

*THE INFLUENCE OF MANAGERIAL ENTRENCHMENT ON THE
CAPITAL STRUCTURE*



By including a sample of publicly listed U.S. firms over the period of 1992 to 2016, this research explores the relationship between managerial entrenchment and the capital structure. Several proxies are applied to measure managerial entrenchment, including CEO stock ownership, CEO duality, CEO tenure and corporate governance. Both the book and market value of leverage are used to measure the capital structure. This research uses a fixed effect regression with robust standard errors to correct for the presence of autocorrelation and heteroscedasticity in the panel data. There is significant evidence that the book value of leverage is higher when a CEO has greater stock ownership. The market value of leverage is significantly positively related to the amount of stocks a CEO owns and negatively to CEO tenure. Limitations and suggestions for further research are also provided.

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Content

1. Introduction	- 3 -
2. Literature review	- 5 -
2.1. <i>Defining the capital structure</i>	- 5 -
2.2. <i>Traditional capital structure theories</i>	- 5 -
2.3.1. Does an entrenched manager take on more of less leverage?	- 15 -
2.3.2. Managerial entrenchment proxies	- 16 -
3. Hypothesis	- 22 -
4. Data and Methodology	- 26 -
4.1. <i>Data</i>	- 26 -
4.2. <i>Variables</i>	- 27 -
4.2.1. Dependent variables	- 27 -
4.2.2. Independent variables	- 28 -
4.2.3. Control variables	- 28 -
4.3. <i>Methodology</i>	- 30 -
4.3.1. Regression technique	- 30 -
4.3.2. Panel data	- 32 -
4.3.3. The regression model	- 32 -
5. Results	- 33 -
5.1. <i>Descriptive statistics</i>	- 33 -
5.2. <i>OLS regression results</i>	- 36 -
5.2.1. Results and hypotheses testing	- 36 -
5.2.2. Evaluation of the estimation models	- 40 -
5.3. <i>Fixed effect regression results</i>	- 46 -
5.3.1. Results and hypotheses testing	- 46 -
6. Limitations and Recommendation	- 50 -
7. Conclusion	- 52 -
8. Bibliography	- 54 -
9. Appendix	- 59 -

1. Introduction

In recent decades, capital structure has been an interesting field of discussion. Despite firm value being influenced by the capital structure, there is still no consensus on how firms select the latter. Choosing the optimal capital structure is one of the most important and difficult decisions in a firm. This leads to the question of what is the optimal combination of debt and equity. In the 1950s Modigliani and Miller began to research capital structure theory. They developed the capital structure irrelevance proposition. Many studies followed that sought to determine an optimal capital structure is. The two most famous theories that were developed from these studies are the tradeoff theory and the pecking order theory. Despite the many theories that have been developed, it seems that there are still struggles in putting together the pieces that match and yet will not fit. Another important contribution has been made by Novaes and Zingales (1995), who argued that these theories neglect the importance who chooses the capital structure of a firm. They question why a manager would choose a certain capital structure if they could personally benefit from another. Some managers make it costly for shareholders to replace them, thereby entrenching themselves within their firms (Berger, Ofek, & Yermack, 1997). In this research, I look beyond the traditional approaches and investigate whether managerial entrenchment can explain variations in capital structure.

Jensen and Meckling (1976) have argued that managers do not always choose the optimal capital structure. This is especially true when managers are entrenched, which is defined as the extent to which managers fail to experience discipline from the full range of corporate governance and control mechanisms (Berger et al., 1997). Entrenched managers have discretion over their firm's leverage choice. Jensen (1986) has argued that entrenched managers prefer capital structures with lower levels of leverage, both because of the fact that leverage limits their flexibility and because of the desire to reduce firm risk. Contradictory evidence is provided by Stulz (1988), who has argued that entrenched managers prefer higher levels of leverage in order to protect the firm from takeovers or to inflate their own voting power. Whether it is before or beyond the optimal capital structure, managerial entrenchment is of importance explaining variation within it.

Understanding the influence of managerial entrenchment is key in analyzing the capital structure decision of firms. Therefore, the first primary objective of this thesis is to investigate the relationship between managerial entrenchment and a firm's capital structure. The determinants of this have been thoroughly explored in the corporate finance literature, within which there has been extensive research conducted that involves the testing of traditional capital theories. Additionally, past research has focused on managerial entrenchment as a variable that could explain capital structure decisions. However, this study has a different time period to these previous examples, namely 1992-2016. The study examines whether there has been a change in the influence of managerial entrenchment and the capital structure over time. Additionally, managerial entrenchment will be represented by different proxies than prior research in order to determine whether those variables have greater explanatory power on the capital structure.

In seeking to answer this main question, the remainder of this thesis is organized as follows. This section has provided an introduction of the research being conducted in this thesis. The next chapter discusses related literature concerning the influences of managerial entrenchment on the capital structure choice. Additionally, a brief overview of previous research into other factors influencing the capital structure choice is given. The third chapter presents the hypotheses used in this thesis and the reasoning behind them. Chapter 4 provides a description of the research data and the methodology used in empirically testing whether or not to accept the hypotheses. The results of the analysis are illustrated and discussed in the fifth chapter, after which the limitations and recommendations for further research are given in the sixth chapter. conclusions are drawn in the sixth chapter. Lastly, the conclusions are drawn in the final chapter.

2. Literature review

In this chapter, a review of existing literature regarding traditional capital structure theories and the relation between managerial entrenchment and the capital structure is discussed. Firstly, capital structure is defined. Secondly, four major traditional theories are outlined: the Modigliani and Millar irrelevance proposition, the tradeoff theory, the pecking order theory, and the agency cost theory. This is followed by a comprehensive discussion of empirical research in the field of the relation between managerial entrenchment and capital structure.

2.1. Defining the capital structure

The overall objective of a firm is to maximize firm value and stakeholder value. Firm value is the total long-run market value of the firm, and it can be calculated as the present value of all expected cash flows, discounted by the weighted average cost of capital (Jensen, 2001). The weighted average cost of capital (in the absence of taxes) is equal to the amount of debt multiplied by the cost of debt plus the amount of equity multiplied by the cost of equity. In order to generate future cash flows and create firm value, firms need to make investments. In turn, these investments need to be financed by either debt or equity. Debt is the amount borrowed by a firm, while equity refers to the owner or shareholders value (Myers, 2003). The decisions that firms face about financing with debt (borrowing money) or equity (issuing new shares or using retained earnings) is an important one that can have a great impact on firm value. The combination of debt and equity that the firm uses to finance its investments is referred to as the capital structure. The optimal capital structure is a mix of debt and equity that minimizes the weighted average cost of capital. In turn, this then increases shareholders' wealth and increases firm value (Berk et al., 2013).

2.2. Traditional capital structure theories

In this paragraph, I provide overview of the most well-known traditional capital theories. Miller and Modigliani were the first to conduct research into capital structure. They developed the capital irrelevant structure theory, which assumes a perfect market. The static tradeoff theory and the pecking order theory are explained thereafter, and both assume an imperfect market with market frictions, taxes, the cost of financial distress, and information asymmetry. The agency

theory, in which the managers' personal incentives are taken into account, is evaluated last. It is important to note is that Myers (2003) has stated that there is no universal theory of capital structure and there will not be one in the future. All theories are conditional on the factors used to explain the choice between debt and equity, such as taxes and agency cost.

2.2.1. Capital structure irrelevance proposition

Modigliani and Miller (MM) were the first to conduct research about the capital structure, doing so in 1958. They developed the capital structure irrelevant proposition, which assumes a frictionless and perfect capital market. A frictionless world means a world without bankruptcy cost, transaction cost, agency cost, asymmetric information, and tax. In this world, the weighted average cost of capital is unaffected by financing. The proposition of debt and equity in the capital structure is irrelevant to firm value. In an interview in the year 1997 Miller provided an example to easily explain the irrelevance proposition: it does not matter in how many slices you cut out of a pizza - the size will still be the same. This example is meant as a proxy for the debt and equity balance: it does not matter how much of each is used because the weighted average cost of capital will remain the same. The interest rate on debt is usually lower than the required return on equity because debt is less risky. However, according to MM's proposition, the gain from obtaining relatively cheap debt is completely offset by the corresponding higher cost of equity due to the greater amount of risk. The reasoning behind this statement is that equity becomes riskier when more debt comes into the capital structure because it has a prior claim to equity in case of default. When equity is riskier, shareholders require a higher return. The weighted average cost of capital thus remains the same regardless of whether the financing is with debt or equity (Myers & Majluf, 1984).

However, a frictionless world is not realistic. In the real world, there are imperfections. Companies have the obligation to pay taxes, they have to pay transaction costs, and face asymmetric information. Contrary to the predications of the irrelevant proposition, these imperfections have result in the capital structure begin relevant and impacting firm value (Myers & Majluf, 1984). Additionally, thirty years after the formulation of the irrelevance proposition, Miller wrote an article about what the view of the proposition is today. He found that, contrary to his expectations, changes in the capital structure indeed lead to changes in firm value. Therefore,

he acknowledged that the irrelevance proposition is a theoretical application rather than a real-world application (Miller, 1988). Nevertheless, the classical theory of MM (1958) was the starting point for further research into capital structure and is still frequently discussed in corporate finance. By assuming perfect capital markets, it highlights the importance of bankruptcy cost, transaction cost, agency cost, asymmetric information, and taxes, as well as how these factors make the debt-equity choice relevant. Showing what does not matter can also show what does matter. The tradeoff theory, pecking order theory, and agency theory take as their initial premise the fact that capital structure is very important to organizations operating in an imperfect world.

2.2.2. Trade-off theory

The static trade-off theory departs from the irrelevance theory of MM (1958) but does not assume a perfect capital market. It instead assumes an imperfect capital market where there are taxes and bankruptcy costs. These assumptions make this theory more realistic and applicable to the real world. By adding these imperfections, the capital structure is made relevant and has an impact on firm value (Kraus & Litzenberger, 1973). The theory recognizes the advantages and the disadvantages of debt. The former includes tax deductibility of interest payments, which makes it more attractive to take on debt due to the lower costs. If there were no offsetting costs of debt, then organizations would be 100% debt financed. However, such disadvantages include bankruptcy costs, more specifically the cost of financial distress. The direct cost of financial distress include legal, administrative, and shutdown cost in case of a default. Indirect costs of financial distress include those associated with a conflict of interest between debt and equity investors. The more debt that exists in a capital structure, the higher the cost of financial stress will be. Debt requires making interest payments, with firms relying more heavily on debt having to pay higher interest costs that increases the chance of default (Myers & Majluf, 1984).

An organization takes on the optimal amount of debt, seeking a point where benefits equal costs. Stated differently, an organization incurs debt up to the point where the present value of the interest tax shields and the present value of the costs of financial distress are equal. As the name of the theory suggests, this represents a tradeoff between tax benefits and financial distress costs. Eventually, organizations must target a certain debt-equity ratio that will result in an optimal debt

level (Beattie et al., 2004).

According to the tradeoff theory, firms must issue debt up to the optimal point where the benefits of where the benefits of debt equal its costs. This indicates that more profitable firms should have higher debt levels due to associated increased tax benefits. However, empirical evidence contradicts this prediction (Fama & French, 1992). Research conducted by Graham (2000) also does not support the tradeoff theory. He found that firms were conservative in their use of debt, even though they could double tax benefits by incurring more up to the optimal level. In explanation, Graham stated that the tradeoff theory does not take certain factors that affect the optimum debt level into account. These factors include the non-debt tax shield, asset collateral, firm size, and the existence of information asymmetry. This last factor is discussed in greater depth during the analysis of the pecking order theory.

2.2.3. Pecking order theory

Donaldson (1961) was the first to introduce the concept of the capital preference of firms in financing their investments. The tradeoff theory states that firms have an optimum debt level, whereas the pecking order theory states that firms have a financing preference for one type of fund, preferring internal financing over external financing and debt issuance over equity issuance over another one. This theory was later modified by Myers and Majluf (1984), it assumes a perfect capital market, except for the existence of information asymmetry. Transaction costs associated with raising capital are higher with the existence of information asymmetry. The latter occurs when one party has information superior to that of another; in this case managers have superior information to shareholders. Shareholders then start looking for signals. Additional debt funding sends a positive signal, as this indicates that managers are confident in their ability to make future interest payments and that the stock price is currently undervalued. Therefore, issuing debt minimizes the information advantage of managers because optimistic managers, who believe that their equity is overvalued, only want to issue debt and not the undervalued equity. Additional equity funding sends a negative signal because this is interpreted as managers believing the firms' stocks are overvalued. Only pessimistic managers, who believe that the firms' stocks are overvalued, want to issue equity. After an equity issuance, investors will immediately downgrade the prices of the firm. This price drop should even be worse when

information asymmetry is greater. This is why firms prefer issuing debt to issuing equity: the cost of raising the former is less than for raising the latter (Myers, 2003).

Shyam-Sunder and Myers (1999) have tested the pecking order theory by observing 157 non-financial firms in the period 1971-1989. If the theory holds, it should be observed that a firm never issues equity and only issues debt when it has inadequate internal cash to finance its investments. To test the theory, the researchers examined the firms' financing deficits, which is calculated as the dividends, capital expenditures and changes in working capital minus the generated cash flows. We would expect that will be issued when a firm has a positive fund flow deficit, and it should retire when it has a negative fund flow deficit. The results of the study confirm that the pecking order theory holds, as well as that it has explanatory power in analysis of corporate financial behavior. However, Frank and Goyal (2003) have criticized the research of Shyam-Sunder and Myers (1999). The main criticism is that the sample of 157 firms is too small to draw a conclusions from. They conducted the same research with 144,000 firms in a different period and observed completely different outcomes that seemingly rejected the pecking order theory. An additional criticism is targeted at the simplifying assumption that a firm's only financing choice is between debt and equity. The pecking order theory does not hold when, for example, straight and convertible debt are added as financing options.

As described, both the tradeoff theory and pecking order theory have been undermined and supported by different bodies of evidence. Graham and Leary (2011) have pointed out that they should be viewed as rather complementary and not mutually exclusive. Which theory can better explain the financing behavior depends on the conditions in which firms operate. Further understanding of financing behavior requires an examination of how managers manage financing, thus acting as agents for shareholders.

2.2.4. Agency cost theory

Jensen and Meckling (1976) were the first to relate the agency cost theory to the capital structure of a firm. They have stated that this theory can also explain the capital structure of a firm, as it is determined by agency cost.

When a firm is created, there are no agency costs because the managers own 100% of the firm. In this instance, the main objective is to maximize firm value. However, as firms expand and establish growth, additional equity is needed, resulting in separation of ownership and control. This separation can lead to agency problems. The conflict of interest between shareholders and managers is created because managers are now entitled to less than 100% of the residual claim. The interest of the shareholders is to maximize the value of a firm; the interest of the manager can in some cases be to maximize their own wealth at the cost of maximizing firm value. Adam Smith (1776) stated that when being managers manage money that is not their own, it is impossible to expect them to act as though it were. Managers invest all of the required effort but do not receive the entire gain. At this point, managers can be tempted to seek private benefits, such as job security and empire building, instead of maximizing firm value (Harris & Raviv, 1991). To minimize these agency problems, shareholders put monitoring in place to ensure that the managers are making optimal decisions from their perspective. However, monitoring cannot completely eliminate agency problems. In addition, monitoring is costly and will reduce returns. These monitoring cost are defined as agency costs, and firms have the objective of minimizing these costs. The higher the agency problems, the higher the need for monitoring will be, the higher the agency costs will be, and the lower firm value will be. An optimal capital structure can be selected in order to minimize the agency cost (Jensen & Meckling, 1976). By taking on more debt, the agency problem can be reduced. Stulz (1990) has demonstrated with a model that managers will always invest free cash flow, even if these projects yield a negative return, unless the cash is required for meeting debt obligations. Issuing debt necessitates meeting such debt obligations. Managers always want to meet this obligation, as those who are unable to do so face an increased risk of being fired. These payments reduce the free cash flows. In turn, this reduction limits the flexibility of managers to achieve private benefits and invest in projects yielding a negative return instead of following the interests of shareholders. However, higher debt levels increase the cost of financial distress. There is a higher chance of bankruptcy and a possible lower credit rating. This leads to another conflict of interest, namely between shareholders and debtholders. The interest of debtholders is to generate enough return to meet the debt obligation; the interest of shareholders is to generate more return to not only meet the debt obligation but also to achieve an excess return-to-pay-out dividend, since debtholders have a prior claim. These conflicts of interest can lead to the tendency of shareholders guiding

management to invest in projects which generate a higher return. Such projects tend to be riskier, and investments in them is referred to as overinvestment. Debtholders can protect themselves with covenants, which can constraint managers from investing in risky projects (Jensen, 1986).

The amount of debt in the capital structure is therefore a tradeoff between the benefits and costs of debt. An example of benefits is a reduction in the agency cost due to the lower free cash flows. The cost of debt includes increased agency cost due to the higher probability of default and the overinvestment incentives of shareholders. What the optimal amount debt in the capital structure should be is difficult to measure, as it is difficult to measure the agency costs faced by a firm. This is the main limitation of the agency theory.

2.2.5. Conclusion of the three theories

The goal of capital structure theories is to explain the heterogeneity in observed capital structures. Myers (2003) has highlighted the importance of the fact that all theories are conditional on the factors used to explain the choice between debt and equity. The tradeoff theory, pecking order theory, and agency theory suggest different factors that may affect the capital structure choice of a firm. These factors include: asset tangibility, taxes, growth opportunities, firm size, liquidity, cost of financial distress, and profitability. There is evidence of all three theories at work. Yet none of the theories is able to provide a conclusive answer to the capital structure choice (Tittman and Wessels, 1988). The three theories are summarized in depth below.

Trade-off theory

This theory tradeoffs the cost, including the costs of financial distress, and benefits, including the taxes deductibility of debt, associated with the use of debt. Following this theory, larger, more profitable firms with a higher tax shield, tangible assets, and low costs of financial distress should have high debt levels. This is because those firms face more benefits than costs through the use of debt. Indeed, Harris and Raviv (1991) have observed that all these factors result in higher levels of debt, with one exception: more profitable firms instead take on lower levels of debt. The tradeoff theory therefore fails to explain the existence of low debt levels in profitable firms (Myers, 1984).

Pecking order theory

This theory examines a financing preference of one type of fund over another one. It prefers internal financing over external financing and debt issuance over equity issuance. Following the theory, more liquid, profitable, and larger firms should have lower debt levels. This is because those firms have more internal funds and thus do not require debt financing. Harris and Raviv (1991) have observed that more profitable and liquid firms obtain lower debt levels. However, the theory fails to explain that empirically larger firms obtain higher debt levels instead of lower levels.

Agency theory

This theory predicts that firms with high free cash flow, exceeding profitable investment opportunities, may hold higher levels of debt. This is because higher debt levels mitigate the agency problems that exist between managers and shareholders. However, higher debt levels engender agency problems between shareholders and debtholders.

Despite the many developed theories, it seems that there are still struggles in putting together the pieces that match and yet will not fit. According to Myers (2003), all of these theories are conditional and there is no universal theory of capital structure. In the next paragraph the impact of managerial entrenchment on the capital structure will be discussed.

2.3. Managerial entrenchment

The role of leverage is introduced in some papers as a way to lower agency problems. Agency theories highlight that the use of debt can mitigate agency problems between managers and shareholders (Jensen, 1986). A higher level of debt increases efficiency because it prevents managers from financing unprofitable projects. However, a question remains as to who decides to take on a higher level of debt with the aim of mitigating agency problems. The ones making this decision are the self-interested managers. Therefore, this decision itself is subject to an agency problem. Novae and Zingales (1995) made the important contribution that those papers discussed the ‘traditional’ leverage determinants and neglected the issue of who chooses the capital

structure of a firm. This prompts the question of whether these managers can realistically be expected to increase the level of debt at their own detriment. The one choosing the capital structure can be entrenched, and this can have an impact on the amount of leverage. Therefore, it is important to study the impact of managerial entrenchment on the capital structure. In this research, I look beyond the traditional approaches and investigate whether managerial entrenchment can explain the variation in capital structure.

Berger et al. (1997) has defined entrenchment as the extent to which managers fail to experience discipline from the full range of corporate governance and control mechanisms. Entrenched managers have incentives to act in their own best interests and pursue personal benefits, usually at the expense of shareholders. They cannot easily be dismissed by the board of directors, as they are costly to replace. The board of directors usually makes the decision as to whether to replace a CEO. In most cases, this is done after disappointing performance. However, managers entrench themselves for the main reason of reducing the probability of being replaced, thereby countering disciplinary forces. An example of this is a contract set by Rick Clemmer, CEO of NXP, in which he made sure that he will receive a large amount of money in the case of an unwanted takeover. The reason for setting up this contract is to entrench himself and thereby lowers his probability of being replaced. Recently the company was acquired by the American Qualcomm and Rick Clemmer received 428 million euro. This is the largest amount of money an executive has ever received after a takeover in the Netherlands. Another example is that of Warner Studio's. Steven Spielberg stated that he would only make highly profitable movies with this company while his friend Steven Ross, CEO of Warner, remained in his position. Steve Ross happens to be one of the highest-paid CEO in the world. These examples illustrate entrenchment devices that CEOs can use. To summarize, the main entrenchment devices include: (a) making investments that are worth more under the current manager than under the best alternative manager, thereby making him more valuable to the firm and costlier to replace (Shleifer & Vishny, 1989); (b) CEO's having several characteristics of entrenchment, such as a long tenure, higher age and low option holding; and (c) weak corporate governance, which can be measured through the entrenchment index, including the presence of a classified board, limits to shareholder bylaw amendments, supermajority requirements for mergers and charter amendments, poison pills, and golden parachutes. The first four provisions of the entrenchment index limit shareholders' voting power

and therefore increase the power of managers; the last are set as a takeover defense (Bebchuk et al., 2009). I will elaborate of these entrenchment devices in Subparagraph 2.3.2.

Any of the practices mentioned above can be employed by a manager to entrench himself. An entrenched manager by definition can exercise discretion over a firm's capital structure, he can decide the financing policy of a firm. In this sense, managerial entrenchment can affect the capital structure. A firm will select the value-maximizing capital structure when the interest of managers and shareholders are perfectly aligned. However, as discussed, the interest of managers and shareholders can be different. Entrenched managers have incentives to act in their own best interests and pursue personal benefits, usually at the expense of shareholders. In this case, the optimal capital structure from an entrenched manager's perspective will differ from that of the shareholders. Entrenchment then has an impact on the capital structure through the intentional deviation of the value-maximizing debt level. This can either be less than the optimal point or beyond it, as elaborated upon further in the following paragraph. The capital structure of a firm is thus not only determined by real market frictions, such as taxes and the costs of financial distress, but also by the degree of managerial entrenchment (Morellec, 2004). Since the research of Jensen and Meckling (1976), much attention has been devoted to studying the relation between managerial entrenchment and capital structure.

Zwiebel (1996) has supported the view of Morellec that entrenchment has an impact on the amount of leverage. He explained that managers seek to maximize job tenure, which is threatened by two possible events: bankruptcy and takeovers. He determined that managers use leverage as a tool to prevent the occurrence of these events, even if this leverage choice does not benefit shareholders. Another study by Novaes and Zingales (1995) compares the capital structure choice made by managers and shareholders whose interest are not perfectly aligned. The interest of the manager is to prevent a takeover, aiming to reduce the probability of a takeover and simultaneously maximize job tenure. The interest of the shareholder deviates from this and entails maximizing firm value. As could be expected, the capital structure choice of both differs. The manager has an entrenchment choice of leverage and the shareholder has a value-maximizing choice of leverage. Whether the entrenchment choice of leverage is less or more than the value-maximizing choice depends on the costs associated with a takeover.

These papers all agree that managerial entrenchment has an impact on leverage. However, they do not explicitly predict whether too little or too much leverage is incurred. Below, I review important empirical research into whether entrenched managers take on more or less leverage than is optimal.

2.3.1. Does an entrenched manager take on more of less leverage?

Previous research has been contradictory in its evidence of the use of leverage of entrenched managers. Some studies argue that entrenched managers use less debt than is optimal from the shareholders' perspective, while some argue that they use more. The main arguments to use less debt than is optimal are to protect their under-diversified human capital and to avoid performance pressure that the large fixed interest payments that debt entails. This ensures their flexibility and reduces firm risk, which in turn prevents them from the fear of personal bankruptcy. The main reasons to increase debt beyond the optimum level are to inflate the voting power of the managers' equity stakes and to minimize the possibility of a takeover attempt (Berger et al, 1997). All of these are discussed below.

Berger et al. (1997) have conducted a cross-sectional analysis of the associations between managerial entrenchment and capital structure. Their sample included 434 industrial firms in the time period of 1984-1991. They found evidence that CEOs with characteristics of entrenchment, such as long tenure, the absence of effective monitoring, and the absence of compensation based on performance, take on lower levels of debt. Entrenched managers seek to avoid debt when there is no pressure from compensation and ownership incentives and effective monitoring. Another important study from Fama (1992) researches the same conclusion: managers prefer lower levels of debt than the optimal. This study researched the human capital of managers and its impact on capital structure. The human capital of a manager is the future wages that they will receive. These usually represent a large part of their income and wealth. In turn, this income is closely related to the performance of a firm through incentive schemes, such as possible bonuses and stocks options held by managers. Therefore, managers are concerned with the overall risk of the firm, as their human capital is tied to the success or failure of the company. When this risk-taking is high and the company goes bankrupt, the managers will lose their income. Managers are unable to diversify their human capital, as it cannot be traded on the market (Amihud & Lev, 1981). Being

unable to diversify their human capital poses a risk for managers, and assuming they are not a risk seeker, they want to minimize this risk. A firm's capital structure can have an impact on the level of risk it takes. Issuing debt entails making interest payments, which leads to pressure to perform and generate cash flow. In turn, this increases the chance of going bankrupt. Reduced levels of debt thus lowers the commitment to make interest payments and reduce risks to performance. Therefore, managers prefer lower levels of debt than is optimal in order to reduce firm risk to protect their under-diversified human capital (Fama, 1980). Another argument in favor of lower debt levels is provided by Jensen (1993), who has argued that debt entails making fixed interest payments, which in turn heightens pressure on the CEO. It will reduce the free cash flow and therefore lower the CEO's ability to exploit personal benefits at the expense of shareholders. Hovakimian et al. (2001) has supported the view that entrenched managers prefer to take on low amounts of debt, arguing that a low debt level provides greater financial flexibility. According to these researchers and many others (Mehran, 1992; Kayan, 2005), entrenched managers prefer to take on lower levels of leverage.

A contradictory stream of research argues that entrenched managers may adopt higher levels of leverage. For instance, studies from both Stulz (1988) and Harris and Raviv (1988) have speculated that entrenched managers prefer higher levels of leverage in order to inflate their voting power. Higher leverage increases concentration of their shareholdings, which in turn enhances their voting power and control over the company. With this increased control, probability of a successful takeover is reduced. These authors argue that entrenched managers increase leverage beyond the optimal point to prevent the occurrence of a takeover.

Prior research is contracting on whether entrenched managers prefer to take on lower or higher levels of leverage in the capital structure. Therefore, this research will only examine whether managerial entrenched has an influence on the capital structure and later draw a conclusion of the direction of this relationship. Therefore, the main hypothesis of this study is: **“Does managerial entrenchment has an influence on the capital structure”**.

2.3.2. Managerial entrenchment proxies

In order to study the effects of managerial entrenchment, it needs to be measured. In the existing

literature, many variables can be used to proxy for entrenchment. However, due to the desired length of this thesis, I only consider the variables with the greatest explanatory power as a proxy for entrenchment. Therefore, I have chosen to use the following variables as proxies: (a) CEO tenure, (b) CEO stock ownership, (c) CEO duality, and (d) corporate governance. Additional variables are used as control variables, such as board independence and board size.

(a) CEO tenure

CEO tenure is the numbers of the years that the current CEO has been at the firm. Following Berger et al. (1997), CEO tenure is a commonly used measurement of managerial entrenchment. Their article explains that a CEO is increasingly able to influence internal governance mechanisms as tenure increases. The power of the CEO over the board of directors increases with years in office. This power enables the CEO to exercise control over their dismissal: it becomes less likely. Finkelstein and Hambrick (1990) have supported the view that CEOs with a longer tenure have more control over the board. Therefore, a CEO with a longer tenure is more likely to be entrenched. A study by Salas (2008) also used tenure to proxy for managerial entrenchment. Specifically, he stated that a CEO can be regarded as entrenched when they have held their position for more than 10 years. Additional motivation is provided by Rose (1994), who has stated that a CEO with a longer tenure is increasingly able to build relationships with managers. This lowers the CEO's probability of being replaced, increasing their entrenchment. A CEO with a longer tenure is therefore commonly used as a proxy for managerial entrenchment.

A variable that is closely related to CEO tenure is CEO age. Research by Bertrand and Mullainathan (2003) has shown that older CEOs are regarded as more entrenched. It is suggested that CEOs become more risk averse with age. As mentioned, entrenched managers usually undertake conservative investments to ensure that they do not take on too much risk. Older CEOs become more risk averse in their investments because they do not want to risk losing their job over making a risky, bad investment. The older the CEO gets, the harder it will be for them to find a new job after being fired. Another study by Signer (2015) has highlighted that there is a positive relation between the age of a CEO and their ability to influence the board of directors. The CEO is now able to get away with pursuing an entrenchment, risk-averse investment strategy. However, since CEO tenure and CEO age are closely related, I have chosen to only use

CEO tenure as a proxy for managerial entrenchment.

(b) CEO stock ownership

CEO stock ownership represents the number of shares held by the CEO divided by the total shares outstanding. What is the chance for a CEO of being replaced when he holds more than 50% of the company shares? As one might expect, it is very low. Stock holdings reduce the likelihood of CEO replacement. Onali et al. (2014) have used stock ownership to proxy for CEO power. If the amount of stock holding increases, the CEO becomes more powerful due to increased voting power. The replacement of the CEO becomes less likely, and he is thus assumed to be more entrenched. To explain why stock ownership is taken as a proxy, they referred to the work of Bhagat et al. (2010), which demonstrated that there is a negative relationship between CEO stock ownership and the probability of CEO replacement. Morck et al. (1988) have referred to this as the entrenchment effect: through inside ownership by the CEO, the chance of his dismissal decreases, thereby granting them discretion to pursue their personal interests. However, this is not the only identified effect associated with increased inside ownership. Other studies (Fenn & Liang, 200; Holderness & Sheehan, 1991; Lennox, 2005) have stated that stock ownership by executives also has an alignment effect, which is in contrast with the aforementioned entrenchment effect. The alignment effect results from the following: managers' and shareholders' interests will be more aligned as the fraction of company share held by executive increases. Managers have a greater incentive to maximize firm value through the increased impact it will have on their own wealth. Morck et al. (1988) have compared both effects and found that when ownership is below 5% or above 30% the alignment effect dominates the entrenchment effect. Managers are not regarded to be entrenched when ownership is below 5% because the impact this has on their level of control is miniscule. With ownership levels of above 30%, the CEO is not regarded to be entrenched, as their wealth is too exposed to deviate from pursuing a non-value-maximizing strategy. In the middle ownership of 5-30%, the entrenchment effect dominates the alignment effect, meaning that CEO ownership level is commonly used as a measurement for entrenchment. This research focuses on U.S.-listed companies, as in this context the chance that a CEO has an ownership level of more than 30% ownership is very small. Therefore, for the sake of simplification, a CEO with greater stock ownership is considered to be more entrenched.

(c) CEO duality

CEO duality occurs when one person holds the positions of both CEO and chairman of the board. According to Jensen (1993), many American companies have CEOs with a dual function. He argues that CEO duality decreases the influence of effective monitoring, which results in lower control by the board over the CEO. In turn, the CEO has more power when holding a dual function and thus is more entrenched. Vo (2010) has built on the view that a CEO with a dual function is less likely to be replaced, since he plays a major role in the company. Henry et al. (2005) have stated that the duality gives rise to domination by the CEO, who possesses power in both the firms' management and its governance. The balance in this hierarchy is disturbed, which gives the CEO enormous power. This power facilitates them in pursuing their self-interest instead of the shareholding interest, and it reduces the probability of them being replaced. To conclude, a CEO holding the positions of both CEO and chairman of the board is assumed to be entrenched.

(d) Corporate governance

The quality of a firms' corporate governance is difficult to measure. However, Bebchuk et al. (2009) have constructed an index to measure this quality: the so-called entrenchment index (hereafter abbreviated to "E index"). This E index includes six provisions, of which four are set to limit the voting power of shareholders and two to prevent a hostile takeover. The four provisions set limits to the voting power of shareholders and include: limits to shareholders' amendment of the bylaws, a classified board, and supermajority requirements for mergers and charter amendments. The other two provisions are poison pills and golden parachutes, aiming to prevent a hostile takeover. According to (the website of) Bebchuk, over 300 empirical studies have used the entrenchment index to measure the quality of a firms' corporate governance. The index score ranges from 0 to 6: one point for the presence of each provision. A high entrenchment score indicates that there are no restraints on management through corporate governance mechanisms (weak corporate governance). A study by Manne (1965) has argued that the discipline mechanism to remove management is reduced by these provisions, thereby enabling managers to entrench themselves. Therefore, the higher the entrenchment score, the less control that shareholders have, the lower the governance quality is, the more power the CEO has, and the more entrenched they are.

(e) Additional variables

There is research about additional variables that can be used as indicators for managerial entrenchment, including (a) CEO stock options, (b) CEO fixed compensation, (c) CEO gender, (d) board independence, and (e) board size. However, I choose not to use these characteristics or to take them as control variables rather than proxies. Firstly, Berger et al. (1997) have stated that stock options can be used to proxy for managerial entrenchment. There is a negative relationship between these two factors: managers with stock options are not regarded to be entrenched. Stock options align the interest of managers and shareholders because their compensation is partially tied to the performance. There is an incentive for managers to maximize firm value and act in the interest of shareholders. Managers with stock options are motivated to undertake riskier investments, as risk-taking increases the volatility of the stock price and thereby the value of the stock option (Smith & Watts, 1992). Conversely, entrenched managers usually undertake conservative investments to ensure that they do not take on too much risk, so there is always room for them to pursue their own goals (Bertrand & Mullainathan, 2003). A CEO is assumed to be entrenched if their compensation is not sensitive to performance, this is the case when option holding are low. Secondly, fixed compensation can also be used as a proxy for entrenchment. Berger et al. (2007) have explained that when entrenched managers are more likely to be able to negotiate their fixed compensation, it will be higher than otherwise. However, in evaluating prior research into the relationship between CEO compensation and entrenchment, it becomes clear that the most commonly used metric is stock ownership, indicating that this has a greater explanatory power. Therefore, I do not use CEO stock options and fixed compensation as variables. Thirdly, Baker and Wurgler (2002) have discussed the relation between CEO gender and entrenchment, arguing that a female CEO is more entrenched because she will pursue a more risk-averse investment strategy. This is a general view and has psychological underpinnings. However, there is little evidence found that female CEOs are more entrenched. Therefore, I choose not to use gender as a proxy for entrenchment. Fourthly, Weisbach (1988) has conducted research into board independence, measured as the percentage of outside directors in the board. A board can have inside directors, regarded as more acquainted with the firm, and outside directors, regarded as more objective in their opinion. Weisbach compared the effectiveness of monitoring by outside boards and inside boards. The results show that the composition of a board with outside directors engenders more effective monitoring. This indicates that an independent board,

with the presence of outside directors, causes CEOs to be less entrenched than boards consisting of only inside directors. Fifthly, Yermack (1996) has researched the impact of board size on firm performance. He states that larger boards are less productive in their decision-making process and are less likely to replace a CEO. Therefore, CEOs are considered to be more entrenched when the board of directors is larger, as the threat of their dismissal is lower. However, board independence and board size are not commonly used measures of entrenchment. This is explained by the E index, which has more explanatory power as a proxy in this instance. Therefore, I have chosen to use board independence and size as control variables.

To summarize, a CEO is regarded as entrenched when they have a long tenure, high stock ownership, and a dual function and are in the presence of weak corporate governance. In this research, additional entrenchment variables are taken as control variables, including board independence and board size. The variables of CEO stock options, CEO fixed compensation, and CEO gender are not used as variables.

3. Hypothesis

The main hypothesis underlying the following sub-hypotheses is: “**Does managerial entrenchment has an influence on capital structure?**”. In this chapter, I hypothesize the relationships between the various managerial-entrenchment-related variables and the leverage level, measured by both the book and market value. As mentioned above, in this thesis the chosen variables to proxy for managerial entrenchment include CEO tenure, CEO stock ownership, CEO duality, and corporate governance.

(a) CEO tenure and leverage

When evaluating literature on CEO tenure and leverage, it seems that CEOs with a longer tenure take on less leverage. A CEO that has a longer tenure might avoid leverage to reduce risk. Studies by Berger et al. (1997) and John and Litov (2010) have found lower leverage in firms run by CEOs with long tenure. Berger et al. (1997) have explained that longer-tenured CEOs prefer to avoid the performance pressure of large fixed interest payments that debt entails. Rakhmayil and Yuce (2009) have added to these findings by arguing that these CEOs are reluctant to issue debt because they wish to retain the ability to attract additional debt when it is needed in the occurrence of the firm encountering financial distress. A study by Barker and Mueller (2002) provides additional motivation. They explain that younger CEOs take more risks because their concerns about their career and financial security are heightened in this stage of their development. For longer-tenured CEOs, it becomes increasingly relevant to keep their job, and they therefore prefer to avoid risk-taking. Wen et al. (2002) have studied the relation between CEO tenure and leverage in Chinese-listed firms. Lee (2014) has done the same for Asian-listed firms. Both studies conclude that longer-tenured CEOs prefer lower levels of debt, motivated by their risk aversion. Other empirical studies support this view (Graham, 2009; Frank and Goyal, 2007). From this, the first hypothesis is formed:

Hypothesis 1: CEO tenure is negatively related to the book value of leverage

(b) CEO stock ownership and leverage

An evaluation of the literature on managerial stock ownership and capital structure, gives the impression that it is limited and with contradictory findings. Research suggesting a positive relation between managerial inside ownership and leverage (Berger et al., 1997; Short et al, 2002)

builds on the idea that issuing equity will dilute their percentage of ownership. Therefore, managers with high inside ownership will prefer to issue debt, as this increases rather than decreases their ownership in the firm. Research indicating a negative relation between inside ownership and leverage (Jensen & Meckling, 1992; Firth, 1995; Bathala et al., 1994; Friend & Hasbrouck, 1988) states that managers with high inside ownership hold a less diversified portfolio than other shareholders. It is speculated that a larger proportion of the wealth of these managers is tied to the performance of the firm than is the case with other stakeholders. Therefore, these managers are more risk-averse and wish to reduce the risk faced by the firm. The issuance of debt bears greater risk than the issuance of equity, as debt obligates the firm to the payment of large levels of interest. In turn, this increases the fear of bankruptcy. Managers with higher inside ownership and that hold a less diversified portfolio prefer to reduce the level of leverage because of the additional bankruptcy risk. As stated, the findings of prior research have been contrary to this. Nonetheless, I expect there to be a positive relation between inside managerial ownership and leverage. Thus, the second hypothesis is stated:

Hypothesis 2: CEO stock ownership is positively related to the book value of leverage

(iii) CEO duality and leverage

Fosberg (2004) has studied the impact of CEO duality on capital structure. CEO duality occurs when one person holds the positions of both CEO and chairman of the board. Fosberg found that firms with CEOs that also hold the position of chairman of the board have lower leverage levels than those of firms where the positions are separated. Moreover, Nazir et al. (2012) have studied the effects of CEO duality and leverage on listed Pakistani firms during 2004-2009. They also find a negative relation, but only in the presence of a risky situation. Hovey (2010) has agreed further evidenced this negative relation through his research into Chinese firms during 1999-2005. Conversely, Abor (2007) has argued that CEO duality leads to higher debt levels within a firm, as duality minimized the problems associated with the separation of ownership and control, which in turn reduces information asymmetry and ultimately leads to better access to debt financing. As stated, the findings of prior research have not reached consensus. Nonetheless, I expect there to be a positive relation between CEO duality and leverage. Thus, the third hypothesis is stated:

Hypothesis 3: CEO duality is positively related to the book value of leverage

(d) Corporate governance and leverage

John et al. (2004) has studied the impact of weak shareholders rights - measured by the governance index of Gompers et al. (2003) - on the capital structure. A managers is assumed to be entrenched in the presence of weak shareholder rights, which is equal to a high governance index score. John et al. (2004) has found that entrenched managers are risk-averse: they prefer to invest in low-risk projects due to their desire to keep the risk of bankruptcy low. In turn, firms with entrenched managers receive higher credit ratings since they invest more in low-risk projects. Subsequently, debt providers allow firms with entrenched managers easier access to debt financing due to this higher credit rating, which prompts entrenched managers to take on more debt. A study by Koerniadi (2013) supports the view that firms with weak corporate governance employ greater leverage in their capital structure. Contradictory evidence has been found by Berger et al. (1997), who stated that CEOs at firms with weak corporate governance take on less leverage. The thought is that weak corporate governance enables CEOs to pursue their self-interest, which in the research of Berger et al. (1997) is to avoid the use of debt. A study by Morellec et al. (2012) concludes the same, finding that stronger corporate governance is associated with higher debt levels. Therefore, corporate governance is positively related to debt. Although the literature is inconclusive about the relation between corporate governance and leverage, the following hypothesis is formulated in line with the main hypotheses of this thesis:

Hypothesis 4: Weak corporate governance increases the book value of leverage

All these hypotheses described above are based on the book value of leverage. However, the apply in the same method to the market value of leverage. Therefore, the following four hypotheses are formulated for the market value of leverage:

Hypothesis 5: CEO tenure is negatively related to the market value of leverage

Hypothesis 6: CEO stock ownership is positively related to the market value of leverage

Hypothesis 7: CEO duality is positively related to the market value of leverage

Hypothesis 8: Weak corporate governance increases the market value of leverage

Table 1 provides a summary of the above mentioned sub-hypotheses, which are designed to provide an answer to the main research question: “Does entrenchment has an influence on the capital structure?”.

Table I
Summary of all the sub-hypotheses and their relationship with entrenchment

All the sub-hypotheses are designed to answer the main research question: “Does managerial entrenchment has an influence on capital structure?”. The table provides an overview of all the independent variables and their expected relationship with entrenchment.

Independent variable	Related to Entrenchment	Null Hypothesis	Alternative Hypothesis
CEO tenure	+	CEO tenure is negatively related to leverage	CEO tenure is positively related to leverage
CEO stock ownership	+	CEO stock ownership is positively related to leverage	CEO stock ownership is negatively related to leverage
CEO duality	+	CEO duality is positively related to leverage	CEO duality is negatively related to leverage
E index	+	(A high score on the) E index is positively related to leverage	(A high score on the) E index is negatively related to leverage

4. Data and Methodology

This chapter describes how the data of this research was collected and analyzed. In order to empirically test the previously formed hypotheses, it is crucial to have gathered the relevant and appropriate data. Firstly, the research strategy and the sample collection are outlined.

Furthermore, the different kinds of variables employed in this research is discussed, as are the methods of their measurement. Lastly, the research methodology describes the chosen research methods.

4.1. Data

The sample consist of publicly listed U.S. firms from 1992 to 2016. The motivation for beginning this dataset in 1992 is that the most famous research about the relationship between managerial entrenchment and capital structure (Berger et al. (1997)) ends its examination in 1991. A focus on the US allows for a larger sample than studying Europe or Asia. Following Berger et al. (1997) all utilities (SIC 4900-4999) and financial firms (SIC 6000-6999) are excluded, as these industries have their own regulation and capital structures that are unlike those of other sectors of the economy.

The data required to test the hypotheses is retrieved from three different databases on Wharton Research Data Services (hereafter WRDS). This is a platform that allows for access to various databases within one location. The first database from which data is collected is Compustat, which contains annual and quarterly accounting data of publicly listed firms. It allows for the retrieval of the data required for the dependent and most of the control variables, including leverage, firm size, tangibility, profitability, and the market-to-book ratio. Next, data about the CEO stock ownership and tenure is retrieved from Execucomp, a database including information about top executives within a company. Lastly, ISS is used to collect data about directors and governance. This is necessary in measuring the E index, CEO duality, board size and independence.

The initial dataset of Compustat consists of 85,521 observations, of ISS it consists of 22,323 observations, and Execucomp has the largest number with 152,092. However, Execucomp also retrieved information about executives that did not hold the position of CEO. After including

only the CEO executives, the number of observations declined to 23,874. This reduction makes sense, as it implies that an average board includes approximately 6 executives. Of these 23,874, there are 607 missing values for the year in which a CEO took up their position. Therefore, the Execucomp database contains 23,267 observations before it is merged with the other databases. The outcome of Compustat is merged with Execucomp and ISS based on a combination of the TICKER and fiscal year, which leaves 85,521 observations. As described, all utilities (SIC 4900-4999) and financial firms (SIC 6000-6999) are excluded, resulting in 70,010 observations being left over. The merged file contains a great number of missing values, such as the E index (83%), CEO tenure (79%), and board independence (79%). For this reason, I have chosen to remove missing values and not replace them, leaving 10,037 final observations. Next, the data has to be cleared of outliers. These can seriously harm the reliability of the data, as they are not regarded as reliable and cause biased results. The procedure for dealing with the most extreme outliers entails winsorizing the 1% left and right tail of the distributions and replacing them (Frank and Goyal, 2008). This procedure does not reduce the number of observations since they are replaced and not removed.

4.2. Variables

In this paragraph, an overview of the different variables is provided. The main research question is whether managerial entrenchment influences capital structure. Therefore, the goal is to test whether a change in the level of managerial entrenchment leads to a change in the capital structure. In this manner, the capital structure is the dependent variable and managerial entrenchment is the independent variable. Additionally, I control for other variables in order to make sure that they do not have explanatory power for this relationship. In the following subparagraphs, the variables are described. A more detailed calculation of the variables can be found in Appendix 1A.

4.2.1. Dependent variables

In this research, the dependent variable is leverage. However, the literature states that there are several definitions of leverage. I have chosen to follow the measurement of John and Litov (2010), who have measured the book leverage ratio as book debt divided by total assets and market leverage as book debt divided by the total market assets. Book leverage is backward-

looking and market leverage is forward-looking, as it captures growth opportunities. In their research, they outline the benefits and disadvantages of both measures. In this research, following Berger et al. (1997), both book leverage and market leverage are used. This approach is chosen because it increases the robustness of the results. Leverage - book and market - is measured at the end of each fiscal year and can take a value of between 0 and 1. A value of 0 indicates the firm is financed with purely equity, while a value of 1 indicates the firm is financed only with debt. Usually, this value is not this extreme and is instead located somewhere within this range.

4.2.2. Independent variables

The independent variable in this research is managerial entrenchment. As mentioned in Paragraph 2.3.3, the chosen variables to proxy for managerial entrenchment include CEO tenure, CEO stock ownership, CEO duality and corporate governance. This paragraph also described the expected relationship between the aforementioned variables and the capital structure. These four proxies are the independent variables. Whether a change in one of these independent variables will lead to a change in the capital structure. Firstly, to calculate CEO tenure, I use the number of years the current CEO has been in their position. Secondly, CEO stock ownership is determined by dividing the shares held by the CEO by the total shares outstanding. The variable CEO duality will take a value of one (1) when one person holds the positions of both CEO and chairman of the board, and it will take zero (0) otherwise (John and Litov, 2010). Lastly, corporate governance will be measured through the E index, which includes six provisions. The index score ranges from 0 to 6: one point for the presence of each provision (Bebuck, 2008). A high entrenchment score indicates that there are no restraints on the management by corporate governance mechanism (weak corporate governance).

4.2.3. Control variables

The objective of this research is to test how the independent variables (the chosen proxies for managerial entrenchment) affect the dependent variable (the capital structure). However, apart from the chosen managerial entrenchment proxies, prior research has indicated that there are more variables that have an influence on the capital structure. In order to make sure that these other variables do not have explanatory power on the capital structure, I control for them with the aim of assessing the robustness of the results. Research conducted by Rajan and Zingales (1995)

has found that the following four variables significantly influence the capital structure: (a) profitability, (b) tangibility, (c) firms size, and (d) growth opportunities. These variables, together with (e) board independence and (f) board size, are taken as control variables. The motivation for the chosen variables and their expected influence on the capital structure is discussed below.

(a) Profitability

The profitability of a firm is said to have an influence on the capital structure through the decreased probability of bankruptcy. Debt providers allow these profitable firms easier access to debt financing as a result of the decreased probability of bankruptcy. Following this ease of access, profitable firms take on more debt (Klock et al., 2005). However, according to the pecking order theory, profitability is negatively related to leverage, as high profitable firms are associated with the greater availability of internal funds and thus, obtain lower levels of leverage (Myers & Majluf, 1984). As previously stated, the findings of prior research as to whether profitability has a positive or negative effect on leverage are mixed. Nevertheless, profitability has an effect on capital structure, and I therefore control for it by utilizing return on assets (ROA), which represents earnings before interest, taxes, depreciations, and amortization (EBITDA) being divided by total assets (John & Litov, 2010).

(b) Tangibility

According to the tradeoff theory, there is a positive relationship between tangibility and leverage. The theory explains that tangible assets may be used as collateral when issuing debt since they can easily be valued by debt providers. This decreases the cost of financial distress, and these firms are subsequently associated with higher levels of leverage. I control for the collateral value of tangible assets by dividing property, plant, and equipment by total assets (John & Litov, 2010).

(c) Firm size

Rajan and Zingales (1995) have shown that firm size has a negative relation with the probability of default through the diversification of investments. Therefore, larger firms face lower costs of financial distress and take on more leverage. The positive relation between firm size and leverage is in line with the predictions of the tradeoff theory. To control for firm size, I use the natural logarithm of total assets.

(d) Growth opportunities

According to the tradeoff theory the level of growth opportunities open to a firm are said to have a negative effect on leverage through the increased costs of financial distress. The growth opportunities are assumed to be risky investments due to their associated uncertainty, which enlarges the probability of bankruptcy. Debt providers are less willing to provide these firms access to debt financing. Rajah and Zingales (1995) have agreed with these findings and found that firms with more growth opportunities prefer to issue equity than debt. I control for growth opportunities through an oft-used proxy: the market-to-book ratio (Myers, 1977).

(e) Board dependence

Board dependence is sometimes used as an indicator for managerial entrenchment, as described in Paragraph 2.3.2. However, the E index has greater explanatory power as a proxy for entrenchment. Therefore, I have chosen to use board independence as a control variables, measured as the percentage of outside executives in the board.

(f) Board size

Boards size is, similarly to board dependence, sometimes used as an indicator for managerial entrenchment. Following the same reasoning I have chosen to control for board size, measured by the number of executives on the board.

4.3. Methodology

This methodology first describes the regression technique used to appropriately analyze the data. Next, the advantages and disadvantages of pooling the data are examined. Lastly, the model to test the research question is described.

4.3.1 Regression technique

In order to investigate the impact of the proxy variables of entrenchment on the capital structure, a regression analysis is employed. A regression analysis allows for the study of the relationship between the dependent variable and the independent variables by measuring the correlation between them. In this research, such an analysis shows whether and how the capital structure changes as a consequence of a change in the level of managerial entrenchment. To estimate the

unknown parameters, the ordinary least square (henceforward OLS) method is applied if the assumptions of this method are not violated. This is an oft-applied method for capital structure research (Frank and Goyal, 2008; Rajan and Zingales, 1995), and it tries to minimize the sum of the squared residuals. The OLS regression method has five key assumptions that must hold in order to ensure that the given results are valid. When these assumptions are met, the linear regression method and its estimation using OLS can be applied (Brooks, 2008). These assumptions are the following:

1. The error terms are normally distributed
2. The error terms have a conditional mean of zero (linearity)
3. The error terms have a constant variance (homoscedasticity)
4. The error terms are uncorrelated between observations (autocorrelation)
5. There is no exact linear relationship among the independent variables (multicollinearity)

All of the assumptions above must hold in order to avoid certain problems arising. These problems include the coefficient estimates or associated standard errors being wrong and/or the assumed distribution being inappropriate. Which one of these problems arises depends on which assumption is violated: if the second assumption does not hold, the error terms do not have a mean of zero, the R^2 can be negative, and there can be a bias in the slope of estimated coefficients. Violating the third and fourth assumptions results in heteroscedasticity and autocorrelation of the error terms. The OLS estimations will still be consistent and unbiased in this case, but the standard errors could be wrong and so misleading conclusion could be drawn. The presence of heteroscedasticity can be detected by conducting a modified Wald's test, and autocorrelation can be determined with a Wooldridge test. The fifth assumption requires that there is no exact linear relationship among the independent variables. When this is violated, the standard errors of the correlations are increased. This can result in some variables being incorrectly interpreted as insignificant. This can be tested using the variance inflation factor (VIF). When the VIF is greater than 10, harmful multicollinearity is present in the data. The solution might be to remove one or more of the independent variables that is causing the multicollinearity; another might be to combine two independent variables; increasing the sample size can also be a solution (Brooks, 2008).

4.3.2. Panel data

The sample consists of publicly listed U.S. firms over the period of 1992-2016. This means that the dataset is panel data, since it includes both time series and cross-sectional elements. The most commonly applied method in managing panel data is to estimate a pooled OLS regression, which involves combining all the data across units (firms) and time (1992-2016). One of the advantages of pooling the data is that it increases the number of observations and therefore results in more information. However, there are complications of applying a pooled OLS regression (Koop, 2013). For example, the error terms tend to have a non-constant variance, leading them to be heteroscedastic. In an attempt to counter this complication of heteroscedasticity, the independent variables are winsorized at the 1% left and right tail of the distributions.

4.3.3. The regression model

There are simple linear OLS regressions and multiple OLS linear regressions. The former is used when the impact of a change in one independent variables is measured on the dependent variable; the latter is used when multiple independent variables jointly influence the dependent variables. In this research, there are more than one independent variables. Therefore, a multiple linear regression is used to test the impact of all of the independent variables on the capital structure. The regression models can be formulated as follows:

$$\text{Model 1} \quad \text{Book Leverage}_{it} = \beta_0 + \beta_1 * \text{Tenure}_{it} + \beta_2 * \text{Ownership}_{it} + \beta_3 * \text{Duality}_{it} + \beta_4 * \text{Eindex}_{it} + \beta_5 * \text{Profitability}_{it} + \beta_6 * \text{Tangibility}_{it} + \beta_7 * \text{FirmSize}_{it} + \beta_8 * \text{GrowthOpp}_t + \beta_9 * \text{Independence}_{it} + \beta_{10} * \text{BoardSize}_{it} + \varepsilon_{it}$$

$$\text{Model 2} \quad \text{Market Leverage}_{it} = \beta_0 + \beta_1 * \text{Tenure}_{it} + \beta_2 * \text{Ownership}_{it} + \beta_3 * \text{Duality}_{it} + \beta_4 * \text{Eindex}_{it} + \beta_5 * \text{Profitability}_{it} + \beta_6 * \text{Tangibility}_{it} + \beta_7 * \text{FirmSize}_{it} + \beta_8 * \text{GrowthOpp}_t + \beta_9 * \text{Independence}_{it} + \beta_{10} * \text{BoardSize}_{it} + \varepsilon_{it}$$

Where β_0 is the intercept, β_1 - β_4 are the slope coefficients of the independent variables, β_5 - β_{10} are the slope coefficients for the control variables, and ε is the error term.

5. Results

This chapter answer the main research question whether managerial entrenchment influences the capital structure. It begins by discussing some of the descriptive statistics and continues with the regression assumptions that must be held to ensure that the given results are valid. When this is confirmed, the four hypotheses are tested, which enables the drawing of conclusion about the main research question. However, if they are violated, a Hausman test must be performed in order to determine whether a fixed-effect or random-effect method is a better estimator.

5.1. Descriptive statistics

Descriptive statistics represents basic information that is gathered from the data. They present the number of observations and the mean, standard deviation, minimum and maximum values for all the variables used in the regression during the sample period from (1992-2016). Table 2 provides illustrates these descriptive statistics.

Table 2
Summary statistics

An overview of all the variables used to analyze the capital structure. Statistics are shown for publicly listed U.S. firms for the years 1992-2016. All utilities (SIC 4900-4999) and financial firms (SIC 6000-6999) are excluded because these industries have their own regulation and capital structures that are unlike those of other sectors of the economy. The most extreme outliers are winsorized at 1% on the left and right tail. For a detailed list of the calculations of the variables, see Appendix 1A.

Variable	Observations	Mean	Std. Dev.	Min	Max
Book leverage ratio	70,010	0.5895	0.6683	0.3421	1.2794
Market leverage ratio	69,989	0.3835	0.2913	0.0082	1.0674
CEO tenure	21,808	8.0760	7.6169	0.4139	36.913
CEO stock ownership	21,808	2.1474	5.4063	0.0000	13.101
CEO duality	15,260	0.6444	0.4786	0.0000	1.0000
Corporate governance	12,282	2.9873	1.6712	0.0000	6.0000
Profitability	70,010	0.0139	0.3674	-0.5780	0.4196
Tangibility	70,010	0.2653	0.2653	0.0000	0.9109
Firm size	70,010	5.4681	2.4411	1.6909	11.135
Growth opportunities	70,046	2.7889	4.6406	0.0000	29.411

Board dependence	15,258	0.7095	0.17422	0.1428	0.9285
Board size	15,260	9.1402	2.3784	0.0000	16.000

The leverage at book value has a mean of 0.590, indicating that publicly listed U.S. firms during the sample period financed 59.0% of their assets with debt. In the research of Berger et al. (1997) with the sample period of 1984-1991, the average debt is 24.7%. This shows that firms increased the book value of leverage during the years. The market value of leverage has a mean of 0.384, which indicates that 38.4% of the market value of the company is financed with debt. It is logical that this percentage is lower than that of the book value of leverage, as the market values of companies are always higher than their book values. Frank and Goyal (2007) have found that U.S. non-farm, non-financial companies during the since the 1990s have had an average ratio of 0.32 market value of leverage. This percentage is close to the observed ratio between 1992 and 2016. Comparing the standard deviations of both variables results in a larger sample variation for the book value, which is expected due to its higher ratio.

The independent variables are CEO tenure, CEO stock ownership, CEO duality, and corporate governance. Firstly, the average number of years that a CEO has held their position is 8.08 years. The shortest period is 0.414 years, and the most loyal CEO has been in the position for almost 37 years. The spread between the minimum and maximum is large, resulting in a high standard deviation of 7.62. Secondly, the average stock held by the CEO compared to the total shares is 2.15%. Logically, many firms have CEOs that do not hold any stock, meaning the minimum is 0. The variable CEO duality will take a value of one (1) when one person holds both the positions of CEO and chairman and zero (0) otherwise. The mean of 0.645 for this variables shows that the CEO also holds the position of chairman in 64,5% of the firms. The last independent variable is corporate governance, which is measured by the E index. It includes six provisions, with index scores ranging from 0 to 6: one point for the presence of each position. A high entrenchment score indicates that there are no restraints on the management by corporate governance mechanisms (weak corporate governance). The average E index score in the sample period is 2.99, which indicates that the average firm has less than 3 provisions.

Finally, some of the values of the control variables are noteworthy. The minimum for profitability is negative, which indicates that not all firms in the sample were profitable. This is in line with expectations, since the sample period includes a financial crisis. However, the average firm of the sample is profitable. Growth opportunities, has a mean of 2.79, indicating that the market expects the average firm to have growth opportunities. The average board size is 9.14; compared to the results of Berger et al. (1997; 2.47 board members), this number has grown substantially.

Table 3 shows the correlation coefficients between the capital structure, the managerial entrenchment proxies, and the control variables. It shows the linear dependence between two variables. It should be noted that dependence between two variables is not automatically a sign of multicollinearity. In order for it to be so, the dependence between the two variables must be at least 0.8 (Brooks, 2008). Table 3 shows that the correlation between two independent variables is in all cases lower than 0.8, indicating that there is no exact linear relationship among the independent variables. In Paragraph 5.3.4 the independent variables are tested for multicollinearity for the second time using the VIF. The correlation coefficients can range from -1 to +1, where -1 indicates a perfect negative relationship and +1 a perfect positive relationship between the two variables. The correlation between the same variables is 1. This is logical, since there is an exact positive linear relationship between them. The correlation between the book value of leverage and the market value takes a high value of 0.452, which means that the variation in one is related to the variation in the other one. The value of correlation between leverage, both book and market, is negative with CEO tenure (-0.107 and -0.093) and stock ownership (-0.119 and -0.103). Conversely, the value of correlation between leverage and CEO duality is positive (0.083 and 0.065). The E-index shows a small non-significant correlation with the book value of leverage (0.000) and a significant positive correlation with the market value of leverage (0.023). The expectations of the hypotheses are significant positive relationships between the all the independent variables and leverage. A correlation matrix can only show the correlation between two variables and not define the relationship. However, in general, the sign of the correlation coefficient determines the sign of the regression coefficient, although further analysis is required to draw meaningful conclusions.

Table 3**Pearson correlation matrix**

An overview of the correlations between any of the two variables used to analyze the capital structure. The correlation coefficients between the capital structure, the managerial entrenchment proxies and the control variables are shown. The most extreme outliers are winsorized at 1% on the left and right tail. For a detailed list of the calculations of the variables, see Appendix 1A. * indicates a statistical significance correlation of at least a 5% level.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Book leverage ratio	1											
(2) Market leverage ratio	0.452*	1										
(3) CEO tenure	-0.107*	-0.093*	1									
(4) CEO stock ownership	-0.119*	-0.103*	0.425*	1								
(5) CEO duality	0.083*	0.065*	0.206*	0.098*	1							
(6) Corporate governance	0.000	0.023*	-0.046*	-0.096*	-0.158*	1						
(7) Profitability	-0.500*	-0.038*	0.018*	0.050*	0.010	0.003	1					
(8) Tangibility	-0.003	0.169*	0.006	-0.002	0.061*	-0.045*	0.162*	1				
(9) Firm size	-0.181*	0.062*	-0.093*	0.011	0.125*	0.141*	0.003	-0.079*	1			
(10) Growth opportunities	-0.151*	-0.335*	-0.014*	0.011	0.017*	-0.029*	0.003	-0.079*	0.008*	1		
(11) Board independence	0.099*	0.067*	-0.151*	-0.252*	0.008	0.419*	0.033*	-0.050*	0.268*	0.009	1	
(12) Board size	0.281*	0.064*	-0.140*	-0.164*	0.123*	0.068*	0.094*	0.112*	0.568*	0.039*	0.166*	1

5.2. OLS regression results

In this paragraph, a summary of the OLS regression result is given and the hypotheses are tested. Subsequently, in order to confirm that the OLS regressions results are valid the underlying OLS assumption are tested. When one or more of the assumptions are rejected, it is necessary to test for panel data effects.

5.2.1. Results and hypotheses testing

Table 4 shows the output of the performed OLS regressions: one with the book value of leverage as the dependent variable and the other with the market value of leverage as the dependent variable. It provides an overview of all the beta coefficients and the significance levels of all the variables. These results are firstly discussed and the hypotheses are tested. Then, in the next subparagraph, the goodness of fit tests are conducted and the underlying key assumption of the OLS are tested.

Table 4**OLS regression results**

The table provides an overview of the OLS regression results with book and market leverage as dependent variables. Statistics are shown for publicly listed U.S. firms for the years 1992-2016. All utilities (SIC 4900-4999) and financial firms (SIC 6000-6999) are excluded because these industries have their own regulations and capital structures that are unlike those of other sectors of the economy. The most extreme outliers are winsorized at 1% on the left and right tail. For a detailed list of the calculations of the variables, see Appendix 1A. Absolute t-values are shown in parentheses. *, ** and *** indicate the significance levels of 10%, 5%, and 1%, respectively.

	Book leverage	Market leverage
CEO tenure	-0.0028*** (9.54)	-0.0018*** (7.02)
CEO stock ownership	0.000 (0.01)	-0.0001 (0.03)
CEO duality	0.0222*** (5.29)	0.0172*** (4.72)
Corporate governance	0.0019 (1.41)	0.0047*** (4.03)
Profitability	-0.2216*** (10.77)	-0.7012*** (39.32)
Tangibility	0.1288*** (14.32)	0.2128*** (27.31)
Firm size	0.0385*** (23.88)	0.0331*** (23.67)
Growth opportunities	0.0061*** (11.65)	-0.0094*** (20.59)
Board independence	0.0704*** (4.62)	-0.0132 (1.00)
Board size	0.0176*** (16.45)	0.0090*** (9.69)
<i>Intercept</i>	-0.4135	0.00621
<i>Observations</i>	10,037	10,037
<i>R-squared</i>	0.2413	0,3348
<i>Adj. R-squared</i>	0.2405	0,3341
<i>F-stat</i>	318,85	504,58
<i>Prob > F-stat</i>	0.0000	0.0000

All sub-hypotheses are tested separately in order to determine whether the independent variables individually have explanatory power on the capital structure and how they relate to the capital structure. There is a significant relationship between the independent variable and the capital structure when the p-value is $0.0000 < 0.05$. The coefficient indicates whether the influence of these independent variables is positively or negatively related to the capital structure. The coefficient lies between -1 and +1, where -1 indicates a perfect negative relationship between the

independent variables and leverage and +1 indicates a perfect positive relationship. When the coefficient is equal to 0, the independent variable has no relation with the leverage ratio. The hypotheses are firstly tested with book leverage as the dependent variable, after which market leverage is used.

The first hypothesis states that CEO tenure is negatively related to book leverage. In order for this hypothesis to be accepted, the p-value must be $0.0000 < 0.05$ and the coefficient has to be negative. Table 9 shows that the p-value is 9.54. Therefore, it can be stated that CEO tenure has a significant influence on the book value of leverage. The coefficient of -0.0028 indicates that this relationship is negative. This means that when the CEO tenure increases by 100 years, leverage decreases by 2.8%. The results thus support much previous research (Berger et al. 1997; John & Litov, 2010; Rakhmayil & Yuce, 2009; Barker & Mueller, 2002; Wen et al. 2002; Lee, 2014; Graham, 2009; Frank & Goyal, 2007) that has concluded that longer-tenured CEOs find it increasingly relevant to keep their job and thus avoid the taking of risk, which is the attraction of debt. To conclude, CEO tenure is significantly negatively related to book leverage, and the first hypothesis is therefore accepted.

The second hypothesis states that CEO stock ownership is positively related to book leverage. This research finds a non-significant positive relationship between CEO stock ownership and book leverage. The coefficient of 0.0000 indicates that the book leverage remains constant as the level of CEO stock ownership changes. Table 9 shows a very low p-value of 0.01, which indicates that the relationship is far from significant. This is in contrast with the research of Berger et al. (1997), which found a significantly positive relationship. It can be stated that in this research there is no relationship found between CEO stock ownership and book leverage. Therefore, the second hypothesis is rejected.

The third hypothesis that CEO duality is positively related to book leverage is now evaluated. When one person holds both the position of CEO and chairman of the board, the leverage levels of an average firm in this sample are lower by 2.2%, at book value. The results are statistically significant at a 1% level. These findings are in line with expectations that CEOs that also holds the position of chairman of the board have higher leverage levels than those of firms that separate

these positions. The research of Abor (2007) is thus accepted, in which he argues that duality reduces the information asymmetry problems and this leads to better access to debt financing. A large proportion of companies in our sample (64.45%) have CEOs who also hold the position of chairman in the board, and these firms have higher book leverage levels. Therefore, the third hypothesis is accepted.

The fourth hypothesis argues that weaker corporate governance tends to increase book leverage. A higher E index equals weak corporate governance. Therefore, to test this, a significant positive relationship between the two variables must be identified. Table 9 shows that the relationship is indeed positive, with a coefficient of 0.007, but it is not significant. Earlier research has evidenced the positive relationship between these variables, with the proposed reasoning that weak corporate governance enables CEOs to pursue their self-interest, which is to invest in low risk projects due to desire to keep the risk of bankruptcy low. In turn, firms with entrenched managers receive higher credit ratings since they invest in more low risk projects. Subsequently, debt providers allow firms with entrenched managers easier access to debt financing due to the higher credit rating. Following the easy access, entrenched managers take on more debt. To conclude, the relationship between weak corporate governance and the book value of leverage is positive but not significant, the fourth hypothesis is rejected.

The fifth hypothesis states that CEO tenure is negatively related to market leverage. Table 9 shows that the p-value is 7.02. Therefore, it can be stated that CEO tenure has a significant influence on the book value of leverage. The coefficient of -0.0018 indicates that this relationship is negative. When CEO tenure increases by 100 years, the market leverage decreases by 1.8%, representing a small reaction. The results thus again support much previous research (Berger et al. 1997; John & Litov, 2010; Rakhmayil & Yuce, 2009; Barker & Mueller, 2002; Wen et al. 2002; Lee, 2014; Graham, 2009; Frank & Goyal, 2007). The fifth hypothesis, that longer-tenured CEOs prefer to avoid leverage, is accepted.

The sixth hypothesis that CEO stock ownership is positively related to market leverage is rejected. The relationship is not significant and as CEO stock ownership increases by 10%, the market leverage decreases by 0.01%, representing a small reaction. These results are in contrast with the studies of Berger et al. (1997) and Short et al. (2002), which suggested a positive

relation between managerial inside ownership and leverage. The results develop the theory that issuing equity will dilutes their percentage of ownership. Therefore, managers with high inside ownership will prefer to issue debt, as this increases their percentage ownership in the firm. The contradicting thought that entrenched managers with high inside ownership hold a less diversified portfolio and therefore wish to reduce the level of leverage because of the additional bankruptcy risk is so accepted. However, this is not in line with the sixth hypothesis that CEO stock ownership is positively related to market leverage.

The seventh hypothesis that CEO duality is positively related to market leverage is here evaluated. The results show that the presence of CEO duality increases market leverage by an average of 1.72% in the sample firms. The results are statistically significant at a 1% level. This is in line with the research of Abor (2007), in which he argues that duality reduces the information asymmetry problems and leads to better access to debt financing. To conclude, the seventh hypothesis is accepted.

The last hypothesis argues that weak corporate governance increases market leverage. In the context of the book value of leverage, this hypothesis is rejected due to the insignificance of the relationship. The results for the market leverage are significantly positive, meaning that firms with weak corporate governance take on higher levels of leverage and vice versa. The beta coefficient of market leverage is greater than that for the book leverage: 0.0019 and 0.0047, respectively. This confirms the stated hypothesis that weak corporate governance increases leverage.

5.2.2. Evaluation of the estimation models

As previously mentioned, this sub-paragraph will start with various goodness of fit tests. It is important to check whether the regression model fits the data. In this thesis three different methods of testing this are applied: (a) the R^2 test, (b) the adjusted R^2 test, and (c) the analysis of variance (ANOVA) test.

(a) R^2

The first method to test whether the regression model is the best fit for the data is examining the R^2 results. This measure shows how much of the variation in the dependent variable is explained

by the independent variables. In this research, an OLS regression is used to estimate the unknown parameters. As stated in Paragraph 4.3.1, this method is designed to minimize the sum of the squared residuals. The R^2 can be measured by dividing the explained sum of squares (ESS) by the residual sum of squares (RSS). Therefore, the OLS regression method fits the data well when the sum of squared residuals is close to zero, such as when the R^2 is high (Brooks, 2008). Table 4 shows the values of the R^2 for book and market leverage, which are 0.241 and 0.335. This means that 24.2% and 33.9% of the variance of the dependent variable is explained by the variables in the formula. The closely related research of Berger et al. (1997) resulted in R^2 values of 0.293 for the book leverage and 0.464 for the market leverage, which is close to the R^2 values calculated in this research.

(b) Adjusted R^2

One problem with the R^2 method as a goodness of fit is that it does not account for the losses in the degrees of freedom when more variables are added to the regression. The adjusted R^2 does take this into account (Brooks, 2008). Therefore, the adjusted R^2 is always equal to or less than the R^2 value. This thesis' model has more than one independent variable. Therefore, the adjusted R^2 method is also used to assess the goodness of fit of the data. Table 4 shows the values of the adjusted R^2 for the book and market leverage, which are 0.241 and 0.334. This means that 24.1% and 33.4% of the variance of the dependent variable is explained by the independent variables. Therefore, a significant part of the variance is explained by the variables in the formula, as the capital structure is influenced by a large amount of factors.

(c) ANOVA

ANOVA is another way of testing whether there is a significant relationship between the dependent and independent variables. The null hypothesis states that there is no significant relationship between the dependent and independent variables. Therefore, the null hypothesis must be rejected in order to confirm that the chosen independent variables are appropriate, which is tested at a 5% significance level. ANOVA firstly calculates the mean of the sum of the squares by dividing the sum of the squares by the accompanied degrees of freedom (Koop, 2013). The F-statistic can be measured by dividing the mean of the explained sum of squares (MSE) by the mean of the residual sum of squares (MSR). As can be seen from Table 4, the p-values associated

with the obtained F-values are 0.000 and 0.000. At a 5% significance level, the null hypothesis must be rejected. Therefore, it can be stated that there is a statistically significant relationship between the dependent and independent variables.

In order to confirm that the OLS regressions results from the previous paragraph are valid the underlying OLS assumptions have to be tested. When one or more of the assumptions are rejected, it is necessary to test for panel data effects. As outlined in Paragraph 4.3.1, the OLS regression method has five key assumptions that must hold in order to ensure that the given results are valid. When these assumptions are met, the method is the best linear unbiased estimator and its estimation using OLS can be applied (Brooks, 2008). These assumptions include (a) normality, (b) linearity, and absence of (c) heteroscedasticity, (d) autocorrelation, and (e) multicollinearity. All of these assumptions are tested below.

(a) Normality

The first assumption is that the error terms are normally distributed. The Skewness Kurtosis test is designed to test for normality using the mean, variance, skewness, and kurtosis (Brooks, 2008). However, since the sample is relatively large and there is a constant term in both models, normality is automatically assumed and the first assumption is thus met.

(b) Linearity

The OLS method requires there to be linearity among the parameters. This assumption can still be met even if the relationship between the variables is non-linear. When this assumption is violated, the relationship between the dependent variables and independent variables is underestimated. The parameters are assumed to be linear in nature when the error terms have a condition mean of zero. Non-linearity can be detected by plotting the standardized residual values against standardized fitted values (Osborne & Waters, 2002). Perfect linearity is present when the dots in the scatterplot are clustered around zero. There is presence of non-linearity when there is a trend in the dots or they are not clustered around zero. Appendix 2A shows scatterplots for CEO tenure and CEO stock ownership for both book and market leverage. The independent variables of CEO duality and corporate governance are not plotted, as they are not continuous. From an examination of the plots, it can be concluded that the error terms follow a normal distribution,

since the dots in both plots are close to zero. However, it must be noted that this conclusion is subjective, as it entails visual inspection (Hayashi, 2000).

(c) Heteroscedasticity

The third assumption requires the variance of the error terms to be constant for each observation. When this is not the case, the OLS estimations will still be consistent and unbiased, but the standard errors could be wrong and so prompt the drawing of misleading conclusions. It is expected that the data suffers from heteroscedasticity, since the sample includes different sections, such as industries. The presence of heteroscedasticity can be detected by conducting a modified Wald’s test. The null hypothesis in this test states that the error terms are homogenous. At a 5% significance level, the null hypothesis must be rejected for p-values lower than 0.05. Table 7 shows a p-value of 0.000 for the book value of leverage and 0.000 for the market value of leverage. It can be concluded that both models suffer from non-constant variances of the error terms. Therefore, the data does not fulfill the required underlying OLS of homoscedasticity of errors. This means that the OLS regression method is not the best linear unbiased estimator, thus requiring the testing of panel data effects. This procedure is performed in Subparagraph 5.3.2.

Table 5
Modified Wald’s test
 The modified Wald’s test helps to determine whether the variances of the error terms are constant for each observation.

	Book leverage	Market leverage
Prob > Chi2	0.0000	0.0000

(d) Autocorrelation

The error terms have to be uncorrelated between any two observations in order for this assumption to hold. Stated differently, the error terms have to be independent. This is not in line with my expectation, since the data covers a period of several years. It is unlikely that the errors of one period are independent of the next period. One way of detecting autocorrelation is by performing a Wooldridge test, which compares error terms in one period with those of the previous period and tries to discover a pattern. The null hypothesis in this test states that the error terms are independent. At a 5% significance level, the null hypothesis has to be rejected for p-values lower than 0.05. When the null hypothesis is rejected, as with heteroscedasticity, the OLS

estimations will still be consistent and unbiased but the standard errors could be wrong and so prompt the drawing of misleading conclusions. Table 6 shows a p-value of 0.0000 for the book value of leverage and 0.0000 for the market value of leverage. Therefore, the error terms are correlated and the fourth assumption is violated. As with heteroscedasticity, it is now necessary to test for panel data effects.

Table 6

Wooldridge test

The Wooldridge test helps to determine whether the variances of the error terms are constant for each observation.

	Book leverage	Market leverage
Prob > F	0.0000	0.0000

(e) Multicollinearity

The fifth key assumption of the OLS regression requires there to be no exact linear relationship among the independent variables (multicollinearity). When multicollinearity is present, standard errors can be increased and leading to some insignificant variables being misinterpreted as significant. In Paragraph 5.1 the first test for multicollinearity was performed by ensuring that the correlation between two independent variables did not exceed 0.8. Another way of testing for multicollinearity is to perform a VIF test (Brooks, 2008). Table 7 shows the VIF index for each of the independent variables. According to Neter, Wasserman, and Kutner (1990) a VIF higher than 10 indicates potential multicollinearity problems. None of the indexes are above ten, and the mean VIF is 1.28, which indicates that there is no harmful multicollinearity in the data.

Table 7

VIF

The VIF helps to determine whether the data suffers from multicollinearity.

The VIF index is given for all the independent and control variables.

A VIF higher than 10 indicates potential multicollinearity problems.

Variable	VIF
CEO tenure	1.35
CEO stock ownership	1.35
CEO duality	1.15
E-index	1.23
Profitability	1.09
Tangibility	1.04
Firm size	1.64

Growth opportunities	1.09
Board independence	1.33
Board size	1.55
Average VIF	1.28

It has been showed that the error terms are normally distributed, that they have a conditional mean of zero, and that there is no exact linear relationship among the independent variables. Therefore, the first, second, and fifth assumptions are fulfilled. However, the third and fourth assumptions are violated because the data suffers from heteroscedasticity and autocorrelation. In this case, the fixed effects or random effects models are better estimators for panel data because they are able to account for heteroscedasticity and autocorrelation. In order to choose between these two models, it must be known whether or not the unique errors are correlated with the independent variables or not. When they are correlated, the fixed effects model has to be used, since the random effects model is not able to correct for this type of correlation. However, it is preferable to use a random effect model when the unique errors are not correlated with the independent variables, although a fixed effects model can still be applied in this case. To test for this correlation between the unique errors and the independent variables, a Hausman test is performed. The null hypothesis states that they are not correlated, and the random effects model is chosen if this is the case. When the null hypothesis is rejected, the fixed effects model is used. Table 8 shows a Chi-squared of 221.82 and Prob > Chi-squared of 0.000. Therefore, the null hypothesis is accepted, and the unique errors are not correlated with the independent variables. This means that the fixed effects model is used.

Table 8
Hausman test

The Hausman test helps to determine whether the fixed or random effect model should be used. The null hypothesis states that the random effect model should be used.

Variable	VIF
Chi-squared	221.82
Prob > Chi-squared	0.0000

5.3. Fixed effect regression results

The firm fixed effects are considered in the regression models to capture the effects of omitted variables that affect the dependent variables cross-sectionally but do not vary over time. It thus allows for control of immeasurable and unknown variables which are fixed in time but vary across firms. The model assist in controlling for unobserved heterogeneity when this heterogeneity is constant over time. The observations are treated as non-random in nature, meaning that omitted variables with explanatory power are not caused by randomness but instead held constant. The intercept is thus able to differ across firms but not over time, since the unobserved effect is time invariant. In the pooled OLS each observations on a company was a separate one without reflecting that it comes from the same company. The fixed effect model has a grouped nature, and the model tells us whether the response of explanatory variables over time is the same for all firms (Brooks, 2008). Additionally, time fixed effects are considered in the regression models to capture the effect of omitted variables that affect the dependent variable over time but have the same impact on all firms. It thus control for unobserved time effects. By also allowing for fixed effects across time, differences from year to year that occur across all firms are controlled.

5.3.1. Results and hypotheses testing

Table 9 shows the output of the performed fixed effect regressions: one with the book value of leverage as the dependent variable and the other with the market value of leverage as the dependent variable. It provides an overview of all the beta coefficients, as well as the significance levels of all the variables.

Table 9**Robust fixed effect regression results (firms and years)**

The table provides an overview of the robust fixed effect regression results with book and market leverage as dependent variables. Statistics are shown for publicly listed U.S. firms for the period of 1992-2016. All utilities (SIC 4900-4999) and financial firms (SIC 6000-6999) are excluded because these industries have their own regulation and capital structures that are unlike those of other sectors of the economy. For a detailed list of the calculations of the variables see Appendix 1A. Absolute p-values are shown in parentheses. *, ** and *** indicate the significance levels of 10%, 5% and 1%, respectively.

	Book leverage	Market leverage
CEO tenure	-0.0002 (0.50)	-0.0005** (2.41)
CEO stock ownership	0.0018** (2.42)	0.0012** (2.52)
CEO duality	0.0044 (0.78)	0.0019 (1.35)
Corporate governance	0.0001 (0.00)	0.0002 (0.09)
Profitability	-0.2525*** (5.72)	-0.5107*** (8.35)
Tangibility	0.0807* (1.98)	0.2051*** (5.15)
Firm size	-0.0075 (0.77)	0.0423*** (6.30)
Growth opportunities	0.0022* (1.79)	-0.0042*** (6.50)
Board independence	-0.0155 (0.71)	-0.0133 (0.68)
Board size	0.0052*** (3.50)	0.0019 (1.35)
<i>Intercept</i>	0.5041	0.0157
<i>Observations</i>	10,036	10,036
<i>R-squared overall</i>	0.1044	0.3296
<i>F-stat</i>	18.82	59.06
<i>Prob > F-stat</i>	0.0000	0.0000

The initial regression models can now be rewritten as the following:

$$\text{Model 1 } \text{Book Leverage}_{it} = 0.5041 - 0.0002 * \text{Tenure}_{it} + 0.0018 * \text{Ownership}_{it} + 0.0044 * \text{Duality}_{it} + 0.0001 * \text{E-index}_{it} - 0.2525 * \text{Profitability}_{it} + 0.0807 * \text{Tangibility}_{it} - 0.0075 * \text{FirmSize}_{it} + 0.0022 * \text{GrowthOpp}_{it} - 0.0155 * \text{Independence}_{it} + 0.0052 * \text{BoardSize}_{it} + \lambda_t + \alpha_i + \varepsilon_{it}$$

$$\text{Model 2 } \text{Market Leverage}_{it} = 0.0157 - 0.0005 * \text{Tenure}_{it} + 0.0012 * \text{Ownership}_{it} + 0.0019 * \text{Duality}_{it} + 0.0002 * \text{E-index}_{it} - 0.5107 * \text{Profitability}_{it} + 0.2051 * \text{Tangibility}_{it} + 0.0423 * \text{FirmSize}_{it} - 0.0042 * \text{GrowthOpp}_{it} - 0.0133 * \text{Independence}_{it} + 0.0019 * \text{BoardSize}_{it} + \lambda_t + \alpha_i + \varepsilon_{it}$$

Where λ_t is the time fixed effect, and α_i is the firm fixed effect.

Various goodness of fit tests have already been performed for the OLS regression in order to determine whether the regression model fits the data. Since the fixed effect regression differs from the OLS regression, these tests are performed again. Table 9 shows the values of the overall R^2 for book and market leverage, which are 0.1044 and 0.3296. This means that 10.44% and 32.96% of the variances of the dependent variable is explained by the variables in the formula. With these percentages, it is possible to compare the dependent variables. The independent variables are three times better at explaining the market leverage than they are at doing so for the book leverage. This indicates that market leverage as a dependent variable is a better fit for the formula of this thesis. Table 9 shows that the obtained F-values are 0.000 and 0.000. Therefore, it can be stated that there is a statistically significant relationship between the dependent and independent variables.

All sub-hypotheses are tested again in order to determine whether the independent variables individually have explanatory power on the capital structure and how they relate to the capital structure. The results of the book leverage will first be discussed and compares that those of the OLS regression, where after the same is done for the market leverage.

The direction of the relationship between the independent variables and book leverage is the same in the fixed effect regression as they are in the OLS regression. However, there is a difference in the significant levels. Firstly, the relationship between CEO tenure and book leverage is negative again, which is in line with previous research that has concluded that longer-tenured CEOs find it increasingly relevant to keep their job and thus avoid the taking of risk, which is the attraction of debt. When CEO tenure increases by 100 years, leverage decreases by 0.2%. However, these results are not significant and therefore the first hypothesis is rejected. Secondly, there was no relationship found between CEO stock ownership and book leverage in the OLS regression results. However, for the fixed effect regression results there is a positive and significant relationship found between CEO stock ownership and the book value of leverage. This is in line with the research of Berger et al. (1997) and Short et al. (2002), which suggested a positive relation between managerial inside ownership and leverage. The results develop the theory that issuing equity will dilutes their percentage of ownership. Therefore, managers with high inside ownership will prefer to issue debt, as this increases their percentage ownership in the

firm. The second hypothesis is therefore accepted. Thirdly, both the regressions find a positive relationship between CEO duality and book leverage. The research of Abor (2007) is thus accepted again, in which he argues that duality reduces the information asymmetry problems and this leads to better access to debt financing. However, the results of the fixed effect regression are not significant and the third hypothesis is rejected. Finally, the relationship between weak corporate governance and book leverage is the same as the OLS regression, positive but not significant. Therefore, the fourth hypothesis is rejected.

The results of the fixed effect regression on the relationship between the independent variables and market leverage will now be discussed. Again, the direction of the relationship is the same in the fixed effect regression as they are in the OLS regression, except for that of CEO stock ownership. Firstly, the relationship between CEO tenure and book leverage is negative again. However, the significant level of the relation decreases from 1% to 5%. This still allows for the acceptance of the fifth hypothesis. Secondly, the direction of the relationship between CEO stock ownership and market leverage changed from negative to positive. Therefore, the results of the fixed effect model are in line with the research of Berger et al. (1997) and Short et al. (2002). As CEO stock ownership increases by 10%, the market leverage increases by 0.18%, representing a small reaction. Nevertheless, the sixth hypothesis is accepted. Finally, CEO duality and weak corporate governance again show positive relationship with market leverage. However, the fixed effect regression results show that both relationships lose their significance. Therefore, the seventh and eighth hypotheses are rejected.

6. Limitations and Recommendation

Firstly, one limitation of this research starts with that it only focused on the United States. It does not consider whether there are difference between the U.S. and Europe and how these differences arise. For further research, I suggest to compare the influence of managerial entrenchment on capital structure on different continents.

Secondly, another limitation in studying the effect of managerial entrenchment is the difficulty encountered in actually measuring entrenchment. There is no database that directly records whether or not a manager is entrenched; this can only be indirectly measured through proxies, which in turn are subjective.

Thirdly, the timeframe of this research includes a financial crisis which is expected to have had an impact on the capital structure. A crisis usually starts with low levels, allowing for the attractiveness of obtaining debt to rise with the associated decreased costs. Therefore, the amount of leverage during this period differs from others, and the impact of managerial entrenchment on the capital structure is expected to be weaker. In further research, it could be interesting to test whether this is indeed the case.

Fourthly, this research already partially captured the effect of omitted variables that affect the dependent variable, both cross-sectional and over time. This effect was captured by firm and time fixed effects. However, these fixed effects greatly reduce, but do not completely eliminate, the chance that a relationship is driven by an omitted variable. An example of an omitted variable is a firms' cash holdings. These are firm specific, but not constant over time. A firms' cash holdings can have correlation with managerial entrenchment through empire building and correlation with the capital structure through a possible increased ability to attract debt financing. Other examples include the interest rate and the CEOs outside wealth. For further research, with the aim to reduce the risk of omitted variables, I suggest that the aforementioned variables and possibly others can be incorporated into the formula. This can also lead to an increase in the R^2 .

Finally, there is a reverse causality problem between managerial entrenchment and capital structure. In particular, the issue is whether managerial entrenchment influences the leverage level, or whether the leverage level influences managerial entrenchment. The leverage level itself may be an efficient mechanism for managerial entrenchment. For example, a higher level of CEO stock ownership has a significant positive relationship with leverage. However, it can also be possible that higher leverage levels reduce the use of external equity capital, thereby increasing

the level of managerial stock ownership. This research provides results to make suggestions about any correlations and associations between various variables, but the results cannot deliver a certain cause and effect. The inverse causality problem is a limitation in this research.

7. Conclusion

The main purpose of this research is to determine whether managerial entrenchment has an influence on capital structure, and if so, whether this relationship is positive or negative. Prior research has focused on managerial entrenchment as a variable that could explain the capital structure decision. Hence, this research contributes to existing literature not because it explicitly focuses on CEO entrenchment but also because of different combination of chosen proxy variables it consider to do so. Additionally, this study contains a different time period, covering 24 years. It examined whether there has been a change in the influence of managerial entrenchment and the capital structure over time.

The sample consists of publicly listed U.S. firms in the period of 1992-2016. The data required to test the hypotheses is retrieved from three different databases, namely Compustat, Execucomp and ISS. Several proxies are applied to measure managerial entrenchment, including CEO stock ownership, CEO duality, CEO tenure and corporate governance. Both the book and market value of leverage are used to measure the capital structure. This research uses a firm and year fixed effect regression with robust standard errors to correct for the presence of autocorrelation and heteroscedasticity in the panel data.

In order to provide an answer to the main research question there are eight hypotheses formulated, the first four are based on the book value of leverage and hypotheses five to eight are based on the market value of leverage. The first and fifth hypotheses that CEO tenure is negatively related with leverage is based on the view that longer tenured CEOs are more likely to be risk averse due to their experience within the firm. They prefer to avoid performance pressure of large fixed interest payments that debt entails. The second and sixth hypotheses that CEO stock ownership is positively related to leverage builds on the idea that issuing equity will dilute their percentage of ownership. Therefore, managers with high inside ownership will prefer to issue debt since this increases, rather than decreases, their percentage ownership in the firm. The third and seventh hypotheses state that CEO duality is positively related to leverage. This is based on the thought that duality reduces the information asymmetry problems and this leads to better access to debt financing. The fourth and eight hypotheses states that weak corporate governance

increases leverage. The thought is that weak corporate governance enables CEOs to pursue their self-interest, which is to increase the use of leverage.

The regression results show that the expected direction of the relationship between the managerial entrenchment proxies and the capital structure is correct for all the hypotheses. However, in order for the hypotheses to be accepted the results have to be significant on a 5% level. The only variable that has significant influence on the book value of leverage is CEO stock ownership. As expected the relationship between both is positive and thus the second hypotheses is accepted. The other three independent variables do not have a significant influence on book leverage and therefore hypotheses one, three and four are rejected. The market value of leverage has a significant relationship with CEO tenure and CEO stock ownership. As expected, CEO tenure has a negative relationship and CEO stock ownership a positive one and therefore the fifth and sixth hypotheses are accepted. CEO duality and corporate governance do not have significant influence with leverage, measured at market value, and therefore hypotheses seven and eight are rejected.

Based on my research result I draw the final conclusion that managerial entrenchment has an influence on the capital structure. However, it must be noted that this influence is only significant for CEO stock ownership and CEO tenure.

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9. Appendix

Appendix 1A

Definition of all the variables and the sources

Variable	Description	Formula	Database
<i>Dependent</i>			
Book debt	Debt in the firm	Liabilities + preferred stock – deferred taxes – convertible debt	Compustat
Book leverage ratio	Book debt divided by total assets	$\frac{\text{Book debt}}{\text{Total assets}}$	Compustat
Market leverage ratio	Book debt divided by the market value of assets	$\frac{\text{Book debt}}{((\text{Book debt}) + (\text{common shares outstanding} * \text{price share}))}$	Compustat
<i>Independent</i>			
CEO tenure	Number of years in the CEO position	Current fiscal year – date became CEO	Execucomp
CEO stock ownership	Percentage of shares held by the CEO	$\frac{\text{Shares held by the CEO}}{\text{Total common shares outstanding}}$	Execucomp
CEO duality	CEO and Chairman of the board	Dummy variable (1) when CEO_Employment and Chairman_Employment	ISS Governance
Corporate governance	E index	One provision for the presence of one of *	ISS Governance
<i>Control</i>			
Profitability	ROA	$\frac{\text{EBITDA}}{\text{Total assets}}$	Compustat
Tangibility	Net property, plant and equipment divided by total assets	$\frac{\text{Net PPE}}{\text{Total assets}}$	Compustat
Firm size	Natural logarithm of total assets	LN (Total assets)	Compustat
Growth opportunities	Market-to-book ratio	$\frac{\text{Market value of equity}}{\text{Book value of equity}}$	Compustat
Board dependence	Percentage of outside directors in the board	$\frac{\text{Percentage of outside executives}}{\text{Total number of executives}}$	ISS Directors
Board size	Number of executives on the board	Total number of executive in the board	ISS Directors

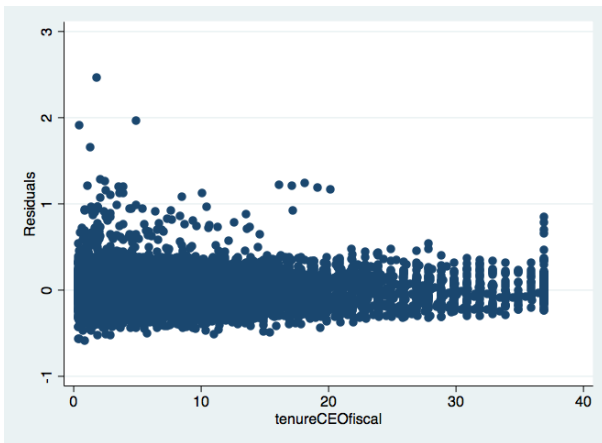
* limits to shareholders amendment of the bylaws, classified board, supermajority requirements for mergers and charter amendments, poison pills and golden parachutes

Appendix 2A

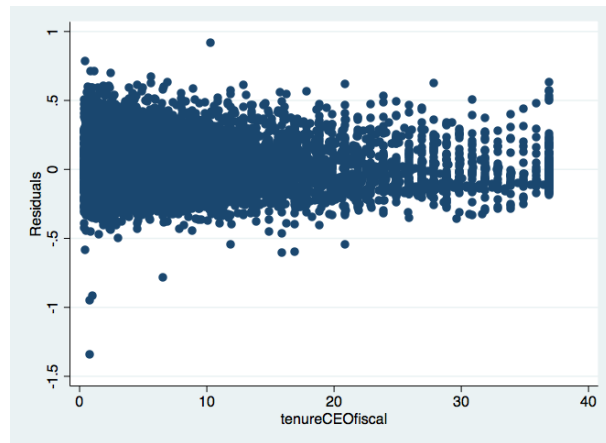
Scatterplot for linearity

An overview of scatterplot for CEO tenure and CEO stock ownership against both book and market leverage. The independent variables CEO duality and Corporate governance are not plotted since they are not continuous. The second key assumption for the OLS method requires linearity among the parameters. Detection of non-linearity is done by plotting the standers residual values against standardized fitted values. There is presence of non-linearity when there is a trend in the dots or they are not clustered around zero.

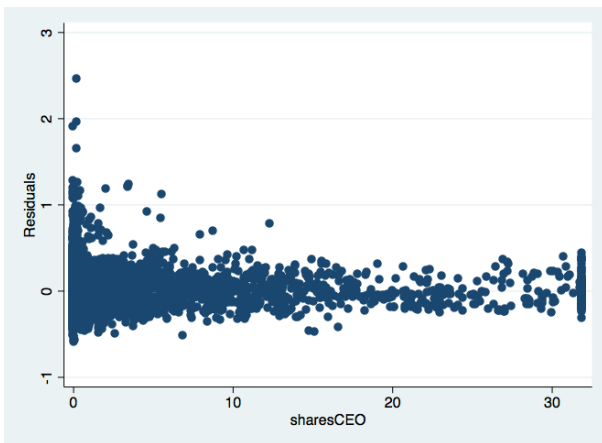
(a) Tenure and Book leverage



(b) Tenure and Market leverage



(c) CEO stock ownership and Book leverage



(d) CEO stock ownership and Market leverage

