THE INFLUENCE OF OWNERSHIP STRUCTURE AND BOARD OF DIRECTORS ON CAPITAL STRUCTURE OF DUTCH LISTED FIRMS

Master thesis

Name: Milou Wiegers

Student number: S2501767

E-mail: m.g.m.wiegers@student.utwente.nl

University: University of Twente

Faculty: Behavioural, Management and Social Sciences (BMS)

Study: Master of Business Administration

Track: Financial Management

Supervisor 1:   Prof. Dr. Ir. A. Bruggink

Supervisor 2:   Dr. X. Huang

Date: 13-12-2022

UNIVERSITY OF TWENTE.

Abstract

This research investigates the corporate governance influence on the firm's capital structure. Studies provide mixed results on the corporate governance characteristics of ownership structure and board of directors' influences on firm leverage. Therefore, hypotheses are included for the variables; ownership concentration, family ownership, board size, board independence, and board gender diversity influence the firm leverage, while leverage is measured by total, long-term, and short-term debt. The sample of 100 Dutch-listed firms from the period 2017 until 2020 is retrieved from the Orbis database, where additional data is hand-collected from reports of the firms. An OLS (ordinary least square) regression analysis is used to test the hypotheses. Because of multicollinearity, the dependent variable long-term debt does not provide a conclusion. The regression analyses result show that family shares ownership significantly negatively influences the firm's total debt, whereas board independence significantly negatively influences the total and short-term debt. For board size, the results show a significant negative influence on short-term debt. For variables ownership concentration and board gender diversity, non-significant results are observed. The robustness tests with lagged variables and timely subsample are included for the validity and reliability of the results, confirming the results. This research has some limitations related to the number of corporate governance characteristics and the sample, which provide future research opportunities.

Keywords: ownership structure, board of directors, capital structure, leverage, Dutch-listed firms.

University of Twente

Table of contents

University of Twente

University of Twente

1. Introduction

1.1 Background information

The corporate capital structure theory is a well-known topic in the research of a firm's financial structure. Over the years, different determinants of capital structure have been investigated. Such as research centered around the topics of the firm-, country-, and industry characteristics that influence the capital structure of firms. According to Filatotchev, Poulsen, and Bell (2019), capital structure decisions have implications for the firm success in the long run. Specifically, firms finance their operations with equity and debt, financial decisions to reach continuity for the firm. Designing the capital structure is known as a key element of the firm.

Corporate governance already functions as one of the main drivers within a firm, providing control and directions over operations. According to Morellec et al. (2012), internal and external governance influences the firm's financing decisions. The corporate governance systems effects can vary in different political, judicial, social, and economic systems (Filatotchev et al., 2019). They can influence firm performance, risk-taking behavior, and firm value. Besides, corporate governance practices, in a good way, can mitigate agency costs (Arping & Sautner, 2010; Schäuble, 2019), mitigating the agency issue between the management and shareholders (Bajaj et al., 2020). These agency costs can arise because of information asymmetry within the firm.

In addition, the corporate governance mechanism is defined as a system for firms to achieve their objectives with resources like finance, human, policies, and machinery. There are different reasons why good corporate governance is essential for firms. For example, good corporate governance attracts investors and suppliers of finance, the firm's risks are monitored, and it balances the interest and agency relationship between shareholders and stakeholders[1]. Recently, corporate governance research is also interest in compliance with the system (Bogtstra et al., 2020). Whereas corporate governance needs to direct corporate behavior, there are examples of not practicing the mechanism resulting in scandals like Volkswagen or Enron[2].

The continental corporate governance system is most common in European countries, knowing there is limited investor protection compared to the Anglo-Saxon system used in the US and the UK (van Ees et al., 2008). Since 2004, the corporate governance code has been active in the Netherlands, also known as the Tabaksblat Code is mandatory for all listed firms (Akkermans et al., 2007). Both corporate governance systems are good corporate governance systems. Overall, the corporate governance effects can be influenced by different corporate governance systems active in countries.

An increasing number of studies look into corporate governance systems (ownership structure and board of directors) influencing the capital structure of firms. However, these studies provide mixed results about the influence of the ownership structure and board of directors on the firm's capital structure. For example, Detthamrong, Chancharat, and Vithessonthi (2017) mention no significant direct results in the relationship between corporate governance characteristics such as board size, board independence, and female directors on the capital structure of non-financial firms. Contrary, board gender diversity has a negative

---

[1] https://www.linkedin.com/pulse/effective-corporate-governance-structures-adopt-your-okoroma
[2] https://www.investopedia.com/terms/c/corporategovernance.asp#toc-how-to-assess-corporate-governance

influence on the capital structure of firms with a multiple-country sample (García & Herrero, 2021).

Additionally, the ownership structure is possibly related to the firm's capital structure (Brailsford et al., 2002). Moreover, Margaritis and Psillaki (2010) mention a positive relationship between family ownership and capital structure. According to Sun et al. (2016), only a handful of studies have looked into how ownership structure affects a firm's capital structure by considering agency problems. According to Granado-Peiró & López-Gracia (2017), research on corporate governance and capital structure can provide insights into their influences on the firm. Further research on the governance factors of the capital structure can be interesting.

1.2 Research objective and contribution

Prior research on the ownership structure, board of directors, and capital structure focused mainly on a large single developed country (e.g. UK, US, Germany), a single developing country (e.g. Vietnam, Thailand), or a multiple country sample. The Netherlands can provide an interesting research area because of its corporate governance code. As mentioned, countries have different corporate governance systems. Several corporate governance codes exist based on a basic corporate governance code but with country-specific components (Ahmad & Omar, 2016). These corporate governance codes sometimes get revised over time. The last revision of the Dutch corporate governance code is from 2016, related to transparency and monitoring, factors that can influence leverage.

Furthermore, the Dutch corporate governance system is a unique combination of the market-based Anglo-Saxon system (e.g. US) and the bank-based Continental-European system (van Ees et al., 2003). Since 2013 the two-tier board structure has been introduced for Dutch-listed firms and allows firms to follow either the one-tier or the two-tier board structure (van Beusichem et al., 2016). The Dutch corporate governance code operates also with a two-tier board system, whereas other countries have a one-tier board system (Adams & Ferreira, 2007; de Jong & Veld, 2001). The two-tier board system of the Dutch corporate governance system is comprised of an executive board (management board) and a supervisory board, in which the supervisory board has a controlling function over the management of the firm (de Jong et al., 2005). The research of de Jong & Veld (2001) investigated the capital structure of Dutch firms. This research attempts to provide a broader explanation of the specific corporate governance characteristics that likely influence the leverage of non-financial Dutch-listed firms. And so, see an opportunity to decrease the gap with this research.

This study looks into the corporate governance influence in which both ownership structure and board of directors on the capital structure are considered. Because of limited time, there is chosen for five corporate governance characteristics. These corporate governance characteristics are most commonly with prior research (e.g. Detthamrong et al., 2017; García & Herrero, 2021; Margaritis & Psillaki, 2010). For the ownership structure, ownership concentration and family ownership will be considered. According to Kabir et al. (1997), ownership concentration has a relatively important role in the Netherlands. Besides, family ownership exerts an important role in non-financial Western European countries, including the Netherlands (Barontini & Caprio, 2006; Faccio & Lang, 2002). Barontini & Caprio (2006) mention that family ownership is related to commitment to the firm's success but also, a potential conflict of interest can arise with shareholders.

For a more complete explanation of corporate governance, the board characteristics like board size, board independence, and board gender diversity are taken. The size and independency of the board have an important role in the effectiveness of the board of directors (John & Senbet, 1998). Next to board size and independence, this research investigates the influence of board gender diversity within the board of directors. Specifically, the influence of gender diversity on financial decisions and their effects on the board of directors. According to García & Herrero (2021), there is scarce research that considers the influence of board gender diversity on the financial decision but nowadays an interest in the composition of the board of directors. In comparison, female directors are more risk-averse than male directors, which can lead to other financial choices.

As mentioned earlier, corporate governance has shown to be an interesting area in financial research. In this study, the single factors of the corporate governance system of Dutch firms are analyzed, attempting to add to the existing literature by looking at the ownership structure and board of directors' influences on the capital structure of non-financial Dutch listed firms. To the best of my knowledge, little research exists about the influences of ownership structure and board of directors on the capital structure of Dutch firms.

Therefore, the research question is: "*How do a firm's ownership structure and board of directors influence the capital structure of non-financial listed firms in the Netherlands?*".

1.3 Outline of the study

The research of this research is organized in the following structure. After this introduction section, section 2 contains the literature review and the hypotheses development. In section 3, the methodology will be discussed as the relevant variables. The data will be discussed in section 4. In section 5, the results of this study are discussed. The last, section 6, consists of the conclusion and limitations of this study and future research recommendations.

2. Literature review & hypotheses development

In this chapter, literature related to the research topic of capital structure and corporate governance is described. Specifically, the main capital structure theories for this research are described. Prior research regarding corporate governance characteristics' influence on capital structure will be explained. Hypotheses are derived based on these previous research and theories. Table 1 at the end of the chapter presents the hypotheses overview.

2.1 Corporate capital structure

Over the years, the corporate capital structure of firms retrieved much interest. Specifically, the capital structure is the composition of equity and debt within the firm, which is used to finance its operations. Finding the right balance by managers is essential for the continuity of firms in the market and the pursuit of an optimal capital structure (de Jong & Veld, 2001). When a firm finances its operation with debt, a leverage effect is created with a debt-to-equity ratio. The irrelevance theory of Modigliani and Miller (1958) has a vital role in the firms' capital structure.

The irrelevance theory of Modigliani and Miller (1958) proposed that in a perfect market the value of the firm is not different because of the financial structure. Moreover, in a perfect market, there are no taxes, no transaction costs, and no asymmetric information. The Modigliani & Miller (1958) proposition is stated with some assumptions. Additional literature is based on the irrelevance theory explaining capital structure decisions. The main theoretical models of capital structure are the pecking order theory, trade-off theory, and agency theory (Jensen & Meckling, 1976; Myers, 1984). Because these theories are important, they will be explained.

2.1.1 Trade-off theory

The trade-off theory is continued on the irrelevance theory of Modigliani and Miller (1958), also called the static trade-off model. The optimal debt ratio of a firm, with constant assets and investment plans, is determined by the trade-off of the costs and benefits of borrowing (Myers, 1984). Moreover, the interest costs are tax-deductible, which makes the debt ratio interesting for firms. It is the trade-off of tax benefits of debt and the costs of financial distress. These *"costs of financial distress include the legal and administrative costs of bankruptcy, as well as the subtler agency, moral hazard, monitoring and contracting costs which can erode firm value even if formal default is avoided."* (Myers, 1984, p. 580). (MYERS, 1984) mentions the firm has an optimal capital structure when it balances the tax advantage of borrowing because the interest costs are tax-deductible, outweighing the costs of financial distress. Specifically, the firm's optimal capital structure is when the benefits of taxes outweigh the negative effect of financial distress.

2.1.2 Pecking order theory

The pecking order theory states an order for firms to finance new investments. This financial decision (i.e. internal or external financings) signals the market of the firm's situation. The firm's managers are able to have information that the shareholders/investors are missing (Myers, 1984; Myers & Majluf, 1984), which leads to information asymmetry. Both the managers (insiders) and shareholders/investors (outsiders) are aware of this information asymmetry (Myers, 1984).

Furthermore, Myers (1984) states the order of internal and external financing for insiders, with the first preference for internal financing, and the second for external financing with debt over equity. Internal financing avoids costs and information asymmetry (Myers,

1984). Besides, debt financing of investments brings costs and sharing information with outsiders. Additionally, equity financing has a higher risk and generates higher prices, and also more information needs to be provided to outsiders its does not the preference of insiders (Myers, 1984).

2.1.3 Agency theory

The agency theory focuses on the conflict of interest between managers and shareholders, which may result in costs. Jensen and Meckling (1976) explain the influence of the agency theory on the financing structure of equity and debt. Moreover, Jensen and Meckling (1976) state that the agent does not always act in the best interest of the principal, which causes agency costs, called the principal-agent conflict. In a perfect situation with no agency costs, the agent (manager) acts optimally in the principal's (shareholder's) interest. However, managers and shareholders do not always work directly next to each other in the firm creating a knowledge gap and causing agency costs. The agency costs consist of the monitoring expenditures by the principal, bonding expenditures by the agent, and residual loss (Jensen & Meckling, 1976).

Furthermore, the optimal capital structure can maximize the firm value. For this reason, it is essential that managers make well-considered financing decisions. Jensen (1986) mentions that managers have control over the future free cash flow, in which they can increase dividends, repurchase stock, or current payout cash that otherwise will be invested in low-return projects or wasted. In this situation, the managers do not always behave in the interests of shareholders. Shareholders want to monitor the actions and behavior of managers, to let them come nearer to their interests. One way to monitor the actions and behavior of managers is debt financing. Debt mitigates the control of managers over future free cash flow (Jensen, 1986). However, with an increase in leverage also agency costs of debt rise (including bankruptcy costs), marginal benefits can be reached with the optimal debt-equity ratio (Jensen, 1986). In the case of debt, the debtholder ensures that the manager meets the obligations that debt financing entails. Because of this, managers take less risky investment projects for free cash flow (Jensen & Meckling, 1976).

Monitoring of the managers is one of the three consistency of the agency costs; bonding expenditures and residual loss are the others. In bonding expenditures, the manager takes costs incurred to convince the shareholders that the manager did not take activities that would negatively affect the shareholders (Jensen & Meckling, 1976). Moreover, the form of contractual guarantees limits the manager's decision-making power (Jensen & Meckling, 1976). The contractual guarantee includes control over financial accounts, restrictions by misbehavior, and limitations in the decision-making of the manager (Jensen & Meckling, 1976). Lastly, the agency costs contain the residual loss. The residual loss is the welfare loss because of the difference in interest between the manager and shareholder (Jensen & Meckling, 1976).

Moreover, corporate governance mitigates agency costs (Arping & Sautner, 2010). Additionally, corporate governance ensures to the investors and other interested parties that the agents are able to manage funds to maximize the firm value (Detthamrong et al., 2017).

2.2 Corporate governance

Several countries implemented codes and principles that guide the corporate governance system, in which corporate governance system differences between countries (Kabir et al., 1997). Specifically, it defines a system of law, rules, and factors to monitor the operations at a firm (Gillan & Starks, 1998). Generally, it is a system that provides the responsibility of

directing and controlling the firm. According to John & Senbet (1998), corporate governance functions as a control mechanism, ensuring the efficient execution of business activities on behalf of the firm's shareholders.

As mentioned earlier, corporate governance has an essential role within the firm. Specifically, corporate governance provides a system that controls and direct the firm, dealing with the conflicting interest between managers and shareholders (John & Senbet, 1998). In other words, *"corporate governance mechanisms have been devised to facilitate the control of management and groups of power in the firm and facilitate the achievement of maximisation of firm value."* (Cuervo, 2002, p. 91). So, for interested parties of the firm, *"corporate governance is a framework to build an environment of accountability, trust and transparency."* (Detthamrong et al., 2017, p. 691). This current study implicates which role firm leverage has in the control mechanism of corporate governance.

2.2.1 Corporate governance in the Netherlands

The corporate governance system has undergone various changes to operate more effectively through the years. In 1971, the Dutch company law was enacted after a proposal of the government commission (Verdam Commission) (de Jong et al., 2005). The focus was on self-regulation by monitoring and transparency (de Jong et al., 2005). This law was to provide the shareholders with more control over the firm. It includes a management board and a supervisory board for a shareholder-controlled firm. The tasks of the supervisory board, called co-optation, consists of taking care of the annual accounts' establishment and approval, the election of the supervisory and management boards, and having co-decision right over the management board decisions (de Jong et al., 2005). This way of operating in a two-tier board structure provides the shareholder more control.

The Netherlands implemented the Dutch corporate governance code, also known as the Tabaksblat Code in 2004 (Akkermans et al., 2007). This code is considered and extended on the earlier mentioned corporate governance system. Corporate governance provides guidelines to comply with the interests of shareholders in which the national regulations are inadequate (Akkermans et al., 2007). Specifically, the focus is on functioning by creating transparent information about the financial statement, accountability to the board, and trust for the shareholders. Principles are included to improve the corporate governance system. *"The Tabaksblat Code presents principles and best practice provisions in five areas: (I) compliance with and enforcement of the Code, (II) the management board, (III) the supervisory board, (IV) the shareholders and general meeting of shareholders, and (V) financial reporting."* (Akkermans et al., 2007, p. 1108). Overall, the code is to increase transparency and accountability but also the quality of the management board and the supervisory board taking to a higher level.

The latest updates to the Dutch corporate governance code were implemented in 2008 and 2016. In 2008 the code of best practices was implemented, forming monitoring reports by the monitoring committee (van Beusichem et al., 2016). This update focuses on operations in practice executed by the governance. In 2016 the Dutch corporate governance code was expanded with an internal audit function (Bogtstra et al., 2020). It provides an internal check over the executions of the governance over the long run, in the case of non-compliance an explanation of why they have not complied.

Overall the Dutch corporate governance system has other aspects in comparison with the Anglo-Saxon system of the US and UK. Whereas the Anglo-Saxon system utilizes a one-tier board structure, with the Dutch corporate governance system, the firms can operate with a one-tier or two-tier board system (van Beusichem et al., 2016). In the one-tier board system, the board members consist of executive and non-executive directors (Maassen & van den Bosch, 1999). Further, the two-tier board system consists of a management board and a supervisory board in which the management board consists of the firm managers and the supervisory board consists of independent individuals also called outsiders (van Beusichem et al., 2016). Maassen & van den Bosch (1999) mention the difference between the board systems within a one-tier board non-executive directors are on the same board as the executive directors, while in a two-tier board, these boards are separated. Because of the separation of these boards, the members are not closely working together.

2.3 Ownership structure

Within the internal corporate governance mechanism, the ownership structure is an essential component. The ownership structure of listed firms consists of ownership concentration and ownership identity. In this research, the following ownership characteristics are included; ownership concentration and family ownership.

2.3.1 Ownership concentration

In the literature, studies focused on the influence of ownership structures on the corporate capital structure of firms. Ownership concentration indicates the shares of the firm held by shareholders. In the case that firms have a high ownership concentration, only a few of those shareholders own the majority of all shares, indicating 40% of all the total shares. These shareholders are also referred to as large shareholders of the firm. As mentioned in the introduction, the continental corporate governance system is known for its limited investor protection. The limited investor protections are attractive for large shareholders (la Porta et al., 1999), which causes a higher ownership concentration in the Netherlands compared to the US and UK (Kabir et al., 1997). This means that large shareholders own the firm's shares, causing an agency problem between large and minority shareholders (Kim et al., 2007).

Ownership concentration can monitor the managers and firm operations. According to Kim et al. (2007), in the case ownership concentration is in the power of a few large shareholders, they are able to effectively monitor the managers and firm operations. Large shareholders have relatively more shares in property than the other 'smaller' shareholders. Because large shareholders bear higher risk, they are willing to monitor the managers and not take unnecessary risks in the investment. Concerning the agency theory, debt limits the control of managers over the free cash flow (Jensen, 1986). In other words, the agency conflict that so arises between shareholders and managers can be mitigated by debt. Large shareholders are in the position to insist managers by using leverage.

In the literature, empirical research has investigated the relationship between ownership concentration and firms' leverage. Margaritis and Psillaki (2010) focus on the relationship between ownership concentration and leverage, mentioning the positive effect of ownership concentration on firm leverage with a sample of French manufacturing firms. Generally, firms with higher concentrated ownership also have higher debt in the capital structure. Brailsford et al. (2002) support these findings of a positive influence of ownership concentration and leverage using a sample of Australian firms, indicating that higher ownership concentrations

result in higher firm leverage. Both these researches show that higher ownership concentration is related to more debt. Additionally, King & Santor (2008) also find a positive relation between concentrated ownership and leverage. Furthermore, a positive relation between ownership concentration is found with the argument that managers prefer to avoid losing control of the firm for non-financial Latin American firms (Céspedes et al., 2010). Additionally, Sheikh & Wang (2012) found a statistically positive relationship between ownership concentration and total debt ratio for non-financial listed firms in Pakistan.

Considering different samples, the results of several researchers show that higher ownership concentration leads to higher leverage. However, Detthamrong et al. (2017) found no significant positive result between ownership concentration and the leverage firms for non-financial firms in Thailand over the period of 2001 until 2014. Furthermore, with a sample of 694 Western European countries, a negative relation between ownership concentration and firm leverage is founded (Santos et al., 2014).

Literature shows that higher ownership concentration is likely to have higher leverage. Besides, the agency theory suggests that debt is a tool to mitigate the agency conflict between managers and shareholders. Concerning the agency theory based on previous research and the high ownership concentration of Dutch firms, the expectation is that ownership concentration positively influences firm leverage. Formulated in the following hypothesis:

Hypothesis 1: Ownership concentration has a positive influence on firm leverage.

2.3.2 Family ownership (family share ownership)

The ownership identity is the type of the firm's shareholders (e.g. family ownership). In Western Europe, family-controlled firms are more likely or rather dominating in non-financial firms but also crucial in continental Europe (sample includes the Netherlands) (Faccio & Lang, 2002; Barontini & Caprio, 2006). The statistics Netherlands (CBS) presents that a large proportion of the firms are family firms, generating jobs and revenue (Custers & Vrolijk, 2020). Emerging research is interested in the financing decisions of family-controlled firms and the underlying factors influencing the decisions (Michiels & Molly, 2017).

Some researchers looked into the financing behavior of family-owned firms. Specifically, diving into the financing of family-owned firms suggests that they prefer internal financing over external finance. External finance is not favored in family-owned firms because it reduces control over the firm (Antoniou et al., 2008). However, financing business operations is necessary to continue growing as a firm. These business operations cannot complete being financed by their input. Croci et al. (2011) mention the preferences of family firms for debt over equity financing.

As mentioned earlier in the agency theory, external financing, like debt, is a way to decrease agency costs. Specifically, the amount of debt in a firm can mitigate agency costs, reducing the control of the managers (Jensen, 1986). And so, mitigates the conflict between managers and shareholders (Jensen, 1986). Family-owned firms have unique characteristics. Specifically, family firms are less likely to face agency conflicts because of their close connection with the firm (Pindado et al., 2015; Santos et al., 2014). This connection with the firm is because family owners invest private assets in the firm and therefore have long-term goals to increase firm value (Pindado et al., 2015). Because most family owners' private assets function as collateral, they are risk-averse and try to reduce the risk of bankruptcy.

Regarding family ownership and leverage, the results are mixed. With a sample of 613 Canadian firms from 1998 until 2005, family firms have higher leverage levels than non-family firms (King & Santor, 2008). In line with these results, Croci et al. (2011) show a significant and positive relation between family firms and leverage using 777 large continental European firms in the period 1998 to 2008. They suggest that family firms have lower agency costs of debt compared to non-family firms.

However, other researchers found the opposite effect between family firms and leverage. Santos et al. (2014) mention that family firms have lower firm leverage, compared to non-family firms reducing the risk of bankruptcy. In their research, they consider 12 Western European countries that led to 694 non-financial listed firms over a time period of 2002-2006. Furthermore, in a sample of 660 German listed firms over the time period of 1995-2006, a significant influence is shown that family firms have lower ratios of leverage than non-family firms (Ampenberger et al., 2013). They suggest that family firms have lower agency costs of debt in comparison with non-family firms.

The most common method of financing is with equity or debt. Related to the literature, family firms prefer to finance their business operation with debt over equity. For families, it can be that because of the loss of control with equity financing. They select debt financing as a more favorable option. Based on this, the hypothesis is that family ownership positively impacts the leverage of the firm.

Hypothesis 2: Family ownership has a positive influence on firm leverage.

2.4 Board of directors

The board of directors is a key element within the internal governance mechanism. Since board characteristics have different contributions, efficiency is influenced by the board composition. This research focuses on board characteristics; board size, independence, and gender diversity.

2.4.1 Board size

The board of directors has the feature to carry out a monitoring role for shareholders in which they find difficulties. The board of directors is one of the crucial elements of the governance mechanism. According to Upadhyay et al. (2014), a dependent factor in the efficiency of the corporate board is the board size. Specifically, the effectiveness of the board in their function of monitoring (John & Senbet, 1998; Upadhyay et al., 2014). According to John & Senbet (1998), the board's function of this effectiveness itself is based on the disciplining of the management and CEOs. In general, the size of the board various between 3 and 9 directors. The minimum number of directors is at least 3, while there are no regulations for the maximum number of directors.

Theoretical research has investigated the effect of the firm's board size. Jensen (1986) mentions that firms with larger boards have higher financial leverage compared to firms with smaller boards. Additionally, firms with larger boards appear to use debt financing over equity financing, in which debt mitigates the control of managers (Jensen, 1986). Opposites, Berger et al. (1997) mention that larger boards have lower leverage. The size of the board differs among firms, providing mixed results in their influences.

Additionally, empirical research has been conducted on the size of the board and firm leverage. Board size has a significant positive influence on firm leverage, according to a sample of 1416 non-banking European listed firms (García & Herrero, 2021). In line with this research,

the results of Sheikh & Wang (2012) show a significant positive relation between board size and the total debt ratio and long-term debt ratio, with a sample of non-financial Pakistan-listed firms from 2004-2008. These results indicate that larger boards have higher debt. Wen et al. (2002) found a positive result between board size and leverage in a sample of 60 Chinese firms between 1996 and 1998 having a two-tier board system.

However, other researchers found different results between board size and firm leverage. For example, Detthamrong et al. (2017) found no significant relation between board size on leverage using a sample of non-financial listed firms in Thailand for a period from 2001 to 2014. With a multiple-country sample, board size even shows a negative result with book leverage (Ezeani, Salem, et al., 2022).

Overall, different board members provide knowledge and skills to the board. Related to the theory, a larger size of the board uses more debt in comparison to a smaller size of the board. A larger size of board includes more different directors increasing the capacity for monitoring, but more board members also make communication and decision-making complicated (John & Senbet, 1998). The board has a monitoring and disciplining function over the managers of the firm. As mentioned, debt can be used as a tool to mitigate the control of managers. Specifically, larger boards can use debt as a tool, mitigating the control over managers. The theory and empirical results also found (including the two-tier board system) influence a firm's capital structure. Therefore, hypothesis 3 can be formulated as a positive impact of board size on leverage.

Hypothesis 3: Board size has a positive influence on firm leverage.

2.4.2 Board independence
Within the firm, independent decision-making is essential for business activities. It requires the board of directors to act in the best interest of the firm. As mentioned, the board of directors has a vital role in monitoring and limiting the conflict between managers and shareholders. Agency costs are mitigated by corporate governance due to practices, laws, and regulations (van Beusichem et al., 2016). Board independence is one of the key factors of the corporate board (Upadhyay et al., 2014). The role of board independence can vary in different corporate governance environments.

In the Netherlands, the supervisory board consists of independent board members. These board members are also known as 'outsiders' who cannot directly be linked to the firm. These outsiders (independent board members) are ''professional managers'' and can have been former members of the management board (de Jong et al., 2005; van Beusichem et al., 2016). These outsiders bring external knowledge and expertise to the firm (van Ees et al., 2008). Outsiders use annual reports to monitor the managers' and firms' activities (van Beusichem et al., 2016). Kim et al. (2007) mention that outsiders are objective monitors because they invest their stock in the firm. Additionally, de Jong et al. (2005) mention that outsiders retrieve a fixed payment, and when they have shares in the firm, it involves a small proportion, it mainly revolves around their reputation because of this, the outsiders are risk averse.

Researchers have investigated the relation between board independence and leverage internationally. Berger et al. (1997) show a relation between board independence and leverage with a sample of US firms, finding a positive relation. This result could mean that a higher number of outsiders leads to higher firm leverage in firms. Moreover, other results lack the

significance of this positive relation between board independence and leverage (Detthamrong et al., 2017).

However, researchers also found opposite results regarding the relation between board independence and leverage. For example, Brisker and Wang (2017) find that board independence is negatively related to leverage. This result is in line with the negative relation between the number of outside directors and leverage with a sample of 60 Chinese listed firms from 1996-1998 (Wen et al., 2002). Wen et al. (2002) mention that this result is in line with their hypothesis that a higher number of outside members have lower firm leverage, and managers tend to have lower leverage because of the active monitoring of the outside directors.

Research suggests that because of the easy access of outsiders to external financing. This can be a favorite because the board independence likes this way of finance. Besides, the agency theory mentions that debt is a tool to mitigate the control of managers. Additionally, independent directors are risk-averse. Related to the literature, it can be suggested that board independence has a positive influence on leverage formulated in the following hypothesis.

Hypothesis 4: Board independence has a positive influence on firm leverage.

2.4.3 Board gender diversity

In the literature, different studies examined the influence of board gender diversity on firm characteristics. According to García and Herrero (2021), there is political and regulatory interest in gender diversity, promoting gender equality in corporate boards with legal obligations and voluntary schemes in the European Union. In European countries, a quota has been implemented which provides a percentage of women among members of the board of directors. In the Netherlands, this quota is 30% without sanction in failing to achieve (Isidro & Sobral, 2015). The effect of more gender equality boards can differ, female react with other interests than men in financing operations (García & Herrero, 2021). According to Adams & Ferreira (2009), the role of female directors is substantial and valuable to the board structure.

In the agency theory, debt can be used to mitigate the manager's control but also increases the risk of bankruptcy (Jensen, 1986). Female directors are risk averse and consider other financial decisions compared to male directors (Huang & Kisgen, 2013). Additionally, female directors did not prefer external debt financing. García & Herrero (2021) mention the participation of female directors on the board create less information asymmetry, which increases the external equity in the capital structure, lowering the leverage.

Furthermore, researchers empirically researched the relation between board gender diversity and leverage. García and Herrero (2021) find a negative relation between board gender diversity and firm leverage using a sample of non-banking European firms over the time period of 2002-2019. These results are consistent with the agency theory. Moreover, Ezeani et al. (2022) reached the same effect with a sample of UK, French, and German firms over a period of 2009-2018, finding a negative relationship between board gender diversity and leverage. However, Detthamrong et al. (2017) found no significant relation between female directors and financial leverage, using data from non-financial listed firms in Thailand from 2001 to 2014.

Additionally, related to the agency theory causes board gender diversity for less information asymmetries, influencing the leverage of firms. Related to the literature and empirical findings, it suggests that board gender diversity has a negative influence on firm leverage. Because of these reasons, hypothesis 5 is formulated as follows:

Hypothesis 5: Women directors have a negative influence on firm leverage.

Table 1 - Hypotheses overview

Hypothesis 1	-	Ownership concentration has a positive influence on firm leverage.
Hypothesis 2	-	Family ownership has a positive influence on firm leverage.
Hypothesis 3	-	Board size has a positive influence on firm leverage.
Hypothesis 4	-	Board independence has a positive influence on firm leverage.
Hypothesis 5	-	Women directors have a negative influence on firm leverage.

3. Research method

In this chapter, the regression model and the model specification are described. Next, the measurements of the included dependent, independent, and control variables are linked to the literature and described. At last, the robustness tests are included.

3.1 Regression model

This study contains ownership structure and board of directors related to the financial statements specific to their relation with the firm's leverage. Related to previous research, this study makes use of balanced panel data. Research centered around the corporate governance and capital structure topic uses mainly the Ordinary least square (OLS) regression analysis. Prior research investigates both the ownership structure and the board of directors' relation with capital structure using an OLS regression analysis (Berger et al., 1997; Detthamrong et al., 2017; Granado-Peiró & López-Gracia, 2017; Sheikh & Wang, 2012; Wen et al., 2002). Additionally, in research investigating the relation between ownership structure and capital structure the OLS regression analysis has been applied (Céspedes et al., 2010; Sun et al., 2016). Lastly, the focus on board characteristics on capital structure also applied the OLS regression method (Ezeani, Kwabi, et al., 2022; García & Herrero, 2021).

The OLS regression technique is a commonly used method in corporate governance and capital structure research. It is known to analyze a single independent variable and several dependent variables (Wooldridge et al., 2010). This study applies the OLS regression method to test the developed hypothesis of ownership and board characteristics influencing firms' leverage. It allows the analysis of the different independent variables (corporate governance characteristics) on the dependent variable (firm leverage). Additionally, this study conducts cross-sectional research that fits right with the OLS regression method.

However, in the OLS regression method assumptions needs to be met for a reliable regression model (Wooldridge et al., 2010). Firstly, must the independent variable not be correlated with the error term, also known as exogenous. Secondly, the error terms must not be homoscedastic. Thirdly, there must be no correlation between the error terms. At last, there needs to be a normal distribution of the error terms (Wooldridge et al., 2010).

3.2 Model Specification

The goal of this study is to test the influence of ownership and board characteristics on leverage. Specifically, to examine the effects an OLS regression model will be used. This model examines the effect of the independent variables; ownership concentration, family share ownership, board size, board independence, and board gender diversity. Also, includes this method the control variables; firm size, return on assets tangibility, and sales growth. Therefore, to test hypotheses 1 to 5, the following model is used:

$$LEV_{it} = \beta_0 + \beta_1 (OWN\_CON)_{it} + \beta_2 (FAM\_OWN)_{it} + \beta_3 (B\_SIZE)_{it} + \beta_4 (B\_IND)_{it} + \beta_5 (B\_GEN\_DIV)_{it} + \beta_6 (CONTROL)_{it} + \mu_{it}$$

Where:

$LEV_{it} =$	Leverage of firm i in year t;
$\beta_0 =$	Intercept;
$\beta_1 (OWN\_CON)_{it} =$	Ownership concentration of firm i in year t;
$\beta_2 (FAM\_OWN)_{it} =$	Family ownership of firm i in year t;

β_3 (B_SIZE)$_{it}$ =   Board size of firm i in year t;
β_4 (B_IND)$_{it}$ =   Board independence of firm i in year t;
β_5 (B_GEN_DIV)$_{it}$ = Board gender diversity of firm i in year t;
β_6 (CONTROL)$_{it}$ = Control variables of firm i in year t (F_SIZE, ROA, TANG, GROWTH);
μ_{it} =   Error term of firm i in year t.

3.3 Variable measurement

3.3.1 Dependent variable

As the dependent variable of this research, firm leverage will be studied to test hypotheses 1 to 5. In previous empirical research, there are differences in measuring leverage. For example, Detthamrong et al. (2017) measured the firm's financial leverage as the total debt to total assets ratio. Several researchers also use this measure of leverage in their research (Berger et al., 1997; Croci et al., 2011; Dasilas & Papasyriopoulos, 2015; King & Santor, 2008; Margaritis & Psillaki, 2010; Wen et al., 2002). Specifically, the book value of leverage is used. Furthermore, some studies make a separation in debt and take the measure of long-term debt divided by total assets (Sheikh & Wang, 2012). Other researcher uses the book value and market value of leverage (Berger et al., 1997; King & Santor, 2008).

As mentioned, different measurements of leverage are used in past research. According to de Jong & Veld (2001), book value is considered by managers in their decision-making process. In line with this, Graham & Harvey (2001) adds that market value is more volatile. One of these reasons can be the stock price volatility that influences the market value (de Jong & Veld, 2001). In this research, the firm leverage is measured as book value, taking total debt (long-term plus short-term) divided by the total assets (TD). Additionally, to gain more insight into the variable, the long-term debt by total assets (LTD) and short-term debt divided by total assets (STD) are taken in line with Sheikh & Wang (2012) and Dasilas & Papasyriopoulos (2015). The long-term and short-term debt variables are measured the same as total debt with the book value.

3.3.2 Independent variable

For the effect of corporate governance on leverage, five variables are measured. The included corporate governance variables are ownership concentration, family ownership, board size, board independence, and board gender diversity. These variables are measured individually to test their effects.

Ownership concentration: Ownership concentration is measured as the ratio of shares held by the three largest shareholders (Detthamrong et al., 2017), the five largest shareholders (Sheikh & Wang, 2012), or as categories percentage dummies of the largest shareholders (Santos et al., 2014). In the Netherlands, the three largest shareholders prevail over the ownership concentration (Kabir et al., 1997). In this research, ownership concentration (OWN_CON) is measured as aggregate shares held by the three largest shareholders.

Family share ownership: Over the family ownership research and capital structure, different measures for family ownership are used. This research uses family ownership (FAM_OWN) as measured due to the aggerate percentage of shares held by the family shareholder members. The measurement method of family ownership has also been used by

Poletti-Hughes & Martínez Garcia (2022). Additionally, Ampenberger et al. (2013) mention conditions when there is family ownership, at least one must be fulfilled; at least 25% of the voting right is by the founding family; in the supervisory board is at least one founding family member; or, in the management board is at least one member of the founding family.

Board size: To measure the board size (B_SIZE), the total number of directors on the board will be taken (Berger et al., 1997; Dasilas & Papasyriopoulos, 2015; Detthamrong et al., 2017; Sheikh & Wang, 2012; Wen et al., 2002). Because the Netherlands uses a one-tier or a two-tier board system, the total number of board members is considered. For the total board members by the one-tier board, the executive and non-executive directors are taken, and by the two-tier board the management board, and the supervisory board.

Board independence: Prior research around board independence and capital structure measured board independence as the ratio of independent directors (including outsiders) divided by the total number of board of directors (Berger et al., 1997; Brisker & Wang, 2017; Dasilas & Papasyriopoulos, 2015; Detthamrong et al., 2017). In the case of the Netherlands, Dutch firms operate with a one-tier board system or two-tier board system. At first, when a firm makes use of a one-tier board system, the number of non-executive directors will be taken. Secondly, the firm can use a two-tier board system, in which the supervisory board consists of independent individuals, also called outsiders (van Beusichem et al., 2016). So, the independent directors are non-executive directors or supervisory board members. In this research, board independence (B_IND) is measured by the non-executive directors or the supervisory board members (total independent and outside directors) divided by the total number of board members. Same as with the board size, the total number of the one-tier and two-tier structures are used.

Board gender diversity: Board gender diversity (B_GEN_DIV) is measured as the total number of female directors divided by the total number of directors on the board. Previous research measures board gender diversity as the ratio number of female directors to the total number of directors (Detthamrong et al., 2017; Ezeani, Kwabi, et al., 2022; García & Herrero, 2021). As mentioned by the other two board variables, namely board size and board independence, also for this variable is the total number of female directors consisting of the executive and non-executive or the management board and supervisory board.

3.3.3 Control variable

In the regression model, control variables are included to reach, which factors also influence the leverage of the firm. Previous literature on capital structure has shown the influence of firm characteristics. Specifically, research around the firm leverage includes some relevant control variables (García & Herrero, 2021; Granado-Peiró & López-Gracia, 2017; King & Santor, 2008; Margaritis & Psillaki, 2010; Pindado et al., 2015; Sheikh & Wang, 2012; Sun et al., 2016). Based on this literature, firm characteristics are included as control variables.

Firm size: In this research, the firm size (F_SIZE) is measured as the natural logarithm of the firm's total assets. This measure of the natural log of the firm's size as the control variable, firm size has also been used in previous research (Detthamrong et al., 2017; García & Herrero, 2021; Granado-Peiró & López-Gracia, 2017; Margaritis & Psillaki, 2010; Wen et al., 2002). Because of this, the total assets have been used as a proxy of total assets.

Return on Assets: Return on assets (ROA) functions as an indicator of the profitability of the firm. Literature show mixed measure for the return on assets variable. In this research, return on assets is measured by earnings before interest and taxes (EBIT) divided by total assets. Previous research around leverage has included this measure for the control variable return on assets (Detthamrong et al., 2017; Margaritis & Psillaki, 2010; Wen et al., 2002).

Tangible assets: In the literature, the tangible assets variable (TANG) is measured as fixed assets divided by total assets (Detthamrong et al., 2017; García & Herrero, 2021; Margaritis & Psillaki, 2010; Santos et al., 2014; Sheikh & Wang, 2012; Sun et al., 2016). This research includes the control variable tangible assets measured as fixed assets divided by total assets.

Growth: Sales growth (GROWTH) is measured as the change in sales over a year divided by the sales at the beginning of that year. The sales growth probably causes a rise in the firm's cash flow, influencing the need for external financing (Croci et al., 2011). Therefore, the variable growth is included as a control variable influencing the leverage (Croci et al., 2011; King & Santor, 2008; Sun et al., 2016).

Industry: In prior research, the industry variables have been included in the regression models to control for the possible effects of the industries (Brailsford et al., 2002; King & Santor, 2008; Sun et al., 2016; van Ees et al., 2003). Industry (IND) is likely to influence the firms' leverage and therefore is also included as a control variable in this research. Most prior research has included industry as a dummy variable to control the possible effects of the industries influencing the capital structure of firms (Brailsford et al., 2002; King & Santor, 2008; Sun et al., 2016; van Ees et al., 2003). In line with these researchers, the industry variable is included as a dummy variable related to the NACE Rev. 2 classification. This classification is the same in all European countries. Table 2 presents the allocation of the industry dummies used in the regression analysis.

Table 2 - Measurement variables

Variables		Measurement
Dependent variable		
Total debt	(TD)	Total debt / Total assets
Long-term debt	(LTA)	Long-term debt / Total assets
Short-term debt	(STA)	Short-term debt / Total assets
Independent variables		
Ownership concentration	(OWN_CON)	Aggregate percentage of shares held by the three largest shareholders
Family ownership	(FAM_OWN)	Aggregate percentage of shares held by the family shareholder members
Board size	(B_SIZE)	Total number of board members
Board independence	(B_IND)	Total independent directors / Total board members
Board gender diversity	(B_GEN_DIV)	Total number of female directors / Total board members
Control variables		
Firm size	(F_SIZE)	Log of the firms' total assets
Return on assets	(ROA)	EBIT / Total assets
Tangible assets	(TANG)	Fixed assets / Total assets
Growth	(GROWTH)	Change in sales over a year / Sales at the beginning of that year
Transport, commodities, and trade	(IND_TCT)	Industry dummy for transport, commodities, and trade; value '1' if NACE Rev. 2 code equals agriculture, forestry and fishing, mining and quarrying, wholesale and retail trade; repair of motor vehicles and motorcycles, or transportation and storage, otherwise value '0'.
Manufacturing	(IND_MANU)	Industry dummy for manufacturing; value '1' if NACE Rev. 2 code equals manufacturing, otherwise value '0'.
Construction and real estimate	(IND_CR)	Industry dummy for construction and real estimate; value '1' if NACE Rev. 2 code equals construction or real estate activities, otherwise value '0'.
Others	(IND_OTHERS)	Industry dummy for others; value '1' if NACE Rev. 2 code equals electricity, gas, steam and air conditioning supply, accommodation and food service activities, information and communication, professional, scientific and technical activities, administrative and support service activities, or arts, entertainment and recreation, otherwise value '0'.

3.4 Robustness test

A robustness test is added to this research to increase the reliability and validity of this research. For the first robustness test, lagged variables are used. The independent and control variables lagged by one period. The regression analysis results with the lagged variables are compared with the regression analysis of the non-lagged variables (original data). When the results are in line, the endogeneity problem is in control. Therefore, the following model is conducted for the robustness test:

$$LEV_{it} = \beta_0 + \beta_1 (OWN\_CON)_{it-1} + \beta_2 (FAM\_OWN)_{it-1} + \beta_3 (B\_SIZE)_{it-1} + \beta_4 (B\_IND)_{it-1} + \beta_5 (B\_GEN\_DIV)_{it-1} + \beta_6 (CONTROL)_{it-1} + \mu_{it}$$

Where:

$\beta_0 =$ Intercept;

$\beta_1 (OWN\_CON)_{it} =$ Ownership concentration of firm i in year t-1;

$\beta_2 (FAM\_OWN)_{it} =$ Family ownership of firm i in year t-1;

β_3 (B_SIZE)$_{it}$ = Board size of firm i in year t-1;
β_4 (B_IND)$_{it}$ = Board independence of firm i in year t-1;
β_5 (B_GEN_DIV)$_{it}$ = Board gender diversity of firm i in year t-1;
β_6 (CONTROL)$_{it}$ = Control variables of firm i in year t-1 (F_SIZE, ROA, TANG, GROWTH);
μ_{it} = Error term.

The second robustness test utilizes the subsample robustness test. A subsample is taken from the time period. For the timely subsample, the period from 2017 until 2020 is reduced by one year to 2017 until 2019. The year 2020 is excluded if the pandemic of Covid-19 influences the sample. On March 2020, Covid-19 has been declared a global pandemic with large global economic implications (Padhan & Prabheesh, 2021). The pandemic has had an adverse effect on the human and global economy, with challenges for investors and policymakers (Padhan & Prabheesh, 2021). The regression analysis is conducted with the subsamples for total, long-term, and short-term debt as dependent variables and the independent and control variables. The robustness test results are compared with the original data and discussed in section 5.4.

In line with prior research, the robustness test with lagged variables and a time subsample are included (Brailsford et al., 2002; Ezeani, Kwabi, et al., 2022; Sun et al., 2016). Others also have robustness tests with industry, country, or other measures as the dependent variable (Brailsford et al., 2002; Detthamrong et al., 2017; Ezeani, Kwabi, et al., 2022; Granado-Peiró & López-Gracia, 2017). However, these robustness tests are not included because of the following reasons. Firstly, this research only focuses on a single country sample which makes the robustness test of a country not optional. Secondly, picking a subsample of the industry makes the sample size smaller and possibly provides not comparable results. At last, another measure for the dependent variable is omitted because of time constraints in collecting the missing data.

4. Sample and data

In this chapter, sample size and data collection has been described. Additionally, some variables are explained in more depth and with literature substantiated.

4.1 Sample size

For the hypothesis testing of this research, a sample of Dutch-listed firms is used. The sample period is between 2017 and 2020. The initial sample is taken from the Orbis database, provided by Bureau van Dijk (BVD). The Orbis database provides firm-specific information about firms worldwide. This sample includes listed firms in the Netherlands, with gathered data restricted to the financials, ownership, and board related to the utilized variables. Some of these firms are excluded from the initial sample for the following reasons.

First, related to prior research, financial services firms are excluded from the sample (de Jong & Veld, 2001; Detthamrong et al., 2017; Ezeani, Kwabi, et al., 2022; Granado-Peiró & López-Gracia, 2017). The main reasons are that financial services firms must meet legal regulations and have more volatility in their leverage because of the operating activities, which lead to different financial structures. For this reason, the financial services firms with a NACE codes 64, 65, and 66 are excluded from the sample. Secondly, firms with missing or negative financial data are excluded from the sample. Specifically, these are firms with missing financial data that cannot be retrieved from their annual reports. Besides, firms with negative equity are generally close to bankruptcy and were therefore omitted from the sample.

In the Netherlands, there are some commonly known classes of shares, namely ordinary shares, priority shares, and preferred shares. Firstly, ordinary shares are also referred to as common shares. With ordinary shares, the shareholder has a part of ownership over the firm, providing voting, dividend, and trading right (de Jong et al., 2005). Second, the priority shares provide the shareholder with a stronger influence on their voting right (de Jong et al., 2005; van Beusichem et al., 2016). Specifically, it provides the shareholder with a special voting right in the case of mergers, company liquidation, or additional capital financing (de Jong et al., 2005; van Beusichem et al., 2016). Lastly, preferred shares can be divided into preferred shares and protective preferred shares. The preferred shares give the shareholder preference for dividend payments over the ordinary shareholders (van Beusichem et al., 2016). Next, protective preferred shares give a protection form to the shareholder during a hostile takeover issued by the management of the firm (de Jong et al., 2005; van Beusichem et al., 2016).

The preferred and priority shares are issued in special situations such as takeovers. As mentioned by (Kabir et al., 1997), priority shares have more voting power than ordinary shares with a smaller number of shares. Additionally, the preferred share has the same voting power as ordinary shares. The management of the firm includes these preferred shares when needed (Kabir et al., 1997). Priority shares are a small number of shares (de Jong, 2002), which are used for special situations most for some time (van Ees et al., 2003). For these reasons and in line with prior research, the ordinary/common shares are used to collect the data for the variables (Brailsford et al., 2002; Ezeani, Kwabi, et al., 2022; Sun et al., 2016).

4.2 Data collection

As mentioned earlier, the firm's financial, ownership, board, and control variables data were generated from the Orbis database. Moreover, missing data on firm financials, ownership, board structure, and control variables are hand-collected from the firm's annual reports. The initial

sample started with 386 Dutch-listed firms. After excluding the financial services firms and firms with missing or negative financial data, 109 firms remained.

Furthermore, Orbis provided extensive ownership and board structure data over the firms. Orbis provides a threshold of 1% ownership data. However, most annual reports report ownership data until 3%. Next to the annual reports, other data sources are used to generate data (e.g. the Netherlands Authority for the Financial Markets (AFM), SEC filings) reporting ownership data until 1%. Consistent with these data sources, this research uses ownership data until 1%. Overall the mentioned data sources are used to verify the Orbis ownership data and gather missing ownership data.

Additionally, a distinction is made in Orbis for the different types of shareholders to indicate the classification of ownership structure (e.g. corporate, bank, hedge fund, etc.). The ownership type of one or more named individuals or families is used to indicate if the shareholder is a family member. However, this ownership type cannot be divided into individuals and families, knowing that not all individuals are family members. Additionally, family ownership is checked in the annual reports if one of the mentioned conditions, as described in the variable measurement section, for family ownership is fulfilled.

In addition to the directly collected data, the family ownership variable is checked, or other shareholder types are owned by one of the family members. In the case of Heineken N.V., the shareholder Heineken Holding N.V. owns more than 50% of the shares. The ultimate control over Heineken Holding N.V. is by a member of the Heineken family. However, it is determined as shareholder type Corporate. In this case, the shares are indirectly owned by the family. There is considered if there were more shareholders by firms generated with other shareholder types but owned by a family member. When this situation occurred, this amount of shareholder types was included in the family ownership variable, and so were those percentages of shares part of the family ownership. For this reason, a more in-depth look has gone at the family ownership variable.

In short, the family ownership variable consists of a combined data collection. Consisting of a combination of data, with first data directly retrieved from Orbis and second a hand-collected check if a family member owned other shareholder types. This method leads to 208 firm observations with family ownership out of 400 firm observations. For the remaining 192 firm observations, no family ownership is noted. In this situation, it is highly plausible that there is no family ownership, and the percentage of shares held by the family is 0%. To maintain the 400 firm observations during the regression analyses, the choice is made to apply an owning share percentage of zero for these observations.

Table 3 below shows an overview of the number of firms through the process of steps for the data collection. It shows the number of firms excluded from the initial sample because of the before mentioned reasons. Besides, the final sample is divided into the classifications (NACE Rev. 2, core code) allocated by the Orbis database presented in appendix A, table 9. This industry distribution is used for industry dummies.

Table 3 - Sample size

Steps		Number of firms
Initial sample of Dutch-listed firms		386
Financial services firms	(170)	216
Missing/ negative financial data	(107)	109
Missing ownership/ board data	(9)	100
Final sample		100
Number of observations		(100*4) 400

5. Results

This section consists of descriptive statistics, a correlation matrix, regression analysis results, and robustness tests. With the results of the regression analyses, the hypotheses are tested and discussed. As mentioned, an OLS regression analysis method is used with the program SPSS in this research.

5.1 Descriptive statistics

Table 4 shows the statistics summary of all the variables used in this research from the sample of 400 firm observations over the time period 2017-2020. The descriptive statistic table shows that the dependent variable total debt (TD) has a mean value of 55%. For example, with a sample of Pakistan firms, the mean value of total debt is 59.62% (Sheikh & Wang, 2012). Additionally, Wen et al. (2002) present a mean value of 44.57%, and Dasilas & Papasyriopoulos (2015) have a mean value of 56%. For the Dutch listed sample mean value of TD at 61.59% is shown by van Ees et al. (2003). These values are in line with the mean value of total debt that is found for the sample of Dutch-listed firms. Both values related to long-term debt (LTD) and short-term debt (STD) are checked and in line with the results of prior research (Arping & Sautner, 2010; Dasilas & Papasyriopoulos, 2015).

The results in table 4 show a mean value for ownership concentration (OWN_CON) of 42%. Prior research by Detthamrong et al. (2017) and Kabir et al. (1997) show a mean value of 56.73% and 45.1% for ownership concentration. The results of this research are close to those of Kabir et al. (1997) using a sample of Dutch-listed firms.

The family ownership (FAM_OWN) mean value is 14%. This mean value for family ownership is lower than the mean values of prior research. These mean values are 37.71% for a sample of Germany-listed firms (Poletti-Hughes & Martínez Garcia, 2022). Additionally, a mean value of 31% from a Latin American countries sample (Ampenberger et al., 2013). It can be that fewer shares are owned by the family themselves in the Netherlands.

The mean value of the board size (B_SIZE) consists of 8 board members. Other researches show a mean value of 9 or 10 for board size (Detthamrong et al., 2017; Sheikh & Wang, 2012; Wen et al., 2002). As mentioned earlier, the board size has a minimum of 3 board members related to regulations which can also be reflected in the table. The table also presents a maximum of 16 board members for Dutch-listed firms.

The board independence (B_IND) presents a mean value of 67%. This can indicate that most boards have outside directors. With a minimum of 0%, there are boards with no outsiders, and at a maximum of 100%, there are also boards consisting entirely of outsiders. Related to other research, results show 36%, 53.9%, and 79.5% mean values for board independence (Berger et al., 1997; Brisker & Wang, 2017; Detthamrong et al., 2017).

The results for board gender diversity (B_GEN_DIV) show a mean value of 20%. Both research of Detthamrong et al. (2017) and García & Herrero (2021) present a mean value of 17% for board gender diversity. Additionally, variations between 11.0% and 15.4% of mean values for board gender diversity are shown for a three-country sample (Ezeani, Kwabi, et al., 2022). These results possibly indicate that the Netherlands is more active in presenting female directors on the board compared to other countries.

Table 4 - descriptive statistics						Percentiles		N
Variables	Mean	Median	Std. Deviation	Minimum	Maximum	Q1	Q3	Valid
(TD)	.55	.56	.21	.02	1.07	.43	.70	400
(LTD)	.28	.26	.18	.00	.91	.12	.40	400
(STD)	.27	.25	.17	.01	.73	.14	.38	400
(OWN_CON)	.42	.37	.21	.09	.95	.25	.57	400
(FAM_OWN)	.14	.00	.24	.00	.93	.00	.16	400
(B_SIZE)	8.02	8.00	2.70	3	16	6.00	10.00	400
(B_IND)	.67	.67	.15	.00	1.00	.60	.75	400
(B_GEN_DIV)	.20	.20	.13	.00	.75	.13	.29	400
(ln F_SIZE) in thousands	7916615.32	1112082.93	19880839.35	203.70	135097497.37	196071.14	5245672.15	400
(ROA)	.01	.05	.16	-1.41	.28	-.01	.08	400
(TANG)	.57	.59	.24	.00	1.00	.45	.73	400
(GROWTH)	0.19	.05	0.96	-1.91	10.27	-.04	.18	400

Note: This table shows the descriptive statistics of the data (number of firms 100, firm-years 400). The variable measures are presented in table 2.

5.2 Correlation analyses

Table 5 presents the Pearson correlation coefficient (correlation matrix) for the sample of Dutch-listed firms from 2017 until 2020. The Pearson correlation matrix is included to test the bivariate analyses. The ranges in values for the correlation coefficient are from -1 until +1, indicating the strength of the relation between the variables. If the coefficients are statistically significant, a value below 0 indicates that there is a negative relation between the variables. A positive value implies a positive relation between the variables. Additionally, the VIF values are presented to check the multicollinearity. The multicollinearity is tested to check if independent variables are highly correlated with each other, causing an incorrect conclusion about the result.

Table 5 presents a correlation between the different measurements of the dependent variable. The variable's total debt and long-term debt show a correlation of (0.656), and short-term debt provides a correlation of (0.542). Both variables have a strong significant positive relation. These results are in line with the expectation because long-term and short-term debt are used to measure the total debt variable. In both cases, long-term debt and short-term debt indicate that an increase in these variables leads to an increase in total debt. Besides, these correlations are in line with prior research (Dasilas & Papasyriopoulos, 2015; Sheikh & Wang, 2012). Additionally, there is a significant negative correlation between long-term debt and short-term debt of (-0.279), which is in line with Dasilas & Papasyriopoulos (2015) founding a significant negative correlation between those two variables.

The dependent and independent variables show some correlations that will be covered. Total debt and board size show a correlation of (0.211). Next, total debt and board gender diversity show a correlation of (0.152), both a significant positive correlation. While family ownership shows a significant negative correlation (-0.165) with total debt. Furthermore, ownership concentration (-0.071) and board independence (-0.021) showed a non-significant negative correlation with total debt. In other words, a larger board size or higher percentage of female directors indicates an increase in total debt, while a higher percentage of ownership concentration, family ownership, and board independence declines total debt. Additionally,

some control variable shows a correlation. The control variables, firm size (0.266), return on assets (0.135), and tangibility (0.187), showed a significant positive correlation with total debt. The control variable, growth (-0.071) shows a negative correlation with total debt. However, the correlation is non-significant.

Moreover, the table shows that there is a significant negative correlation between long-term debt and family ownership (-0.215). This indicates that a higher percentage of family ownership decreases long-term debt. Whereas, the correlation between board size (0.313) and board gender diversity (0.177) with long-term debt presents a significant positive correlation. The same as with the total debt variable, the long-term debt correlation with ownership concentration and board independence shows non-significant correlations. In which ownership concentration has a negative value of (-0.089) and board independence has a positive value of (0.016). In comparison with total debt, the control variables have a significant positive correlation with long-term debt. With a coefficient for firm size (0.203), return of assets (0.111), and tangibility (0.461) correlation with long-term debt. However, the control variable growth (-0.038) has a non-significant negative correlation with long-term debt.

Related to short-term debt, none of the variable ownership concentration, family ownership, board size, board independence, or board gender diversity shows a significant result. Ownership concentration and family ownership show a positive correlation with short-term debt, indicating that a higher percentage of shares owned by the three largest shareholders or family members increases short-term debt. Related to the board of directors, these variables show a negative correlation. In other words, a larger board size or higher percentage of outside directors or female directors on the board causes a decline in short-term debt. Overall, some values have a non-significant result, which might be explained because these values have a low coefficient close to zero.

Another remarkable correlation is between ownership concentration and family ownership, with a significant positive correlation (0.445). This relatively high significant correlation can indicate multicollinearity between the two independent variables. Regarding the other independent variables, there are no correlations indicating multicollinearity. For this reason, the variables are tested on multicollinearity.

Finally, the VIF values are included in the table. As mentioned earlier, the VIF test is included to check if there is no multicollinearity of the variables. VIF values with a value higher than 10 indicate multicollinearity, which might be causing unreliable results. In this research, the lowest VIF value is 1.027, where the highest value provided is 1.624, which is not close to 10. So, the multicollinearity assumption is met, indicating multicollinearity is not a problem in this study.

Table 5 - Correlation matrix

		1	2	3	4	5	6	7	8	9	10	11	12	VIF
1	(TD)	1												
2	(LTA)	.656**	1											
3	(STA)	.542**	-.279**	1										
4	(OWN_CON)	-.071	-.089	.009	1									1.624
5	(FAM_OWN)	-.165**	-.215**	.030	.455**	1								1.367
6	(B_SIZE)	.211**	.313**	-.081	-.333**	-.288**	1							1.525
7	(B_IND)	-.021	.016	-.045	-.286**	-.113*	.235**	1						1.280
8	(B_GEN_DIV)	.152**	.177**	-.003	-.186**	-.134**	.243**	.173**	1					1.202
9	(F_SIZE)	.266**	.203**	.112*	-.127*	-.089	.441**	.279**	.206**	1				1.384
10	(ROA)	.135**	.111*	.047	-.029	-.208**	.219**	-.018	.201**	.115*	1			1.338
11	(TANG)	.187**	.461**	-.276**	.115*	.021	.161**	-.163**	.218**	.084	.324**	1		1.390
12	(GROWTH)	-.071	-.038	-.048	-.009	.053	-.026	-.053	-.094	-.055	-.087	-.079	1	1.027

Note: in this table the correlation matrix is presented. *** significance level at 1%, ** significance level at 5%, * significant level at 10%. The dependent variable is TD. The independent variables are OWN_CON, FAM_OWN, B_SIZE, B_IND, and B_GEN_DIV. Control variables are F_SIZE, ROA, TANG, GROWTH.

5.3 Regression analysis

A regression analysis has been conducted to test the hypotheses and answer the research question. Tables 6, 7, and 8 present the regression analysis results in which the unstandardized coefficients of the explanatory variables are included. The regression analyses are carried out with the dependent variable total, long-term, and short-term debt. At first, column 1 to 5 shows the individual testing results of the independent ownership and board variables. Second, columns 6 and 7 present the separated results of ownership concentration and family ownership together with the other independent and control variables. In the column of model 1, all the independent variables are included in the regression analysis. The results in de columns show a few value differences between the single independent variables and all the independent variables.

Additionally, the F-statistic and the adjusted R^2 are included in the table. The F-statistic tests if the regression model is a good fit for the data. And so, if the independent variables explain the model better than a model without the independent variables. The models have a strong significance level of 1% for the F-values over all the tables. This value indicates that the independent variables fit the data of this research. Furthermore, the adjusted R^2 is included for the designation of the dependent variables' proportion of variance explained by the independent and control variables.

The models have all included the industry dummies and control variables. These variables are included because there is a high probability that the variables affect firm leverage. Industry dummies are included to control the influence of industries on leverage. As well as the control variables to take control over their impact. The control variables are firm size, return on assets, tangibility, and growth. While running the regression analyses, there is checked for meeting the assumptions of this regression previously mentioned in the third section.

5.3.1 Influence of governance characteristics on leverage (total debt)

Model 1, presented in table 6, shows the regression analysis results with total debt as the dependent variable. Both family ownership and board independence results show a significant negative correlation. The higher percentage of family share ownership leads to a decline in firm leverage, a 10.4% (-0.104*) decrease in total debt for each 1% increase of shares owned by family members. Furthermore, board independence's higher share percentages indicate a decline in firm leverage for every 1% increase of owned shares by outsider directors, a decrease of 16.6% (-0.166*) in total debt. Although, these results are not both in line with prior research. For board independence, Sheikh & Wang (2012) found a significant positive coefficient with firm leverage. Whereas, Dasilas & Papasyriopoulos (2015) found the same negative results but non-significant. Wen et al. (2002) found a significant negative result, explaining that more outside directors as board members effectively monitor the management. Therefore, leverage is not necessarily needed for this. Next, for family share ownership, Poletti-Hughes & Martínez Garcia (2022) found a significant negative result on firm leverage which is in line with the mentioned result. Ampenberger et al. (2013) mention that family ownership did not prefer leverage.

Furthermore, the results present that ownership concentration has a negative correlation, and board size and board gender diversity have a positive correlation with leverage. For ownership concentration, the coefficient estimate would mean that a higher percentage of shares held by the three largest shareholders has a negative influence and leads to a decline in leverage.

In other words, if the three largest shareholders own a higher percentage of shares, they have less of a tendency to attract debt capital. Opposite, board size has a positive estimated coefficient on firm leverage, indicating that firms with larger board sizes have higher debt capital. The same as for board size shows board gender diversity has a positive coefficient on firm leverage. Firms that increase the number of women directors on their boards indicate an increase in debt capital. However, the coefficients are not statistically significant for none of the independent variables; ownership concentration, board size, and board gender diversity. Because of this, the results cannot provide a valid conclusion. Detthamrong et al. (2017) found the same non-significant results regarding ownership concentration, board size, and board gender diversity. Furthermore, the board gender diversity result is contrary to the significant positive results by García & Herrero (2021).

Alongside the independent variables are the control variables included in the regression analysis. The firm size and tangibility results are as expected, with a significant positive coefficient, indicating that larger sizes of firms have higher leverage and more debt capital. The same for a firm with higher tangible assets who have a higher ratio of total debt. Moreover, return on assets shows a positive influence and growth a negative correlation, both results were non-significant. These results are comparable with Dasilas & Papasyriopoulos (2015) and also show a significant positive result for firm size and tangibility. Other than expected, the return on assets and growth did not show significant results.

As mentioned with the adjusted R^2, there is an indication of how much the dependent variable explains by the independent and control variables. Table 6, model 1 shows an adjusted R^2 of 0.140 (14%), indicating that 14% of the total debt explains by the independent and control variables. The model shows the highest adjusted R^2 of the table because the other columns only include one independent variable. Other researchers like Dasilas & Papasyriopoulos (2015) found an adjusted R^2 of 0.351 (35.1%) or even Sheikh & Wang (2012) an adjusted R^2 of 0.571 (57.1%). The adjusted R^2 is relatively low, meaning that other variables influence the dependent variable not included in this research.

Regarding the empirical results mentioned above, hypotheses 1 to 5 are not supported. The results indicate related to the agency theory that the corporate governance characteristics of ownership concentration, family ownership, board size, board independence, and board gender diversity on leverage do not hold for the Dutch-listed firms. For the ownership structure variable, this means the following hypothesis 1 stated that ownership concentration has a positive influence on firm leverage. However, the statistical results show a non-significant negative correlation. Therefore, hypothesis 1 is not supported. Furthermore, hypothesis 2 has to be rejected as the results show a significant negative correlation for family ownership while expecting a positive correlation. So, the results do not support hypothesis 2.

In response to the board of directors developed hypotheses, hypothesis 3 stated that board size has a positive influence on firm leverage. The statistical results show a non-significant positive coefficient not supporting hypothesis 3. Hypothesis 4 is related to board independence. Regarding the statistical test result, hypothesis 4 has to be rejected, with a significant negative, while expecting a positive test result. Lastly, hypothesis 5 stated that board gender diversity negatively influences the firm leverage. The statistical test results in a non-significant positive correlation, not supporting hypothesis 5. To conclude, all the hypotheses

related to the agency theory on corporate governance characteristics and capital structure are not supported.

As mentioned earlier in the correlation matrix section, there is a relatively high correlation between ownership concentration and family ownership. Next to the VIF test, columns 6 and 7 are presented to check the multicollinearity between these variables. As the results present, ownership concentration remains non-significant and family ownership significant, which indicates no multicollinearity. Because of this, the findings can be interpreted as the influence of corporate governance characteristics on capital structure.

Table 6 - Results of regression analysis influence ownership structure/ board of directors on capital structure (total debt)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Model 1
Intercept	0.463***	0.440***	0.382***	0.508***	0.412***	0.544***	0.504***	0.540***
	(14.001)	(14.993)	(9.125)	(8.541)	(12.954)	(7.389)	(7.856)	(7.363)
(OWN_CON)	-0.111*					-0.112		-0.061
	(-2.193)					(-1.988)		(-1.014)
(FAM_OWN)		-0.134**					-0.124**	-0.104*
		(-3.099)					(-2.771)	(-2.141)
(B_SIZE)			0.007			0.004	0.004	0.003
			(1.586)			(0.940)	(0.929)	(0.670)
(B_IND)				-0.107		-0.174*	-0.151*	-0.166*
				(-1.517)		(-2.372)	(-2.112)	(-2.269)
(B_GEN_DIV)					0.115	(0.108)	0.112	0.104
					(1.470)	(1.341)	(1.414)	(1.308)
(ln F_SIZE)	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(4.891)	(5.000)	(4.035)	(5.391)	(4.872)	(4.424)	(4.438)	(4.498)
(ROA)	0.072	0.035	0.064	0.077	0.068	0.049	0.015	0.020
	(1.040)	(0.492)	(0.911)	(1.100)	(0.968)	(0.693)	(0.209)	(0.287)
(TANG)	0.172***	0.168***	0.147**	0.137**	0.141**	0.135**	0.133**	0.141**
	(3.707)	(3.695)	(3.207)	(2.930)	(3.052)	(2.793)	(2.790)	(2.922)
(GROWTH)	-0.010	-0.008	-0.010	-0.010	-0.008	-0.010	-0.008	-0.009
	(-0.922)	(-0.783)	(-0.921)	(-0.953)	(-0.779)	(-0.966)	(-0.814)	(-0.860)
Industry	Included	Included	Included	Included	Included	Included	Included	Included
Adjusted R^2	0.117	0.127	0.112	0.111	0.111	0.127	0.135	0.140
F-statistic	7.588***	8.271***	7.261***	7.230***	7.210***	6.261***	6.642***	6.175***
Observations	400	400	400	400	400	400	400	400

Note in this table results of the regression analyses of total debt on ownership structure, board of directors, and firm-specific control variables are presented. With the total debt as dependent variable. The independent variables are OWN_CON, FAM_OWN, B_SIZE, B_IND, and B_GEN_DIV. The unstandardized coefficient is shown with the approprate significance level, *** significance level at 1%, ** significance level at 5%, * significant level at 10%. The values between the parenthesis are the T-values.

5.3.2 Influence of governance characteristics on leverage (long-term debt)

As mentioned, total debt can be divided into long-term and short-term debt. This section presents the regression analysis results with the dependent variables of long-term debt. Model 1 of table 7 shows the regression analysis results with the independent (ownership concentration, family ownership, board size, board independence, board gender diversity) and control variables concerning long-term debt.

Model 1 presents the results of ownership concentration and family ownership showing a negative correlation with long-term debt. The ownership concentration result indicates a higher percentage of shares held by the three largest shareholders declines long-term debt. In other words, the three largest shareholders owning more shares are less likely to attract long-term debt. Also, a higher percentage of shares ownership by family members will result in a decline in long-term debt. The significant result indicates that with a 1% increase in owned shares by the family, long-term debt decreased by 15.1% (-0.151***). However, ownership concentration shows a non-significant result leaving no conclusion can be given about this result. Related to prior research Sheikh & Wang (2012) found a positive but non-significant result for ownership concentration. Prior research on family ownership found also a significant negative influence on firm leverage (Poletti-Hughes & Martínez Garcia, 2022).

Additionally, the board of directors' variables provides a positive correlation with long-term debt. Board size shows a significant positive correlation with long-term debt, indicating that larger board sizes have increased long-term debt. An increase of one board member shows an increase of 1.1% (0.011**) in long-term debt. Likewise, the results of Dasilas & Papasyriopoulos (2015) and Sheikh & Wang (2012) show a significant positive correlation between board size to long-term debt. While board independence and board gender diversity also provide positive results do not provide a significant result. It could have indicated that a higher percentage of outside directors or female directors increases the long-term debt and so firm leverage. Other research also found a positive but non-significant result for board independence (Dasilas & Papasyriopoulos, 2015; Sheikh & Wang, 2012). In order of the board gender diversity variable, the result is inconsistent with the results of García & Herrero (2021) shows a significant negative influence.

Next to the independent variables, the control variables were included. The results show that firm size, tangibility, and growth have a positive influence on long-term debt, whereas the return on assets shows a negative influence. However, only return on assets and tangibility show a significant influence. In other words, a higher EBIT leads to declines in long-term debt for return on assets and higher fixed assets increase long-term debt for tangibility. Other than expected shows firm size and growth have a non-significant influence.

This model 1 shows an adjusted R^2 of 0.319 (31.9%), indicating that 31.9% of the dependent variable long-term debt is explained by the independent and control variables. In columns 1 to 5, single independent variables are used, which explains the lower adjusted R^2. Prior research by Dasilas & Papasyriopoulos (2015) found a comparable adjusted R^2 of 30.3%, while Sheikh & Wang (2012) show an adjusted R^2 of 53.4%. As already mentioned by the adjusted R^2 of the total debt regression analysis, it can be that other variables influence the dependent variable long-term debt not included in this research.

Related to the hypotheses, the regression analysis with long-term debt does not support all of the hypotheses. First, hypothesis 1 is not supported by these results and expects ownership concentration to have a positive influence on firm leverage, resulting in a non-significant negative result. Second, the result for hypothesis 2 shows a strong-significant negative correlation were expecting a positive correlation. This result rejects hypothesis 2. Third, hypothesis 3 expects that board size has a positive influence on firm leverage. This result is the outcome of the regression model, in which board size has a significant positive correlation with firm leverage causing not to reject hypothesis 3. Lastly, hypotheses 4 and 5 are not supported by the regression model results. For hypothesis 4, board independence results are positive as expected but non-significant. Whereas hypothesis 5, board gender diversity shows a non-significant positive result expecting a negative result.

Overall, the regression analysis with long-term debt as a dependent variable supports the board size hypothesis 3. In other words, if the long-term debt variable is included as firm leverage, the board size hypothesis becomes true as expected. For the other hypotheses, the model found no support related to the results.

As mentioned in the total debt paragraph, columns 6 and 7 are included to check the multicollinearity between ownership concentration and family ownership. By using the VIF test, multicollinearity was initially not a problem. However, column 6 shows a significant negative correlation between ownership concentration and long-term debt, which indicate multicollinearity. For this reason, long-term debt as a dependent variable can no statement be made on the findings.

Table 7 - Results of regression analysis influence ownership structure/ board of directors on capital structure (long-term debt)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Model 1
Intercept	0.095***	0.063**	-0.065*	-0.004	0.035	-0.016	-0.039	-0.023
	(3.632)	(2.736)	(-1.985)	(-0.077)	(1.363)	(-0.102)	(-0.787)	(-0.397)
(OWN_CON)	-0.157***					-0.115*		-0.028
	(-3.915)					(-2.336)		(-0.599)
(FAM_OWN)		-0.193***					-0.160***	-0.151***
		(-5.713)					(-4.619)	(-3.999)
(B_SIZE)			0.016***			0.013***	0.012***	0.011**
			(4.834)			(3.670)	(3.446)	(3.213)
(B_IND)				0.071		0.000	0.019	0.012
				(1.238)		(0.008)	(0.339)	(0.215)
(B_GEN_DIV)					0.085	0.021	0.020	0.016
					(1.339)	(0.329)	(0.322)	(0.262)
(ln F_SIZE)	0.001**	0.001***	0.001	0.001**	0.001***	0.001	0.001	0.001
	(3.235)	(3.412)	(1.396)	(3.158)	(3.405)	(1.419)	(1.512)	(1.549)
(ROA)	-0.088	-0.142*	-0.114*	-0.077	-0.086	-0.115*	-0.159**	-0.156*
	(-1.591)	(-2.578)	(-2.072)	(-1.367)	(-1.532)	(-2.092)	(-2.895)	(-2.837)
(TANG)	0.414***	0.409***	0.373***	0.395***	0.377***	0.392***	0.397***	0.401***
	(11.237)	(11.489)	(10.413)	(10.511)	(10.150)	(10.306)	(10.775)	(10.712)
(GROWTH)	-0.001	0.002	-0.001	0.000	0.001	-0.001	0.001	0.001
	(-0.077)	(0.186)	(-0.127)	(0.044)	(0.079)	(-0.123)	(0.108)	(0.080)
Industry	Included	Included	Included	Included	Included	Included	Included	Included
Adjusted R^2	0.273	0.302	0.287	0.247	0.247	0.292	0.320	0.319
F-statistic	19.687***	22.608***	21.044***	17.360***	17.404***	15.987***	18.055***	16.553***
Observations	400	400	400	400	400	400	400	400

Note in this table results of the regression analyses of long-term debt on ownership structure, board of directors, and firm-specific control variables are presented. With the long-term debt as dependent variable. The independent variables are OWN_CON, FAM_OWN, B_SIZE, B_IND, and B_GEN_DIV. The unstandardized coefficient is shown with the appropriate significance level, *** significance level at 1%, ** significance level at 5%, * significant level at 10%. The values between the parenthesis are the T-values.

5.3.3 Influence of governance characteristics on leverage (short-term debt)

In addition to including long-term debt, the results of short-term debt were also examined related to the independent and control variables. Table 8 shows the results of this regression analysis. Model 1 provides the regression analysis results with all independent (ownership concentration, family ownership, board size, board independence, and board gender diversity) and control variables to short-term debt as the dependent variable.

Model 1 results that ownership concentration has a negative correlation with short-term debt, meaning that when the three largest shareholders own a higher percentage of shares, short-term debt declines. Additionally, family ownership shows a positive correlation, indicating that when family members own a higher percentage of shares increases the firm's short-term debt. However, both results are non-significant. Croci et al. (2011) mention a significant positive result with short-term debt, while this research did not present the result.

Next, the board variable's results are highlighted. The regression model result shows a significant negative correlation between board size on short-term debt. This indicates that larger board sizes decline the short-term debt ratio. In other terms, with an increase of one board member, short-term debt decreases by 0.8% (-0.008*). Similarly, board independence results from a negative correlation with short-term debt, indicating a higher percentage of outsiders on the board declines in the short-term debt. Every 1% increase of owned shares by outsiders leads to a decrease of 17,8% (-0.178**) in short-term debt.

In line with prior research, Dasilas & Papasyriopoulos (2015) found the same significant negative result for board size explaining that larger boards insist on lower leverage by the management, while the board independence result is negative but non-significant. It can be that the negative results for board independence can be explained by Wen et al. (2002) that outside directors are effective monitors. The board gender diversity variable results in a non-significant positive correlation, which indicate that a higher percentage of female directors on the board increases the short-term debt. García & Herrero (2021) found a result that board diversity encourages the firm use of short-term debt. However, the analyses did not show this result.

The control variable firm size, return on assets, and tangibility shows as expected a significant correlation with short-term debt. Wherein firm size and return on assets show a positive correlation. Results indicate that in larger firm sizes and for return on assets a higher ratio of EBIT increases the short-term debt ratio. While tangibility shows that a higher fixed assets ratio declines short-term debt. Related to the prior models show growth with a non-significant negative correlation.

The regression analysis with short-term debt as the dependent variable and all independent and control variables shows an adjusted R2 of 0.141 (14.1%). This result indicates that 14.1% of the short-term debt variable can be explained by the included independent and control variables. The columns with the single independent variable have a lower adjusted R2 because only one out of the five independent variables are included. Dasilas & Papasyriopoulos (2015) show an adjusted R^2 of 24.6% of the short-term debt model. This lower adjusted R^2 indicates that other not included variables influence the short-term debt variable.

The regression model results show not all the developed hypotheses are supported. Whereas expecting a positive correlation for ownership concentration on short-term debt, results show a non-significant negative correlation. Hypothesis 2 is not supported and did not

find any support. The result for family ownership is positive as expected but non-significant. Hypotheses 3 and 4 have expected a positive influence on board size and board independence. However, these results are significantly negatively related to short-term debt. Hence, hypotheses 3 and 4 are rejected based on these results. For hypothesis 5, board gender diversity is not supported while expected a negative result, a non-significant result is presented.

Alongside the other dependent variable, columns 6 and 7 are included to check the multicollinearity. The results show no multicollinearity problem which was also established by the VIF test. For this reason, the results can be considered related to the impact of corporate governance characteristics on the firm's capital structure.

Table 8 - Results of regression analysis influence ownership structure/ board of directors on capital structure (short-term debt)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Model 1
Intercept	0.368***	0.377***	0.448***	0.512***	0.377***	0.561***	0.543***	0.562***
	(14.086)	(16.222)	(13.690)	(11.063)	(15.054)	(9.763)	(10.822)	(9.799)
(OWN_CON)	0.046					-0.010		-0.022
	(1.160)					(-0.232)		(-0.702)
(FAM_OWN)		0.059					0.036	0.047
		(1.731)					(1.039)	(1.231)
(B_SIZE)			-0.009**			-0.009*	-0.008*	-0.008*
			(-2.825)			(-2.502)	(3.035)	(-2.330)
(B_IND)				-0.178**		-0.174**	-0.170**	-0.178**
				(-3.233)		(-3.050)	(-3.035)	(-3.112)
(B_GEN_DIV)					0.031	0.087	0.093	0.088
					(0.498)	(1.388)	(1.488)	(1.411)
(ln F_SIZE)	0.001**	0.001**	0.001***	0.001***	0.001**	0.001***	0.001***	0.001***
	(2.942)	(2.941)	(3.769)	(3.662)	(2.704)	(4.240)	(4.174)	(4.210)
(ROA)	0.160**	0.177**	0.178**	0.153**	0.154**	0.164**	0.174**	0.177**
	(2.919)	(3.168)	(3.249)	(2.831)	(2.796)	(3.002)	(3.138)	(3.181)
(TANG)	-0.242***	-0.251***	-0.227***	-0.258***	-0.236***	-0.257***	-0.264***	-0.260***
	(-6.612)	(-6.684)	(-6.356)	(-7.120)	(-6.500)	(-6.830)	(-7.120)	(-6.894)
(GROWTH)	-0.009	-0.010	-0.009	-0.010	-0.009	-0.009	-0.009	-0.010
	(-1.090)	(-1.171)	(-1.052)	(-1.272)	(-1.070)	(-1.115)	(-1.148)	(-1.178)
Industry	Included	Included	Included	Included	Included	Included	Included	Included
Adjusted R^2	0.109	0.113	0.124	0.129	0.106	0.140	0.142	0.141
F-statistic	7.101***	7.337***	8.048***	8.401***	6.945***	6.898***	7.010***	6.458***
Observations	400	400	400	400	400	400	400	400

Note in this table results of the regression analyses of short-term debt on ownership structure, board of directors, and firm-specific control variables are presented. With the short-term debt as dependent variable. The independent variables are OWN_CON, FAM_OWN, B_SIZE, B_IND, and B_GEN_DIV. The unstandardized coefficient is shown with the approprate significance level, *** significance level at 1%, ** significance level at 5%, * significant level at 10%. The values between the parenthesis are the T-values.

5.4 Robustness check

The robustness tests are included to increase the validity and reliability of this research. The results of the robustness test are included in Appendixes B and C. The first robustness test is the regression analysis, where lagged variables are implemented. For the second robustness test, subsamples of time are included in the regression analysis.

5.4.1 Lagged variables

In the original regression analyses, non-lagged variables are used. For testing the causality between corporate governance and capital structure, the independent and control variables are lagged by one period. The results of this analysis will be compared with the results of regression analyses with original data (non-lagged variables). For this reason, total, long-term, and short-term debt are included as dependent variables, and the three regression analyses with lagged variables are conducted.

The three regression analysis results with lagged independent and control variables are shown in Appendix B, tables 10-11-12. These results are in line with the results of the models on the original data. Table 10 shows the regression analysis results with total debt and the lagged independent and control variables, presenting the same results for ownership concentration, family ownership, board size, board independence, and board gender diversity variables compared to the original data.

Table 11 and 12 presents the regression analysis results with the same lagged independent and control variables, as mentioned above. However, the long-term and short-term debt are included to compare with the original data of their results. Same as with total debt, results are similar to the results of the original data. Concerning the results of the lagged variables, the same conclusion is made as with the original data.

5.4.2 Subsample

The robustness test consists of a subsample in the time period of 2017-2019. The regression analysis results with time subsample are presented in appendix C table13. The table columns show the results with the subsamples over the dependent variables total, long-term, and short-term debt. All models include the independent and control variables.

The regression analysis results with time subsamples show some changes in the results. The positive and negative correlation of the independent and control variables on total, long-term, and short-term debt are in line with the original data. However, the significant level shows some small changes, the board independence significant level is stronger correlated with total debt than with the original data. Brailsford et al. (2002) encountered the same changes during the time sample robustness test in the significant levels of the results. An explanation for this variation of results can be that the relationship between corporate governance characteristics and firm leverage varies over time (Brailsford et al., 2002). This observation is in line with this research and not obstructing this research proceeds.

6. Conclusion and Discussion

6.1 Main results and discussion

Corporate governance research is still a hot interesting area for research. Prior research results are mixed about the corporate governance influence on capital structures. The central objective of this research is the influence of corporate governance characteristics (ownership structure and board of directors) on the capital structure of firms. Therefore, the research question is: *"How do a firm's ownership structure and board of directors influence the capital structure of non-financial listed firms in the Netherlands?"*. To answer the research question, several regression analyses are conducted. Where prior research mainly focuses on large developed, developing, or multiple countries, this research focuses on a sample of 100 non-financial Dutch-listed firms over a period of 2017-2020. In order to collect the data sample, most of the data is collected through the Orbis database additional data is hand-collect via reports of the firms themselves.

There are five hypotheses developed to test with the OLS regression analyses. The corporate governance characteristics are ownership concentration, family ownership, board size, board independence, and board gender diversity included as independent variables. The measures for leverage are total, long-term, and short-term debt as dependent variables. Additionally, the control variables firm size, return on assets, tangibility, growth, and industry are implemented. The hypotheses predicted a positive influence on ownership structure, family ownership, board size, and board independence whereas a negative influence is expected for board gender diversity on firm leverage based on the agency theory.

After conducting the multiple regression analyses with the different measures of the dependent variables, not all results were significant. In the first analysis of total debt, family ownership and board independence show a significant negative result. Related to family ownership, the negative influence on total debt can indicate the preference for internal financing. In other words, higher family share ownership leads to a decline in total debt. This outcome of not favoring external debt financing is also mentioned earlier based on prior research (Antoniou et al., 2008; Croci et al., 2011). Additionally, there is a significant negative result between board independence and total debt. This result provides that a higher number of outside directors on the board declines total debt. Wen et al. (2002) mention that this decline in total debt can be explained by the active monitoring of outside directors, making debt financing redundant for monitoring. To close, these hypotheses are rejected, providing the insight there is no positive influence of family ownership and board independence on total debt. The other hypotheses related to ownership concentration, board size, and board gender diversity provide non-significant results and do not support the hypotheses. Therefore, these results lack to provide a valid conclusion, indicating there is no influence.

The second analysis conducted a regression analysis with long-term debt as the dependent variable. Same as with total debt, family ownership shows a significant negative correlation with long-term debt. As mentioned, families do not favor debt financing (Antoniou et al., 2008; Croci et al., 2011). Furthermore, board size shows a significant positive influence on long-term debt. The most common is when the board becomes larger, and more outside directors enter the board. In line with Dasilas & Papasyriopoulos (2015), larger boards use more long-term debt. Whereas, there is no significant result found for board independence. Next to the VIF test to check multicollinearity between the independent variable, columns are included

with ownership concentration and family ownership with the other independent and control variable. Based on these results it can be said that there is multicollinearity between ownership concentration and family ownership which cause no conclusion can be made about the long-term debt variable and the independent and control variables.

In the last analysis, short-term debt is included as the dependent variable in the regression analysis. In these results, board size shows a significant negative relation. As mentioned above, a positive influence on long-term debt can be the counterpart of a negative influence on short-term debt. This result can indicate that when boards are larger (more outside directors) they do not favor short-term debt for the less maturity of debt for monitoring the managers. This result is in line with prior research showing a negative correlation (Berger et al., 1997; Dasilas & Papasyriopoulos, 2015). Whereas in the long-term regression analysis, board independence was non-significant. In the short-term regression analysis, it provides a significant negative result. This indicates that with more outside directors on the board, short-term debt declines, which is in line with the results of the board size. Same as with total and long-term debt, not all hypotheses are supported. The hypotheses regarding ownership concentration, family ownership, or board gender diversity provide no valid conclusion.

In the remainder of the conclusion, only total and short-term debt are included because of the multicollinearity in the long-term debt as a dependent variable. Related to these results, three independent variables are non-significant in all two developed regression analyses. Namely, ownership concentration and board gender diversity are non-significant to total and short-term debt. As mentioned before, these results are other than expected. For board gender diversity, this result was not expected because the Pearson correlation matrix provides a correlation with total debt. However, comparing board independence did not show a correlation in the correlation matrix, but in the regression analysis, this result came out.

To increase the validity and reliability of this research, robustness tests are implemented. The first robustness test consists of a regression analysis with lagged independent and control variables by one period. This robustness test provides comparable results to the original regression analysis. In the second robustness test, a subsample of time is included. The results of this robustness test show some changes in the significance level, which is also found by Brailsford et al. (2002), not directly obstructing the results.

Overall, this research investigated the influence of ownership concentration, family ownership, board size, board independence, and board gender diversity on firm leverage in the most recent Dutch corporate governance system. Related to the research question, there is not one overall direct answer found for the ownership structure and the board of directors' influences on the capital structure of non-financial listed firms in the Netherlands. Based on these results, first, there can be said that family share ownership negatively influences leverage taken total debt. Secondly, board independence negatively influences the firm leverage regarding total and short-term debt. At last, board size negatively influences short-term debt. Whereas, in the regression with long-term debt multicollinearity between independent variables was a problem. Based on these results, there cannot be a substantive answer can be given about ownership concentration and board gender diversity influence on capital structure. However, it can be noted that based on this research, ownership concentration and board gender diversity did not influence the capital structure of non-financial Dutch-listed firms.

6.2 Limitations and future research

This research provides a contribution to the existing research about corporate governance and the capital structure of firms. Additionally, this research partly narrowed the research gap, providing insights for managers, shareholders, and investors. Although this research knows several limitations, creating opportunities and recommendations for future research. The first limitation is that there are five corporate governance characteristics (ownership concentration, family ownership, board size, board independence, and board gender diversity) considered in the Dutch corporate governance system. The corporate governance systems consist of many more characteristics, for example, managerial ownership, CEO duality, and audit committee on the board (Schäuble, 2019). Second, in this research, a sample of Dutch-listed firms is used. However, the results of private/unlisted firms can differ because of other regulations. Third, the sample period is from 2017 to 2020, which is the period after the latest revision of the Dutch corporate governance system and focused on one country. Fourth, the independent variables ownership concentration and family ownership are together included in the same regression model, which created multicollinearity in the long-term debt regression. At last, the data used in this study from 2017 to 2020 only include one year (2020) in which there was the Covid-19 pandemic.

Related to the limitations and recommendations mentioned above, insights for future research are provided. Future research can include additional Dutch corporate governance characteristics to research their influence on the capital structure. Next, future research can focus on larger sample sizes. Specifically, future research can be extended to include other countries with revision of corporate governance mechanisms (or lack of research results) or another time period. So that research can be compared. Besides, the variables ownership concentration and family ownership can be taken separately to see if this provides new insights. The last recommendation needs maybe some more years to show any effect. There can considered how the Covid-19 pandemic influences the external financing of firms, especially the corporate governance role in this period.

7. Acknowledgements

Reference

Adams, R. B., & Ferreira, D. (2007). A theory of friendly boards. *Journal of Finance, 62*(1). https://doi.org/10.1111/j.1540-6261.2007.01206.x

Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, *94*(2). https://doi.org/10.1016/j.jfineco.2008.10.007

Ahmad, S., & Omar, R. (2016). Basic corporate governance models: a systematic review. In *International Journal of Law and Management* (Vol. 58, Issue 1). https://doi.org/10.1108/IJLMA-10-2014-0057

Akkermans, D., van Ees, H., Hermes, N., Hooghiemstra, R., van der Laan, G., Postma, T., & van Witteloostuijn, A. (2007). Corporate governance in the Netherlands: An overview of the application of the Tabaksblat Code in 2004. *Corporate Governance: An International Review*, *15*(6). https://doi.org/10.1111/j.1467-8683.2007.00634.x

Ampenberger, M., Schmid, T., Achleitner, A. K., & Kaserer, C. (2013). Capital structure decisions in family firms: Empirical evidence from a bank-based economy. *Review of Managerial Science*, *7*(3). https://doi.org/10.1007/s11846-011-0077-2

Antoniou, A., Guney, Y., & Paudyal, K. (2008). The determinants of capital structure: Capital market-oriented versus bank-oriented institutions. *Journal of Financial and Quantitative Analysis*, *43*(1). https://doi.org/10.1017/s0022109000002751

Arping, S., & Sautner, Z. (2010). Corporate governance and leverage: Evidence from a natural experiment. *Finance Research Letters*, *7*(2). https://doi.org/10.1016/j.frl.2010.02.003

Bajaj, Y., Kashiramka, S., & Singh, S. (2020). Application of capital structure theories: a systematic review. In *Journal of Advances in Management Research* (Vol. 18, Issue 2). https://doi.org/10.1108/JAMR-01-2020-0017

Barontini, R., & Caprio, L. (2006). The effect of family control on firm value and performance: Evidence from continental Europe. *European Financial Management*, *12*(5). https://doi.org/10.1111/j.1468-036X.2006.00273.x

Berger, P. G., Ofek, E., & Yermack, D. L. (1997). Managerial entrenchment and capital structure decisions. *Journal of Finance, 52*(4). https://doi.org/10.1111/j.1540-6261.1997.tb01115.x

Bogtstra, R., Garretsen, I., & Renes, R. (2020). Compliant in principle! and in practice? Internal audit at listed companies in the Netherlands: beyond compliance with the Dutch Corporate Governance Code. *Maandblad Voor Accountancy En Bedrijfseconomie*, *94*(3/4). https://doi.org/10.5117/mab.94.50021

Brailsford, T. J., Oliver, B. R., & Pua, S. L. H. (2002). On the relation between ownership structure and capital structure. *Accounting and Finance, 42*(1). https://doi.org/10.1111/1467-629X.00001

Brisker, E. R., & Wang, W. (2017). CEO's Inside Debt and Dynamics of Capital Structure. *Financial Management, 46*(3). https://doi.org/10.1111/fima.12169

Céspedes, J., González, M., & Molina, C. A. (2010). Ownership and capital structure in Latin America. *Journal of Business Research*, *63*(3). https://doi.org/10.1016/j.jbusres.2009.03.010

Croci, E., Doukas, J. A., & Gonenc, H. (2011). Family Control and Financing Decisions. *European Financial Management*, *17*(5). https://doi.org/10.1111/j.1468-036X.2011.00631.x

Cuervo, A. (2002). Corporate governance mechanisms: A plea for less code of good governance and more market control. In *Corporate Governance: An International Review* (Vol. 10, Issue 2). https://doi.org/10.1111/1467-8683.00272

Dasilas, A., & Papasyriopoulos, N. (2015). Corporate governance, credit ratings and the capital structure of Greek SME and large listed firms. *Small Business Economics*, *45*(1). https://doi.org/10.1007/s11187-015-9648-y

de Jong, A. (2002). The Disciplining Role of Leverage in Dutch Firms. *Review of Finance*, *6*(1). https://doi.org/10.1023/a:1015082700388

de Jong, A., DeJong, D. v., Mertens, G., & Wasley, C. E. (2005). The role of self-regulation in corporate governance: Evidence and implications from The Netherlands. *Journal of Corporate Finance*, *11*(3). https://doi.org/10.1016/j.jcorpfin.2004.01.002

de Jong, A., & Veld, C. (2001). An empirical analysis of incremental capital structure decisions under managerial entrenchment. *Journal of Banking and Finance*, *25*(10). https://doi.org/10.1016/S0378-4266(00)00163-1

Detthamrong, U., Chancharat, N., & Vithessonthi, C. (2017). Corporate governance, capital structure and firm performance: Evidence from Thailand. *Research in International Business and Finance*, *42*, 689–709. https://doi.org/10.1016/j.ribaf.2017.07.011

Ezeani, E., Kwabi, F., Salem, R., Usman, M., Alqatamin, R. M. H., & Kostov, P. (2022). Corporate board and dynamics of capital structure: Evidence from UK, France and Germany. *International Journal of Finance and Economics*. https://doi.org/10.1002/ijfe.2593

Ezeani, E., Salem, R., Kwabi, F., Boutaine, K., Bilal, & Komal, B. (2022). Board monitoring and capital structure dynamics: evidence from bank-based economies. *Review of Quantitative Finance and Accounting*, *58*(2). https://doi.org/10.1007/s11156-021-01000-4

Faccio, M., & Lang, L. H. P. (2002). The ultimate ownership of Western European corporations. *Journal of Financial Economics*, *65*(3). https://doi.org/10.1016/S0304-405X(02)00146-0

Filatotchev, I., Poulsen, A., & Bell, R. G. (2019). Corporate governance of a multinational enterprise: Firm, industry and institutional perspectives. *Journal of Corporate Finance*, *57*. https://doi.org/10.1016/j.jcorpfin.2018.02.004

García, C. J., & Herrero, B. (2021). Female directors, capital structure, and financial distress. *Journal of Business Research*, *136*. https://doi.org/10.1016/j.jbusres.2021.07.061

Gillan, S. L., & Starks, L. T. (1998). A survey of shareholder activism: Motivation and empirical evidence. *SSRN Electronic Journal*. doi:10.2139/ssrn.663523

Graham, J. R., & Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics*, *60*(2–3). https://doi.org/10.1016/S0304-405X(01)00044-7

Granado-Peiró, N., & López-Gracia, J. (2017). Corporate Governance and Capital Structure: A Spanish Study. *European Management Review*, *14*(1). https://doi.org/10.1111/emre.12088

Huang, J., & Kisgen, D. J. (2013). Gender and corporate finance: Are male executives overconfident relative to female executives? *Journal of Financial Economics*, *108*(3). https://doi.org/10.1016/j.jfineco.2012.12.005

Isidro, H., & Sobral, M. (2015). The Effects of Women on Corporate Boards on Firm Value, Financial Performance, and Ethical and Social Compliance. *Journal of Business Ethics*, *132*(1). https://doi.org/10.1007/s10551-014-2302-9

Jensen, M. C. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review*, *76*(2). https://doi.org/10.2139/ssrn.99580

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4). https://doi.org/10.1016/0304-405X(76)90026-X

John, K., & Senbet, L. W. (1998). Corporate governance and board effectiveness. *Journal of Banking and Finance*, *22*(4). https://doi.org/10.1016/S0378-4266(98)00005-3

Kabir, R., Cantrijn, D., & Jeunink, A. (1997). Takeover defenses, ownership structure and stock returns in the Netherlands: An empirical analysis. *Strategic Management Journal*, *18*(2). https://doi.org/10.1002/(SICI)1097-0266(199702)18:2<97::AID-SMJ855>3.0.CO;2-2

Kim, K. A., Kitsabunnarat-Chatjuthamard, P., & Nofsinger, J. R. (2007). Large shareholders, board independence, and minority shareholder rights: Evidence from Europe. *Journal of Corporate Finance*, *13*(5). https://doi.org/10.1016/j.jcorpfin.2007.09.001

King, M. R., & Santor, E. (2008). Family values: Ownership structure, performance and capital structure of Canadian firms. *Journal of Banking and Finance*, *32*(11). https://doi.org/10.1016/j.jbankfin.2008.02.002

la Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (1999). Corporate ownership around the world. *Journal of Finance*, *54*(2). https://doi.org/10.1111/0022-1082.00115

Maassen, G. F., & van den Bosch, F. A. J. (1999). On the supposed independence of two-tier boards: Formal structure and reality in the Netherlands. *Corporate Governance: An International Review*, *7*(1). https://doi.org/10.1111/1467-8683.00126

Margaritis, D., & Psillaki, M. (2010). Capital structure, equity ownership and firm performance. *Journal of Banking and Finance*, *34*(3). https://doi.org/10.1016/j.jbankfin.2009.08.023

Michiels, A., & Molly, V. (2017). Financing Decisions in Family Businesses: A Review and Suggestions for Developing the Field. In *Family Business Review* (Vol. 30, Issue 4). https://doi.org/10.1177/0894486517736958

Modigliani, F., & Miller, M. H. (1958). The American economic Revlew VOLUME XLVIII JUNE 1958 NUMBER THREE THE COST OF CAPITAL, CORPORATION FINANCE AND THE THEORY OF INVESTMIENT. *The American Economic Review*, *48*(3).

Morellec, E., Nikolov, B., & Schürhoff, N. (2012). Corporate Governance and Capital Structure Dynamics. *Journal of Finance*, *67*(3). https://doi.org/10.1111/j.1540-6261.2012.01735.x

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

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2). https://doi.org/10.1016/0304-405X(84)90023-0

Padhan, R., & Prabheesh, K. P. (2021). The economics of COVID-19 pandemic: A survey. *Economic Analysis and Policy*, *70*. https://doi.org/10.1016/j.eap.2021.02.012

Pindado, J., Requejo, I., & de la Torre, C. (2015). Does Family Control Shape Corporate Capital Structure? An Empirical Analysis of Eurozone Firms. *Journal of Business Finance and Accounting*, *42*(7–8). https://doi.org/10.1111/jbfa.12124

Poletti-Hughes, J., & Martínez Garcia, B. (2022). Leverage in family firms: The moderating role of female directors and board quality. *International Journal of Finance and Economics*, *27*(1). https://doi.org/10.1002/ijfe.2147

Santos, M. S., Moreira, A. C., & Vieira, E. S. (2014). Ownership concentration, contestability, family firms, and capital structure. *Journal of Management and Governance*, *18*(4). https://doi.org/10.1007/s10997-013-9272-7

Schäuble, J. (2019). The impact of external and internal corporate governance mechanisms on agency costs. *Corporate Governance (Bingley)*, *19*(1). https://doi.org/10.1108/CG-02-2018-0053

Sheikh, N. A., & Wang, Z. (2012). Effects of corporate governance on capital structure: Empirical evidence from Pakistan. *Corporate Governance (Bingley)*, *12*(5). https://doi.org/10.1108/14720701211275569

Sun, J., Ding, L., Guo, J. M., & Li, Y. (2016). Ownership, capital structure and financing decision: Evidence from the UK. *The British Accounting Review*, *48*(4), 448–463. https://doi.org/10.1016/j.bar.2015.04.001

Upadhyay, A. D., Bhargava, R., & Faircloth, S. D. (2014). Board structure and role of monitoring committees. *Journal of Business Research*, *67*(7). https://doi.org/10.1016/j.jbusres.2013.07.017

van Beusichem, H., de Jong, A., DeJong, D., & Mertens, G. (2016). Transparency, corporate governance and firm performance in The Netherlands. *Maandblad Voor Accountancy En Bedrijfseconomie*, *90*(7/8). https://doi.org/10.5117/mab.90.31343

van Ees, H., Elmer, S., & Postma, T. J. B. M. (2003). Board Characteristics and Corporate Performance in the Netherlands. *Eastern Economic Journal*, *29*(1).

van Ees, H., van der Laan, G., & Postma, T. J. B. M. (2008). Effective board behavior in The Netherlands. *European Management Journal*, *26*(2). https://doi.org/10.1016/j.emj.2008.01.002

Wen, Y., Rwegasira, K., & Bilderbeek, J. (2002). Corporate governance and capital structure decisions of the Chinese listed firms. *Corporate Governance*, *10*(2). https://doi.org/10.1111/1467-8683.00271

Wooldridge, Abadie, A., Cattaneo, M. D., Stuart, E. a., Imbens, G. W., Doudchenko, N., Imai, K., Kim, I. S., Wang, E., Hernán, M. A., Brumback, B., Robins, J. M., & Wooldridge. (2010). Econometric analysis of cross section and panel data. Kapitel11_Wooldridge2010.pdf. *Economica*, *25*(1).

Appendices

Appendix A: Industry subdivision of the sample

Table 9 - Subdivision of the sample into the industries

NACE Rev. 2, core code	Number of firms
Agriculture, forestry and fishing	1
Mining and quarrying	2
Manufacturing	47
Electricity, gas, steam and air conditioning supply	1
Construction	4
Wholesale and retail trade; repair of motor vehicles and motorcycles	7
Transportation and storage	2
Accommodation and food service activities	2
Information and communication	15
Real estate activities	4
Professional, scientific and technical activities	11
Administrative and support service activities	2
Arts, entertainment and recreation	2
Total sample	100
Industry dummy	
Transport, commodities, and trade	12
Manufacturing	47
Construction and real estimate	8
Others	33
Total sample	100

Appendix B: Regression analyses with lagged variables

Table 10 - Results of regression analysis influence ownership structure/ board of directors on capital structure (total debt) - lagged variables

Variable	(1)	(2)	(3)	(4)	(5)	Model 1
Intercept	0.487***	0.453***	0.385***	0.576***	0.424***	0.627***
	(12.714)	(13.495)	(7.918)	(8.115)	(11.507)	(7.129)
(OWN_CON)	-0.139*					-0.100
	(-2.354)					(-1.439)
(FAM_OWN)		-0.161**				-0.113*
		(-3.246)				(-2.041)
(B_SIZE)			0.008			0.004
			(1.695)			(0.728)
(B_IND)				-0.175*		-0.252**
				(-2.110)		(-2.935)
(B_GEN_DIV)					0.133	0.113
					(1.392)	(1.172)
(F_SIZE)	0.001***	0.001***	0.001**	0.001***	0.001***	0.001***
	(4.105)	(4.219)	(3.306)	(4.832)	(4.036)	(3.998)
(ROA)	0.066	0.021	0.057	0.083	0.063	0.017
	(0.822)	(0.260)	(0.692)	(1.029)	(0.773)	(0.204)
(TANG)	0.161**	0.163**	0.131*	0.102	0.127*	0.114*
	(2.987	(3.075)	(2.467)	(1.843)	(2.379)	(2.029)
(GROWTH)	-0.007	-0.005	-0.007	-0.008	-0.006	-0.006
	(-0.591	(-0.462)	(-0.641)	(-0.688)	(1.596)	(-0.561)
Industry	Included	Included	Included	Included	Included	Included
Adjusted R^2	0.110	0.125	0.102	0.107	0.099	0.145
F-statistic	5.626***	6.334***	5.262***	5.472***	5.116***	5.218***
Observations	300	300	300	300	300	300

Note in this table results of the regression analyses of total debt on ownership structure, board of directors, and firm-specific control variables are presented. With the total debt as dependent variable. The independent variables and control variables are lagged by one period. The independent variables are OWN_CON, FAM_OWN, B_SIZE, B_IND, and B_GEN_DIV. The unstandardized coefficient is shown with the approprate significance level, *** significance level at 1%, ** significance level at 5%, * significant level at 10%. The values between the parenthesis are the T-values.

Table 11 - Results of regression analysis influence ownership structure/ board of directors on capital structure (long-term debt) - lagged variables

Variable	(1)	(2)	(3)	(4)	(5)	Model 1
Intercept	0.124***	0.080**	-0.065	0.052	0.053	0.030
	(4.154)	(3.107)	(-1.745)	(0.917)	(1.806)	(0.447)
(OWN_CON)	-0.182***					-0.049
	(-3.954)					(-0.925)
(FAM_OWN)		-0.215***				-0.161***
		(-5.656)				(-3.818)
(B_SIZE)			0.019***			0.013***
			(4.988)			(3.436)
(B_IND)				0.022		-0.048
				(0.325)		(-0.728)
(B_GEN_DIV)					0.103	0.011
					(1.349)	(0.152)
(F_SIZE)	0.001**	0.001**	0.001	0.161**	0.001**	0.001
	(2.744)	(2.926)	(0.937)	(2.896)	(2.837)	(1.318)
(ROA)	-0.052	-0.113	-0.084	-0.038	-0.049	-0.131*
	(-0.825)	(-1.795)	(-1.344)	(-0.592)	(-0.747)	(-2.107)
(TANG)	0.387***	0.391***	0.343***	0.359***	0.348***	0.372***
	(9.198)	(9.594)	(8.428)	(8.099)	(8.176)	(8.685)
(GROWTH)	0.002	0.004	0.001	0.002	0.003	0.003
	(0.265)	(0.504)	(0.123)	(0.259)	(0.349)	(-0.334)
Industry	Included	Included	Included	Included	Included	Included
Adjusted R^2	0.262	0.299	0.283	0.222	0.227	0.326
F-statistic	14.254***	16.955***	15.781***	11.690***	11.973***	13.026***
Observations	300	300	300	300	300	300

Note in this table results of the regression analyses of long-term debt on ownership structure, board of directors, and firm-specific control variables are presented. With the long-term debt as dependent variable. The independent variables and control variables are lagged by one period. The independent variables are OWN_CON, FAM_OWN, B_SIZE, B_IND, and B_GEN_DIV. The unstandardized coefficient is shown with the approprate significance level, *** significance level at 1%, ** significance level at 5%, * significant level at 10%. The values between the parenthesis are the T-values.

Table 12 - Results of regression analysis influence ownership structure/ board of directors on capital structure (short-term debt) - lagged variables

Variable	(1)	(2)	(3)	(4)	(5)	Model 1
Intercept	0.363***	0.373***	0.450***	0.524***	0.371***	0.597***
	(11.921)	(13.897)	(11.836)	(9.443)	(12.744)	(8.567)
(OWN_CON)	0.043					-0.051
	(0.927)					(-0.926)
(FAM_OWN)		0.054				0.048
		(1.371)				(1.095)
(B_SIZE)			-0.010**			-0.010*
			(-2.722)			(-2.386)
(B_IND)				-0.196**		-0.204**
				(-3.032)		(-3.004)
(B_GEN_DIV)					0.031	0.102
					(0.404)	(1.332)
(F_SIZE)	0.001*	0.001*	0.001**	0.001**	0.001*	0.001***
	(2.469)	(2.468)	(3.309)	(3.215)	(2.254)	(3.778)
(ROA)	0.118	0.134*	0.141*	0.121	0.112	0.148*
	(1.847)	(2.049)	(2.202)	(1.922)	(1.729)	(2.283)
(TANG)	-0.226***	-0.228***	-0.212***	-0.257***	-0.220***	-0.258***
	(-5.288)	(-5.367)	(-5.106)	(-5.937)	(-5.212)	(-5.790)
(GROWTH)	-0.009	-0.009	-0.008	-0.010	-0.009	-0.009
	(-1.005)	(-1.062)	(-0.940)	(-1.145)	(-0.966)	(-1.029)
Industry	Included	Included	Included	Included	Included	Included
Adjusted R^2	0.091	0.094	0.111	0.116	0.088	0.130
F-statistic	4.725***	4.869***	5.647***	5.899***	4.627***	4.724***
Observations	300	300	300	300	300	300

Note in this table results of the regression analyses of short-term debt on ownership structure, board of directors, and firm-specific control variables are presented. With the short-term debt as dependent variable. The independent variables and control variables are lagged by one period. The independent variables are OWN_CON, FAM_OWN, B_SIZE, B_IND, and B_GEN_DIV. The unstandardized coefficient is shown with the approprate significance level, *** significance level at 1%, ** significance level at 5%, * significant level at 10%. The values between the parenthesis are the T-values.

Appendix C: Regression analyses with a time subsample

Table 13 - Results of regression analysis influence ownership structure/ board of directors on capital structure - subsample (2017-2019)

Variable	2017-2019 TD	2017-2019 LTD	2017-2019 STD
Intercept	0.613***	-0.001	0.614***
	(6.931)	(-0.017)	(8.815)
(OWN_CON)	-0.080	-0.022	-0.058
	(-1.141)	(-0.391)	(-1.058)
(FAM_OWN)	-0.114*	-0.172***	0.058
	(-2.041)	(-3.922)	(1.326)
(B_SIZE)	0.002	0.012**	-0.010*
	(0.293)	(2.852)	(-2.476)
(B_IND)	-0.236**	-0.038	-0.198**
	(-2.738)	(-0.555)	(-2.921)
(B_GEN_DIV)	0.064	0.008	0.056
	(0.658)	(0.104)	(0.732)
(F_SIZE)	0.001***	0.001	0.001***
	(4.329)	(1.344)	(4.153)
(ROA)	0.063	-0.181**	0.245***
	(0.773)	(-2.807)	(3.785)
(TANG)	0.126*	0.407***	-0.281***
	(2.253)	(9.229)	(-6.357)
(GROWTH)	-0.001	0.006	-0.007
	(-0.068)	(0.726)	(-0.811)
Industry	Included	Included	Included
Adjusted R^2	0.137	0.316	0.155
F-statistic	4.965***	12.494***	5.581***
Observations	300	300	300

Note in this table results of the regression analyses of total debt, long-term debt, and short-term debt on ownership structure, board of directors, and firm-specific control variables are presented. With the total debt, long-term debt, and short-term debt as dependent variable. The independent variables are OWN_CON, FAM_OWN, B_SIZE, B_IND, and B_GEN_DIV. The subsample used in this regression consist of manufacturing. The unstandardized coefficient is shown with the approprate significance level, *** significance level at 1%, ** significance level at 5%, * significant level at 10%. The values between the parenthesis are the T-values.