of the ratio of all outside or independent directors to the number of total directors. In this study, since the Netherlands uses a two-tier board system, board independence (BD_IND) will be measured by the number of members on the supervisory board, divided by the sum of all members on the supervisory and management board.

Ownership concentration (OWN_OC)

Brailsford et al. (2002) and Santos et al. (2014) study the effect of ownership concentration on capital structure. Consistent with these studies, ownership concentration (OWN_OC) will be measured as the aggregate percentage of shares held by the five largest shareholders.

Institutional share ownership (OWN_ISO)

Following the work of Santos et al. (2014), shareholders are considered institutional investors when it is either a financial company, an insurance company, a mutual pension fund/trust, a private equity company or a bank. Institutional share ownership (OWN_ISO) is measured as the aggregate percentage of ordinary shares held by institutional investors.

Family share ownership (OWN_FAM)

While studying capital structure decisions in family firms, Ampenberger, Schmid, Achleitner, and Kaserer (2013) created a list of criteria of which at least one should be satisfied in order to consider a firm to be held by a family. These are: 1) the founding family has voting rights of at least 25%; 2) At least one member of the supervisory board is a founding family member; 3) At least one member of the management board is a founding family member. Moreover, to determine whether a firm is family-held, the aggregate percentage of all family member shareholders is used to measure family share ownership (OWN_FAM). This paper uses the shareholder type definition 'One or more named individuals or families' of ORBIS database to determine whether a shareholder is a family member. Knowing that not all individuals are family members, I have chosen for this method due to time constraints.

Additionally, OWN_FAM^2 has been created by squaring the values of OWN_FAM. Both variables will be used to test for the non-linear relationship between family ownership and leverage (Brailsford et al., 2002).

3.2.3. Control variables

This paper studies the effect of corporate governance mechanisms on capital structures for Dutch listed firms. To fully understand the nature of this relationship, other (controlling) variables may be included as well (Babbie, 2013). Following the work of Brailsford et al. (2002), and Detthamrong et al. (2017), a set of firm specific control variables will be included. These firm-specific control variables are firm size, tangibility, profitability, and industry. These control variables are also included in the 'core model of leverage' from Frank and Goyal (2009). Frank & Goyal (2009) review the popular capital structure theories and assess eleven related factors of leverage using several measures. Resulting from their research, they identify a 'core model of leverage' which includes only six factors that reasonably explain leverage. Their core model of leverage is able to explain more than 27% of the variation in leverage, while other factors only add 2%. Consistent with Detthamrong et al. (2017), and Frank and Goyal (2009), Firm size (SIZE) is measured by the natural logarithm of total assets, tangibility (TANG) is measured by the ratio of fixed assets to total assets, and profitability (ROA) is measured by the ratio of EBIT to total assets. All values are book values. Industry can also be a potential influencer of a firms' capital structure. Distinguishing between industries is important as firms can face different processes, rewards and risks and thus face different financing preferences. Following the work of Brailsford et al. (2012), in this paper, I make a distinction between four industries of which dummy variables are created. These industries are 1) manufacturing; 2) wholesale/retail; 3) services; and 4) other industries. The industries are identified and distinguished by the NACE rev. 2 main section codes and names which are provided by the ORBIS database. An overview of which codes equal each industry is given in table 2.

Table 2: Overview of all variables and its related measurements

	Abbreviation	Measurement
Dependent variables		
Long-term debt	LTD	Long-term debt / total assets
Short-term debt	STD	Short-term debt / total assets
Total debt	TD	Total debt / total assets
Independent variables		
Board size	BD_SIZE	Sum of all members on the supervisory and management board
Board independence	BD_IND	Number of supervisory board members / number of total board members
Ownership concentration	OWN_OC	Aggregate percentage of ordinary shares held by top 5 shareholders
Institutional share ownership	OWN_ISO	Aggregate percentage of ordinary shares held by institutional investors
Family share ownership	OWN_FAM	Aggregate percentage of ordinary shares held by all shareholders indicated as families or individuals in Orbis database.
Family share ownership^2	OWN_FAM^2	(Aggregate percentage of ordinary shares held by all shareholders indicated as families or individuals in Orbis database)^2
Control variables		
Firm size	SIZE	Natural logarithm of total assets
Tangibility	TANG	Fixed assets / total assets
Profitability	ROA	EBIT / total assets
Industry variables		Distinguished into industries by the NACE rev. 2 main section codes and names, provided by ORBIS database, provides total of 14 industries.
Dummy for manufacturing	DUM_MANU	Dummy variable for manufacturing industries. Holds the value "1" when industry is equal to 'Manufacturing' NACE Rev. 2 main section and "0" otherwise.
Dummy for wholesale	DUM_WHOL	Dummy variable for manufacturing industries. Holds the value "1" when industry is equal to 'Wholesale and retail traide; repair of motor vehicles and motorcycles' NACE Rev. 2 main section and "0" otherwise.
Dummy for service	DUM_SERV	Dummy variable for manufacturing industries. Holds the value "1" when industry is equal to 'Transportation and Storage; Accommodation and food service activities; Information and communication; Administrative and support service activities; Other service activities' NACE Rev. 2 main section and "0" otherwise.
Dummy for other	DUM_OTHE	Dummy variable for manufacturing industries. Holds the value "1" when industry is equal to 'Agriculture, forestry and fishing; Mining and quarrying; Electricity, gas, steam and air conditioning supply; Construction; Professional, scientific and technical activities; Human health and social work activities; Arts, entertainment and recreation' NACE Rev. 2 main section and "0" otherwise.

This table shows the abbreviation and measurement of all variables used in this research.

4.   Sample and Data

This chapter gives an overview of the sample and data that is used to study the effect of corporate governance mechanisms on capital structure for Dutch listed firms.

4.1. Sample

The sample is drawn from Dutch publicly listed companies after excluding all firms in the financial and utility sector from the sample. This is consistent with other studies investigating corporate governance and capital structure (e.g. Detthamrong et al., 2017; Bruslerie & Latrous, 2012; Pindado & De La Torre, 2012). This is because firms in the financial and utility sector must adhere to specific regulations which can influence their capital structure. Furthermore, firms that have negative equity values are also excluded from the sample. These firms are often close to bankruptcy. Lastly, firms with missing and extreme values are also excluded from the sample. This resulted in a sample of 106 firms.

4.2. Data

The corporate governance data (ownership) as well as the financial data is gathered from the Orbis database, accessed by a license of University of Twente. Additionally, the annual reports of the firms are consulted to verify and gather the remaining board, ownership or uncomplete data. The ORBIS database reports ownership data even below 1%. Although most annual reports do not report ownership of under 3%, I will only report the ownership levels starting at 1%. The initial data of ownership structure in the ORBIS database was cross-checked with the firm's annual report. The cross-checking showed that the ownership and board structure does not vary frequently, but rather in periods of multiple years. This is in line with what Benson and Davidson (2009) and Zhou (2001) argue about in their study. They argue that, while ownership and board structure may differ substantially across firms, they change slowly across multiple years. This enhanced the consideration to re-determine the time-period for investigation. First, a three-year period expanding from 2016-2018 was determined to investigate. However, in 2016, the new Dutch corporate governance code was introduced which was only first implemented by the firms in 2017. Thus, a real effect on capital structure would not be shown before 2018 since the implementation and effects also need time to show result. Hence, in line with other studies, such as the ones from Mandaci and Gumus (2010), and McConnel and Servaes (1990), ownership and board structure variables will only be studied in one particular year. Specifically, all independent and control variables will be measured with data from 2017, whereas the dependent variable will be measured with data from 2018. This is in line with lagged-variables methodology explained in chapter 3.

The initial dataset with companies from ORBIS consisted of 176 Dutch listed firms. The first criterium was that the financial and utility companies were excluded. This resulted in a sample of 135 firms. Lastly, companies with missing or extreme values were excluded which led to a final sample of 106 firms. Table 3 shows the industry distribution of all sample firms.

Table 3: Industry distribution of sample firms

Industry	Count
Agriculture, forestry and fishing	1
Mining and quarrying	3
Manufacturing	44
Electricity, gas, steam and air conditioning supply	1
Construction	5
Wholesale and retail trade; repair of motor vehicles and motorcycles	10
Transportation and storage	2
Accommodation and food service activities	2
Information and communication	21
Professional, scientific and technical activities	8
Administrative and support service activities	4
Human health and social work activities	1
Arts, entertainment and recreation	2
Other service activities	2
Total	106

This table shows the industry distribution of all sample firms. The industries that are used are taken from ORBIS Database, which is the database used for all data.

5. Empirical results

5.1. Descriptive statistics

In table 4 the summary statistics of all variables are presented for the sample of Dutch listed firms. The results show that the dependent variable long-term debt (LTD) has a mean value of 27%. This value can be compared with findings of other studies. Detthamrong et al. (2017) finds decreasing leverage values from 32% in 2001 to 24% in 2014. Brailsford et al. (2002) finds mean leverage values of 53% in the period ranging from 1989 to 1995. Moradi and Paulet (2019) find mean leverage of 26% for firms in the Netherlands with a sample ranging from 1999 to 2015. Berger et al. (1997) finds a mean value for leverage of 25%. From this, we can conclude that the long-term debt values are quite equal to other studies. The total debt (TD) and short-term debt (STD) leverage values of other studies are also quite equal to mean values reported in this report.

For Board Size (BD_SIZE), a mean value of 8 is found in the sample. Other studies find mean values of 11 for non-financial firms in Thailand (Detthamrong et al., 2017) and 3 for a sample of Dutch listed firms in the period 1984-1991 (Berger et al., 1997). The difference can be explained by the difference in time. First, the Dutch corporate governance code has been revised in 2009 and 2016 and now forces firms to have a minimum of 3 supervisory directors. Second, firms have grown throughout time, and as a firm grows, the board of directors grows likewise. Board independence (BD_IND) has a mean value of 64%. Berger et al. (1997) finds a mean value of 54% whereas Detthamrong et al. (2017) finds a mean value of 36%. Differences can be explained by the country of observation and time difference. Berger et al (1997) studies American firms from the 90's. Detthamrong et al. (2017) studies firms in Thailand.

Table 4: Summary statistics

Variables	N	Mean	Std. Deviation	Min.	1st. Quartile	Median	2nd. Quartile	Max.
Dependent variables								
LTD	106	.27	.19	.01	.10	.23	.42	.68
STD	106	.29	.19	.02	.14	.25	.40	.80
TD	106	.55	.21	.06	.43	.58	.69	.95
Independent variables								
BD_SIZE (in size)	106	8	2.63	3	6	8	9	14
BD_IND	106	.64	.10	.42	.57	.64	.71	.85
OWN_OC	106	.55	.23	.13	.36	.53	.76	.99
OWN_ISO	106	.44	.26	.00	.23	.45	.63	.96
OWN_FAM	106	.18	.19	.00	.05	.13	.25	.82
Control variables								
lnSIZE (in €mln)	106	2.40	2.95	0.10	0.34	0.85	4.11	9.76
TANG	106	.56	.23	.01	.40	.57	.73	.98
ROA	106	.02	.15	-.53	-.01	.06	.10	.28

This table shows the descriptive statistics for each variable after winzorizing at the 5% level (5% and 95% percentile).

For ownership concentration (OWN_OC) a mean value of 55% is found in the sample. Detthamrong et al. (2017) finds a mean value of 57%. Berger et al. (1997) finds a mean value of 54%. Wen et al. (2002) finds a mean value of 34%. De Jong (2001) finds a mean value of 37% for listed non-financial firms in the Netherlands over the period 1992-1997. The difference between findings of De Jong and this study can be explained by the difference in time. Lukens (2016) finds a mean value of 47% while investigating

non-financial firms over the period 2010-2015. For institutional ownership (OWN_ISO), a mean value of 44% is found in the sample. Other studies find values of 33% (Sun et al., 2016) and 41% (Demiralp et al., 2011). Family share ownership (OWN_FAM) finds a mean value of 18% in this study. Other studies related to this one finds a mean value of 23% (Santos et al., 2014) or 44% (Faccio and lang, 2002). The difference can be explained by the country of observation, which are different in those studies, compared with this one (e.g. Germany, America, France). A recent empirical study (from 21st century) on Dutch listed firms which includes family ownership is not found. The big difference between the mean and the max value can be explained by the fact that some companies are owned for big parts by the original founding family. They often keep large stake of the shares. ENVIPCO HOLDING N.V. for example, is owned for 82% by family ownership.

5.2. Bivariate analyses

The Pearson's correlation matrix is used to perform the bivariate analysis. The matrix is presented in table 5. From this table we can read, like expected, that the different measures of the dependent variables are significantly correlated with each other. Total debt is significantly correlated with LEV (long-term debt) and STD (short-term debt). Which means, just like expected, that total debt increases when either one of these variables increase. Furthermore, we can read that TANG is positively correlated with LTD (.369***) and STD (-.321***).

SIZE is significantly correlated with BD_SIZE (0.535***), which is normal since bigger companies often have bigger boards. Other than that, some control variables are significantly correlated with the dependent and independent variables. Due to its high correlation values, a check for multicollinearity is performed by calculating the variation inflation factors (VIF) for all variables. The lowest VIF score is 2,364, which is lower than 5.0, and therefore, no multicollinearity is found in this study (results not presented) (Hair et al., 2014). From this we can conclude it is safe to use these variables in the regressions since no multicollinearity is found.

5.3. Multivariate regression analyses

In this section, the results from the multivariate regression analyses will be presented. Respectively, the results of the hypotheses, which were formulated in section 2.5., are described. During the analysis, the data is continuously checked on normality assumptions, homoscedasticity, linearity and multicollinearity issues. None of the assumptions are breached except for the normality assumption in the dependent variable. During this process, it is found that the dependent variable long-term debt is not completely normally distributed. A Shapiro-Wilk normality test, in which an Alpha of 5% is used, showed significance at the 5% level. Total debt and short-term debt, however, are normally distributed and should be good to use for analysis.

However, the use of a regression technique remains valid when the sample size is large when normality assumptions are breached, since this is based on the central limit theorem. In this study, I have a sample size of 106, and will run the results for both long-term- and short-term debt as dependent variables. The results will be compared. Also, results for total debt will be run as robustness checks. Table 6 shows the results of the OLS regression which is performed to test these hypotheses. The dependent variable long-term debt is used in this regression, along with all independent and control variables. Table 6 shows seven models. In model (1), the dependent variable is regressed on the control variables and the industry dummies. In model (2)-(6), the dependent variable is regressed on each independent variable separately together with the control variables and industry dummies. In model (7), the dependent variable is regressed on all independent and control variables, together with the industry dummies. Model (7) is the full model which will be used to test the hypotheses 1-4.

5.3.1. Hypothesis 1: The impact of board size on leverage

Hypothesis one states that board size (BD_SIZE) has a positive impact on leverage. The results in table 6 will show whether this prediction holds. Model (7) is the model that is sufficient to test this hypothesis. The values hold an insignificant impact of board size on leverage (b = -.067; t= -.642). Due to insignificant results, no conclusions can be taken based on this data.

5.3.2. Hypothesis 2: The impact of board independence on leverage

The second hypothesis states that board independence (BD_IND) has a negative impact on leverage. Board independence can also be observed in model (7). Model (7) shows an insignificant relationship between board independence and leverage (b=.030; t=-.319). Since no significant results are found, no valid conclusion can be derived. Thus, the hypothesis should be rejected.

Table 5: Pearson correlations between all variables

Pearsons Correlations

	LTD	STD	TD	BD_SIZE	BD_IND	OWN_OC	OWN_ISO	OWN_FAM	SIZE	TANG	ROA
LTD	1										
STD	-.371**	1									
TD	.589**	.532**	1								
BD_SIZE	.006	.008	.012	1							
BD_IND	.051	-.004	.042	.016	1						
OWN_OC	-.121	.073	-.047	-.116	-.234*	1					
OWN_ISO	.148	-.120	.030	.040	.163	-.275**	1				
OWN_FAM	-.168	.116	-.052	-.151	-.075	.366**	-.405**	1			
SIZE	.162	-.014	.136	.493**	.083	-.157	.128	-.154	1		
TANG	.413**	-.201*	.202*	.028	.115	.063	.060	.053	.222*	1	
ROA	-.107	.094	-.016	.132	.176	-.038	.098	-.054	.190	.170	1

*The asterisks ** and * denote statistical significance at the 1% and 5% level (2-tailed), respectively.*

Table 6: OLS Regression results for the impact of corporate governance mechanisms on capital structure with the dependent variable long-term debt (LTD)

Variables		Long-term debt (LTD)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Constant)	.058 (1.082)	.100 (1.104)	-.006 (-.049)	.100 (1.478)	.016 (.269)	0.87 (1.586)	.079 (.487)
BD_SIZE		-.060 (-.574)					-.067 (-.642)
BD_IND			.055 (.616)				.030 (.319)
OWN_OC				-.094 (-1.020)			-.011 (-.109)
OWN_ISO					.137 (1.549)		.065 (.658)
OWN_FAM						-.183** (-2.101)	-.155 (-1.544)
SIZE	.111 (1.218)	.141 (1.336)	.109 (1.193)	.093 (1.009)	.097 (1.072)	.079 (.878)	.109 (1.025)
TANG	.442** (4.815)	.439*** (4.757)	.438**** (4.742)	.450*** (4.885)	.436*** (4.779)	.457*** (5.052)	.447*** (4.816)
ROA	-.210** (-2.284)	-.205** (-2.201)	-.220 (-2.346)	-.211** (-2.293)	-.219** (-2.390)	-.218** (-2.409)	-.220** (-2.341)
Industry dummies	Included	Included	Included	Included	Included	Included	Included
N	106	106	106	106	106	106	106
Adjusted R2	.207	.202	.202	.207	.218	.233	.211

This table shows the standardized coefficients with their statistical significance. The t-statistics are presented in the parentheses. The asterisks *** and ** denote statistical significance at the 1%, 5% level, respectively. In model (1), the dependent variable is regressed in terms of the control variables. In model (2)-(6), the dependent variable is regressed on each independent variable together with control variables. Model (7) represents the full model which is used for the hypotheses 1, 2, 3 & 4. Variable definitions are given in table 2.

Table 7: OLS Regression results of family ownership to test the non-linear impact of corporate governance mechanisms on capital structure with the dependent variable long-term debt (LTD).

Variables	Long-term debt (LTD)	
	(1)	(2)
(Constant)	.087	.091
	(1.586)	(1.585)
OWN_FAM	**-.183****	-.240
	(-2.101)	(-.945)
OWN_FAM^2		.061
		(.239)
SIZE	.079	.082
	(.878)	(.896)
TANG	**.457*****	**.459*****
	(5.052)	(5.032)
ROA	**-.218****	**-.220****
	(-2.409)	(-2.407)
Industry dummies	Included	Included
N	106	106
Adjusted R2	.233	.226

This table shows the standardized coefficients with their statistical significance. The t-statistics are presented in the parentheses. The asterisks *** and ** denote statistical significance at the 1%, 5% level, respectively. In model (1), the dependent variable is regressed in terms of the interaction variable OWN_FAM together with control variables. In model (2), the squared OWN_FAM^2 variable has been added. Model 2 will indicate whether there is a non-linear effect of OWN_FAM on leverage. This table is used for hypothesis 5. Variable definitions are given in table 2.

5.3.3. Hypothesis 3: The impact of ownership concentration on leverage

The third hypothesis predicted a positive relation between ownership concentration and leverage. From table 6 we can read that there is a negative and insignificant relationship between OWN_OC and long-term debt (b=-.011; t=-.109). From the data, it can be concluded that also this hypothesis should be rejected since no significant results were found.

5.3.4. Hypothesis 4: The impact of institutional ownership on leverage

Hypothesis 4 predicted a negative impact of institutional ownership (OWN_ISO) on leverage. To find out whether this holds true, model (7) in table 6 should be assessed. Model (7) shows an insignificant relationship between the independent and dependent variables (b=.065; t=-.658). As a result, concluding from these values, the hypothesis should be rejected, and no valid conclusion can be made.

5.3.5. Hypothesis 5: The impact of family ownership on leverage

Hypothesis 5 predicted a non-linear relationship between family ownership (FAM_OWN) and leverage. To test this hypothesis, table 7 will be used. From table 7 we can read that there is a significant and negative relation between FAM_OWN and leverage when only the control variables are added in the equation. However, FAM_OWN^2 needs to be added to the equation to check if there is a non-linear relationship. From table 7, we can read that OWN_FAM (b=-.240; t=-.945) is negative and OWN_FAM^2 (b=.061; t=.239) is positive, which would induce a non-linear relationship. However, since there is not a significant relationship, the hypothesis should be rejected, and no valid conclusions can be drawn.

5.3.6. Other findings

Looking at the adjusted R squared values, it shows that model 6 in table 6, when the dependent variable is regressed on the independent variable OWN_FAM together with the control variables and industry dummies, is holding the highest adjusted R2 value. The adjusted R2 value of .233 means that the model is explaining about 23% of the variation in the model. The lowest value is hold by models (2) and (3). Where the independent variables BD_SIZE and BD_IND together with the control variables and industry dummies are regressed on the dependent variables.

Furthermore, looking at the control variables, TANG and ROA are both significantly related to leverage in model (7) and have values of b=.447***; t=4.816 and b=-.220**; t=-2.341, respectively. This means that long-term debt increases when TANG increases and decreases when and ROA increases. The bigger and more profitable a firm becomes, the lesser debt it will use. In this comparison, TANG has more

confidence than ROA since the significant values are 1% and 5% respectively. This is in line with other studies like those of Brailsford et al. (2002); Berger et al. (1997); Moradi and Paulet (2019).

5.4. Robustness tests

The OLS regression model did not provide any sufficient results for the stated hypotheses. However, to check the reliability and validity of the regression, several robustness tests will be made to test the model. First, I perform the same analysis for the subsample manufacturing, since this is the biggest subsample. Second, the dependent variable long-term debt (LTD) will be replaced with other measurements, namely, short-term debt (STD) and total debt (TD). Thirdly, a fixed effects regression will be run with all data from both years 2017 and 2018, causing the sample size to double since there are two observations per company instead of one, and likewise, its chances for significant results.

5.4.1. OLS-regression robustness test subsample analysis

As a robustness test, the analysis to test hypotheses 1-5 will be performed for the subsample manufacturing. This subsample accounts for almost half of the total sample. The results are presented in table 8. In model (1), all independent variables, together with control variables and industry dummies, are regressed on the dependent variable long-term debt. The results do not show any significant results, other than that TANG and ROA are having significant effect on leverage. As a result, the robustness test strengthens the findings of the original analysis, where hypotheses 1-4 had to be rejected. Model (2) is used to test hypothesis 5 and shows whether there is a non-linear relationship between family ownership and leverage. No significant relation is found, and thus, hypothesis 5 needs to be rejected as well, strengthening the original analysis.

Table 8: Robustness test with OLS Regression results of subsample analysis of the effects of corporate governance mechanisms on capital structure with the dependent variable long-term debt (LTD).

Variables	Long-term debt (LTD)	
	(1)	(2)
(Constant)	.245	**.170****
	(1.207)	(2.196)
BD_SIZE	-.164	
	(-.954)	
BD_IND	-.010	
	(-.067)	
OWN_OC	-.072	
	(-.444)	
OWN_ISO	.137	
	(.857)	
OWN_FAM	-.043	.158
	(-.243)	(.333)
OWN_FAM^2		-.293
		(-.647)
SIZE	.264	.183
	(1.418)	(1.247)
TANG	**.277***	.242
	(1.760)	(1.466)
ROA	**-.355****	**-.317****
	(-2.407)	(-2.253)
Industry dummies	Included	Not included
N	47	47
Adjusted R2	.086	.118

This table shows the standardized coefficients with their statistical significance for the subsample Manufacturing. The t-statistics are presented in the parentheses. The asterisks ** and * denote statistical significance at the 5%, and 10% level, respectively. In model (1), the dependent variable is regressed on all independent, control variables and industry dummies are included. Model (1) is used for hypothesis 1-4. In model (2), the dependent variable is regressed on the OWN_FAM and OWN_FAM^2 independent variables together with control variables. Industry dummies are not included. This model is used for hypothesis 5. Variable definitions are given in table 2.

5.4.2. OLS-regression robustness test with different measures

As a second robustness test, the dependent variable leverage will be replaced with two different measures, namely short-term debt (STD) and total debt (TD). The definitions and measurements of these variables are given in section 3. The same models are now run with these variables and are presented in table 9 and 10 in appendix I and II.

When short-term debt is used as the dependent variable, the results vary slightly from the original models. Family ownership and the interaction variables do not longer have a significant value in model (2) (b=-.105; t=-.435) and thus, hypothesis 5 should be rejected in this model. The significant value is in this case tangibility (TANG) in all three models, indicating a negative result on leverage at the 5% level. The adjusted R squared values have decreased to .024 in all three models.

When total debt is used as the dependent variable, table 10 shows that only family ownership has significant values in model (2) (b=-.492**; t= 1.997) together with the interaction term OC_LOW*OC_FAM (b=.468**; t=2.025), which means that hypothesis 5 also in this model can be confirmed at a significance of 5%. Other significant values are not found in table 10 and the adjusted R squared values, however, hold negative values of -.047, -.013 and -.013 for models (1), (2), and (3), respectively. The negative adjusted R squared values indicate insignificance of the explanatory variables. Thus, none of the results in table 10 can be used for analysis.

5.4.3. Robustness test with a fixed effects regression

A second robustness test is performed by doing a fixed effects regression (summary statistics are presented in appendix III). A fixed effects model clears the unobserved heterogeneity problem, which the OLS-regression fails to observe. To perform the fixed effects regression, the data from years 2017 and 2018 are gathered from ORBIS database, and any missing data is manually gathered from the firm's annual reports. The analysis is performed in order to check whether the regression results are driven by firm-level unobserved heterogeneity. The analysis is performed without using lagged variables. The results are presented in table 11.

Comparing the results of the fixed effects regression with the OLS regression, the findings are more or less the same. In model (1) & (2) of table 11, where long-term debt is the independent variable, it shows that hypotheses 1-5 are all rejected since no significant values can be found.

Control variables TANG and ROA are found significant in the fixed effects regression as well as in the OLS-regression, showing that tangibility will lead to an increase in leverage values of long-term debt, respectively. This effect is in line with other studies (Berget et al., 1997; Detthamrong et al., 2017; Moradi & Paulet, 2019). And showing that profitability will lead to a decrease of long-term debt.

Other findings are that the adjusted R squared values are slightly lower in the fixed effects regression than in the OLS regression. Model (7) in table 6 shows that the full model of the OLS regression has an adjusted R-squared value of .211. Whereas model (1) of table 11 has a value of .188. Moreover, the different measures of leverage used for the robustness tests, show incredibly low adjusted R squared values compared with the original models (e.g. .024 for STD and -.047 for TD in tables 9 and 10).

In summary, the fixed effects regression is rejecting all hypotheses (1-5). This is in line with the OLS-regression, which also rejected all hypotheses. Thus, despite using different methods, the same results are found.

Table 11: Robustness test with fixed effects regression results for the impact of corporate governance mechanisms on capital structure with the dependent variable long-term debt (LTD).

Variables	Long-term debt (LTD)	
	(1)	(2)
(Constant)	.168	**.097****
	(1.395)	(2.249)
BD_SIZE	-.106	
	(-1.465)	
BD_IND	.012	
	(.178)	
OWN_OC	-.013	
	(-.174)	
OWN_ISO	-.009	
	(-.128)	
OWN_FAM	**-.164****	-.141
	(-2.255)	(-.751)
OWN_FAM^2		-.015
		(-.080)
SIZE	**.123***	.077
	(1.662)	(1.164)
TANG	**.415*****	**.412*****
	(6.225)	(6.220)
ROA	**-.117***	**-.119***
	(-1.729)	(-1.798)
Industry dummies	Included	Included
N	212	212
Adjusted R2	.188	.191

*This table shows the standardized coefficients with their statistical significance. The t-statistics are presented in the parentheses. The asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively. In model (1), the dependent variable total debt is regressed in terms of the independent and control variables together with the industry dummies. In model (2), the dependent variable is regressed on the OWN_FAM and OWN_FAM^2 independent variables together with control variables. Variable definitions are given in table 2.*

6. Conclusion

In this chapter, a summary of the findings and conclusion of this research will be given. Additionally, limitations and recommendations for future research are conducted.

6.1. Summary of findings

The purpose of this research is to examine the impact of corporate governance on the capital structure of Dutch listed firms. This paper extends the corporate governance and capital structure literature since the relation is investigated after significant changes in the Dutch corporate governance code were introduced. The latest study on this subject in the Netherlands is that of De Jong (2001), and the results will therefore be compared with his results (where possible) before conclusions are drawn. This section will also answer the central research question of this study, which is: *"How does corporate governance influence the capital structure for Dutch listed firms?"*. In order to answer this research question, six hypotheses were created and investigated in chapter five by running an OLS regression as well as a fixed effects model for robustness testing.

Hypothesis 1 predicts a positive impact of board size on leverage. The results in chapter 5 show no significant results which means that no support for this hypothesis is found. Other studies, like the one of De Jong (2001) and Detthamrong et al. (2017), do also not find significant results of the relation between board size and leverage. This implies that the number of directors on a board do not impact the amount of debt being used by a company, otherwise known as the capital structure. Leverage is not significantly affected and thus, hypothesis 1 is rejected.

Hypothesis 2 predicts a negative impact of board independence on leverage, meaning that independent directors lower the amount of debt being used in a company, and thus, influence a firm's capital structure. The results conducted in chapter 5 do not support this hypothesis since no significant values are found. Likewise, De Jong (2001) and Detthamrong et al. (2017) do not find significant results for this relationship. This implies that, for Dutch listed firms, independent directors do not directly influence the amount of leverage in a company since no evidence is found.

Hypothesis 3 predicts a positive impact of ownership concentration on leverage. The results in chapter 5 do not show significant results in both the OLS regression as well as the fixed effects regression. Thus, no valid conclusion can be drawn. Other studies that investigate this relationship are those of Brailsford et al. (2002) and Bruslerie and Latrous (2012). Brailsford et al (2002) only find a significant positive relationship between ownership concentration and leverage. Whereas Bruslerie and Latrous (2012) find support for both a positive and negative relationship at lower and higher levels of ownership, respectively.

Hypothesis 4 predicts a negative impact of institutional ownership on leverage. The hypothesis does not find support in either of the regressions. This implies that no valid conclusions can be drawn on in this study.

Hypothesis 5 predicts a non-linear relation between family ownership and leverage. Hypothesis 5 does not find support in both the OLS-regression and the robustness tests. This implies that also for hypothesis 5, no valid conclusions can be drawn.

In summary, no significant relations between corporate governance mechanisms and leverage (capital structure) have been found in this study. The control variables size, tangibility and return on assets do find support in some models. Thus, overall, the findings of this research do not support the predictions, as predicted by the literature and theories, that corporate governance influences the capital structure of Dutch listed companies. This is in line with the findings from De Jong (2001), who neither found support for relationships between corporate governance mechanisms and capital structure in Dutch listed firms. Deriving from the results, corporate governance mechanisms do not influence the capital structure of Dutch listed firms, which is the answer on the central research question. Other conclusions cannot be taken since no significant values were found.

6.2. Limitations and recommendations

This section discusses the limitations of this research, as well as the recommendations for future research. First, one limitation of this research is that it used a sample which did not give a lot of observations. The sample consisted of 106 firms after excluding those with missing values. A bigger sample with more observations might give more significant results. Especially the OLS regression suffered from the small sample. The second limitation is that only the data from two years are being used. The possibility exists that these two years are unusual compared with other years. And since the OLS regression used lagged variables, only one year of data was used for both the dependent and independent variables, which also increased the chance that the research could be affected by unusual data compared with other years. Moreover, the used data stems from after the new corporate governance code which was introduced in 2016 and is the latest data available. The third limitation is that this research only focused on Dutch publicly listed companies. The results are not generalizable for private/unlisted companies since listed companies are exposed to certain legislations that might affect the capital structure.

The recommendations for future research are built on the limitations. First, future research should include more observations, which generates a bigger dataset. This will increase the reliability, validity

and significance. This could be reached by increasing the years of investigation. Adding more years of observation to the research fixes the first two limitations described above and makes it interesting to compare the results from before and after the change in the Dutch corporate governance code. The second recommendation is to also focus on private/unlisted companies. Most of the current empirical research about this topic investigate only listed companies. Private companies are often neglected while these account for a big part of the Dutch industries. Lastly, a recommendation for future research is to perform a similar research in a different country, or in a combination with a different country. This would also explain whether the insignificant results are solely related to the Dutch setting, or also to other settings.

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Appendixes

Appendix I – Robustness test OLS Regression results with short-term debt as the dependent variable

Table 9: Robustness test with OLS Regression results for the impact of corporate governance mechanisms on capital structure with the dependent variable short-term debt (STD).

Variables	Short-term debt (STD)	
	(1)	(2)
(Constant)	**.438****	**.384*****
	(2.500)	(6.553)
BD_SIZE	-.011	
	(-.097)	
BD_IND	-.016	
	(-.155)	
OWN_OC	-.030	
	(-.263)	
OWN_ISO	-.094	
	(-.860)	
OWN_FAM	.104	-.212
	(.928)	(-.772)
OWN_FAM^2		.385
		(1.398)
SIZE	.044	.084
	(.372)	(.853)
TANG	**-.240****	**-.271*****
	(-2.323)	(-2.755)
ROA	.156	**.181***
	(1.494)	(1.836)
Industry dummies	Included	Included
N	106	106
Adjusted R2	.024	.099

*This table shows the standardized coefficients with their statistical significance. The t-statistics are presented in the parentheses. The asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively. In model (1), the dependent variable short-term debt is regressed in terms of the independent and control variables together with the industry dummies. In model (2), the dependent variable is regressed on the OWN_FAM and OWN_FAM^2 independent variables together with control variables. This model is used for hypothesis 5. Variable definitions are given in table 2.*

Appendix II – Robustness test OLS regression results with total debt as the dependent variable

Table 10: Robustness test with OLS Regression results for the impact of corporate governance mechanisms on capital structure with the dependent variable total debt (TD).

Variables	Total debt (TD)	
	(1)	(2)
(Constant)	.517**	.477***
	(2.485)	(6.626)
BD_SIZE	-.071	
	(-.585)	
BD_IND	.013	
	(.121)	
OWN_OC	-.037	
	(-.308)	
OWN_ISO	-.023	
	(-.206)	
OWN_FAM	-.050	-.382
	(-.429)	(-1.319)
OWN_FAM^2		.355
		(1.222)
SIZE	.137	.121
	(1.117)	(1.160)
TANG	.195*	.205*
	(1.822)	(1.969)
ROA	-.062	-.075
	(-.577)	(-.722)
Industry dummies	Included	Included
N	106	106
Adjusted R2	-.047	-.004

This table shows the standardized coefficients with their statistical significance. The t-statistics are presented in the parentheses. The asterisks ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively. In model (1), the dependent variable total debt is regressed in terms of the independent and control variables together with the industry dummies. In model (2), the dependent variable is regressed on the OWN_FAM and OWN_FAM^2 independent variables together with control variables. This model is used for hypothesis 5. Variable definitions are given in table 2.

Table 12: Summary statistics fixed effects data

Variables	N	Mean	Std. Deviation	Min.	1st. Quartile	Median	2nd. Quartile	Max.
Dependent variables								
LTD	212	.27	.20	.01	.09	.22	.43	.81
STD	212	.29	.19	.00	.14	.26	.39	.85
TD	212	.56	.22	.05	.44	.57	.71	.98
Independent variables								
BD_SIZE (in size)	212	8	2.28	3	7	8	9	14
BD_IND	212	.64	.09	.42	.57	.64	.71	.85
OWN_OC	212	.53	.24	.10	.31	.51	.73	.99
OWN_ISO	212	.44	.26	.00	.23	.45	.66	.97
OWN_FAM	212	.19	.20	.00	.05	.13	.26	.82
Control variables								
lnSIZE (in €mln)	212	2.40	2.81	0.10	0.35	0.87	3.85	9.76
TANG	212	.57	.22	.01	.45	.58	.73	.98
ROA	212	.03	.13	-.53	.01	.05	.09	.28

This table shows the descriptive statistics for each variable after winzorizing at the 5% level (5% and 95% percentile).