Master Thesis

The influence of ownership structure on the capital structure in Dutch firms

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25th November 2016

UNIVERSITEIT TWENTE.

Abstract

This research aims at uncovering the relationship between ownership structure and capital structure. Where prior studies merely focus on British, Chinese and American firms, this study provides a new view on Dutch firms. I find that ownership concentration by the largest five aggregate shareholders has a linear significant relationship with leverage. Furthermore, I find a strong significant positive effect of family ownership on leverage. Managerial ownership proved to have a linear significant relationship with leverage. Moreover, contradicting earlier studies, a positive significant relationship between institutional ownership and leverage if found. Lastly I found that corporate ownership has no effect on leverage in the sample of Dutch listed firms. The results of this research have practical relevance in the sense that managers can understand why different shareholders have different preferences in financing methods and leverage levels and it may give insights on using the capital structure to attract a desired type of investor or to keep undesired ones away.

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1. Introduction

1.1 Introduction

After Modigliani and Millers' theorem (1958) on the capital structure of firms was introduced, the subject became a field of interest for scholars. Especially their study in 1963, in which they state that levered and unlevered firms do not have the same value, paved the way for finding the determinants for leverage and indirect the optimal capital structure to maximize firm value.

Over the years, three major theories on how the corporate capital structure is formed became leading. Trade-off theory by Kraus and Litzenberger (1973), pecking-order theory by Myers and Malouf (1984) and agency theory by Jensen and Mackling (1976). Although trade-off theory and pecking-order theory are commonly used and proven, this research departs from them and focusses more tightly on agency theory. In agency theory, Myers and Majluf (1984) state that the relationship between an agent and principal is delicate and brings along information asymmetry between the two parties (i.e. managers having more information than owners, due to their involvement in a company's daily operations).

Moreover, they find that separation of ownership and control in a firm has the potential to cause misaligned interests between the two parties. The quality of the relationship between parties, the level information asymmetry and the alignment of interests has the potential to influence the decision making in a firm and the potential to impact various factors, such as value and leverage (Brailsford, Oliver & Pua, 2002). Ensuring that the agent serves their interests, principals generally prefer the instalment of several costly monitoring and disciplinary instruments.

Myers and Majluf (1984) postulate that the capital structure of a firm can serve as an alternative tool to protect the interests of the principal. Debt financing introduces debt holders to the firm, which are inclined to monitor management and enforce restrictions upon their behaviour in order to guarantee interest payments and repayment of the money lend. The amount of debt financing used in order to monitor and control management, depends on the identity of the owner and the size of its ownership. Myers and Majluf (1984) link ownership structure and capital structure in their agency theory and suggest an influence of ownership structure on the latter.

Miguel and Pindado, (2001) and Frank and Goyal (2009) state that a firm's capital structure not only depends on the traditional factors considered in corporate finance research. Lemmon, Roberts and Zender (2008) add to that and note that traditional leverage determinants explain a minor part of the variation in leverage (at most 30 %). It may also be affected by other factors that also reduce agency problems that exist between different types of stakeholders inside the company (Florackis and Ozkan, 2009) (Miguel, Pindado & De La Torre, 2005)(D'Mello and Miranda, 2010). Therefore, a firm's ownership structure is likely to be an important determinant of corporate capital structure (Pindado, Requejo & De La Torre, 2015).

The firm's ownership structure may induce an effect on the capital structure, either through the concentration or through the identity of the shareholders (De Jong, 2002).

Much literary evidence of the influence of ownership structure on capital structure is found for British, Chinese, and American firms. However, there seems to be little recent research that specifically focusses on Dutch listed and formerly listed firms. Extensive research in the post 2000 literature, only results in finding the work of De Jong (2002) and Faccio, M., Lang, L.H.P. (2002). Many others like Pindado, J., Requejo, I., De La Torre, C. (2014) only focus on one aspect of ownership structure, such as family control or managerial ownership (Florackis & Ozkan, 2009).

Reviewing the influence of ownership structure on the corporate capital structure for as well ownership concentration as the predominant ownership identities has not been done after the 2008 credit crisis. Since the effects of the 2008 recession where felt globally and many changes had to be made in corporate finance in order to survive. Where changing corporate finance strategies creates a suspicion of a change in the relationship between ownership structure and the corporate financial structure, this research investigates if this relationship has been altered and provides an updated view on the matter.

Additionally, this research provides practical relevance for managers of Dutch firms. Previous studies on British and American firms can provide valuable insights to managers of Dutch firms, due to similarities between Dutch and those British and American firms. It is naturally expected that this study, since it focusses on Dutch firms, provides better insights on the effect of ownership identity on the corporate capital structure of Dutch firms.

Managers can use the results of this research to gain insights on relation between their shareholders' identity and the size of their shareholdings and their preferred financing method and leverage levels. It can help managers to avoid friction on the matter (e.g. activist shareholders), by making shareholder supported corporate financing decisions. Moreover, managers can learn on the effects of both types of agency problems and develop strategies to mitigate both types of agency problems, hence decreasing potential over- or underinvestment problems. Lastly, it gives insights on using the capital structure to attract a desired type of investor or to keep undesired ones away (i.e. anti-takeover defence).

1.2 Objective and contribution

The academic objective of this paper is to investigate the effect of ownership structure on the capital structure of Dutch firms. Other evidence on Dutch firms is scarce and conclusions and findings of previous research are relatively old, i.e. 2010 and earlier. Since the 2008 recession effects on corporate performance was felt globally, many firms had to change their corporate financing strategies and capital structure in order to survive. On the one hand, management may decide that leverage levels have to be reduced in order to reduce costs and survive. On the other hand, leverage levels may need to go up to cover for decreased revenue and profit. Fosberg (2012) found evidence for the latter and saw increased leverage levels.

Changing corporate finance strategies creates a suspicion of a change in the relationship between ownership structure and the corporate financial structure. This study investigates if this relationship has been altered and provides an updated view on the matter. Therefore, this research will further add to the understanding of the influence ownership structure on capital structure in general and may provide new or even different insights for Dutch firms.

The research question that is central in this research is:

- *How does the ownership structure influence the capital structure of Dutch firms?*

In order provide an answer to the research question, two sub questions have to be answered.

- How does ownership concentration influence the financial leverage of a firm?
- How does ownership identity influence the financial leverage of a firm?

1.3 Structure

This paper will continue as followed. Chapter two gives an overview and explanation of this papers' key concepts and an analysis of the literature results so far is provided. Chapter three discusses the available statistical techniques and describes the methodology used. Chapter four displays the data selection criteria and the data sample used. Chapter five presents the results and robustness testing. Lastly, chapter six presents the conclusion, limitations and future research possibilities.

2. Literature review

This chapter explores the theories and concepts concerning this study. Additionally it gives deeper insights in the reasoning behind some relationships. Following the theoretical exploration, hypotheses will be formulated to test the discussed constructs. Conclusively a review of the existing literature is provided to create a clearer, holistic view on the work and findings of other scholars.

2.1 Corporate capital structure

Corporate operating activities and investment activities have to be financed with cash. To obtain sufficient cash a company can use multiple techniques which generally can be divided into internal financing, debt financing and equity financing. All forms having their own vehicles (Hillier, Jaffe, Jordan, Ross and Westerfield, 2010).
Although mentioned separately, internal financing is a form equity financing. Internal financing comes from funds already existent inside a firm, for instance retained earnings, cash or from the savings account. Financing from internal funds is the cheapest form of financing, since no premium or interest has to be paid in order to acquire access to these funds (Hillier, et al., 2010).

Debt financing can be done via many vehicles. It includes taking short borrowings, such as bank overdrafts, trade credit and credit from suppliers. Other than that, financing via long term borrowing, such as mortgages, bank loans or the issuance of corporate bonds (Hillier, et al., 2010). Contrary to internal financing, debt financing is not without costs. Debt holders expect to be compensated for their services and charge interest on the amount due (Hillier, et al., 2010). These interest payments are tax deductible, hence meaning they can be subtracted from the taxable income of a firm. This lowered taxable income in turn results in a lower tax bill. In order to profit as much as possible form this tax advantage, it is lucrative for firms to attract as much debt as possible.

Besides equity financing via internal funds, equity financing can be done via external funds by issuing shares. By selling shares, a company sell partial ownership and the coherent portion of cash flow and voting rights (Hillier, et al., 2010). Like issuing debt, issuing shares is not without costs. Next to the emission costs, investors expect to be compensated. They expect that they receive their fair share of profit in accordance with the cash flow rights they own. (Hillier, et al., 2010).

Opposed to equity financing, debt financing is proportionally, a cheap form of raising capital. This is mainly due to the tax deductibility of the interest payments made, lowering the taxable income. Equity financing does not provide this tax benefit (Carpenter and Petersen, 2002). Significant disadvantage however, is the commitment to pay interest instalments and the repayment of the principal. Thus increasing costs, which in turn increases bankruptcy risk. Equity financing is relatively expensive and involves selling off proprietorship and coherent voting rights. Next to the absence of tax deductibility, some forms of equity finance are burdened with transactions costs a tax “penalty” on dividends (MacKie-Mason, 1990). On the other hand, the risk of equity financing is low. In principle there is no commitment to

reimburse the investors with periodically installed payments or even a reimbursement of the investment.

The composition of debt and equity financing is called the capital structure of a company. When a company takes on debt, the company becomes levered, with leverage as the ratio of debt to equity. Whilst both forms clearly have advantages and disadvantages, Modigliani and Millers' theorem (1958) states that the value of a firm does not depend on the way it is financed. Two identical firms except for the financial structure, the 100 percent equity financed and the other financed by a combination of equity and debt, have the same value. They state that firm value arises from its ability to generate earnings and the underlying value of the assets it holds (Modigliani and Miller, 1958). Furthermore, Modigliani and Miller (1958) assume that the capital market is perfect and that debt and equity are perfect substitutes. Moreover there are no bankruptcy costs, no agency costs, no transaction costs, no tax and no asymmetric information.

Later work of Modigliani and Miller (1963) updates the view on the capital structure and adds corporate income taxes. From hereon they state that levered and unlevered firms do not have the same value. Value increases of levered companies are the result of the pre-named tax deductibility of interest. The amount of tax saved is the additional value of a levered firm over an unlevered firm (Modigliani and Miller, 1963). Since most shareholders and managers are seeking risk minimization, costs minimization and value maximization, most managers try to find the optimal combination between equity and debt financing

2.2 Capital structure theories

Over the years different theories on the capital structure were developed. Each explaining the decision making on financing and the composition of the capital structure differently. Following are the most well know theories.

2.2.1 Trade off theory

Trade-off theory by Kraus and Litzenberger (1973) describes plausible reasoning to the formation of a firms' capital structure. Kraus and Litzenberger (1973) state that in a complete and perfect capital market, the firms' market value is independent of its capital structure. However, they also state that taxation of corporate profit ands and the existence of bankruptcy penalties are market imperfections which stand central in proving the effect of leverage on the firms' market value (Kraus and Litzenberger, 1973). For instance, the interest tax shield which allows firms to deduct interest payments made. Meaning that the interest payments made can be portrayed as costs made and subtracted from the gross profit, lowering the net profit. In turn lowering the tax payable. Theoretically, a firm could borrow endless amounts of money and create value by doing so. However, repayment of debt and interest on that debt increases the firms' financial obligations and increases the risk of financial distress and the risk of bankruptcy (Kraus and Litzenberger, 1973). Trade-off theory assumes that the capital structure is influenced by the costs and benefits of debt. These are traded off against one another to derive at the appropriate and optimal level of leverage (Frank and Goyal, 2011).

2.2.2 Pecking order theory

Pecking-order theory by Myers and Majluf (1984) states that the capital structure is determined by three sources of financing, namely internal financing, debt and equity. Myers and Majluf (1984) state that managers favour internal financing over debt financing and debt financing over equity financing. They add that information asymmetry is source of this order of preference (Myers and Majluf, 1984). Internal financing logically invokes no distress due to information asymmetry. In case of debt financing, the firm will only invest if the net present value of the investment to be made is larger than the required amount of debt. Due to information asymmetry, the possibility exists that debt holders undervalue the firms' assets and the proceeds of the investment. Causing the opportunity costs to drop below the costs of debt financing, forcing managers to forego the investment (Myers and Majluf, 1984).

Equity financing incurs the same information asymmetry problems between management and investors as debt financing, but on top of that issuing new equity reduces the value of the existing equity. Further lowering the opportunity costs (Myers and Majluf, 1984). They add that the firms' value is higher under debt financing policy, because the loss in the market value due to underinvestment is less. Pecking order theory dictates that in capital budgeting decision making, one should use these three sources in subsequent order and only move on to the next if the current source is depleted (Frank and Goyal, 2011).

2.2.3 Agency theory

Agency theory (Jensen & Meckling, 1976) presumes that a company's managers not always act in the best interest of its owners. They state that managers maintain an own agenda in which wealth maximization of the firms owners is not always a number one priority. Managers can act in this way, because they have superior information on the firm and its daily activities and the ability to produce information that biased (Jensen & Meckling, 1976).Inequality in interests of managers and owners due to self-interest of both parties or inequality in information available, may lead to agency costs.

A common example is overinvestment. Jensen (1986) explains that managers have incentives to cause their firms to grow beyond the optimal size. Growth increases a managers' power by increasing the amount of resources under their control. Motivated by their own (often target based) compensation (Fahlenbrach, 2009), free cash flow[1] is used to in invest in small or even negative NPV[2] projects to build their empire (Jensen, 1986) and to avoid dividend payments (Francis, Hasan, John & Song, 2007). Another common example of agency cost is perquisite consumption. In which case managers are using the free cash flow of the firm for their own consumption e.g. a corporate jet, plush offices, luxury cars, etc. (Jensen, 1986).

Whereas overinvestment and perquisite consumption are agency costs which directly lead to a loss for shareholders' wealth, other types of agency costs exist. First, monitoring costs.

[1] Free cash flow is cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital (Jensen, 1986).
[2] NPV is the abbreviation for Net Present Value. NPV is calculated by discounting future cash flows at the cost of capital (Jensen, 1986).

Monitoring costs are the costs incurred with monitoring management and overseeing if their actions are in the best interest of the shareholders (Jensen, 1986). Second are bonding costs. These are costs made to ensure that a firms' management act in favour of its shareholders. Excellent remuneration, bonuses and share based remuneration are examples of bonding costs (Jensen, 1986).

Another way of reducing agency costs is changing the capital structure of the firm. Specifically, increasing the leverage level of the firm and thus attracting debt holders. Namely, indebtedness is burdened with interest payments and repayment of the principal. Hence, it reduces the cash flow at the discretion of managers, in turn mitigating the cost of agency. Secondly, debt mitigates such conflict by increasing the fractional ownership of the managers when owning shares (Jensen, 1986). Furthermore, debt and specifically debt holders have a monitoring and controlling effect. Seeking to secure interest payments and the repayment of the lend money, debt holders monitor managerial behaviour and restrict their actions via debt covenants.

Jensen and Meckling (1976) also state that there are agency costs of debt. Resulting from a potential conflict of interest between a firms' owners/shareholders and its debt holders. This type of conflict may lead to suboptimal investments, such as underinvestment and asset substitution. Asset substitution is the case when shareholders force management to swap low risk, low yield assets and project for high risk, high risk projects Jensen and Meckling (1976). When an investment yields a large return, above the face value of debt, equity holders (i.e. company owners) capture its surplus. If the investment fails and yields no or little returns, below the face value of debt, debt holders bear the risk (Harris & Raviv, 1991). Therefore equity holders may benefit from high risk, high yield investments, even if they are value decreasing. Poor investment and loss of the equity investment can result in a decrease of the value of debt, whereas the loss of the equity investment can be offset by a gain in in equity value captured. Therefore, shareholders prefer high risk, high yield projects, whereas debtholders prefer low risk, low return projects (Harris & Raviv, 1991). Hence, resulting in reluctance of debtholders to invest in some positive NPV projects which are too risky in their perception. Another possible result of this conflict, the other way around, is underinvestment. A situation where shareholders reject valuable, but low NPV projects, because all returns will flow towards the debt holders with no excess returns left for the shareholders (Jensen and Meckling, 1976)(Myers, 1977). The costs that arise with the struggle between bond and stockholders are called the agency cost of debt.

In agency theory, shareholders use debt in order to protect their investment. However, whilst using debt a balance must be found between its advantages to shareholder and shareholder-bondholder problems. Hence, since not all shareholders are the same, it is to be expected that not all shareholders favour the same debt level.

2.3 Ownership concentration

The concentration of shares held by shareholders can be of influence on the corporate capital structure. Large shareholders have a larger stake in a firm than small shareholders; they bear more risk (i.e. a larger amount of capital invested bears risk). Grier and Zychowicz (1994) find that large shareholders with concentrated ownership are inclined to monitor management. Moreover, large shareholders are more inclined to monitor their investment and corporate management, than smaller shareholders (Schleifer and Vishny, 1986). Large shareholders prefer debt as a monitoring and control mechanism (Grossman and Hart, 1982)(King & Santor, 2008). Its mitigating effect on agency costs between managers and owners, such as managerial perquisite consumption and overinvestment, is favoured over the additional costs it brings. Possessing a large quantity of shares, thus many voting rights empowers large shareholders to do so. They can force management into taking on more debt, or appoint managers which installs the desired leverage ratio (Harris & Raviv, 1988)(Brailsford, Oliver and Pua, 2002).

Brailsford, et al. (2002) find a positive relation between ownership concentration and leverage. They find that the monitoring effect of debt explains the debt favourability. Margaritis and Psillaki (2010), use a sample of French manufacturing firms between 2002 and 2005. They find a positive significant effect for ownership concentration on leverage, but no significant effect for ownership type on leverage. Pindado and De La Torre (2011), examined the same effect in 135 companies for the period 1990-1999. Just like Margaritis and Psillaki (2010), they find a positive and significant effect between ownership concentration and leverage. Suggesting a positive relation between ownership concentration and leverage.

On the other hand, concentrated shareholding (i.e. large shareholders with a concentrated amount of shares) can be a substitute for the monitoring role of debt to control management. They may even coerce management in preferred actions and behaviour (Margaritis & Psillaki, 2010)(McConnell and Servaes, 1990)(Claessens, Djankov, Fan & lang, 2002)(Cornett, Marcus, Saunders & Tehranian, 2007). Lowering the need of debt and its monitoring role, suggesting a negative relation between higher levels of ownership concentration and leverage. Adding to the expected negative relation between ownership concentration and leverage is expropriation theory of Shleifer and Vishny (1997). They state that large investors may represent their own interests, which are not always in line with those of other investors. Minority shareholders run the risk of being expropriated out of a company's wealth by large shareholders (Claessens, Djankov, Fan & Lang, 2002). Claessens, et al. (2002) state that large shareholders use their control power and cash flow rights to maximize their own welfare and redistribute wealth away from others. Large shareholders can expropriate minority shareholders by using the firms' assets to pursue private benefits or by transferring resources out of the firm (Claessens, et al. (2002). Johnson, LaPorta, Lopez-de-Silanes and Shleifer (2000) define transferring resources out of the firm to the controlling shareholder as tunnelling. Where enjoying private benefits through expropriation of wealth, there may be reluctance among large shareholders to use debt in order to avoid monitoring Pindado and De La Torre, 2011). Evidence exists of lenders reluctance to provide loans due to the high(er) risk of expropriation (Pindado, Requejo & De La Torre, 2014).

Short, et al. (2002), study a sample of 226 firms listed on the London Stock Exchange, for the period 1988 to 1992. They find a negative effect of ownership concentration on leverage. They find that the substitution effect is causing this relation. Santos, et al. (2014) study the relationship between ownership concentration and capital structure in a sample of 684 firms across 12 western European countries, among which The Netherlands. They also find a negative relation between the two. They find that this negative effect is caused by substitution effect of ownership concentration to leverage, the risk adversity of large block holders and the disliking of the monitoring effect of debt.

Both studies only look at the single largest shareholder and use a cut off at the lower end of ten percent. Short, al al. (2002) use data of firms listed on the London Stock Exchange, which are not small firms in terms of market capitalization and the ten percent cap of Santos, et al. (2014) means that the smallest possible block holder would at least have to invest €133.000,00. Thereby they exclude the smaller block holders from their sample, who might favour higher debt levels in order to protect their investment. This may be a possible explanation for the fact that they only find a negative relationship between ownership concentration and leverage.

Contrary to other studies, La Bruslerie and Latrous (2012) found a non-linear relationship between ownership concentration and capital structure. La Bruslerie and Latrous (2012) examine 112 French listed firms in de period 1998-2009 and make a discrepancy in the amount of cash flow rights owned by the block holder(s). Due to this discrepancy, they find a non-linear inverted u-shaped relationship between the level of controlling shareholders' ownership and leverage. When the concentration of cash flow rights of controlling owners is small, a positive relation is present, until a certain point, at which the relationship turns negative. Hence indicating that controlling owners with little cash flow rights inflate debt to increase their proportional amount of cash flow rights and enjoy the monitoring function of debt. After reaching the turning point, controlling owners have accumulated a large portion of the cash flow rights and favour lower debt levels to avoid the monitoring effect of debt. Making the expropriation of wealth possible.

2.4 Ownership identity

In addition to the concentration of share ownership and its influence on the capital structure, the identity of the shareholder(s) also is of influence. Not all types of shareholders have the same level of knowledge on investing, the company invested in and or the same risk level they favour. Therefore each type of shareholder favours other leverage levels (De La Bruslerie & Latrous, 2012)(Santos, Moreira & Vieira, 2014). According to the existing, relevant literature a distinction in ownership identity exists between, state ownership, family ownership, institutional ownership, managerial ownership, corporate ownership and private ownership (Faccio & Lang, 2002)(De La Bruslerie & Latrous, 2012)(Santos, Moreira & Vieira, 2014).

Since not all forms of ownership identity are common in developed economies and likewise in Dutch firms, only a review is given of the ownership identity types which are expected to be present in Dutch firms. The aim is to provide a deeper understanding of the ownership

identity types, there influence on the capital structure (i.e. providing a sense of direction on the relationships between these variables) and to support the development of the hypotheses.

2.4.1 Family ownership

There are quite a few theories on how family ownership of a firm influences the capital structure. All providing their own explanation on how family owned firms perceive leveraging the firm. There is as much research indicating a positive relation between family ownership and debt, as there is indicating a negative relation.

On the one hand, there is a negative relation between family ownership and debt, because family owners will prefer internal financing over debt. Suggesting that pecking order theory is the explaining theory in regards to family owned firms and their capital structure. This is caused by their undiversified portfolios and the financial distress and bankruptcy risks of debt (Anderson & Reeb, 2003b)(Faccio, Marchica & Mura, 2011). In accordance with agency theory, some scholars argue that the restriction of debt usage might also be preferred in order to avoid monitoring of creditors (Pindado, Requejo & De La Torre, 2015)(Pindado & De La Torre, 2011). Which in turn could limit the enjoyment of private benefits of control (e.g. wealth expropriation and perquisite consumption) (Pindado, Requejo & De La Torre, 2015)(Volpin, 2002).

Santos, et al. (2014) use a sample of 694 firms from twelve Western European countries for the years 2002 to 2006. Caused by the potential risk of bankruptcy they find a negative relation between family ownership and leverage. Concluding that family firms are more averse to increase debt levels. Schmid (2013) finds similar result in a sample of 695 German family owned firms for the years 1995 to 2009, but adds the avoidance of external monitoring as cause in his conclusion.

On the other hand, a positive relation between family ownership and debt is to be expected. When internal funds are not sufficient to finance all activities, external resources have to be attracted. Family ownership and control will become diluted when using equity financing. Thus, in order to avoid such dilution, family firms will favour debt over equity (Schmid, 2013). In addition, debt usage can reduce the risk of a hostile takeover (Santos, Moreira & Vieira, 2014)(King & Santor, 2008). According to Yu and Zheng (2012), the favourability of debt financing in family owned firms is supported by the fear of IPO underpricing.

King & Santor (2008) find a positive relation between family ownership and leverage, whilst investigating 613 Canadian firms in the period 1998 to 2005. They find that the main reason for debt favourability is the fear of ownership dilution. In another study, Croci, Doukas and Gonenc (2011) also find a positive relationship between family ownership and leverage whilst researching the relationship in European continental firms during the period 1998-2008. Again appointing control issues and the diluting effect of equity financing as the main reason for family owned firms to favour debt financing.

A possible explanation for the different results in the King and Santor (2008) and the Croci, et al. (2011) study as opposed to that of Santos, et al. (2014) and Schmid (2013) is the focus of

the study. Whereas the latter two focus on revealing debt avoidance due the coherent monitoring effects, King and Santor (2008) and the Croci, et al. (2011) aim at revealing the adversity towards ownership dilution of equity financing and thus the favourability of debt.

More interesting La Bruslerie and Latrous (2012) find a non-linear relationship between family ownership and leverage. Whereas families generally like the non-diluting effect of debt financing. Additionally, in case of partial family ownership, they also see the potential of the monitoring effects debt and therefore favour debt financing over equity financing. La Bruslerie and Latrous (2012) also find that when larger proportions of a firm are family owned, families tend to actively watch their investment and monitor management in order to mitigate agency problems. Hence resulting in a substitution effect and lowering the desire for debt financing.

2.4.2 Managerial ownership

Jensen and Meckling (1976) state that managerial ownership reduces the managerial incentives for perquisite consumption, expropriation shareholders' wealth or engagement in suboptimal investment activities, due to partially bearing the costs of their actions. Increasing the managerial stake at risk increases managerial risk adversity, the fear of bankruptcy and financial distress. Increased managerial ownership aligns managers and shareholders, thereby reducing agency costs and the need for controlling function of debt (Margaritis & Psillaki, 2010) (Brailsford, Oliver and Pua, 2002). Moh'd, Perry & Rimbey (1998) add to that and state that because as well managerial ownership as debt have a monitoring and controlling function, both can be considered as substitutes for mitigating agency costs. Following this consensus, it can be concluded that a negative relation exists between managerial ownership and leverage.

On the other hand, more managerial ownership (i.e. more stake at risk) should increase risk adversity by management and would expect to lead to managements' preference of low risk investments. By increasing the leverage level, they rule out the possibility of asset substitution enforced by other shareholders (Short et al, 2002). Resulting in better alignment between managers and debtholders, which in turn lowers the agency costs of debt, which in turn lowers the costs of debt. Lower costs of debt lead to a higher debt capacity, hence indicating towards a positive relation between managerial ownership and leverage. Another argument for a positive relationship is the fact that managers can voluntarily increase debt levels significantly to avoid hostile take-overs, endangering their position (Zwiebel, 1996)(Wang, 2011).

Short, et al. (2002) use a sample of 226 U.K. firms for the period 1988 to 1992 to find the effects of managerial structure on leverage. They report a positive effect between the two. Zwiebel, et al. (1996) and Wang (2011), found a similar relation when the firm is performing poorly. However, the results of the latter two can be explained by obvious reason. Zwiebel, et al. (1996) and Wang (2011) already assume the entrenchment of management and therefor they logically claim a positive effect. The state that entrenched managers tend to use debt as a way of financing their empire building desires and use debt as an anti-takeover measure when other measures are not in place (e.g. golden parachutes).

More logical is the reasoning of Brailsford, Oliver and Pua (2002), they combine both contradicting theories and state that a non-linear relationship between managerial ownership and debt exists . An increase of managerial ownership, results in transfer of control over the firm from shareholders to managers. When managerial ownership reaches high levels, management entrenchment occurs, leading to opportunism and the pursuit of self-interests (Brailsford, Oliver and Pua, 2002). When going rogue, managers also increase the agency cost of debt by only investing in high risk, high yield projects, of which they have the intention of reaping the benefits and leaving the costs for the debtholders. To prevent such situations, Jensen and Meckling (1976) suggested that besides managerial ownership, the use of debt should be increased. An increase of corporate debt results in a conceptual shrinkage of the equity base and therefore increases in the fractional ownership of managers.

Brailsford, et al. (2002) investigate 49 Australian listed companies between 1989 and 1995. They find a non-linear relation between managerial ownership and leverage. Managers tend to raise debt levels to increase company value when they only own a small portion of the firm. As their stake grows, debt levels are significantly reduced. Instigated by the desire to undertake riskier investments with higher profits and a lower monitoring of their work. Florakis and Ozkan (2009) with a sample of 956 UK listed firms during the period 1999-2004 and Sun, et al. (2015) with a sample of all U.K. firms during the period 1998-2012 both also find a non-linear relationship between managerial ownership and leverage. They find evidence in the same directions as Brailsford, et al. (2002). They find that lower managerial ownership levels align the interests of corporate managers and shareholders, leading to lower costs of debt. In this case, firms are likely to raise more debt, resulting in higher debt (Sun, et al., 2015). However, this relation becomes negative when managerial ownership levels increase further. They claim that entrenchment of management is the explanation. Adding that corporate managers who own high percentages of firm shares are in a better position to protect their private interests from the risk of bankruptcy associated with high levels of debt (Sun, et al., 2015).

2.4.3 Institutional ownership

According to Santos, Moreira & Vieira (2014), one speaks of an institutional investor i.e. institutional ownership, when the shareholder is a financial company, an insurance company, a mutual pension fund, a private equity company or a bank.

Institutional ownership is widely associated with lower debt ratios (Moh'd, Perry & Rimbey, 1998)(Santos, Moreira & Vieira, 2014). Pound (1988) proposed three hypotheses which give insights in the relation between institutional ownership and leverage: the efficient monitoring hypothesis, the conflict of interest hypothesis and the strategic alignment hypothesis. The efficient monitoring hypothesis (Pound, 1988) states that institutional investors have greater expertise and can monitor management at lower cost than small shareholders. Moreover large institutional investors have the opportunity, resources and ability to discipline and influence managers (Cornett, Marcus, Saunders & Tehranian, 2007). Maug (1998) notes that institutions' monitoring and influencing management mostly derives from the size of their shareholdings and the marketability of these shareholdings. Chung and Wang (2014) and

Santos, Moreira & Vieira (2014) both conclude, based on earlier work, that the presence of the institutional investor might be a substitute for the disciplinary role of debt.

The conflict of interest hypothesis (Pound, 1988) suggests that the possibility of other profitable future business relations with the firm, coerce institutional investors to vote in line with management. Accepting the preference of a firms' management for low leverage. Thereby sustaining the current relationship and securing future profitable investment opportunities for the institutional investor.

The strategic alignment hypothesis (Pound, 1988) suggests that institutional investors and managers find it mutually advantageous to cooperate. Thus reducing the use of debt financing in order to maintain the mutually beneficial relationship. In line with each of these hypotheses, a negative relationship between institutional ownership and debt is to be expected (McConnell and Servaes, 1990)(Michaely & Vincent, 2012)(Santos, Moreira & Vieira, 2014).

Santos, et al. (2014) find a negative relationship between institutional ownership and leverage. Indicating that the institutional owner acts as a substitute for the monitoring and discipline role of debt as main explanation. They add that the aversion to risks as bankruptcy and financial distress associated with debt financing is another possible explanation for low debt levels. Michaely and Vincent (2012) use a fluctuating sample of U.S. firms, with an average of 4246 firms a year for the period 1979-1997. They find a negative relation between institutional ownership and leverage and also claim that the substitution effect is the cause. Finally Fayoumi and Abuzayed (2009) find no evidence of institutional shareholders using capital structure decisions to monitor managerial behaviour. They therefore conclude a negative relationship between institutional ownership and leverage.

Interestingly and contradicting most of literature on the matter, Sun, Ding, Guo and Li (2015) find a positive relationship between institutional ownership and leverage. They argue that some institutional shareholders are banks and force the firms they hold shares in to borrow money from them. Although this reasoning holds statistically, it seems somewhat surreal and provides new fields to explore. One explanation could be these banks use this forced borrowings technique to obtain more and cheaper ownership in the company they invested in. I.e. they demand the issue of convertible bonds.

2.4.4 Corporate ownership

One can speak of corporate ownership, when the shares of a company are held by another non-financial company (i.e. not an institutional owner/investor). For instance a manufacturing company holding excess cash, which is not required to finance its own producing activities (Santos, Moreira & Vieira, 2014). Scarcity of scientific research on this type of ownership suggests an absence, which is logically explained. According to pecking order theory (Myers and Majluf, 1984), retained earnings usually will not suffice to fulfil the financing needs of a company. Thus, issuing bonds or stocks to obtain the funds needed for own investments, leaving no excess cash to invest in other businesses. When excess cash is available for investing in other companies, preference for high debt is expected. Maintaining own

operations at a profitable level, little time is left for extensive monitoring external investments. Thus, favouring high(er) leveraging of the firm invested in, enjoying the monitoring and disciplining effect of debt, thereby mitigating agency costs.

However, the literature is superfluous on other forms of corporate ownership such as pyramidal ownership structures and mergers and acquisitions and their influence on the capital structure. First, an increased debt capacity is seen as a main reason to engage in mergers and acquisitions (Lewellen, 1971). Additionally, Brealey and Myers (1991) state that mergers reduce earnings variability and thereby bankruptcy costs (Agliardi, Amel-Zadeh and Koussis, 2016). Thus mergers are perceived as value creating and are making debt safer (Ghosh and Jain, 2000). Secondly, increased leverage creates value through increased tax deductions of the coherent increased interest payments (Ghosh and Jain, 2000).

Ghosh and Jain (2000) perform study on pre- and post-merger leverage. In a sample of 239 mergers completed between 1978 and 1987 they found that target and acquiring firms have a larger combined debt capacity which they try to utilize fully by taking on more debt. They also test if the enlarged debt is the result of pre-merger unused debt capacity, but do not find cohering results. It appears that a merger announcement can also be interpreted as an indirect leverage-increasing announcement after which the merged firms fully utilize the increase in debt capacity by taking on more debt (Ghosh and Jain, 2000). Agliardi, et al. (2016) find similar results and state that merging firms that have lower correlation of cash flows have larger merger gains and increase leverage more after the merger. They find that firms with decreases in volatility and bankruptcy costs due to the merger have higher merger gains and have higher increases in leverage after the merger.

Although not common in developed economies, pyramidal ownership is existent. In pyramidal ownership structures, tunnelling is expected to cause increased leverage in bottom of the pyramid subsidiaries (Paligorova & Xu, 2012). Ultimate owners expropriate wealth by shifting resources from the bottom to the top through inflated payment for intangibles or transfer pricing (Johnson, La Porta, Lopez-de-Silanes and Shleifer, 2000). Increasing the amount of expropriated wealth is done via increased leverage in the lower echelons of the pyramid. Rolling the cash over to affiliates, ultimate owners can easily access the cash without detection (Paligorova & Xu, 2012). As long as the subsidiaries do not face financial distress, leverage will be increased followed by expropriating actions (Paligorova & Xu, 2012).

Paligorova & Xu (2012) investigate a number of explanations for the higher use of debt in pyramids. The results cannot reject the hypothesis that debt is associated with expropriation activities of ultimate owners. Additionally they do not find support of the use of debt as a device for enhancing control or discipline, reducing tax liability, or sharing of risk. To the extent that shareholders and creditors evaluate the risk of expropriation differently, the ultimate owners of pyramidal firms may still have an incentive to use debt as an expropriation device given that the rising cost of debt is lower than the cost of equity.

In table one below, an overview of the pre-named existing literature is provided. The first column explains the relationship. The second column states the sign of the relationship stated in column one and the third column indicates the concerning article.

Literature overview

Subject	Sign of the relationship	Literature
Effects of ownership concentration on leverage	+	Brailsford, et al. (2002), Margaritis & Psilaki (2010), Pindado & De La Torre (2011)
	-	Short, et al. (2002), Santos, et al. (2014)
	Non linear	La Bruslerie & Latrous (2012)
Effects of family ownership on leverage	+	King & Santor (2008), Croci Doukas and Gonenc (2011)
	-	Volpin (2002), Anderson & Reeb (2003b), Faccio, et al. (2003), Pindado & De La Torre (2011), Schmid (2013), Pindado, et al. (2015), Santos, et al. (2014)
	Non linear	La Bruslerie & Latrous (2012)
Effects of managerial ownership on leverage	+	Short, et al. (2002), Wang (2011)
	-	Jensen & Meckling (1976), Moh'd, et al. (1998)
	Non-linear	Brailsford, et al. (2002), Florakis & Ozkan (2009), Sun, et al. (2015)
Effects of institutional ownership on leverage	+	Sun, et al. (2015)
	-	Santos, et al. (2014), Cornett, et al. (2007), Michaely & Vincent (2012), Fayoumi & Abuzayed (2009)
Effects of corporate ownership on leverage	+	Ghosh & Jain (2000), Paligorova & Xu (2012), Agliardi, et al. (2016)

Table 1: this table presents a overview of the literature discussed in the literature review

2.5 Hypotheses

It is believed that the relationship ownership concentration and leverage follows the logic of La Bruslerie and Latrous (2012). Incentivized by protecting their investment, investors with small concentrations of ownership prefer debt as a monitoring and control mechanism and suggest a positive relation between ownership concentration and leverage is present, till upon a certain point, at which the relationship turns negative. After reaching the turning point, concentrated ownership favours lower debt levels to avoid the monitoring effect of debt. Making the expropriation of little shareholders' wealth by large shareholders possible. In line

with this logic, a non-linear relationship between ownership concentration and leverage is expected.

Hypothesis 1: Ownership concentration has a non-linear effect on leverage.

Even though there is some evidence for a negative relation or even a non-linear relationship between family ownership and leverage, it is expected that these relations are the effect of a type of family ownership, in which the family does not interacts with the business' operation. Although these results are found, it is expected that more family owned firms prefer to lever the firm. It is expected that the diluting effect of equity financing and losing control over the firm is expected to outweigh the negative aspects of debt financing. Resulting in either, primarily expected, internal financing or, when necessary, debt financing.

Hypothesis 2: Family ownership has a positive effect on leverage.

After reviewing the literature, a non-linear relation between managerial ownership and leverage is expected. Managers tend to raise debt levels to increase company value when they only own a small portion of the firm. As their stake grows, debt levels are significantly reduced. Instigated by the desire to undertake riskier investments with higher profits and a lower monitoring of their work.

Hypothesis 3: Managerial ownership has a non-linear effect on leverage.

It is expected that a negative relation exist between institutional ownership. As stated by Santos, et al. (2014), the institutional owner is expected to be a substitute for the monitoring and disciplining role of debt. Where most of the empirical evidence points to a negative relationship, it is expected that this same relationship is found for this particular research.

Hypothesis 4: Institutional ownership has a negative effect on leverage.

Ghosh and Jain (2000) found that target and acquiring firms have a larger combined debt capacity which they try to utilize fully by taking on more debt. Additionally, Johnson et al., (2000) state that ultimate owners expropriate wealth by shifting resources from the bottom to the top through inflated payment for intangibles or transfer pricing (Johnson, La Porta, Lopez-de-Silanes and Shleifer, 2000). Increasing the amount of expropriated wealth is done via increased leverage in the lower echelons of the pyramid. Therefor a positive relation between corporate ownership and leverage is expected.

Hypothesis 5: Corporate ownership has a positive effect on leverage.

3. Methodology

This chapter reviews the regression techniques which are commonly used in capital structure research, specific advantages and drawbacks and additionally a justification for the statistical technique used in this paper.

3.1 Regression techniques

3.1.1 Ordinary least squares method

Ordinary least squares (OLS) regression is a statistical technique which is widely used for capital structure studies (e.g. Rajan & Zingales, 1995; Brailsford, et al., 2002; Florakis & Ozkan, 2009; Margaritis & Psillaki, 2010). OLS regression is used to explain the relationship between a dependent variable Y and one or more independent variables X over time, across sections or both. It does so by minimizing the sum of squares of the residuals (i.e. the differences between the outcomes predicted by the regression formula and observed outcomes from the dataset) (Freedman, 2009). A big advantage of OLS is strong consistency can be achieved with minimal assumptions on the design and weak moment conditions on the errors (Lai, Robbins & Wei, 1978).

In order to produce reliable regression results, OLS dependents on meeting four assumptions. One, the independent variables have to be exogenous; hence they don't correlate with the error terms. Two, the error term have to be homoscedastic. Three, the error terms have to be uncorrelated. Fourth, the error terms have to be normally distributed (Freedman, 2009). Violations of the OLS assumptions may occur from various reasons. For instance, small N problems in the collection of data (Podestá, 2002) or an omitted explanatory variable (Freedman, 2009). Solutions to these common problems can be found in other statistical techniques.

3.1.2 Pooled ordinary least squares method

OLS regression usually has a cross-sectional or temporal focus. A special case of OLS regression is when cross-sectional and temporal research designs are combined. Combining the cross-sectional units (i) and the temporal element time (t) is also called panel research. Which according to Podestá (2002) is usually conducted with the use of pooled ordinary least squares regression. Using this kind of regression model solves many problems which the research methods would face individually (i.e. temporal of cross-sectional). First the small number of observations often suffered by both. Secondly, increasing variability, resolving slow variability or invariability of firms. Third, variation of both, namely time and space can be captured at once (Podestá, 2002).

There are drawbacks to using pooled OLS regression, Janoski, and Hicks (1994) state that it tends to generate five complications. The first problem is that regression errors tend not to be independent from one period to the next. Thus, they might be serially correlated. Hence meaning correlated over time (Podestá, 2002)(Janoski, and Hicks, 1994).

Second, errors tend to be cross-sectional heteroscedastic. Meaning that error variances are different across sections, for example across industries. Meaning that some sections that have

higher values on specific variables, such as revenue, tend to have less restricted and higher variances (Podestá, 2002)(Janoski, and Hicks, 1994). Moreover, errors of a pooled OLS regression analysis can show heteroscedasticity because the scale of the dependent variable deviate much from one to another, for example revenue (Podestá, 2002)(Janoski, and Hicks, 1994).

Third, regression errors tend to be correlated across sections. For example, errors of a biotech company at a specific moment in time can be correlated with errors of another biotech company at the same moment in time. However there does not have to be error correlation between one of the two companies and for instance the health care section. Cross-sectional error correlation refers to closely related sections (Podestá, 2002)(Janoski, and Hicks, 1994).

Fourth, errors tend to conceal unit and period effects. Even when starting with data that is homoscedastic and not auto-correlated, there is risk of producing a regression with observed heteroscedastic and auto-correlated errors (Podestá, 2002)(Janoski, and Hicks, 1994).

When the assumption that sections and time series are homogeneous is violated and they appear not to be, then least squares estimators will be a compromise. Consequently they are unlikely to be a good predictor of the time series and the cross-sectional units, the level of heteroscedasticity and auto-correlation will be significantly larger (Podestá, 2002)(Janoski, and Hicks, 1994).

Fifth, errors might be non-random across sections or time series units because parameters are heterogeneous across subsets of units (Podestá, 2002)(Janoski, and Hicks, 1994). For example, processes linking dependent and independent variables tend to vary across sections or time series, such as revenues and number of customers. Resulting in errors that tend to reflect some causal heterogeneity across space, time or both (Podestá, 2002)(Janoski, and Hicks, 1994).

3.1.3 Fixed effects method

The fixed effects model is a statistical model that treats the observed objects as if they are non-random. Meaning that omitted explanatory variables are treated as if they are not caused by randomness and therefore held constant (Gardiner, Luo & Roman, 2009). In a fixed effects model it is assumed that a time invariant effect, casu quo variable, exists that correlates strongly with one or more of the independent variables in the regression model (Gardiner, Luo & Roman, 2009). In panel data research on the capital structure, industry fixed effects and time fixed effects are common (Brailsford, et al., 2002; Florakis & Ozkan, 2009; Margaritis & Psillaki, 2010; Ampenberger, et al., 2011).

Although the fixed effects model entails advantages, there are drawbacks to using this technique. Greene (2004, state that it is possible to condition a large number of constants out of a model. However it is impossible to condition constants in most cases. Moreover, they state that regressing with fixed group sizes, T, there appears to be a significant small sample bias in the estimator (Greene, 2004).

3.1.4 Random effects method

The random effects model is a special case of the fixed effect model. It assumes total individuality of the observed cases and allows individual effects (Gardiner, Luo & Roman, 2009). Meaning that an omitted individual specific effect is treated as if it's caused by total randomness and can therefore not become an explanatory variable (Gardiner, Luo & Roman, 2009). Random effects models do not introduce estimated dummy variables but estimated values on the mean and standard deviation of the distribution effects. Reducing variance on variables and leaving the degrees of freedom intact (Clark & Linzer, 2015).

The greatest drawback of random effects modelling is the problem of bias that can be introduced in the estimates of the coefficient of the explanatory variables (Clark & Linzer, 2015). Therefore, the errors terms of the covariate (variable influencing another independent variable) of interest cannot be correlated with explanatory variables as is the case in fixed effect models. For example industry effects influencing the tangibility of assets held by a company. Furthermore, no autocorrelation is allowed (Clark & Linzer, 2015).

Choosing between a fixed effect model and random effect model as the appropriate technique can be done by first running the fixed effect model, then the random effect model. Afterwards a Durbin-Wu-Hausman test should be performed to indicate the correct model and estimation method (Gardiner, Luo & Roman, 2009)(Clark & Linzer, 2015). It is not uncommon for scholars to use both and compare results across the estimation methods. For example, Al-Najjar & Hussainey (2011).

3.2 Model justification

This research is as well temporal as cross-sectional research. Namely, many variables from different Dutch firms over several years and their effect on the capital structure are studied. Moreover, following the work of Brailsford, et al. (2002), Florakis and Ozkan (2009) and Ampenberger, et al. (2011), this research uses pooled OLS regression to examine the relationship between ownership structure and leverage. To correct for the potential pitfalls of pooled OLS, the independent variables are lagged with one year in order to prevent autocorrelation and to isolate the analysis from the potential reverse causality (Deesomsak et al., 2004) (Margaritis and psillaki, 2010). To avoid problems associated with outliers and to reduce cross-sectional heteroscedasticity, all independent variables Winsorized at the 0.01 and 0.99 level, thereby following Harvey, et al. (2004), Ampenberger, et al. (2011) and Santos, Moreira & Vieira (2014). Furthermore the normality assumptions for the regression errors will be checked consistently.

It could be argued that fixed effects modelling should additionally be applied as an estimation method to exploit the variation in ownership structure over time. However, it is expected that the ownership structure is rather stable among Dutch listed firms and therefore offers no variation to exploit. Furthermore, unobserved heterogeneity through firm fixed effects is not expected. On the other hand, industry fixed effects are to be expected and should thus be controlled for. It is decided to add industry dummies to the pooled OLS regression model. Whereas theoretical underpinning does not specify this as an industry fixed effects model, its practical implication will render the same results.

To test this research's hypotheses, multiple regression models are run. This due to expected collinearity between the explanatory variables ownership identity and ownership concentration. Resulting into the following regression models.

1. $LEV_{(i,t)} = \alpha_0 + \beta_1 BLOCK_{(i,t-1)} + \beta_2 BLOCK^2_{(i,t-1)} + \beta_3 CONTROLS_{(i,t-1)} + \varepsilon_{(i,t)}$
2. $LEV_{(i,t)} = \alpha_0 + \beta_1 FAM_{(i,t-1)} + \beta_2 MAN_{(i,t-1)} + \beta_3 MAN^2_{(i,t-1)} + \beta_4 INSTIT_{(i,t-1)} + \beta_5 CORP_{(i,t-1)} + \beta_3 CONTROLS_{(i,t-1)} + \varepsilon_{(i,t)}$

In which the variable $CONTROLS_{(i,t-1)}$ can be further defined as: $\beta_{x\ (NAT.LOG.)} FIRM\ SIZE_{(i,t-1)} + \beta_{x+1}\ EARNINGS\ VOLATILITY_{(i,t-1)} + \beta_{x+2}\ GROWTH\ OPPORTUNITIES_{(i,t-1)} + \beta_{x+3}\ LIQUIDITY_{(i,t-1)} + \beta_{x+4}\ PROFITABILITY_{(i,t-1)} + \beta_{x+5}\ TANGIBILITY\ OF\ THE\ FIRMS'\ ASSETS_{(i,t-1)} + \beta_{x+6}\ NDTS_{(i,t-1)} + \beta_{x+7}\ INDUSTRY_{(i,t-1)}$.

3.3 Variable selection and construction

3.3.1 Dependent variables

The dependent variable in this research is leverage. Throughout the literature, quite a few, different ways of measuring leverage have been proposed. For instance, the ratio of total debt to total assets (Harvey et al, 2004) or the ratio of long term debt to total assets (De Jong, 2002). It is argued that short term debt is composed by the current portion of long term debt, bank overdrafts and debt to credit institutions. Furthermore, the height of short term debt can differ largely over years, distorting leverage levels (De Jong, 2002).

Other discrepancy can be made between book or market leverage. Wide disparity in the literature suggests both options (Santos, Moreira and Vieira, 2014). De Jong, Kabir and Nguyen (2008) use market leverage in their research, whereas Mackay and Phillips (2005) promote book leverage and Booth, Varouj, Demirguc-Kunt, and Maksimovic (2001) rely on both. Although market leverage generally provides a more realistic measure of leverage, since it is closer to the intrinsic firm value (Santos, Moreira & Vieira, 2014), De Jong (2002) states the capital structure of most Dutch firms is measured in book value and they therefore base their capital structure decisions on these book values (De Jong, 2002).

Since it is expected that using market leverage and only long term debt renders the best, most representative results, it is therefore chosen as the primary leverage proxy. Thus meaning the market value of long term debt divided by the market value of total assets.
To be as thorough as possible and to mitigate the effects of choosing the wrong proxy for leverage, the regression will be modelled four times. First, with the most favourable leverage proxy than followed by the other three leverage proxies.

Market leverage 1 (MLEV1)
The primary leverage proxy MLEV1 will be calculated by taking the book value of long term debt divided by the book value of total debt (short term debt + Long term debt) plus the market value of equity.

Market leverage 2 (MLEV2)
MLEV2 will be calculated by the book value of total debt divided by the book value of total debt plus the market value of equity.

Book leverage 1 (BLEV1)
BLEV1 is calculated by the book value of long term debt divided by the book value of total assets.

Market leverage 2 (BLEV2)
BLEV2 is calculated by book value of total debt divided by the book value of total assets.

The market value of total assets is calculated by making use of the accounting equation: assets = liabilities + equity. Thus the market value of total assets equals the market value of equity plus the market value of debt. The market value of equity is found by calculating the market capitalization, which is share price at time *t* multiplied by the total number of outstanding shares at time *t*. Due to information and available data limitations and following (La Bruslerie & Latrous, 2012), the book value of debt is used as measure for its market value.

3.3.2 Independent variables

The explanatory variables (i.e. independent variables) in this research are ownership concentration and ownership identity, together forming the omnibus variable ownership structure.

Ownership concentration (BLOCK)
In order to test the effect of ownership concentration, this research follows the work of Brailsford, et al. (2002), La Bruslerie & Latrous (2012) and Santos,Moreira & Vieira (2014). To measure the aggregate of shares held by the five largest shareholders, the variable *BLOCK* is created. Additionally, $BLOCK^2$ is created by squaring the values of BLOCK. Both variables are used to test the hypothesized non-linear relationship between leverage and ownership concentration. A positive significant value on BLOCK and a negative significant value on $BLOCK^2$ produces a maximum point (Brailsford, et al., 2002).

To measure the influence of ownership identity, the variables FAMILY, MANAGERIAL, INSTITUTIONAL, CORPORATE and are used and measured by the percentage of shares held by the largest shareholder if they are of one of the identity types.

Family share ownership (FAM)
Family share ownership is classified the aggregate percentage of ordinary shares owned by all members of the founding family. The criteria set for accounting as a family firm in this research, follow Ampenberger, et al. (2011). Hence at least one of the following criteria must be satisfied: (1) the founding family owns at least 25% of the shares and/or (2) at least one member of the founding family is represented in the supervisory board and/or (3) at least one member of the founding family is involved in top management.

Managerial share ownership (MAN)
Managerial share ownership is measured as the aggregate percentage of ordinary shares owned by all executive and non-executive directors. Additionally, MAN^2 is created by squaring the values of MAN.

Institutional share ownership (INSTIT)
Institutional ownership will be measured by the aggregate percentage of shares held by institutions. Institutional shareholders are an aggregate for banks, insurance companies, pension funds and mutual funds or a financial company (Santos, et al., 2014).

Corporate share ownership (CORP)
Corporate share ownership will be measured by the aggregate percentage of shares held by corporations/firms other than institutional owners.

3.3.3 Control variables

Although this study investigates the impact of ownership structure on leverage, other variables also influence the firms' capital structure (Titman and Wessels, 1988)(Rajan & Zingales, 1995)(Brailsford, et al., 2002). In order to control for these effects of non-interest, so called variables are included in the regression model. Following the work of Brailsford, et al. (2002) these control variables and their sign are:

Firm size (SIZE)
Firm size is calculated by taking the natural logarithm of the book value of assets. This variable is expected to have a positive influence on the leverage level of a firm. Bigger firms are usually more diversified and thus less prone to bankruptcy risks, which in return allow higher debt levels. For smaller firms, the opposite holds (Titman and Wessels, 1998)(Brailsford, et al., 2002). Other common measures for this variable are the natural logarithm of the number of employees (Ampenberger, et al, 2011), or the natural logarithm of the annual sales/revenue (Titman & Wessels, 1988).

Earnings volatility (VOL)
Earnings volatility is calculated by taking the standard deviation of the annual percentage change in earnings before interest, taxes and depreciation. For calculation of the standard deviation, data of the previous three years are used. Ferri and Jones (1979) state that earnings volatility is an indication of business risk. Future income is key in being able to pay interest charges (Ferri & Jones, 1979)(Brailsford, et al., 2002). Potential debt holders regard a firms' future earnings as key criteria for receiving their installed payments of interest and the

principal (Brailsford, et al., 2002). The expected sign on this control variable is negative, since more constant earnings will attract more potential debt holders. Titman and Wessels (1988) measure earnings volatility by the standard deviation of the annual percentage change in operating income.

Growth (GROWTH)

Growth is calculated by the annual percentage change in total assets. In line with agency theory, is expected that this variable has positive sign. Managers of high growth firms have more cash at their disposal and thus have more tendencies to invest sub-optimal and expropriate wealth. Inclining the need for the monitoring function of debt (Titman and Wessels, 1988)(Brailsford, et al., 2002). On the other hand, pecking order theory from Myers and Majluf (1984) suggests that sufficient internal funds should diminish the need for issuing debt. Thus invoking a negative sign for this variable. Given the focus of this research, a positive sign is expected on GROWTH. Other proxies for GROWTH are capital expenditure to total assets (Titman & Wessels, 1988).

Liquidity (LIQUID)

According to Brailsford, et al. (2002) and Ampenberger, et al. (2011), the liquidity of a firm is an important determinant for capital structure. They state that high liquid firms borrow less money to finance their investing activities, since they have sufficient own funding capabilities. Hence building their equity base (Brailsford, et al., 2002).Deviating from Brailsford, et al. (2002), this research uses a liquidity proxy instead of a free cash flow proxy. It is chosen to do so, because a firm holds more assets which can be turned into cash rather easily to fund operations or investing. Using the free cash flow proxy from Brailsford, er al. (2002) distorts the regression outcome, since it does not hold in real world situations. Liquidity is calculated by dividing the book value of current assets through the book value current liabilities. It is expected that the liquidity proxy has a negative sign.

Profitability (PROFIT)

Profitability is derived by ratio of earnings before interest and tax to total assets. Titan and Wessels (1998) and Brailsford, et al. (2002) suggest that the profitability of a firm relates to their capital structure. They state that more profitable firms will demand less debt because internal funds are available. When more earnings are available for retention, firms tend to build their equity base relative to their debt (Brailsford, et al., 2002). Therefore a negative sign is expected for PROFIT. Other profitability proxies are operating income to sales (Titman & Wessels, 1988), operating income to total assets (Jensen, Solberg & Zorn, 1992).

Tangibility of the firms' assets (TANG)

Whereas Brailsford, et al. (2002) uses the intangible assets in his proxy, this research deliberately takes the tangible assets. In order to avoid default on this proxy for firms who do not own intangible assets. Tangibility of the firms' assets is measured by the ratio of fixed assets (property, plant and equipment) to total assets. The sign for this variable is expected to be positive. Namely, the assets owned by a firm influence the capital structure choice of a firm (Titman and Wessels, 1998). Especially if the assets owned are tangible, they are very

suitable to serve as collateral for debt financing. Hence, making debt financing easier and cheaper than when assets are not tangible, such as patents (Titman and Wessels, 1998).

Non-debt tax shield (NDTS)

The non-debt tax shield variable is calculated by the annual depreciation expense divided by total assets. Brailsford, et al. (2002) and DeAngelo and Masulis (1980) state that the greater the non-debt tax shields, the lower the benefit of additional debt. Firms with a higher non-debt tax shield are expected to receive lower tax benefits from issuing new debt and therefore will use less debt (Brailsford, et al., 2002)(DeAngelo & Masulis, 1980). For this reason a negative relationship is expected between leverage and the non-debt tax shield variable.

Industry (INDUS)

A firms' industry is seen as a possible determinant of capital structure. Firms in similar industries face similar processes; reward and risk characteristics and therefore firms in similar industries are inclined to have corresponding financing preferences (Brailsford, et al., 2002). To control for the influence of the industry a company is in, the variable *INDUSTRY* is created. The following dummy variables are created to serve as proxies for the different identities.

Industry dummies overview

Dummy name	Industry classification
$INDUS_1$	Manufacturing
$INDUS_2$	Services
$INDUS_3$	Wholesale/Retail
$INDUS_4$	Holding

Table 2: this table presents the industry dummies and their abbreviations

The following table summarizes all variables used in this research, their sign and gives a description of their measurement scale.

Variable overview

Variable	Sign	Description
Leverage	Mlev1	Book value of long term debt divided by the book value total debt + market value of equity
	Mlev2	Book value of total debt divided by the book value total debt + market value of equity
	Blev1	Book value of long term debt divided by the book value of total assets
	Blev2	Book value of total debt divided by the book value of total assets
Ownership identity	FAM	Aggregate percentage of shares held by a family(member)
	MAN	Aggregate percentage of shares held by managers
	MAN^2	(Aggregate percentage of shares held by managers)^2
	INSTIT	Aggregate percentage of shares held by institutions
	CORP	Aggregate percentage of shares held by corporations/firms
Ownership concentration	BLOCK	Percentage of shares held by the largest five shareholders
	$BLOCK^2$	(Percentage of shares held by the largest five shareholders)^2
Firm size	SIZE	Natural logarithm of total assets
Earnings volatility	VOL	The standard deviation (previous three years) of the annual percentage change in earnings before interest, taxes and depreciation
Growth opportunity	GROWTH	The annual percentage change in total assets
Liquidity	LIQUID	Current assets divided by the current liabilities
Profitability	PROFIT	Earnings before interest and tax divided by total assets
Tangibility of the firms' assets	TANG	Fixed assets divided by total assets
Non-debt tax shield	NDTS	The annual depreciation expense divided by total assets
Industry	INDUS	Industry in which the firm operates
Error	ε	Residuals

Table 3: this table presents an overview of all variables used in this study

4. Data

4.1 Sampling strategy and targeted data

This research focusses on the effects of ownership structure on the capital structure of Dutch listed firms over a period of five years. The five year period stretches from 2010 to 2014 and is deliberately chosen to avoid distortion by the global credit crunch of 2008. It is a requirement for the firms included in this study that they were listed for at least two years in the time period intended. However, being listed currently is no requirement for this research since there are many formerly public companies who are not listed anymore.

Following previous studies that investigate the effect of ownership structure on leverage, like Pindado and De La Torre (2011), De La Bruslerie and Latrous (2012) and Pindado, Requejo and De La Torre (2015), financial firms, such as banks and insurance companies are excluded from the sample. First, resulting from the way they operate, these firms have very different financial structures. For example, banks borrow money from their individuals (e.g. savings account), which they afterwards lend to other customers to make money. Absence of a (fairly large) equity base, like in industrial firms, makes that they, on average, have higher leverage levels. Secondly, financial firms are excluded because they have to comply with very strict legal requirements. Second, firms with negative equity are excluded from the sample since their near bankruptcy. Furthermore firms that have much incomplete data for the targeted time frame will be excluded from the sample.

Information that will be gathered from the targeted firms is confined by short term debt, long term debt, market value of equity, total assets, earnings before interest, tax and depreciation, current assets, current liabilities, earnings before interest and tax, fixed assets, industry classification and ownership data (i.e. concentration and identity of the top five shareholders).

4.2 Share classes in Dutch listed firms

Collections ownership data presents a choice. Namely, there are several different share classes in Dutch listed firms. In contrast to other countries, among which the USA, preferred shares and priority shares are not the same in The Netherlands. This section gives a description of the three classes of shares that are most common in The Netherlands.

Ordinary shares or common shares, which give the holder partial ownership of the firm (De Jong, De Jong, Mertens & Wasley, 2005). Additionally, they give the holder the right to receive dividends, the right to vote, liquidation rights and if issued in its class, the opportunity to purchase additional shares (De Jong, et al., 2005). Second, there are preferred shares or preference shares. Preferred shares give the holder all the same rights as a common shareholder but one. Namely, the right to receive a fixed dividend pay-out with priority over common shareholders. On top of that, Cumulative preferred shares give the holder the additional right to claim foregone dividends from previous years, due to low profits (Ees, Postma & Sterken, 2003) (De Jong, et al., 2005). Third, a firm can issue priority shares. Priority shares have special voting rights and give their holder special rights. For instance, approval of M&A activities, liquidation of assets and the appointment of members of the management or supervisory board. (Ees, et al., 2003)(De Jong, et al., 2005).

Due to the fact that preferred and priority shares are usually issued to specially related and from time to time used as anti-takeover measures (Ees, et al., 2003)(De Jong, et al., 2005), it is expected that their volume will be low and their holders will ipso facto have more voting power. Possibly distorting the relationship between ownership structure and capital structure. Additionally, following Brailsford, et al. (2002) and Ampenberger, et al. (2011), this research only focusses on the common shares and its holders.

4.3 Data collection and data sample

Firm data is retrieved from the Orbis database for financial data. Incomplete firm data from Orbis will filled by handpicking the missing values from annual reports.

The initial dataset from the Orbis databank consisted out 312 Dutch listed and formerly listed firms. After excluding financial firms, such as pension funds, banks, etc., 279 firms were left. Excluding firms with missing data and the exclusion of firms with negative equity reduced the number of firms in the dataset to 104.

Each firm in this sample has 10 observation years, which makes 1040 firm_year observations. Furthermore all years except for 2010-2014 are excluded from the sample. Lastly, firm_years with too many missing data were deleted, resulting in a final number of 557 firm year observations.

Data sampling strategy

Data reduction steps	Number of firms in the sample
Starting dataset from Orbis	312
Excluding financials firms	279
Exclude firms with missing data	110
Excluding firms with negative equity	104
Final number of firms	**104**
↓	↓
Data reduction steps	Number of firm_years in the sample
Number of firm_year observations	104 firms * 10 years = 1040
Excluding all years but 2010-2014	626
Exclude years with missing data	562
Final number of firm_year observations	**562**

Table 4: this table displays the data sampling strategy and the steps taken to come to the final number of 562 firm_year observations

5. Empirical results

5.1 Univariate analysis

In table 5 the summary statistics are presented for the sample of Dutch listed non-financial firm over the period 2010-2015. Result show that Mlev1 has a mean of 19.06% [median=14.49%]. In comparison with findings of others Ampenberger et al. (2011) find comparable values on the same proxy and report a mean of 22% [median=20%] in their German sample of 660 firms.

Mlev2 has a mean of 28.94% [median=23.18%], similar to the 2009 study of Al-Fayoumi and Abuzayed, in which a slightly lower mean of 28.10% [median=20.40%] is reported. Also similar to the results of Santos, et al. (2014), who find a mean of 31.2% [median=28.6%]. However, Florakis and Ozakan (2009) report very different and lower values with a mean of 9.73% [median=7.05%]. Since they offer no explanation, it is likely to conclude that the timeframe is key. The sample runs from 1999 to 2004, a time in which stocks were booming and the 'internet bubble' was coming to a peak (i.e. (extremely) high market value of equity in the denominator of the leverage proxy will result in a low leverage level). Blev1 has a mean of 16.45% [median=13.49%]. Other Dutch studies of (De Jong, 2002) find a mean of 13.2% [median=11.3%] and (De Jong & Van Dijk, 2007) report a mean of 12.8% [no median reported].

It is noticeable that the book leverage measures have a lower mean than the market leverage measures, mostly because one would suspect it to be the other way around. Inclusion of the market value of equity in the denominator should shrink the market leverage value below their book value counterparts. A possible explanation for this phenomenon is a relatively large number of observations with a market-to-book ratio, smaller than one. Hence meaning that the book value of total assets is higher than the book value of debt and the market capitalization combined of some firm_year observations.

The average firm size in this sample is 650.2 million euro, which is smaller than the 1426 million euro reported by De Jong and Van Dijk (2007) or the 3229 million euro by (De Jong (2002). Due to the fact that the same firm size proxy is used, the period examined must be explanatory to these differences. Furthermore, the average percentage of block holding is 46.98%, again very similar to the results of other Dutch studies of (De Jong, 2002), (De Jong & Van Dijk, 2007) and (Kabir, Cantrijn and Jeunink, 1997) who respectively report 43.3%, 45.6% and 49.2%. Other studies on western European firms report similar high values. Among which (Florakis and Ozakan, 2009) whom report a mean of 47.21% for UK firms and (Faccio and Lang, 2002) whom report a mean of 38.48% for all western European countries combined.

Summary statistics

	N	Mean	Median	Std. Deviation	Minimum	Maximum
Mlev1 in (%)	562	19.06	14.49	18.54	0	86.56
Mlev2 in (%)	562	28.94	23.18	23.76	0	100
Blev1 in (%)	562	16.45	13.49	14.73	0	69.31
Blev2 in (%)	562	24.01	21.96	16.88	0	98.00
Size in (€ * million)	562	650.2	787.8	8.8	16.4	24,471
Vol	562	3.827	0.985	7.342	0.107	29.279
Growth	562	0.054	0.026	0.191	-0.287	0.537
Liquid	562	1.460	1.289	0.770	0.511	3.518
Profit	562	0.050	0.056	0.081	-0.148	0.198
Tang	562	0.531	0.559	0.231	0.090	0.895
NDTS	562	0.031	0.028	0.021	0.00	0.079
Block in (%)	562	46.98	44.35	24.24	0.00	95.56
FAM in (%)	138	48.37	47.20	24.61	5.69	95.56
MAN in (%)	101	16.44	10.41	19.67	0.02	88.70
INSTIT in (%)	447	30.57	25.88	19.65	0.40	92.00
CORP in (%)	120	26.24	19.72	24.13	3.47	64.35

Table 5: this table reports the means, medians, standard deviations, minimums and maximums of the sample of 562 Dutch listed non-financial firms over the period 2010-2015. For variable definitions see table 3.

The ownership levels of the different ownership identities show higher levels than peer research. The average level of family share ownership is 48.37% [median=47.2%], which is lower than the 59% mean [median=51.55%] that Ampenberger, et al. (2011) found. Managerial share ownership averages 16.44% [median=10.41%], which is similar to the average levels of Brailsford, et al. (2002), 10.65%, 11.6% by Florakis and Ozkan (2009) and 11.84% by McConnell and Servaes (1990). Institutional investors hold 30.57% [median=25.88%] where De Jong and Van Dijk (2007) report a mean of 11.05% and (Kabir, et al. (1997) 9.9%. Corporate ownership results on average by owning 26.24% [median=19.72%] of the shares.

Lastly, leverage and ownership levels appear to be quite stable over time, but not across industries. The results of distribution over time and across industries are presented in tables 6 and 7.

Leverage and ownership over time

	2010 (N=87)		2011 (N=91)		2012 (N=93)		2013 (N=93)		2014 (N=98)		2015 (N=100)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Mlev1 in (%)	18.00	14.09	18.03	13.80	21.02	15.77	20.57	15.80	17.27	13.34	19.48	14.74
Mlev2 in (%)	28.58	25.10	27.09	20.73	32.45	28.70	31.85	24.80	26.64	20.04	27.25	21.24
Blev1 in (%)	15.52	16.37	15.95	13.53	16.29	12.29	16.76	13.18	16.31	13.14	17.70	13.30
Blev2 in (%)	24.55	23.79	23.53	20.71	24.34	22.00	24.43	23.09	23.49	21.68	23.81	21.39
Block in (%)	45.30	43.70	46.17	44.14	45.91	42.83	45.53	43.46	49.42	47.92	49.15	48.17
FAM in (%)	12.28	.00	12.39	.00	10.61	.00	10.38	.00	12.70	.00	12.82	.00
MAN in (%)	2.68	.00	3.15	.00	2.89	.00	2.77	.00	3.07	.00	3.13	.00
INSTIT in (%)	23.10	19.77	22.74	19.08	24.84	20.24	24.21	20.62	25.61	23.77	25.13	22.72
CORP in (%)	4.67	.00	5.30	.00	5.24	.00	6.12	.00	6.32	.00	5.61	.00

Table 6: this table reports the means, medians of leverage and ownership of the sample over time. For variable definitions see table 3.

Leverage and ownership across industries

	Manufacturing (N=252)		Services (N=203)		Wholesale/Retail (N=54)		Holding (N=53)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Mlev1 in (%)	20,05	15,63	18,62	14,89	12,29	10,79	22,97	13,68
Mlev2 in (%)	29,38	23,81	25,68	21,20	23,03	18,23	45,39	44,66
Blev1 in (%)	16,09	13,86	17,89	13,58	14,15	11,21	14,98	8,92
Blev2 in (%)	23,05	21,91	24,11	21,11	24,52	24,04	27,67	23,79
Block in (%)	45,49	37,58	44,72	42,83	44,17	45,90	65,62	62,39
FAM in (%)	13,61	.00	8,81	.00	1,53	.00	25,91	.00
MAN in (%)	0,90	.00	2,37	.00	2,69	.00	15,23	.00
INSTIT in (%)	25,11	21,52	22,90	20,21	33,72	39,00	16,36	.00
CORP in (%)	4,32	.00	7,59	.00	4,43	.00	4,82	.00

Table 7: this table reports the means, medians of leverage and ownership of the sample across industries. For variable definitions see table 3.

In table 8 the Pearson correlation coefficients are reported. The control variable SIZE has a significant positive correlation with all four proxies of leverage. This indicates a positive relation between firm size and leverage; hence larger firms are more levered. The long term leverage proxies Mlev1 and Blev1 have correlations of over 0.400 with size, suggesting that the size matters even more in acquiring long term debt.

Other significant correlations are found between the various leverage proxies and the control variables LIQUID, PROFIT and TANG. Negative significant correlations between LIQUID and the leverage proxies indicate that firms with high liquidity have lower leverage levels. The same holds for the negative significant correlations between PROFIT and the total debt leverage proxies. More profitable firms have lower leverage levels and specifically lower short term debt levels. Positive significant correlations between TANG and the market leverage proxies suggest that firms with tangible assets have higher leverage ratios than their little tangible assets possessing counterparts. Suggesting that assets are serving as collateral

for loans as stated by Titman and Wessels (1998). Lastly, the negative significant correlation between institutional share ownership and Mlev1 and Mlev2 support the consensus of Moh'd, Perry & Rimbey (1998) and Santos, Moreira & Vieira (2014) that institutional investors favour lower debt levels.

The block holding variable shows a strongly negative significant correlation with SIZE; hence large firms have less concentrated ownership. Possibly a consequence of the large market capitalization. Additionally the same negative correlation is found between managerial ownership and size, thus managerial ownership is more or less reserved for small and mid-sized enterprises. A possible explanation can be that large companies have more monitoring and control mechanisms, such as a larger debt capacity and analyst coverage. They do not need to mitigate agency costs by share payments to management. Smaller companies whom have less monitoring and controlling mechanisms are more inclined to use share payments to mitigate agency costs. Interestingly, a negative correlation is found between PROFIT and managerial ownership. Suggesting that managerial ownership results in managerial risk adversity, as Short et al, (2002) predicted.

Institutional share ownership correlates positively with the profitability of a firm, which could mean two things. Option one, institutional investors only invest (i.e. own shares) in (highly) profitable firms or option two, firms become more profitable when institutional investors invest in them (i.e. own their shares). Moreover, a negative significant between institutional investors and VOL confirms that institutional investors dislike firms with volatile earnings.

Family share ownership and corporate share ownership both show very strong positive correlations with the variable block holding. This suggests that families and corporations are more inclined to hold large portions of a company's shares. Strangely, institutional ownership correlates positively with the block holding variable Block. Indicating that they aim to hold large amounts of shares. Contrary to the expectation of owning little amounts of shares to minimize exposure and maximize portfolio diversification. Moreover, institutional ownership has a strong negative correlation with all other identity forms.

Correlation Matrix

	Mlev1	Mlev2	Blev1	Blev2	Size	Vol	Growth	Liquid	Profit	Tang	NDTS	Block	FAM	MAN	INSTIT	CORP
Mlev1	1															
Mlev2	.810**	1														
Blev1	.712**	.464**	1													
Blev2	.577**	.657**	.822**	1												
Size	.402**	.210**	.423**	.247**	1											
Vol	.034	.036	-.046	-.052	-.120**	1										
Growth	-.070	-.120**	.041	.016	.057	-.096*	1									
Liquid	-.233**	-.351**	-.222**	-.365**	-.117**	.053	.129**	1								
Profit	-.154**	-.292**	-.009	-.142**	.226**	-.155**	.299**	.176**	1							
Tang	.196**	.143**	.348**	.290**	.178**	.038	-.039	-.429**	.005	1						
NDTS	-.046	-.082	.061	.050	-.103*	-.223**	.007	-.106*	-.001	.137**	1					
Block	-.072	.112**	-.117**	.036	-.341**	.100*	.086*	.106*	-.038	-.164**	-.002	1				
FAM	.036	.140**	-.085*	-.023	-.057	.169**	-.005	.160**	-.074	-.169**	-.120**	.509**	1			
MAN	.014	.129**	.007	.141**	-.236**	.094*	.049	-.025	-.116**	.050	.041	.193**	-.038	1		
INSTIT	-.136**	-.104*	-.033	.011	-.164**	-.111**	.037	-.023	.170**	.036	.094*	.189**	-.437**	-.224**	1	
CORP	-.019	-.020	-.013	-.033	.047	-.066	.030	.010	-.062	-.092*	.018	.318**	-.110**	-.047	-.222**	1

Table 8: this table reports the correlations between the variables. **. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed). For variable definitions see table 3.

5.2 Multivariate analysis

5.2.1 Ownership concentration

In table 9, the regression results for model 1, as specified in section 3.2, without the Block^2 variable are presented. The Block variable has positive significant coefficients for all leverage proxies, with and without industry dummies. In line with work of Brailsford, et al. (2002), Margaritis & Psilaki (2010) and Pindado & De La Torre (2011), a positive relationship is found between ownership concentration and leverage.

Several of the control variables have statistically significant coefficients. Furthermore, the signs of the control variables are consistent for all leverage proxies and render the same results as predicted. The variable SIZE has a positive relationship with leverage, LIQUID and PROFIT have a negative relationship with leverage. Overall this regression model explains, depending on the leverage proxy chosen, approximately 23.1% to 30.1% of the variation in the dependent variable leverage.

Regression model 1: ownership concentration with and without Block^2

	Mlev1		Mlev2		Blev1		Blev2	
(Constant)	-.344***	-.401***	-.041	-.048	-.342***	-.361***	-.077	-.067
	.000	.000	.610	.582	.000	.000	.207	.301
Block	.090**	.431***	.209***	.237*	.081**	.221	.179***	.115
	.027	.003	.000	.093	.044	.124	.000	.439
Block^2	X	-.354**	X	-.030	X	-.146	X	.067
	X	.015	X	.834	X	.308	X	.651
Size	.468***	.479***	.299***	.300***	.442***	.446***	.281***	.279***
	.000	.000	.000	.000	.000	.000	.000	.000
Vol	.032	.044	-.023	-.022	-.005	.000	-.044	-.046
	.412	.264	.538	.558	.902	.998	.266	.246
Growth	-.021	-.018	-.040	-.040	.060	.061	.075*	.075*
	.589	.633	.287	.290	.116	.110	.057	.058
Liquid	-.119***	-.123***	-.287***	-.287***	-.049	-.050	-.255***	-.255***
	.006	.004	.000	.000	.253	.240	.000	.000
Profit	-.202***	-.198***	-.271***	-.271***	-.110***	-.109***	-.187***	-.187***
	.000	.000	.000	.000	.007	.008	.000	.000
Tang	.070	.058	.015	.014	.245***	.240***	.165***	.167***
	.102	.176	.712	.732	.000	.000	.000	.000
NDTS	-.001	.003	-.075**	-.075**	.070*	.071*	.017	.016
	.974	.933	.047	.049	.071	.064	.666	.683
N	562	562	562	562	562	562	562	562
Adjusted R^2	.256	.262	.301	.300	.277	.277	.232	.231
						YES		

Table 9: this table reports the regression results of model 1, as specified in section 3.2, with and without the Block^2 variable. The first row of each variable denotes beta, the second row denotes the significance level. Industry dummies are inserted in all regressions. For variable definitions see table 3.

Since a non-linear relationship is expected, the variable Block^2 is added as specified in model 1 in section 3.2. The coefficient for the variable Block is consistently positive but not consistently significant for all leverage proxies, with and without industry dummies. The Block^2 variable is not consistently negative for all leverage proxies, with or without industry dummies. Moreover it is insignificant for all leverage proxies except Mlev1. As in model 1 without Block^2, the control variable SIZE has a positive statistically significant coefficient. LIQUID and PROFIT have a negative statistically significant coefficient. Overall this regression model explains, depending on the leverage proxy chosen, approximately 23.1% to 30.0% of the variation in the dependent variable leverage.

Based on the Mlev1 leverage proxy for model 1, a non-linear relationship is expected between ownership concertation and leverage. The x value of the maximum point of model 1 with Mlev1 as leverage proxy, the point at which the relationship becomes non-linear, lies at x = 0.6088. For the other proxies, the x value for this maximum point lies at Mlev2 = 3.95, Blev1 = 0.7568, Blev2 = -0.8582. This suggests that the inflection point, depending on the leverage proxy, lies at 60.88%, 395%, 75.68% or -85.82% of concentrated ownership.

Since only Mlev1 shows significance for the Block2 variable, the inflection points of the other proxies have to be interpreted cautiously. But when further analysing the results, it can be stated that the regressions that use the total debt proxies render impossibly high or low ownership concentration levels at which the relationship becomes non-linear. This is not possible in practice. The inflection points for the other two long term debt leverage proxies provide a plausible range of 60% to 76% in which the relationship between concentrated ownership and leverage becomes non-linear.

Based on the regression results of model 1with the Block^2 variable, hypothesis 1 cannot be accepted. However, the hypothesis is supported by the long term debt proxies. When taking the results of table 9 into consideration it can be concluded that at least a positive linear relationship between ownership concentration and leverage exists, similar to earlier findings of Brailsford, et al. (2002), Margaritis & Psilaki (2010) and Pindado & De La Torre (2011).

5.2.2 Ownership identity

In table 10, the regression results for model 1, as specified in section 3.2, without the MAN^2 variable are presented. The variable FAM, representing family ownership has positive coefficients for all leverage proxies. For the leverage proxies using total debt, Mlev2 and Blev2, there is strong statistical significance. Mlev1 has weak statistical significance and Blev1 no statistical significance. Although not significant on the Blev1, results are in line with King and Santor (2008), Croci Doukas and Gonenc (2011) and Schmid (2013). Supporting the idea that Dutch family owners fear the diluting effect on control and cash flow right of issuing equity. Hypothesis 2, there is a positive relationship between family ownership and leverage is accepted.

The effect of managerial ownership on leverage, expressed by the variable MAN in table 10, appears to be positive. MAN has positive coefficients for all leverage proxies and accordingly strong statistical significance. Results suggest that managers of Dutch listed firms prefer

higher leverage levels when they own company shares. Whereas results are in line with earlier work of Jensen (1986), Short et al. (2002) and (Wang (2011), cause of these results is undecided and can be with either one of them.

The institutional ownership variable INSTIT renders positive coefficients for all leverage proxies and is strongest and in term of effect as significance for both proxies using total debt. Results indicate that the more shares institutional owners own, the more they want to increase the financial leverage. Regarding the results, they especially favour an increase of short term debt as they own increasingly larger portions of shares. These results are not in line with work of Fayoumi & Abuzayed (2009), Michaely & Vincent (2012) and Santos, et al. (2014), who all find a negative relation between institutional ownership and leverage.

A possible explanation could be the presence of a large number of hedge funds, mutual funds, private equity funds and investment firms amongst the institutional investor identity. Even though these investors do have better information alignment with a firm's management and more knowledge on investing than the general public, they may lack resources to monitor their investments as intensively as a large pension fund could. Confirmed by Cornett, et al. (2007) whom state that large institutional investors have the opportunity, resources and ability to discipline and influence managers. Another possibility is fear of other shareholders for wealth expropriation by large institutional shareholders, supported by a large portion of voting power.

No decisive effect of corporate ownership on leverage can be found in the regression results. Coefficients differ in sign per leverage proxy and also differ between using industry dummies and not using industry dummies with Blev2. Furthermore no statistical significance is found for any leverage proxy. Apparently, no evidence can be found for wealth expropriation of ultimate owners by tunnelling practices as suggested by Paligorova & Xu (2012). Nor any evidence for post-merger utilization of the increased debt capacity indicated by Ghosh and Jain (2000).

Also several of the control variables in model 2 have statistically significant coefficients. Furthermore, the signs of the control variables are consistent for all leverage proxies and render the same results as predicted. The variable SIZE has a positive relationship with leverage and PROFIT has a negative relationship with leverage. Overall this regression model explains, depending on the leverage proxy chosen, approximately 25.0% to 30.8% of the variation in the dependent variable leverage.

Since a non-linear relationship is expected, the variable MAN^2 is added as specified in model 2 in section 3.2. The coefficient for the variable MAN is consistently positive and consistently strongly significant for all leverage proxies, with and without industry dummies. The MAN^2 variable is consistently negative for all leverage proxies, with or without industry dummies. Moreover it is strongly significant for all leverage proxies except Mlev2, which show less strong significant results.

Based on the coefficients for the MAN and MAN^2 variables for all leverage proxies, a non-linear relationship is expected between managerial ownership and leverage. The x value of the

maximum point of model 2 with Mlev1 as leverage proxy, the point at which the relationship becomes non-linear, lies at x = 0.8161 For the other proxies, the x value for this maximum point lies at Mlev2 = 2.16, Blev1 = 0.8765, Blev2 = 1.55. This suggests that the inflection point, depending on the leverage proxy, lies at 81.61%, 216%, 87.65% or 155% of managerial ownership. This is not possible for the total debt leverage proxies in a practical sense. The inflection points for the other two long term debt leverage proxies provide a plausible range of 81% to 88% in which the relationship between managerial ownership and leverage becomes non-linear.

Regression model 2: ownership identity with and without MAN^2

	Mlev1		Mlev2		Blev1		Blev2	
(Constant)	-.327***	-.362***	-.020	-.045	-.363***	-.398***	-.120**	-.152**
	.000	.000	.809	.589	.000	.000	.047	.012
FAM	.078*	.081*	.231***	.232***	.048	.052	.174***	.177***
	.091	.077	.000	.000	.287	.245	.000	.000
MAN	.098**	.411***	.184***	.357***	.132***	.519***	.262***	.574***
	.027	.000	.000	.000	.002	.000	.000	.000
MAN^2	X	-.329***	X	-.181**	X	-.405***	X	-.328***
	X	.001	X	.049	X	.000	X	.001
INSTIT	.041	.068	.149***	.164***	.103**	.136***	.212***	.239***
	.399	.162	.001	.001	.031	.004	.000	.000
CORP	-.027	-.023	.026	.029	-.002	.003	.025	.029
	.500	.564	.493	.455	.959	.936	.522	.453
Size	.472***	.500***	.304***	.319***	.470***	.505***	.328***	.356***
	.000	.000	.000	.000	.000	.000	.000	.000
Vol	.027	.014	-.031	-.038	-.001	-.017	-.043	-.056
	.492	.715	.420	.322	.969	.652	.270	.151
Growth	-.018	-.008	-.035	-.029	.058	.071*	.072*	.082**
	.634	.831	.350	.433	.126	.059	.062	.032
Liquid	-.125***	-.125***	-.302***	-.302***	-.048	-.048	-.262***	-.262***
	.004	.004	.000	.000	.264	.257	.000	.000
Profit	-.200***	-.184***	-.270***	-.261***	-.118***	-.099**	-.197***	-.181***
	.000	.000	.000	.000	.004	.016	.000	.000
Tang	.058	.035	.004	-.009	.226***	.198***	.140***	.117***
	.181	.421	.932	.829	.000	.000	.001	.007
NDTS	-.001	-.007	-.075**	-.078**	.065*	.058	.010	.005
	.976	.866	.048	.039	.091	.122	.796	.901
N	562	562	562	562	562	562	562	562
Adjusted R^2	0.256	.270	0.308	.311	0.288	.306	0.261	.275

Table 10: this table reports the regression results of model 2, as specified in section 3.2, with and without MAN^2. Industry dummies are inserted in all regressions. The first row of each variable denotes beta, the second row denotes the significance level. Industry dummies are inserted in all regressions. For variable definitions see table 3.

Regarding the results depicted in table 10, the positive FAM coefficients for three of the four leverage proxies, give suspicion of a positive significant effect of family ownership on leverage. In line with the work of King and Santor (2008) and Croci Doukas and Gonenc (2011), hypothesis 2 is accepted. There is a positive relationship between family ownership and leverage Furthermore, there is no consistent evidence for a non-linear relationship between managerial ownership and leverage. However, the results do support a non-linear relationship between managerial ownership and leverage, since the regression results of the long term debt leverage proxies render hypothesis confirming results. Due to lacking consistent evidence, hypothesis 3 cannot be accepted.

When taking the results of table 10 into consideration it can be concluded however that a positive linear relationship between managerial ownership and leverage exists, similar to earlier findings of Short, et al. (2002) and Wang (2011). On the effect of institutional ownership on leverage, mixed results for the different leverage proxies are found. The INSTIT variable renders positive and significant coefficients on for all leverage proxies but Mlev1. Results are inconclusive but mostly positive. Therefore hypothesis 4 is supported by the results. Lastly, hypothesis 5 is rejected due to the inconclusive results and missing significance in both variants of model 2.

5.3 Robustness tests

In this section additional regression analyses are carried out, in order to test the robustness of the main results. First, as a result of high correlation between the institutional ownership identity and the other identities they are regressed separately. Secondly, regressions are performed without the firms in the holding industry. Thirdly, in order to test for the influence of time and see if there are differences over time, yearly cross-sectional regressions are analysed. fourth, the cross-sectional influence of industry type is analysed. Lastly, the main regression models are performed again with using the shares held by the single largest shareholder instead of the aggregate shareholdings of the top 5 shareholders.

5.3.1 Robustness testing by separating identities

The correlation matrix in table 8 shows that there is a quite high negative correlation between the ownership identity INSTIT and the other ownership identities. Since the high correlation factors between these identities can influence the regression results, it is chosen to test model 2 with a separated INSTIT ownership identity.

The results are presented in tables 11 and 12. Furthermore, the model in table 11 is also tested without the MAN2 variable. When comparing the regression result with separated identities with the main results, no exceptionally different results are found. As well for the model with the MAN^2 variable as for the model without the MAN^2 variable. Family ownership, measured by the variable FAM has a positive relationship with the market leverage measures, but not with the book leverage counterpart measures. The regression results of the effect of managerial ownership on leverage are more consistent than in the main results and now provides a range, with exception of Mlev2, of 53% to 90% at which the relationship becomes non-linear. Both institutional and corporate ownership show no significant results. The results seem to be robust, despite the high correlation between the identities.

Robustness testing with separated identities

	Mlev1		Mlev2		Blev1		Blev2	
(Constant)	-.300***	-.317***	,104	.095	-.310***	-.326***	.005	-.008
	.000	.000	,158	.198	.000	.000	.932	.885
FAM	.058	.048	,157***	.153***	-.003	-.014	.070*	.062
	.142	.220	,000	.000	.948	.714	.081	.122
MAN	.084**	.369***	,134***	.254***	.098***	.434***	.190***	.424***
	.041	.000	,001	.007	.016	.000	.000	.000
MAN^2	X	-.308***	X	-.129	X	-.363***	X	-.253***
	X	.001	X	.157	X	.000	X	.008
CORP	-.037	-.040	-,012	-.013	-.028	-.032	-.029	-.031
	.323	.286	,741	.718	.445	.390	.445	.409
N	562	562	562	562	562	562	562	562
Adjusted R^2	.256	.269	.296	.297	.277	.296	.236	.244

Table 11: this table reports the regression results of model 2 as specified in section 3.2, with and without the MAN^2 variable and without the INSTIT variable. The first row of each variable denotes beta, the second row denotes the significance level. Industry dummies are inserted in all regressions. For variable definitions see table 3.

Robustness testing with separated identities

	Mlev1	Mlev2	Blev1	Blev2
(Constant)	-.272***	.153*	-.318***	.007
	.000	.055	.000	.903
INSTIT	-.011	.001	.051	.069*
	.785	.979	.191	.086
N	562	562	562	562
Adjusted R^2	.249	.265	.273	.210

Table 12: this table reports the regression results of model 2 as specified in section 3.2, without the FAM, MAN, MAN^2 and CORP variable. The first row of each variable denotes beta, the second row denotes the significance level. Industry dummies are inserted in all regressions. For variable definitions see table 3.

5.3.2 Robustness testing by excluding the holding industry

Based on the fact that the firms in the holding industry not really have corporate activities rather than just being shareholder, robustness is tested by performing the main regressions without these companies . As table 13 depicts, the leverage ratios do not change that much. The ownership however do change much compared to the initial results.

	N	Mean	Median	Std. Deviation	Minimum	Maximum
Mlev1 in (%)	509	18.66	14.60	18.08	0.00	86.56
Mlev2 in (%)	509	27.23	22.57	22.39	0.00	1.00
Blev1 in (%)	509	16.60	13.73	14.74	0.00	69.31
Blev2 in (%)	509	23.63	21.93	16.62	0.00	98.00
Block in (%)	509	45.04	42.83	23.51	0.00	95.96
FAM in (%)	509	10.42	0.00	22.30	0.00	95.96
MAN in (%)	509	1.68	0.00	5.19	0.00	30.58
INSTIT in (%)	509	25.14	21.59	21.34	0.00	92.00
CORP in (%)	509	5.64	0.00	16.02	0.00	64.35

Table 13: this table reports the means, medians, standard deviations, minimums and maximums of the sample of 509 Dutch listed non-financial firms over the period 2010-2015. For variable definitions see table 3.

After regressing model 1 without the firms in the holding industry results change. The adjusted R^2 has gone up by plus minus 3 percent and the regression results for a linear relationship between ownership concentration and leverage has become more significant for all leverage proxies. For the regression model testing for a non-linear relationship between ownership concentration and leverage, the significance has remained the same.

Robustness testing of model 1 without the holding industry

	Mlev1		Mlev2		Blev1		Blev2	
(Constant)	-.344***	-.385***	.009	-.007	-.355***	-.354***	-.066	-.045
	.000	.000	.905	.932	.000	.000	.271	.478
Block	.120***	.385***	.188***	.276*	.117***	.114	.182***	.030
	.003	.009	.000	.056	.004	.432	.000	.838
Block2	X	-.274*	X	-.091	X	.003	X	.157
	X	.059	X	.528	X	.984	X	.283
N	509	509	509	509	509	509	509	509
Adjusted R^2	.286	.290	.305	.305	.298	.296	.277	.277

Table 14: this table reports the regression results of the robustness testing of model 1 without the holding industry. The first row of each variable denotes beta, the second row denotes the significance level. For variable definitions see table 3.

Regarding the regression results of model 2 without the firms in the holding industry, slightly less consistent significant results are found as opposed to the main results. Many identities lose little significance when regressed against the different leverage proxies. The results are depicted in table 15

Robustness testing of model 2 without the holding industry

	Mlev1		Mlev2		Blev1		Blev2	
(Constant)	-.343***	-.326***	.008	.016	-.390***	-.380***	-.123**	-.117*
	.000	.000	.921	.848	.000	.000	.046	.058
FAM	.085*	.104**	.179***	.186***	.071	.085*	.160***	.167***
	.065	.024	.000	.000	.116	.062	.000	.000
MAN	.110**	-.249**	.108**	-.024	.151***	-.107	.175***	.035
	.012	.035	.012	.839	.000	.358	.000	.769
MAN2	X	.383***	X	.141	X	.276**	X	.150
	X	.001	X	.228	X	.018	X	.202
INSTIT	.095*	.092*	.169***	.168***	.158***	.156***	.244***	.243***
	.059	.062	.001	.001	.001	.001	.000	.000
CORP	-.005	-.012	.029	.027	.016	.011	.031	.028
	.901	.772	.472	.510	.691	.780	.453	.493
N	509	509	509	509	509	509	509	509
Adjusted R^2	.302	.297	.302	.302	.308	.314	.295	.296

Table 15: this table reports the regression results of the robustness testing of model 2 without the holding industry. The first row of each variable denotes beta, the second row denotes the significance level. For variable definitions see table 3.

Results suggest an influential effect of the firms in the holding industry on the other firms and results are not very robust for inclusion or exclusion of this particular industry.

5.3.3 Robustness testing over time

Since the main results supported a linear relationship between ownership concentration and leverage, this result is also tested for its robustness over time and is depicted in table 16. Surprisingly, results do not seem to be very robust over time and significance varies per leverage measure per year. It cannot conclusively be said what year(s) provide the explaining power for the main regression results. However, a non-linear relationship was hypothesized and therefore, its robustness over time is also tested. Table 22 in the appendices shows the yearly cross-sectional results on the relationship between ownership concentration and leverage. The coefficients of the Block and $Block^2$ variables are consistent with the main results in section 5.2.1. For the years 2010, 2011, 2012 and 2013 and the inflection points of the years 2010 to 2013 lie beneath 1. However the significant non-linear effect found for the Mlev1 proxy in the main results derives its explaining power from the year 2010 only. The main results for model 1 do not seem to be very robust over time

Regarding the ownership identities and their influence on leverage, it can be concluded that the model used is not very robust over time for all identities. Table 17 shows that there is no consistent significant relation over time between any of the ownership identities and leverage, as is found in the main results. When testing for the robustness over time of model 1 with the MAN^2 variable, not much different result are found (table 23). No consistent significant relation can be found between family ownership and leverage as is found in the main results. On the relationship between managerial ownership and leverage, the model is robust. However the main results only derive explanatory power from the year 2015. Possibly the result of the very small N of managerial ownership in the sample. The same effect is in place for the relationship between institutional ownership and leverage. Although almost all coefficients are the as those in the main results, significance is only found for the year 2015. It seems that this effect cannot be the result of a small N in institutional ownership since it comprises more than half of the sample. The results of the yearly cross-sectional robustness testing on the relationship between corporate ownership and leverage are similar to the main results. Inconsistent and insignificant. All in all both models do not appear to be very robust over time. It appears that the main regression results for both models are derived by the combined explanatory power of all the years in the sample.

Robustness testing over time of model 1 without Block^2

	2010				2011				2012				2013				2014				2015			
	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2
(Constant)	-.172	.191	-.340***	-.057	-.373**	-.074	-.360***	-.065	-.501***	-.117	-.463***	-.156	-.425***	-.138	-.320**	-.130	-.217	.080	-.210	.103	-.347**	-.087	-.357***	-.105
	.316	.385	.003	.674	.036	.739	.010	.688	.005	.606	.001	.354	.020	.527	.021	.356	.149	.672	.115	.520	.028	.634	.007	.503
Block	.019	.119	.108	.262**	.112	.184*	.175*	.255**	.162	.227**	.162	.236**	.073	.203*	.099	.193*	.041	.257***	-.051	.078	.198*	.325***	.050	.119
	.861	.282	.277	.013	.269	.071	.089	.015	.110	.028	.123	.033	.491	.061	.353	.077	.690	.007	.613	.448	.061	.001	.613	.257
N	87	87	87	87	91	91	91	91	93	93	93	93	93	93	93	93	98	98	98	98	100	100	100	100
Adjusted R^2	.257	.253	.397	.341	.27	.304	.290	.276	.294	.278	.246	.171	.209	.195	.211	.185	.171	.312	.208	.173	.155	.287	.235	.166

Table 16: this table reports the regression results of the robustness testing over time for model 1 as specified in section 3.2 without the Block^2 variable. The first row of each variable denotes beta, the second row denotes the significance level. Control variables and industry dummies are inserted in all regressions. For variable definitions see table 3.

Robustness testing over time of model 2 without MAN^2

	2010				2011				2012				2013				2014				2015			
	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2
(Constant)	-.126	.253	-.284**	.049	-.383**	-.121	-.388***	-.134	-.496***	-.123	-.492***	-.213	-.402**	-.161	-.314**	-.203	-.223	.060	-.272*	.000	-.377**	-.054	-.470***	-.249
	.471	.260	.014	.725	.036	.590	.006	.400	.008	.601	.001	.213	.035	.471	.024	.148	.165	.765	.056	.999	.021	.775	.001	.111
FAM	-.033	.050	.055	.158	.098	.218*	.169	.303***	.146	.262**	.132	.245**	.027	.211*	-.051	.086	.029	.295***	-.083	.071	.273**	.407***	.114	.192
	.792	.693	.626	.185	.403	.062	.148	.009	.207	.025	.264	.046	.817	.072	.653	.448	.809	.008	.482	.543	.032	.001	.333	.111
MAN	-.054	-.095	.074	.078	.113	.138	.090	.113	.181	.251**	.211*	.314***	.110	.288**	.117	.382***	.102	.277***	.093	.288***	.154	.235**	.210**	.350***
	.701	.504	.563	.556	.324	.224	.427	.311	.112	.028	.070	.010	.340	.013	.295	.001	.372	.008	.400	.010	.173	.026	.047	.001
INSTIT	-.057	.039	-.012	.077	.109	.207*	.225*	.351***	.116	.176	.172	.256**	.016	.166	.070	.238*	.016	.222*	.030	.157	.223*	.282**	.194	.265**
	.647	.757	.912	.512	.368	.084	.062	.003	.337	.147	.164	.046	.898	.187	.572	.053	.905	.062	.818	.222	.091	.021	.114	.036
CORP	-.055	.014	.046	.221**	-.057	-.038	-.075	-.071	-.023	.021	-.055	-.042	.053	.058	.215**	.159	.001	.095	-.010	.041	-.016	.127	-.077	.008
	.593	.896	.621	.027	.561	.696	.443	.455	.810	.831	.574	.678	.617	.575	.037	.118	.990	.328	.927	.698	.882	.197	.434	.938
N	87	87	87	87	91	91	91	91	93	93	93	93	93	93	93	93	98	98	98	98	100	100	100	100
Adjusted R^2	.230	.220	.369	.311	.280	.300	.293	.321	.278	.278	.245	.198	.186	.207	.238	.252	.148	.320	.194	.204	.154	.282	.268	.236

Table 17: this table reports the regression results of the robustness testing over time for model 2 as specified in section 3.2 without the MAN^2 variable. The first row of each variable denotes beta, the second row denotes the significance level. Control variables and industry dummies are inserted in all regressions. For variable definitions see table 3.

5.3.4 Robustness testing across industries

When checking across industries in table 18 and 19, some interesting results appear in the regression analyses. The relation between ownership concentration and leverage only is significant for all leverage proxies in the manufacturing industry. Considering the abundance in assets present in manufacturing, fear of empire building or wealth expropriation by management is logical. Oddly no same significance is found in other industries, even though agency costs can be an issue there as well.

Interestingly the effect of institutional ownership on leverage shows a positive significant effect in the manufacturing industry and a negative significant effect on most of the leverage proxies in the holding industry. Suggesting that institutional investor prefer more debt in a manufacturing firm as they hold more shares, but the opposite for when they are owning holding firms. All in all, none of the models show robust results across the different industries. Confirming the fact that the industry a firm operates in matters for the relationship between ownership structure and leverage.

Further, increasing corporate ownership in the wholesale/retail industry appears to increase leverage levels of the firms they own. This could indicate that other shareholders fear empire building or wealth expropriation by management.

When testing for robustness across industries with the $Block^2$ variable in model 1 (table 24), results are practically equal to those in table 18. Moreover, when calculating the inflection point in all industries, only the manufacturing industry has a plausible 76.9%. All other inflection point shows values over x = 1 or under x = 0. When testing for robustness across industries with the MAN^2 variable in model 2 (table 22), results are very different to those in table 16. However, since the inflection points for the model lies at values over x = 1 or under x = 0, the results of table 18 are seen as closed to reality.

Robustness testing across industries of model 1 without Block^2

	Manufacturing				Services				Wholesale/Retail				Holding			
	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2
(Constant)	-.316***	-.125	-.216***	-.015	-.568***	-.164	-.500***	-.179*	-.327*	.469*	-.363**	.156	-.790**	-.013	-.336	.365
	.002	.311	.002	.834	.000	.142	.000	.086	.064	.087	.028	.381	.036	.979	.122	.283
Block	.174***	.350***	.095	.249***	.085	.016	.130**	.109*	.095	.194*	.143	.312***	-.154	.272**	-.364*	-.102
	.010	.000	.155	.000	.151	.783	.031	.074	.475	.095	.224	.003	.236	.035	.002	.464
N	252	252	252	252	203	203	203	203	54	54	54	54	53	53	53	53
Adjusted R^2	.208	.255	.213	.209	.374	.387	.345	.328	.539	.657	.643	.743	.572	.591	.663	.501

Table 18: this table reports the regression results of the robustness testing across industries for model 1 as specified in section 3.2 without the Block^2 variable. The first row of each variable denotes beta, the second row denotes the significance level. Control variables are inserted in all regressions. For variable definitions see table 3.

Robustness testing across industries of model 2 without MAN^2

	Manufacturing				Services				Wholesale/Retail				Holding			
	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2
(Constant)	-.293***	.017	-.236***	.033	-.562***	-.179	-.498***	-.183*	-.728**	.133	-.556**	.285	-1.365***	-.735	-.788***	-.383
	.009	.900	.003	.682	.000	.112	.000	.082	.013	.616	.038	.180	.002	.199	.001	.268
FAM	.165**	.337***	.114	.293***	.134**	.110	.112	.097	-.216	-.041	-.273**	-.086	-.361**	.292	-.656***	-.268
	.027	.000	.120	.000	.065	.120	.130	.195	.136	.581	.034	.272	.038	.103	.000	.114
MAN	.019	-.091	-.019	-.163**	.068	-.002	.232***	.224***	.083	.638***	-.145	.457***	-.208	.373**	-.276*	.265
	.791	.183	.781	.018	.336	.974	.001	.002	.580	.000	.276	.000	.221	.039	.061	.118
INSTIT	.148*	.261***	.151*	.257***	-.043	-.107	.144*	.147*	.384*	.057	.362*	.038	-.576***	-.102	-.629***	-.330**
	.090	.002	.080	.003	.567	.144	.058	.056	.077	.609	.058	.744	.000	.517	.000	.032
CORP	.072	.191***	.060	.095	-.027	-.048	.000	.023	.121	.182***	.200*	.338***	.045	.242*	-.005	.147
	.275	.003	.354	.136	.680	.453	.997	.734	.329	.007	.071	.000	.711	.059	.960	.219
N	252	252	252	252	203	203	203	203	54	54	54	54	53	53	53	53
Adjusted R^2	.194	.240	.210	.234	.381	.405	.358	.341	.569	.883	.668	.872	.666	.663	.756	.673

Table 19: this table reports the regression results of the robustness testing across industries for model 1 as specified in section 3.2 without the MAN^2 variable. The first row of each variable denotes beta, the second row denotes the significance level. Control variables are inserted in all regressions. For variable definitions see table 3.

5.3.5 Robustness testing using the single largest shareholder

In this section models 1 and 2 are regressed, this time only using the single largest shareholders' holdings instead of the aggregate shareholdings of the top 5 shareholders. The coefficient for the variable Block is consistently positive and consistently significant for all leverage proxies, with and without industry dummies. The $Block^2$ variable is consistently negative for all leverage proxies. Moreover it is significant for all leverage proxies.

The x value of the maximum point of model 1 with Mlev1 as leverage proxy, the point at which the relationship becomes non-linear, lies at x = 0.5462. For the other leverage proxies these x values are Mlev2 = 0.9316, Blev1 = 0.5280 and Blev2 = 0.7795.

This suggests that the inflection point for the relationship between ownership concentration and leverage when using the shareholdings of the single largest shareholder lies between 53.80% and 93.16% depending on the leverage proxy used. These result are more consistent and plausible than the main regression results.

Ownership concentration for the single largest shareholder

	Mlev1	Mlev2	Blev1	Blev2
(Constant)	-.332***	.031	-.340***	-.038
	.000	.693	.000	.509
Block	.319**	.395***	.339***	.396***
	.014	.002	.008	.003
$Block^2$	-.292**	-.212*	-.321**	-.254*
	.025	. 092	.012	.054
N	562	562	562	562
Adjusted R^2	0.256	0.301	0.279	0.231

Table 20: this table reports the regression results of model 1 as specified in section 3.2. Instead of the aggregate shareholdings of the top 5 shareholders, only the single largest shareholders' holdings are used. The first row of each variable denotes beta, the second row denotes the significance level. Control variables and industry dummies are inserted in all regressions. For variable definitions see table 3.

In model 2 the coefficient for the variable MAN is consistently positive and consistently strongly significant for all leverage proxies, with and without industry dummies. The MAN^2 variable is not consistently negative for all leverage proxies, with or without industry dummies.

However the maximum point of model 2 lies for all total debt leverage proxies at values greater than x = 1. This is not possible in a practical sense and therefore a non-linear relationship is also ruled out for model 2 when only using the shareholding of the single largest shareholder. Similar to the main results, the long term debt proxies in this robustness test provide a sub 100% range for the maximum point which lies between 76% and 78%.

The positive FAM coefficients for three of the four leverage proxies, give suspicion of a positive significant effect of family ownership on leverage, in line with the main results.

On the effect of institutional ownership on leverage, results are similar to the main results. Mixed results for the different leverage proxies are found. The INSTIT variable renders positive and significant coefficients on for all leverage proxies but Mlev1. Regarding corporate ownership, as in the main results, no consistent coefficients are found and none of the coefficients is significant. All in all the main models are robust to using a different number of shareholders and their shareholdings.

Ownership identity for the single largest shareholder

	Mlev1	Mlev2	Blev1	Blev2
(Constant)	-.322***	.042	-.365***	-.079
	.000	.592	.000	.176
FAM	.083*	.226***	.045	.155***
	.057	.000	.285	.000
MAN	.301**	.054	.479***	.379***
	.014	.649	.000	.002
MAN2	-.265**	.053	-.415***	-.213*
	.026	.646	.000	.074
INSTIT	.047	.137***	.123***	.204***
	.287	.001	.004	.000
CORP	-.022	.049	-.010	.041
	.590	.209	.796	.302
N	562	562	562	562
Adjusted R^2	0.256	0.302	0.294	0.247

Table 21: this table reports the regression results of model 2 as specified in section 3.2. Instead of the aggregate shareholdings of the top 5 shareholders, only the single largest shareholders' holdings are used. The first row of each variable denotes beta, the second row denotes the significance level. Control variables and industry dummies are inserted in all regressions. For variable definitions see table 3.

6. Conclusion and future limitations

6.1 Conclusion

This research tests if the agency theory of Myers and Majluf (1984) holds for Dutch firms. It tests the impact of ownership identity and ownership concentration on the capital structure of Dutch firms for the period 2010 to 2015. First analysis of the firms in the sample reveals that firm characteristics (i.e. leverage level, size, etc. of the Dutch firms are comparable to those in other developed economies in other studies (Brailsford, et al., 2002), (De Jong, 2002), (De Jong & Van Dijk, 2007) (Florakis & Ozkan, 2009) and (La Bruslerie & Latrous, 2012).

In contradiction to expectation and the studies of Brailsford, et al. (2002), Florakis & Ozkan (2009) and La Bruslerie & Latrous (2012), no consistent strong significant non-linear relationship between ownership concentration and leverage is found in this study. Results however do support such a relationship, but due to lacking consistent and strongly significant results hypothesis 1 cannot be accepted. There is however evidence for a linear relationship between the two and it is fairly robust against using different proxies for leverage.

Robustness testing over time indicates that the effect found, is not robust over the years and consistent statistical significance is absent. Further robustness testing across industries reveals that only the manufacturing industry provides explanatory power for the statistical significant effect found in the main results. It seems that it was a right decision to control for industry effects. Regarding the robustness testing over time, controlling for time effects would not have been a bad idea also. Lastly, robustness testing with only using the shareholdings of the single largest shareholder is performed. The model supports the initial regression results and regarding those main regression results and the result of the robustness tests, hypothesis one is accepted.

For the model testing the relationship between family ownership and leverage, all FAM coefficients for all leverage proxies are positive. Moreover, significance is found for these coefficients, except for those of the Blev2 proxy. All robustness testing that is performed renders more or less similar results as found initially and therefore indicating that the model is robust. Results suggest a positive relationship between the family ownership and leverage, which is in line with earlier work of King and Santor (2008) and Croci Doukas and Gonenc (2011). It could indicate that Dutch family owned firms dislike the diluting effect of issuing new equity and therefore prefer issuing debt. Therefore hypothesis two is accepted. Further robustness testing show no different results as the initial regression results,

On the relation between managerial ownership and leverage, table 10 presents a linear relationship. The MAN variable has positive coefficients for all leverage proxies and accordingly strong statistical significance. Further testing for evidence for the hypothesized non-linear relation between the two results are found in the same table. It depicts a strong significant non-linear relationship between managerial ownership and leverage for the proxies, indicated by the positive coefficient for the MAN variable and the negative coefficient for the MAN^2 variable. However the maximum point of model 2 with Mlev1 as

leverage proxy, the point at which the relationship becomes non-linear, lies at x = 0.8161 For the other proxies, the x value for this maximum point lies at Mlev2 = 2.16, Blev1 = 0.8765, Blev2 = 1.55. This suggests that the inflection point, depending on the leverage proxy, lies at 81.61%, 216%, 87.65% or 155% of managerial ownership. This is not possible for the total debt leverage proxies in a practical sense. The inflection points for the other two long term debt leverage proxies provide a plausible range of 81% to 88% in which the relationship between managerial ownership and leverage becomes non-linear.

Therefore the effect of managerial ownership on leverage in this study is at least linear. Regarding hypothesis 3 can said that the results support a non-linear relationship, but do not confirm it. Therefore the hypothesis cannot be accepted. Results suggest that managers of Dutch listed firms prefer higher leverage levels when they own company shares. These results are in line with earlier work of Jensen (1986), Short et al. (2002) and (Wang (2011), cause of these results is undecided and can be with either one of them.

The institutional ownership variable INSTIT renders positive coefficients for all leverage proxies and is strongest and in term of effect as significance for both proxies using total debt. Results indicate that the more shares institutional owners own, the more they want to increase the financial leverage. Regarding the results, they especially favour an increase of short term debt as they own increasingly larger portions of shares. These results are not in line with work of Fayoumi & Abuzayed (2009), Michaely & Vincent (2012) and Santos, et al. (2014), who all find a negative relation between institutional ownership and leverage.

A possible explanation could be the presence of a large number of hedge funds, mutual funds, private equity funds and investment firms amongst the institutional investor identity. Even though these investors do have better information alignment with a firm's management and more knowledge on investing than the general public, they may lack resources to monitor their investments as intensively as a large pension fund could. Confirmed by Cornett, et al. (2007) whom state that large institutional investors have the opportunity, resources and ability to discipline and influence managers. Another possibility is fear of other shareholders for wealth expropriation by large institutional shareholders, supported by a large portion of voting power.

All robustness testing except testing across industries renders the same results. Interestingly, the effect of institutional ownership on leverage shows a positive significant effect in the manufacturing industry and a negative significant effect on most of the leverage proxies in the holding industry. Suggesting that institutional investor prefer more debt in a manufacturing firm as they hold more shares, but the opposite for when they are owning holding firms. All in all, none of the models show robust results across the different industries. Confirming the fact that the industry a firm operates in matters for the relationship between ownership structure and leverage.

Lastly, the corporate ownership coefficients are inconclusive and insignificant for all leverage proxies. Suggesting there is no relationship at all between corporate ownership and leverage. Contradicting the work of Ghosh & Jain (2000), Paligorova & Xu (2012) and Agliardi, et al. (2016), which all state that a positive relation should exist between corporate ownership and leverage. The difference may potentially be explained by the definition of corporate ownership used by the forenamed authors. Paligorova & Xu (2012) speak of pyramidal

ownership structures in which the ultimate owner tries to lever all his firms as much as possible, to then expropriate these borrowings. Ghosh & Jain (2000) and Agliardi, et al. (2016) both speak of mergers, all forms of corporate ownership which are not the case in the sample of this study. This study's sample mostly contains partial ownership in different quantities, which may be the cause for a relationship of different form than expected. Furthermore none of the robustness tests renders different results. Therefore hypothesis five is rejected.

6.2 Limitations and future research

First, despite some of the findings that are consistent with expectations and previous work of others, not all hypotheses could be accepted. A potential cause for these inconsistencies could be the regression technique used, namely pooled OLS regression. As section 3.1.2 describes, the pooled OLS technique has several drawbacks such as autocorrelation due to the time-series effect included. Although efforts are made to overcome the imperfections in the technique, inexperience of the researcher may have affected the fullness and effectiveness of these corrections.

Second, consistent non-significant effects for the control variables Growth, Tang and NDTS appear in all models in almost all regressions. It suggests the explaining power of these variables on a firms' leverage is small or non-existent.

Third, the existence of priority shares can distort the relationship between ownership and leverage. This study focusses only on common shares through which shareholders exert power. In the existence of priority shares common shares usually have reduced or no voting power. Thereby common shareholders cannot influence the capital structure of the firm and thereby the relationship between ownership and leverage found can be distorted. Next to that, the retrieved data is real world data and for this reason its error terms will not exactly fit the normality assumptions. Moreover the error terms of the four leverage proxies, which are the dependent variables, also do not follow the normality assumptions. Deleting extreme cases or outliers in order to get the data within normality specifications is no valid option, since the observations are true observations and no misspecifications. Naturally these outliers influence the regression results and the presence of many outliers increases the chance on a type 2 error and might explain the rejection of second hypothesis. Further, sub sample sizes of when the largest aggregate shareholder identity are managerial or corporate, are too small. Respectively 33 cases, smaller than 6% of the total sample and 53 cases, smaller than 10% of the total sample.

Finally, this thesis studies the impact of ownership structure on the capital structure. The adjusted R^2 scores of all model are on average in the ,200 to ,320 range. Indicating that on average 20% to 32% of the variance in leverage is explained by the models. Thus, other factors than the variables used may be of influence too. Some aspects which were not considered in this study are the influence of the interest rate, the difference, the industry's average capital ratio and for instance the influence of corporate governance on the capital structure. Research of others hint for the influence of the factors mentioned and should be included in future studies to test and control for their effect on the corporate capital structure.

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Appendices

Robustness testing over time of model 1 with Block^2

	2010				2011				2012				2013				2014				2015			
	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2
(Constant)	-.231	.128	-.340***	-.039	-.457**	-.133	-.389***	-.080	-.515***	-.120	-.493***	-.165	-.515***	-.171	-.361**	-.154	-.228	.181	-.202	.157	-.351**	-.012	-.360**	-.080
	.182	.565	.004	.775	.014	.564	.008	.638	.004	.617	.001	.353	.008	.463	.014	.307	.167	.380	.165	.369	.049	.954	.015	.652
Block	.584*	.591*	.114	.063	.648*	.484	.409	.360	.578	.242	.416	.304	.578	.354	.403	.364	.104	-.173	-.102	-.224	.221	.025	.072	-.008
	.092	.090	.718	.848	.065	.169	.250	.317	.201	.522	.281	.452	.119	.347	.277	.336	.794	.631	.793	.574	.603	.949	.859	.985
Block2	-.610*	-.510	-.006	.216	-.554	-.310	-.242	-.108	-.528	-.015	-.267	-.071	-.528	-.158	-.319	-.179	-.066	.449	.054	.314	-.023	.311	-.022	.131
	.086	.153	.985	.522	.111	.372	.490	.760	.379	.968	.492	.862	.154	.674	.391	.635	.870	.219	.891	.434	.956	.425	.957	.756
N	87	87	87	87	91	91	91	91	93	93	93	93	93	93	93	93	98	98	98	98	100	100	100	100
Adjusted R^2	.276	.264	.388	.336	.311	.302	.286	.267	.292	.269	.241	.161	.220	.187	.209	.177	.161	.316	.199	.169	.146	.284	.227	.157

Table 22: this table reports the regression results of the robustness testing over time for model 1 as specified in section 3.2. The first row of each variable denotes beta, the second row denotes the significance level. Control variables and industry dummies are inserted in all regressions. For variable definitions see table 3.

Robustness testing over time of model 2 with MAN^2

	2010				2011				2012				2013				2014				2015			
	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2
(Constant)	-.137	.248	-.300***	.030	-.402**	-.124	-.406***	-.142	-.516***	-.126	-.516***	-.232	-.439**	-.192	-.344**	-.230	-.264	.024	-.315**	-.046	-.430***	-.115	-.520***	-.307**
	.435	.277	.009	.828	.028	.585	.004	.378	.006	.594	.000	.175	.023	.398	.015	.106	.104	.906	.028	.781	.009	.546	.000	.049
FAM	-.036	.049	.051	.153	.098	.218*	.169	.303***	.153	.263**	.144	.253**	.034	.216*	-.044	.092	.023	.291***	-.090	.065	.282**	.415***	.124	.202*
	.777	.700	.655	.197	.404	.064	.147	.010	.186	.026	.219	.040	.774	.067	.697	.415	.847	.009	.440	.577	.025	.000	.282	.088
MAN	.108	-.033	.385	.378	.361	.169	.385	.222	.436*	.288	.639**	.606**	.400	.489*	.427	.657**	.457*	.501**	.507*	.663**	.535**	.580***	.626***	.767***
	.718	.912	.154	.181	.163	.509	.132	.377	.093	.269	.016	.028	.148	.075	.110	.014	.088	.039	.051	.011	.028	.010	.006	.001
MAN2	-.168	-.064	-.324	-.311	-.259	-.032	-.308	-.114	-.270	-.039	-.452*	-.309	-.298	-.207	-.320	-.283	-.371	-.234	-.432*	-.392	-.401*	-.365*	-.439**	-.440**
	.539	.817	.190	.228	.283	.892	.197	.627	.272	.875	.071	.234	.247	.418	.200	.252	.142	.302	.078	.109	.077	.081	.037	.040
INSTIT	-.048	.042	.005	.094	.126	.209*	.246**	.359***	.136	.179	.207*	.280**	.041	.183	.096	.262**	.047	.242**	.066	.189	.262**	.318***	.237*	.308**
	.705	.739	.963	.426	.301	.085	.043	.003	.263	.147	.094	.031	.750	.152	.441	.036	.724	.045	.609	.142	.048	.010	.053	.015
CORP	-.053	.015	.052	.226**	-.059	-.038	-.077	-.072	-.023	.021	-.055	-.042	.059	.063	.222**	.165	.013	.102	.004	.053	-.004	.138	-.064	.021
	.614	.889	.579	.023	.550	.696	.430	.453	.812	.832	.573	.680	.575	.549	.031	.105	.906	.294	.972	.613	.972	.157	.509	.831
N	87	87	87	87	91	91	91	91	93	93	93	93	93	93	93	93	98	98	98	98	100	100	100	100
Adjusted R^2	.224	.209	.376	.316	.281	.291	.300	.314	.280	.269	.267	.202	.190	.204	.244	.255	.161	.320	.215	.219	.175	.299	.297	.265

Table 23: this table reports the regression results of the robustness testing over time for model 2 as specified in section 3.2. The first row of each variable denotes beta, the second row denotes the significance level. Control variables and industry dummies are inserted in all regressions. For variable definitions see table 3.

Robustness testing across industries of model 1 without Block²

	Manufacturing				Services				Wholesale/Retail				Holding			
	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2
(Constant)	-.359***	-.147	-.237***	-.025	-.564***	-.161	-.489***	-.160	-.383*	.608*	-.515***	.168	-.757*	-.159	-.372	.195
	.000	.245	.001	.742	.000	.171	.000	.142	.054	.048	.005	.404	.054	.748	.101	.565
Block	.606***	.526**	.392*	.379	.058	-.005	.041	-.023	.495	-.358	1.167**	.251	-.351	.937	-.038	1.108*
	.010	.022	.096	.110	.796	.983	.857	.922	.437	.511	.035	.599	.561	.112	.944	.081
Block2	-.456*	-.187	-.313	-.138	.028	.022	.092	.137	-.412	.568	-1.055*	.063	.197	-.662	-.326	-1.205*
	.056	.421	.189	.565	.903	.922	.688	.557	.520	.302	.057	.896	.738	.246	.532	.052
N	252	252	252	252	203	203	203	203	54	54	54	54	53	53	53	53
Adjusted R^2	.217	.254	.216	.207	.370	.384	.343	.326	.533	.658	.664	.737	.563	.595	.659	.533

Table 24: this table reports the regression results of the robustness testing across industries for model 1 as specified in section 3.2. The first row of each variable denotes beta, the second row denotes the significance level. Control variables are inserted in all regressions. For variable definitions see table 3.

Robustness testing across industries of model 2 without MAN^2

	Manufacturing				Services				Wholesale/Retail				Holding			
	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2	Mlev1	Mlev2	Blev1	Blev2
(Constant)	-.294***	-.014	-.229***	.024	-.542***	-.167	-.487***	-.178*	-.538**	.162	-.466*	.219	-1.372***	-.763	-.804***	-.415
	.010	.919	.004	.765	.000	.137	.000	.091	.036	.553	.079	.303	.002	.172	.000	.166
FAM	.166**	.346***	.110	.297***	.140**	.113	.116	.098	-.265**	-.045	-.295**	-.074	-.270	.559**	-.343*	.216
	.027	.000	.136	.000	.050	.110	.115	.189	.039	.549	.021	.340	.233	.017	.058	.260
MAN	.028	.125	-.113	-.062	-.589**	-.339	-.187	.060	-1.447***	.508*	-.829*	.844***	.180	1.524**	1.071**	2.350***
	.873	.453	.509	.710	.014	.154	.446	.812	.001	.053	.053	.002	.784	.025	.044	.000
MAN2	-.010	-.231	.100	-.107	.689***	.353	.440*	.172	1.459***	.124	.653*	-.370	-.331	-.980*	-1.147***	-1.776***
	.954	.158	.549	.513	.004	.139	.075	.493	.000	.593	.091	.124	.541	.077	.010	.000
INSTIT	.149*	.278***	.144*	.265***	-.051	-.111	.139*	.145*	.232	.044	.294	.076	-.470**	.211	-.262	.238
	.093	.001	.099	.002	.488	.128	.066	.060	.223	.701	.121	.514	.046	.364	.154	.224
CORP	.072	.208***	.053	.103	-.049	-.059	-.014	.017	.069	.177***	.176	.352***	.051	.262**	.018	.184*
	.279	.001	.421	.114	.445	.355	.833	.800	.528	.010	.105	.000	.673	.038	.849	.080
N	252	252	252	252	203	203	203	203	54	54	54	54	53	53	53	53
Adjusted R^2	.191	.244	.208	.232	.404	.409	.365	.340	.675	.881	.683	.877	.661	.656	.789	.758

Table 25: this table reports the regression results of the robustness testing across industries for model 1 as specified in section 3.2. The first row of each variable denotes beta, the second row denotes the significance level. Control variables are inserted in all regressions. For variable definitions see table 3.