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Managerial Entrenchment and Capital Structure

Evidence from Norway

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Abstract

In this thesis, we investigate the relationship between CEO entrenchment and capital structure, an area with limited prior research in a Norwegian context. For the purpose of this study, we define entrenchment as the degree to which CEOs are insulated from the full scope of corporate governance and control mechanisms. This includes equity-based compensation incentives, board monitoring, and the presence of large share blockholders. We also consider age and tenure as relevant CEO characteristics. To conduct our analysis, we have assembled a unique dataset manually collected from annual reports and financial statements covering the years 2015-2022.

Our empirical results indicate that entrenched CEOs, identified by low equity ownership, high fixed compensation, less stringent monitoring mechanisms (e.g., larger boards and absence of large share blockholders), and longer tenures, are generally associated with lower levels of leverage. Additionally, we find that older CEOs with longer tenures, higher fixed compensation, and lower equity ownership are more likely to implement zero- or almost zero-leverage policies.

Keywords – Managerial Entrenchment, Equity Incentives, Capital Structure, Corporate Governance

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1 Introduction

The chief executive officer (CEO) holds the most influential management position within a company and bears the greatest responsibility for acting in line with shareholder interests. The board of directors, elected by the shareholders, is responsible for appointing the CEO and ensuring that the CEO is compensated and monitored in a way that minimizes the agency costs arising from the separation of ownership and control. Agency theory, as proposed by Jensen and Meckling (1976), highlights the misalignment between shareholders and the CEO regarding topics such as capital structure choices, where the CEO might prioritize personal gains over shareholder value.

Managerial entrenchment is defined as the degree to which CEOs are insulated from the full scope of governance and control mechanisms in place to mitigate agency costs. This includes equity-based compensation incentives, board monitoring, and the presence of large share blockholders. Certain CEO characteristics such as age and tenure, are also expected to be associated with increased power over governance and control mechanisms. As outlined by Berger et al. (1997), this concept captures the lack of effective governance and control mechanisms in place to regulate the CEO´s actions. CEOs may prefer lower leverage to minimize firm risk and protect their non-diversified human capital (Fama, 1980), CEOs may also increase leverage to amplify the voting power of their equity stakes, thereby reducing the likelihood of hostile takeovers (Harris & Raviv, 1988; Stulz, 1988).

To mitigate the agency costs that occur between CEOs and Shareholders, firms implement various corporate governance mechanisms, broadly categorized into monitoring and bonding costs. Equity incentives serve as bonding measures, aligning the interests of the CEO with shareholders through stock and stock options, thereby reducing the need for extensive monitoring (Holmstrom & Milgrom, 1991). CEOs may also purchase shares independently, further aligning their interests with shareholders and reducing agency costs. Monitoring costs involve actions by the principal to ensure the agent‘s actions align with their interests. This study focuses on the main internal monitoring mechanisms, specifically, share blockholders and the board of directors (Cremers & Nair, 2005). While external mechanisms like takeovers and the market for corporate control exist, they are less prevalent in the Norwegian context and are complex to model. Although debt can mitigate agency costs by constraining the CEO´s operational freedom, as noted by (Harris & Raviv, 1988; Jensen, 1986; Zwiebel, 1996), we view leverage levels primarily as a result of agency costs and the effectiveness of the governance mechanisms in place.

This thesis explores the relationship between managerial entrenchment and capital structure amongst Norwegian listed companies. Our main research questions are: (1) How does managerial entrenchment influence the leverage levels of firms? (2) Are entrenched CEOs more likely to adopt zero- or almost-zero leverage policies? To address these questions, we analyze the relationship between equity and compensation incentives, internal governance and control mechanisms, CEO characteristics, and leverage, controlling for firm—and industry-specific characteristics and broader economic conditions.

We utilize a unique dataset manually collected from annual reports and company statements. It covers CEO compensation, stock and option ownership, board information, shareholder data, and CEO characteristics, complemented by financial data from the Refinitiv Eikon database. Our dataset covers the years 2015-2022, providing an unbalanced panel data set that allows us to control for various factors influencing managerial entrenchment and capital structure. We employ several econometric methods to investigate the relationship between managerial entrenchment and capital structure choices.

Previous research on this topic has primarily focused on firms in the United States, with limited studies examining Norwegian companies, to our knowledge. Noteworthy studies by Berger et al. (1997) and Strebulaev and Yang (2013) emphasize the importance of CEO equity incentives and governance mechanisms in shaping capital structure decisions. The specific context of Norwegian firms, with its unique regulatory and corporate governance environment, provides an extension to this literature. By focusing on Norway, we believe that this study contributes to a broader understanding of how managerial entrenchment influences capital structure across different institutional settings.

Our findings indicate that CEOs characterized by low equity ownership, high fixed compensation, less stringent monitoring mechanisms (e.g., larger boards and absence of share blockholders), and longer tenures, are associated with lower levels of leverage. Additionally, older CEOs with lower equity ownership, longer tenures, and higher cash compensation, often proxies for entrenchment, are more likely to adopt zero—or almost zero-leverage policies.

The structure of this paper is as follows: Section 2 presents a review of the relevant theoretical framework and literature on managerial entrenchment and capital structure. Section 3 presents our hypotheses. Section 4 describes the data sources and variable construction and presents the descriptive statistics. Section 5 outlines the econometric methods used. Section 6 presents the empirical results, while Section 7 discusses these findings and relates them to existing literature. Finally, Section 8 addresses the robustness of our analysis, and Section 9 concludes the study, offering suggestions for future research.

2 Theoretical Framework

In this part, we will introduce the theoretical framework that will serve as the foundation of our analysis. We will review previous work to highlight the topic's relevance and create a basis for the methodology and hypothesis of our study. The Theoretical Framework is divided into four parts. First, we will present the theory of managerial entrenchment and capital structure. Furthermore, we will present agency theory and the crucial task of ensuring that CEOs and shareholders have aligned goals. Next, we will present the theory on equity incentives, capital structure, and risk. Finally, we will look at capital structure theory.

2.1 Managerial Entrenchment and Capital Structure

Managerial Entrenchment is defined as the degree to which managers fail to experience discipline from the full spectrum of corporate governance and control mechanisms. This includes equity-based compensation incentives, efficient monitoring by the board and the presence of large share blockholders. Certain CEO characteristics, such as age and tenure are also expected to be associated with entrenchment. This concept, as outlined by Berger et al. (1997), captures a critical aspect of corporate management where there may be a lack of accountability mechanisms to regulate executive actions effectively.

Considerable research has been done on this subject in the past. Notably, research by Fama (1980) revealed that certain CEOs prefer lower levels of leverage than what would be considered optimal. This cautious approach is often adopted in an effort to minimize the risk to the firm and thereby protecting their own non-diversified personal investment in the company, also known as their human capital.

Other studies suggest that high debt levels can limit managers ability to divert free cash flows for personal interests, which could undermine from the overarching goal of maximizing shareholder value. This perspective suggests that debt acts as a deterrent against managerial self-interest by restricting their operational freedom. (Jensen, 1986)

Further, other studies suggest that entrenchment motives may cause CEO's to deliberately increase the firm's leverage beyond what might be considered optimal. The intention behind this is to strengthen the influence of their own equity stakes and thereby mitigating the likelihood of hostile takeovers. This line of reasoning is outlined by Harris and Raviv (1988) and Stulz (1988), suggesting that leverage can be strategically manipulated to strengthen managerial control.

2.2 Agency theory

A crucial part of modern business practices is ensuring that CEOs and shareholders have aligned goals. This intricate relationship was first detailed by Jensen and Meckling (1976). They describe it as a scenario in which one or more individuals (the principal(s)) hire another individual (the agent) to perform certain tasks on their behalf, which involves entrusting the agent with a degree of decision-making authority. This arrangement aims to optimize returns for both parties but it can lead to conflicts of interest, where CEOs may prioritize personal gains over shareholder interests. This issue is referred to as agency costs and requires careful management to preserve the company´s value.

According to Jensen and Meckling (1976), agency costs are comprised of three elements. The first two regard the costs related to the two approaches that can mitigate agency costs, either monitoring or bonding. The third part regards the residual loss of firm value that is not avoided through the monitoring and bonding measures in place. Bonding refers to the agent‘s actions to commit to acting in the principal‘s best interest. This usually involves compensation structures and incentive mechanisms using stock options, equity ownership, and contractual agreements or limitations to assure the agent‘s intentions. Theory regarding incentive mechanisms will be presented further below.

Monitoring costs are actions taken by the principals to ensure that the agent’s actions align with the principals’ interests. This involves the continuous monitoring of the principal-agent contract and can, for instance, be performance evaluation and supervision. Monitoring mechanisms can be classified into two broad categories – internal and external governance mechanisms (Cremers & Nair, 2005). Blockholders and the board of directors are often seen as the primary internal monitoring mechanisms, while takeovers and the market for corporate control are the primary external mechanisms.

Shleifer and Vishny (1986) point out that large shareholders have incentives to monitor management and pay for the gain that occurs in a potential takeover, increasing the probability of a bidder. In this way, internal and external control mechanisms work together as the presence of large shareholders is associated with stricter monitoring of the CEO and a higher probability of corporate takeovers. They also suggest that internal and external governance mechanisms are stronger complements in firms with low leverage. These findings align with theories proposed by Harris and Raviv (1988), Novaes (2003), Stulz (1988), and Zwiebel (1996), who suggest that higher debt reduces the probability of a takeover.

A study by Yermack (1996) indicates that managerial disciplinary mechanisms related to the threat of dismissal and compensation lose power as the board size increases, hence having a negative association with firm value. Other studies such as Weisbach (1988) and Rosenstein and Wyatt (1990) indicate that CEOs face stricter monitoring when the board of directors has a large share of outside or independent directors.

Misalignment between the CEO and shareholders may occur due to differing risk preferences between the principal and agent, which can lead to their preferred actions being divergent (Eisenhard, 1989; Jensen, 1986). The wealth of the CEO may be more exposed to the idiosyncratic risk of the company than that of the shareholders, who can diversify their investments more widely. As a result, reducing leverage and risk may be in the CEO's best interest. This misalignment can be particularly problematic in firms with significant growth opportunities and risk-averse managers, where Guay (1999) argues that firms with risk-averse managers would benefit if the managers were incentivized to invest in riskier, but positive NPV projects. This aligns with Coles et al. (2006), Hayes et al. (2012), and Williams and Rao (2006), who find that CEO compensation closely linked to firm value incentivizes more risk-taking.

2.3 Equity Incentives, Capital Structure and Risk

Our study investigates CEO equity incentives through three variables: CEO stock ownership, the Options-to-Shares ratio, and the sensitivity of CEO wealth to company performance (Delta). CEO stock ownership, expressed as a ratio to shares outstanding, is meant to capture incentive alignment with shareholders. The Options-to-Shares ratio provides an estimate of performance-based incentive compensation, capturing how stock options may induce risk-taking (Jensen & Murphy, 1990; Yermack, 1995). By including

Delta, we also consider how share price fluctuations affect the CEO's monetary wealth relative to their total cash compensation. These variables collectively capture different aspects of equity incentives and their potential impact on capital structure.

As proposed by agency theory, equity-based compensation serves as both a monitoring and bonding mechanism to ensure that the CEOs' actions align with the interests of the shareholders (Holmstrom & Milgrom, 1991; Jensen & Meckling, 1976). The higher the complexity of the work done by the CEO, the more demanding and costly the monitoring process is, and the greater the need for well-organized governance structures. Performance-based compensation mechanisms can be such a governance tool for the principal. Holmstrom and Milgrom (1991) suggest that the higher the share of the CEOs personal wealth is dependent on firm performance, the less monitoring is necessary.

As suggested by Jensen and Meckling (1976), characteristics such as firm size, growth opportunities, and monitoring costs affect the optimal level and portfolio of equity incentives for a given firm. Smith Jr. and Watts (1992) hypothesize that a high level of growth opportunities makes assessing the CEO's decisions more difficult, suggesting that increasing equity incentives would lower monitoring costs. They find a positive relationship between a firm's growth opportunities and the use of equity incentives.

Previous studies discuss the skewed distribution of CEO stock ownership, where most have relatively low stakes while a few have substantial ownership positions (Frank, Murray Z. and Goyal, Vidhan K., 2007). Additionally, the incentive effects of the shares may vary depending on the level of ownership, potentially motivating managers at lower ownership levels while entrenching those at higher levels. W. S. Kim and Sorensen (1986) find that firms with higher inside ownership have higher leverage, suggesting that this finding may be due to agency costs. Conversely, high equity ownership levels might induce CEOs to lower leverage and risk to safeguard their underdiversified human capital, potentially diminishing shareholder value (Benson & Davidson, 2009). Other studies have also found a positive but decreasing relationship between CEO stock ownership and firm performance (McConnell & Servaes, 1990; Morck et al., 1988). When Friend and Lang (1988) examines the relationship between managerial self-interest and capital structure for listed US companies, they find that the highest levels of CEO ownership were associated with lower levels of leverage due to the increased risks associated with higher leverage.

Many argue that a positive relationship exists between CEO risk incentives provided by stock options and firm risk, which is often associated with higher leverage (Coles et al., 2006; E. H. Kim & Lu, 2011; K. Kim et al., 2017; Williams & Rao, 2006). A widely cited reason is that the convexity of options provides incentives for risk-taking, which can be achieved through higher leverage. However, some argue that the direction of the relationship between CEO stock options and risk and leverage is more nuanced, pointing to the increased risk of the personal wealth of the CEO that comes with stock options. Options may, therefore, provide the CEO with incentives to reduce their personal risk by reducing company risk (Carpenter, 2000). As discussed by Lambert et al. (1991), differences in risk aversion and managerial preferences should be accounted for when valuing options, and option incentives can be both positively and negatively related to risk. Additionally, the characteristics of the options can reduce CEO risk-taking, especially when a large share of the options portfolio is in the money (Lewellen, 2006).

On the contrary, John and Litov (2010) suggests that firms with weaker incentive- and governance mechanisms have higher leverage levels. They argue that entrenched CEOs tend to reduce risk by adopting more conservative investment policies. Consequently, debtholders may view them as less risky borrowers, granting them better terms of access to debt financing and better credit ratings. At the same time, they suggest that, given the lower degree of alignment of entrenched managers and shareholders, the terms in the equity market will be less favorable to such firms. The consequence of the relatively more favorable terms in the debt market and unfavorable terms in the equity market for firms with entrenched CEOs would then be reflected in the leverage ratio of such firms.

2.4 Capital Structure Theory

The capital structure literature has been dominated by two main theories: the static tradeoff theory and the pecking order theory. The static tradeoff theory implies that firms have a target leverage ratio and adopt their leverage towards this target. The pecking order theory, however, suggests that, due to asymmetric information, companies adopt a hierarchical order of preferences for financing, where internal financing is preferred over external financing (Myers, 1984). Furthermore, firms prefer debt if external financing is needed, and equity is only issued as a last resort.

In several cases, the two theories have corresponding predictions. For instance, if a firm needs external financing and its leverage ratio is below its target ratio, the pecking order theory and the static tradeoff theory predict that the firm will issue debt. The static tradeoff theory implies a move towards the target, whilst the pecking order theory suggests that a firm will always cover its external financing needs with debt, so long as the debt capacity is not reached (Myers, 1984).

The tradeoff theory suggests that firms choose debt levels to balance corporate tax shields with expected costs of financial distress (Brennan & Schwartz, 1984; Kraus & Litzenberger, 1983; Myers, 1984; Strebulaev, 2007). However, the theory has received only mixed empirical support (Frank & Goyal, 2015; Graham & Leary, 2011). Notably, industries with lower volatility and more tangible assets have higher leverage ratios, aligning with the theory, however, many firms maintain low or no leverage, challenging the theory's validity (Strebulaev & Yang, 2013). The high volatility of leverage ratios begs the question of whether persistent firm characteristics influence the long-term leverage targets (DeAngelo & Roll, 2015). Additionally, Eckbo and Kisser (2021) looks at high-frequency net-debt issuers – the subsample of firms most likely to follow the tradeoff theory – and finds that these firms do not act accordingly.

A fundamental prediction of the tradeoff theory is a positive relationship between profitability and leverage. However, the empirical relationship has long been negative for public industrial firms (Frank, Murray Z. and Goyal, Vidhan K., 2007; Rajan & Zingales, 1995; Strebulaev & Yang, 2013; Titman & Wessel, 1988). Eckbo and Kisser (2021) find that the correlation between profitability and leverage is negative even in periods when firms undertake large rebalancing's of capital structure financed by debt. Hence, many of the predictions of the tradeoff theory do not hold empirically.

Using leverage as a tool to address agency costs has received interest in the literature (Berger et al., 1997; Harris & Raviv, 1990; Jensen, 1986; Milidonis & Stathopoulos, 2014). Firms can use higher levels of debt than CEOs initially would prefer as a bonding measure to reduce the conflicts of interest that may be especially prominent if the CEO stock ownership is low. Higher levels of debt can increase the potential threat of bankruptcy, which impacts the job prospects and wealth of the manager (K. Kim et al., 2017). This is, in turn, argued to provide disciplinary mechanisms and better align the interests of the CEO with those of the shareholders (Grossman, Sanford J. and Hart, Oliver D., 1983). Zwiebel (1996) suggests that managers voluntarily choose debt to credibly constrain their own future empire-building. While acknowledging these perspectives, we view leverage levels primarily as a result of agency costs and the effectiveness of the governance mechanisms in place.

A study by Lemmon et al. (2008) highlights that unobserved, time-invariant factors, primarily a firm's initial leverage ratio, to a large extent dictate its stable and long-term leverage ratio. This research finds that firms tend to maintain their initial leverage levels, often less affected by conventional determinants of leverage. Additionally, they find that current leverage significantly influences future security issuance, indicating that firms' financial policies are at least partly driven toward maintaining their leverage ratios relatively close to their long-run averages, suggesting that current and initial leverage ratios are important.

Strebulaev and Yang (2013) document that from 1962 to 2009, a significant portion of large public nonfinancial U.S firms consistently held low or no debt, suggesting that equity incentives, CEO characteristics, and the governance mechanisms in place influence these leverage choices. Furthermore, they note that this often results in under-levered firms and unexploited tax-shield benefits, reflecting a divergence in behaviors compared to the predictions of classic capital structure theories.

3 Hypothesis Development

In this section, we will present the study's hypotheses and their reasoning. The following hypotheses are based on the presented theoretical framework and empirical findings related to the topics. The literature on equity incentives, governance, CEO characteristics, entrenchment, and several classical corporate finance theories is not always empirically aligned. By testing our hypotheses, we aim to determine whether CEO entrenchment influences capital structure.

For the purpose of this study, we define entrenchment as the degree to which CEOs are insulated from the full spectrum of corporate control and governance mechanisms. This includes stock—or compensation-based performance incentives, the presence of large share blockholders, and board monitoring (Berger et al., 1997). Understanding this concept is crucial as it forms the basis of our investigation into the influence of CEO entrenchment on capital structure decisions. By definition, entrenched CEOs have discretion over their firms' leverage choices. Benson and Davidson (2009) and Fama (1980) suggest that CEOs may prefer lower than optimal leverage levels and levels that are predicted by classical capital structure theories, due to a desire to reduce firm risk to protect their underdiversified human capital. As suggested by Jensen (1986) this may also be due to the dislike of the performance pressures associated with higher levels of debt. On the other hand, Harris and Raviv (1988) and Stulz (1988), suggest that entrenched managers may increase leverage beyond what is considered optimal to reduce the possibility of takeovers and inflate their voting power.

3.1 CEO Entrenchment and Capital Structure

The empirical evidence points to varying conclusions regarding the relationship between CEO entrenchment and capital structure. It indicates that the relationship is complex and dependent on circumstances and firm characteristics. Furthermore, it is dependent on how one measures CEO entrenchment. Based on the presented theoretical framework, empirical findings, and the abovementioned definition of entrenchment, we expect the relationship between CEO entrenchment and leverage to be negative. The first hypothesis we want to test is therefore:

Hypothesis 1: Entrenched CEOs seek to avoid leverage.

CEO entrenchment will be measured in different ways. This includes the incentive and compensation mechanisms in place, the boards' size and composition, the presence of major share blockholders, and the CEO characteristics expected to be associated with entrenchment. Definitions of these variables and their empirical reasoning will be presented in section 4.2.

3.2 CEO Entrenchment and Zero-leverage Behavior

Another interesting empirical phenomenon is the substantial presence of zero—or almost zero-leverage firms. Such leverage levels go against the predictions of classical capital structure theories, such as the pecking order theory and the static tradeoff theory and suggest that these firms leave substantial amounts of money on the table by not taking advantage of the tax shield and disciplinary benefits that come with debt (Jensen, 1986; Strebulaev & Yang, 2013). Additionally, Strebulaev and Yang (2013) find that from 1962 to 2009, on average 10.2 percent of large public nonfinancial US firms have zero debt, nearly 22 percent have less than 5 percent book leverage ratio, and 32 percent have zero or negative net debt. Furthermore, they find that firms with higher CEO equity ownership and longer tenure are more likely to have zero or nearly zero debt, particularly if boards are smaller and less independent. Studying the determinants of zero-leverage behavior can help shed light on the mechanisms that lead firms to become low leverage, as such factors are likely dominating for zero-debt firms and are, hence, easier to identify. The second hypothesis we therefore want to test is the following:

Hypothesis 2: Entrenched CEOs are more likely to have zero- or almost zero-leverage.

4 Data

The data section part is comprised of three parts. First, an overview of the data sources used to create the sample. Second, a description of the variables used in the empirical analysis. Finally, descriptive statistics are presented.

4.1 Data Sources

From a data perspective, the availability of data on CEO equity holdings and compensation, CEO characteristics, board information, and shareholder information is the main challenge when studying the relationships of interest in this paper. To our knowledge, no publicly available data sets or databases contain this information with sufficient detail for Norwegian companies. In other countries, such as the United States, there exist relevant databases containing CEO compensation data. The Standard & Poor´s ExecuComp database is an example commonly used for collecting data on executive compensation. The lack of such standardized data sources provides a challenge for doing empirical analysis on such topics for Norwegian firms.

We have approached this challenge by creating our own data set. Through a comprehensive manual effort, we have collected data on CEO compensation, equity holdings, CEO characteristics, board size and composition, as well as shareholder information for a sample of Norwegian listed firms. We have done this by manually going through each company's annual reports and collecting data on total remuneration, share- and option holdings, board size, board composition, and the presence of share blockholders. One of the main challenges with this manual collection effort was in connection to the board. Many companies lacked sufficient information in the annual reports to classify them as inside or outside directors. Hence, we had to investigate each board member individually to assess their independence. A challenge has also been the collection of data on equity holdings and compensation data, as this has required us to go through all annual reports and remuneration reports and plot the numbers manually. The data-collection process has given us a unique dataset that provides a solid basis for the analysis of how various CEO equity incentives, CEO characteristics, and governance mechanisms can be related to capital structure in a Norwegian context.

The structure of the data is an unbalanced panel data set, containing compensation data, board information, CEO characteristics, shareholder information, and firm data for the years 2015-2022. Due to poor reporting quality or lack of information availability certain companies have been excluded from the data set. The sample selection process was based on four criteria. Firstly, all financial firms are excluded due to the fundamental difference in corporate governance and leverage between the financial industry and other sectors of the economy (Berger et al., 1997). Secondly, we only include companies listed on Oslo Børs (XOSL) and Euronext Expand (XOAS). Thirdly, we only include firms with at least one full year of data. Lastly, we only include firms with adequate availability of data regarding CEO compensation and board composition.

We have excluded companies listed on Euronext Growth and Euronext NOTC based on their characteristics. There are stricter criteria for getting listed on XOAS and XOSL, as it demands increased financial disclosure and a market cap above a certain level. Companies listed on Euronext Growth are early-stage companies with lower market cap, fewer shareholders, and limited legal and financial due diligence prior to listing (Oslo Stock Exchange, 2022). The companies listed on NOTC are private firms, so the listing only serves as an information system, where investors initiate trading of shares of private companies (Verdipapirforetakenes Forbund, 2021). By excluding these companies, we have a dataset containing more homogeneous firms. Additionally, since the CEO, board, and shareholder data are crucial for the analysis, we only include companies that publicly disclose this information. By Norwegian standards, such data is required to be disclosed (Oslo Stock Exchange, 2022). However, some companies are registered in a foreign country, such as the Cayman Islands, where there are other financial reporting regulations, which do not require disclosing CEO compensation information. An overview of the sample selection is detailed in Table 4.1.

The resulting data set consists of 1023 observations for 151 firms over eight years. The companies are classified into 18 different sectors in accordance with the GICS industry classification codes. In addition to the CEO compensation and characteristics data, board information, and shareholder information, selected financial data has been sourced from the Refinitiv Eikon database.

Table 4.1: Selection Criteria for Firms

The table provides a overview of the data selection process and outlines the criteria used to filter out firms in our data sample. It results in the 151 firms that we use further in our analysis

No	Criteria	Description	Firms remaining
0	All firms	All listed firms in Norway	332
1	Non-financial firms	Financial firms excluded	286
2	Listed on XOAS or XOSL	ENX and NOTC firms excluded	179
3	Listed before 2022	Minimum 1 year as a listed firm	164
4	Sufficient CEO data	Sufficient CEO data	151

4.2 Variable Description

Three groups of variables have been created from the data set: leverage variables (dependent variables), CEO equity incentive and compensation variables, board- and shareholder variables and CEO characteristics (explanatory variables), and firm characteristics (control variables). Below is a description of the key variables used in the empirical analysis.

4.2.1 Dependent variables

The main dependent variable in our analysis is the leverage ratio. We measure the level of leverage at the end of each fiscal year using two continuous variables that take values between 0 and 1:

$$\text{Leverage (book value)} = \frac{\text{total debt (book value)}}{\text{total assets (book value)}} \tag{4.1}$$

$$\text{Leverage (market value)} = \frac{\text{total debt (book value)}}{\text{total debt (book value)} + \text{equity (market value)}} \tag{4.2}$$

Mitton (2024) finds that total debt divided by total assets is the most common dependent variable in leverage regressions. We also include Leverage market value to get a perspective on the leverage ratio in relation to the company's market value. This is in line with Berger et al. (1997) and John and Litov (2010).

We choose to include both the book value of leverage and the market value of leverage as they give different indications of the firm's level of leverage. Welch (2004) points out that market leverage may change passively due to changes in stock price, and hence may not be an active managerial choice. However, market leverage may more directly influence CEO equity incentives due to its impact on the volatility of the stock price (Coles et al., 2006). Hence, there is a tradeoff between the leverage measure which could be most important to the CEO (leverage market value), and the measure that is perhaps a less noisy measure of the CEO's decision-making (leverage book value).

To investigate the second hypothesis, we use binary dependent variables that equal 1 if the firm has zero or almost zero leverage in its capital structure.

We define zero-leverage (ZL) firms as those with below 0.5 percent leverage book value. We use 0.5 percent leverage book value as a threshold since this increases our tests' sample size and statistical power. Furthermore, we assume that firms with very low leverage operate similarly to those with absolutely no debt. Finally, we assume a leverage book value of 0.5 percent to be insignificant and assume that any debt is perhaps taken on for specific strategic purposes that do not significantly influence the firm's risk profile.

$$ZL = \text{Firm with below 0.5\% leverage book value} \tag{4.3}$$

We define almost zero-leverage firms as those with below 5 percent leverage book value. Strebulaev and Yang (2013) point to several reasons for why it may be interesting to also look at AZL firms, the main argument being that classical capital structure theories suggest leverage ratios well above zero.

$$AZL = \text{Firm with below 5\% leverage book value} \tag{4.4}$$

4.2.2 Compensation and incentive variables

$$\text{CEO Ownership} = \frac{\text{Shares owned directly}}{\text{Shares outstanding}} \tag{4.5}$$

Jensen and Meckling (1976) and several others, such as Holmstrom and Milgrom (1991) and McConnell and Servaes (1990) have identified managerial equity ownership as an important influence on firm value. Hence we include in our model the CEO´s direct stock ownership as a percentage of shares outstanding. We expect that CEOs with high stock ownership will have stronger incentives to make value-maximizing decisions regarding capital structure. However, as claimed by Morck et al. (1988), this may not hold overall levels of ownership since high ownership may safeguard managers against other corporate governance mechanisms. Additionally, higher CEO stock ownership may be associated with higher risk aversion due to the CEO's underdiversified human capital (Benson & Davidson, 2009; Fama, 1980). Hence, we cannot explicitly predict the association between CEO equity ownership and leverage.

$$\text{Options to Shares} = \frac{\text{CEO Option Holdings}}{\text{Shares Outstanding}} \tag{4.6}$$

We also include a variable measuring the CEO´s option holdings, again as a percentage of common shares outstanding. Hence, the variable is the percentage of the firm the CEO can acquire by exercising all options. Granting CEOs stock options is, as with stock ownership, a monitoring initiative used by firms to align incentives. This variable should help us measure the relationship between CEO equity ownership and leverage. Additionally, it likely serves an important purpose in giving an estimation of the CEO´s performance-based incentive compensation, which normally depends largely on stock options (Jensen & Murphy, 1990; Yermack, 1995). On the one hand, stock options could enforce actions by the CEO, which are aligned with shareholder interests (Coles et al., 2006; Williams & Rao, 2006). On the contrary, options may provide the CEO with incentives to reduce their personal risk by reducing company risk (Carpenter, 2000). The characteristics of the options can also potentially reduce risk-taking, particularly if a large share of the options portfolio is in the money (Lewellen, 2006). We view a CEO as entrenched if her compensation is not sensitive to performance (Berger et al., 1997). Hence, if entrenched CEOs prefer low (high) leverage, we expect a positive (negative) coefficient estimate for the Options to Shares variable.

$$\text{Delta} = \frac{(\text{Shares owned by CEO} \times 0.01 \times \text{Share price})}{\text{Total annual remuneration}} \tag{4.7}$$

The CEO Ownership variable has some weaknesses. For instance, it does not consider the value of the ownership position relative to the wealth and total remuneration of the CEO. Hence, it may fail to measure CEO equity incentives and wealth accurately in relative terms. Therefore, we will also measure equity incentives by applying a variable relative to stock price and wealth. The variable represents a scaled measure of the CEO's wealth-performance sensitivity. It is also referred to as "Delta" and measures the NOK change in CEO wealth for a 1 percent change in share price, divided by the annual remuneration. The variable is inspired by Edmans et al. (2009) and builds on the idea that the more shares the CEO holds, the more they are affected by a change in stock price, and the higher the yearly remuneration, the less the stock price change affects the wealth.

Hence, Delta indicates how aligned the CEO is with shareholders and how exposed the CEO is to the idiosyncratic risk of the company. As CEOs may be underdiversified by having equity ownership in the firm, they could have a higher risk exposure than diversified shareholders (Benson & Davidson, 2009; Fama, 1980). As a result, CEOs may forego positive NPV projects if they are perceived as very risky (Coles et al., 2006). On the other hand, Higher Delta could induce managers to work harder or more efficiently as the manager shares gains and losses with the shareholders.

Furthermore, Delta is uncorrelated with firm size and has an appealing empirical quality for measuring CEO equity incentives (Edmans et al., 2009). Others also argue that measuring managerial equity incentives with the monetary value of ownership is more accurate than using share ownership percentages (Baker & Hall, 2004).

$$\text{Total Remuneration} = \text{Salary} + \text{Non-equity compensation} \tag{4.8}$$

We expect an additional characteristic of entrenched managers to be a high level of fixed compensation, as one may expect entrenched CEOs to extract excessive resources from the company (Berger et al., 1997). We use the sum of salary and non-equity-based compensation as proxies for total remuneration since estimates by Jensen and Murphy (1990) and Yermack (1996) indicate that CEOs cash compensation has a very low sensitivity to changes in firm value.

4.2.3 Board- and Shareholder Variables

$$\text{Board Size} = \log(\text{Board Size}) \tag{4.9}$$

To measure CEO entrenchment, we have included a Board Size variable. Board size is found to be an important determinant of the effectiveness of corporate governance in theoretical articles (Jensen, 1993; Lipton & Lorsch, 1992). Additionally, empirical studies by Berger et al. (1997), Strebulaev and Yang (2013), and Yermack (1996) indicate a significant association between the size of the board and leverage and firm value. Yermack (1996) suggests that managerial disciplinary mechanisms related to the threat of dismissal and compensation lose power as the size of the board increases, hence we take the natural logarithm of this variable.

$$\text{Percent of Outside Directors} = \text{Percent of outside directors on the board} \tag{4.10}$$

Many studies, such as Rosenstein and Wyatt (1990) and Weisbach (1988), indicate that CEOs face stricter monitoring when the board of directors has a large share of outside or independent directors. To capture this important effect, we include a variable measuring the percentage of outside directors. We have excluded "grey" directors who have personal business relationships, large share ownership positions (above 5 percent) or are relatives of current or former executives.

$$\text{Share Blockholders} = \begin{cases} 1 & \text{Presence of at least one 5\% share blockholder} \\ 0 & \text{Otherwise} \end{cases} \tag{4.11}$$

We include an indicator variable equal to 1 if the company has 1 or more shareholders with at least 5 percent of the common stock. This variable is included because large blockholders have strong incentives to monitor CEOs actively (Berger et al., 1997).

We collected data on the number of blockholders in each firm. However, we have not included specific details such as ownership percentage or whether the blockholders are institutional investors, which could be important indicators of blockholder effectiveness (Cremers & Nair, 2005).

4.2.4 CEO characteristics

It is reasonable to believe that the CEOs in the sample have different risk preferences. Therefore, we expect the incentive effects from the compensation and governance mechanisms to vary. CEO characteristics are included to explore whether these factors are related to capital structure.

We include CEO age and CEO tenure, measured in years. Age and tenure, in addition to CEO cash compensation (salary & total remuneration), are all used in previous studies as proxies for CEO risk aversion (Coles et al., 2006). We include the variable measuring the CEOs´ years in office in the belief that a CEO´s power over internal corporate governance mechanisms increases with CEO tenure (Berger et al., 1997). Furthermore, we use the logarithm of this variable because we believe that CEO control over corporate governance mechanisms will increase over time at a decreasing rate.

Inspired by research pointing at both measurable and perceived gender differences regarding risk aversion, we include a dummy variable representing the CEO gender (Faccio et al., 2016; Martin et al., 2009).

4.2.5 Control variables

In addition to the corporate governance variables, we supply our model with standard control variables for other firm characteristics expected to affect leverage. Control variables are included since we believe they may influence the dependent variable, and we believe it will reduce error variance and help achieve the zero conditional mean.

Looking at what has been done in existing literature is a common starting point when addressing the topic of control variables. Mitton (2024) finds a lack of consistency across groups of control variables used in the empirical corporate finance literature. However, there were some exceptions. The most consistently used control variable was found to be firm size, included in 84 percent of the sample regressions, while investments and profitability were found to be the second most used group of variables, appearing in approximately 50 percent of the sample regressions.

In line with Rajan and Zingales (1995) we include their suggested determinants of leverage, namely, firm size, tangibility, market-to-book, and profitability. For firm size, we use the natural logarithm of total assets; for tangibility, we include CAPEX to total assets to proxy for firms with high investments in tangible assets, whilst we include R&D costs to assets to proxy for asset uniqueness and firms with high investments in intangible assets. Furthermore, the market-to-book ratio is included as a proxy for investment and growth opportunities. Finally, return on assets (ROA) as measured by income before discontinued operations and extraordinary items to assets, is included to control for company profitability.

$$\text{Total Assets} = \log(\text{Total assets}) \tag{4.12}$$

Previous research has found that firm size is an important determinant of leverage (Rajan & Zingales, 1995). Larger firms could have better access to capital markets due to their size, reputation, and established track record. They may also have more diversified revenue streams, reducing risk. Furthermore, they often have more collateral assets, making it easier to finance with debt. The natural log of total assets was found to be the most commonly used proxy for firm size (Mitton, 2024).

$$\text{CAPEX} = \frac{\text{CAPEX}}{\text{Total Assets}} \tag{4.13}$$

Capital expenditure is frequently used as a control variable in previous research focusing on topics of capital structure and incentives due to potential impacts on risktaking and on incentives provided to managers (K. Kim et al., 2017). Previous research has used CAPEX as a proxy for investments and growth opportunities and as a proxy for the firm's investment in tangible assets (Armstrong & Vashishtha, 2012; Coles et al., 2006). Investments in tangible assets are easier to collateralize than investments in intangible assets, hence making debt financing more obtainable.

$$\text{MTB} = \frac{\text{Market Cap}}{\text{Book Value of Equity}} \tag{4.14}$$

The market-to-book ratio (MTB) is often used to measure investment and growth opportunities (Coles et al., 2006; Rajan & Zingales, 1995). A higher MTB suggests that investors expect future growth opportunities and profitability to exceed the company´s current book value. The theory predicts a negative relationship between MTB and Leverage, an explanation being that firms tend to issue equity when their stock price is high relative to the book value (Rajan & Zingales, 1995). Another possible explanation as suggested by Fama and French (1992) is that firms in financial distress (high leverage) may be discounted at a higher rate since the distress risk is priced in. Studies by DeAngelo et al. (2011) and Myers (1977) indicate that firms with high growth opportunities have less of an incentive to take on debt, due to potential debt overhang problems and suboptimal investment strategies.

$$\text{ROA} = \frac{\text{Income before discontinued operations and extraordinary items}}{\text{Average Total Assets}} \tag{4.15}$$

It is common in the literature to control for company profitability (Berger et al., 1997; Harris & Raviv, 1991; Rajan & Zingales, 1995). We include a return on assets variable (ROA) to control for company profitability. We define ROA as Income before discontinued operations and extraordinary items divided by average total assets. Income before discontinued operations and extraordinary items is used as it is independent of irregular or non-recurring events, providing a clearer picture of how CEOs manage and utilize the company´s assets in their regular business activities. In accordance with the pecking order theory, Myers and Majluf (1984) predict a negative relationship between profitability and leverage because firms will prefer to finance with internal funds over debt. On the other hand, Jensen (1986) predicts a positive relationship if the market for corporate control is effective and induces companies to pay out cash by increasing leverage. If, however, the market for corporate control is ineffective, CEOs of profitable firms would prefer to avoid the disciplinary mechanisms of debt, providing a possible explanation for a negative correlation between profitability and leverage. Lenders should, on the other hand, be more willing to lend to profitable firms.

$$\text{R\&D} = \frac{\text{R\&D Expense and amortization}}{\text{Total assets}} \tag{4.16}$$

In line with Berger et al. (1997) and Coles et al. (2006), we include the R&D variable to measure the uniqueness of assets and proxy for growth opportunities. The variable captures a firm´s investment in innovation and intangible assets, influencing its financing and investment strategies (Armstrong & Vashishtha, 2012; Coles et al., 2006). Firms with high R&D expenses relative to total assets are often more innovative and risk-taking, which impacts their risk profile and capital structure. In accordance with the Pecking Order Theory, firms prefer internal financing and debt over equity; however, high R&D costs indicate uncertain future returns and intangible assets that are harder to collateralize, often leading to a higher proportion of equity in the capital structure. This also aligns with the static tradeoff theory, which suggests that firms with a higher share of intangible assets have lower leverage due to increased expected financial distress costs (Frank & Goyal, 2009).

$$\text{Initial AZL dummy} = \begin{cases} 1 & \text{if the first observation of a firm is AZL} \\ 0 & \text{otherwise} \end{cases} \tag{4.17}$$

Finally, in line with Strebulaev and Yang (2013) and in the belief that initial leverage levels are predictors of future leverage levels, particularly for low-leverage firms, we include a dummy variable that equals 1 if the firm has almost zero leverage in the first observation of the firm in our sample. This control variable is only included in the logit regression.

4.3 Descriptive statistics

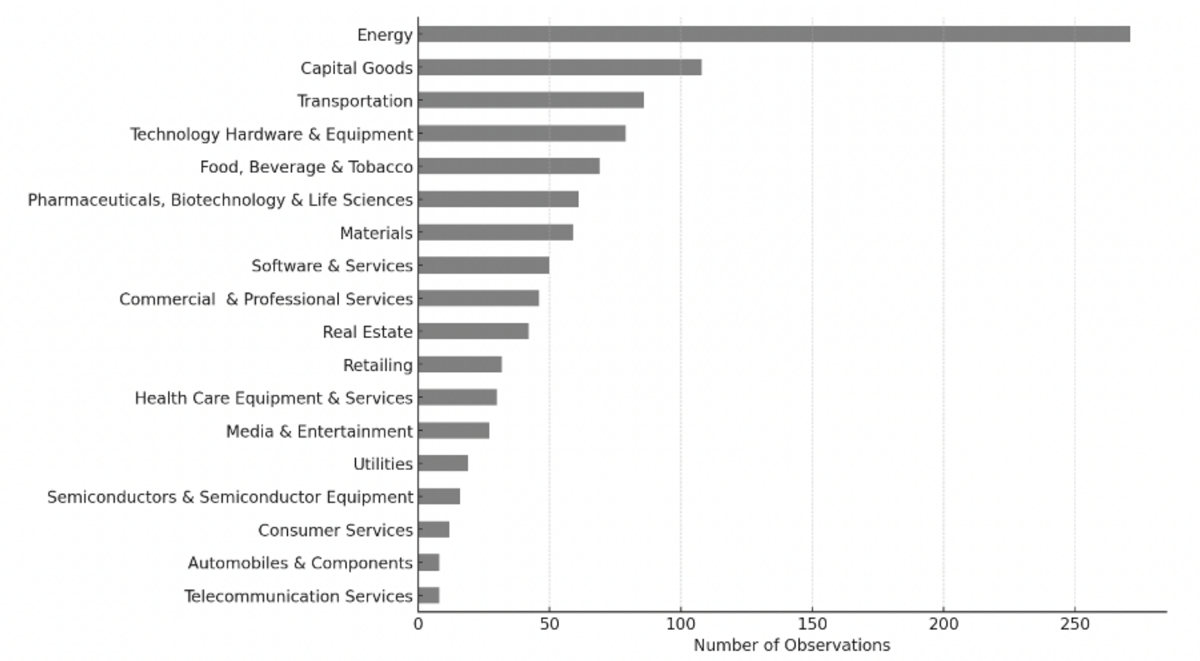
In the following section, we will provide some insight into the dataset that is the foundation of our study. First, we provide an overview of the number of observations and companies we have per industry group. Next, we present an overview of the leverage ratios and stock- and option holdings per sector. Furthermore, we present a table describing the variables that will be used in the regression. Finally, we present a table showing the leverage ratios and incentive variables per industry group.

The number of observations for the 18 sectors in the sample is illustrated in Figure 4.1. The distribution is relatively skewed, with Energy, Capital Goods, Transportation, Technology Hardware and Equipment, and Food, Beverage and Tobacco making up a large part of the sample observations. Norway is known for its large exports of oil and gas and is a top ten exporter of crude oil globally and one of the most important providers of natural gas to the EU and UK, covering over one-fourth of the demand (Norsk Petroleum, 2024).

Besides a large energy and shipping sector, Norway is also known for a strong presence of industrial companies and seafood companies and is the largest exporter of fish and aquaculture products to the EU (European Commission, 2022). These particularities are captured well in the sample as the capital goods, technology and hardware sectors, and Food, Beverage and Tobacco sectors have a high number of observations. Furthermore, the figure shows that selected sectors have few sample observations. This presents a challenge when performing sub-sector analysis.

Figure 4.1: Number of Observations across GICS Industry Groups

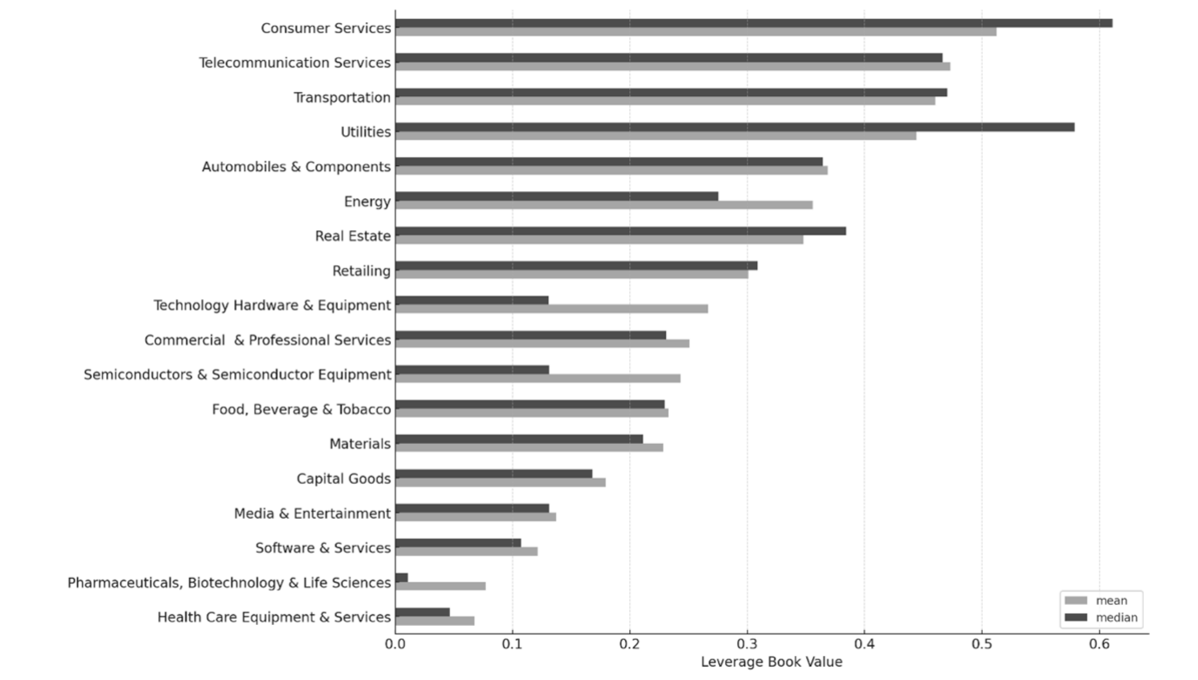
The figure illustrates the distribution of observations across different GICS Industry Groups within our dataset.



As presented in Figure 4.2 there are substantial differences in leverage ratios between different industry groups. Some sectors, such as the Energy, Transportation, and Real Estate sectors, have relatively high leverage ratios. This could naturally be due to the characteristics of these sectors, with longer contracts, more stable cash flows, and a higher share of collateral assets. Other sectors such as Media and Entertainment, Software and Services, and the biotech and healthcare sectors, have relatively low leverage ratios. This could again be due to the characteristics of the sectors, where there are often higher growth opportunities, more risk, and a lower share of collateral assets, which generally is associated with lower levels of leverage (Gaver & Gaver, 1993; W. S. Kim & Sorensen, 1986).

Figure 4.2: Leverage ratio across GICS Industry Groups

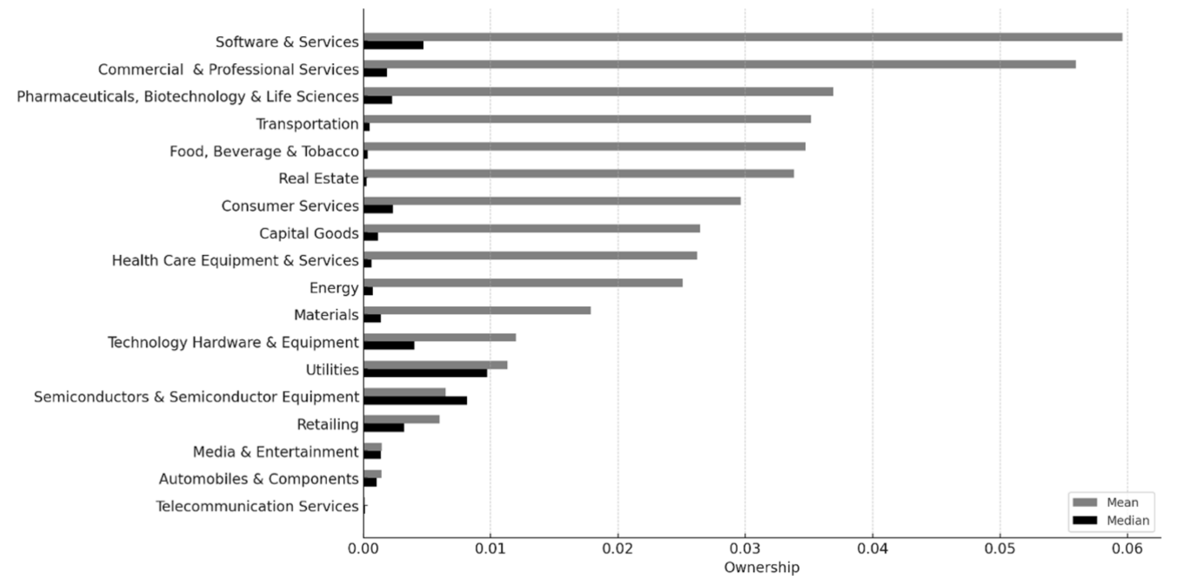
The figure illustrates the mean (grey) and median (black) leverage ratio (Book Value) across the different GICS Industry Groups.



As presented in Figure 4.3 there are notable differences in CEO ownership across the industry sectors. Sectors such as Software & Services and Commercial & Professional Services stand out as they have a higher mean than the other sectors. This could be due to the nature of the competition in these sectors, with constant demand for innovative and strategic leadership and incentive-based compensation can be used to attract young executive talents. In addition, in the Software & Services sector, we have many start-up/small venture firms where the CEOs (often the founders) retain their substantial ownership as they grow. It also aligns with Gaver and Gaver (1993) and Kwon and Yin (2006), who find that High-tech and growth firms firms tend to have use more equity-based compensation opposed to low-tech and low-growth firms. Opposite we have sectors such as Energy, Capital Goods, and Utilities. These sectors are often more mature, low-growth, and low-tech. Kwon and Yin (2006) finds in their study that such firms tend to use more cash-based compensation rather than equity-based.

Figure 4.3: Ownership across GICS Industry Groups

The figure illustrates the mean (grey) and median (black) ownership stake across the different GICS Industry Groups. Ownership is calculated as number of shares owned by the CEO directly divided by total shares outstanding.



In Figure 4.4 we have presented the Options to Shares ratio across the different industry sectors. High-tech firms like Software & Services, Commercial & Professional Services and Pharmaceuticals & Biotechnology stands out here with a higher mean relative to the other sectors. This is in line with (Kwon & Yin, 2006) who find that High-Tech firms tend to use larger amounts of stock options as compensation for CEOs, opposed to Low-Tech firms. It is also in line with Gaver and Gaver (1993) who find that growth firms use more equity-based compensation. For the lower means of options, we find the more mature sectors such as Capital Goods, Energy and Utilities. These sectors tend to have more stable demand, more predictable cash flows and less aggressive growth strategies, which can make equity-based compensation less attractive and favor cash-based compensation more. This is line with Gaver and Gaver (1993), who find that firms with less aggressive growth-strategies tend to use less equity-based compensation opposed to growth firms.

Generally, we see that the median across the industries is much lower than the mean. This indicates that the distributions across the industries is skewed, and a few very high observations is driving the mean up.

Figure 4.4: Options to Shares across GICS Industry Groups

The figure illustrates the mean (grey) and median (black) Option to Shares ratio across the different GICS Industry Groups. Options to Shares is measured as CEO option holdings divided by number of shares outstanding.

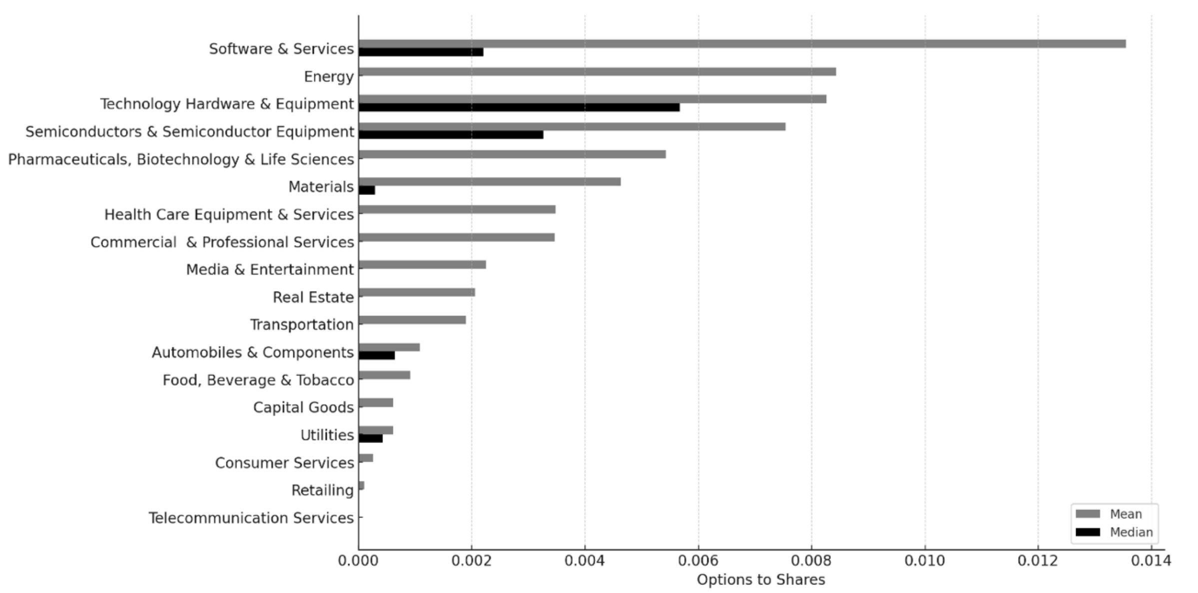


Table 4.2 provides interesting insights into leverage ratios, compensation variables, CEO characteristics, board- and shareholder characteristics, and firm characteristics in the sample period.

The Leverage Book Value has a mean of 0.277 (27.7 percent), and the maximum is 3.39 (339 percent), which is an observation we consider an outlier. Leverage Book Value and Leverage Market Value are in line with the findings of Berger et al. (1997) and previous studies in the US (Strebulaev & Yang, 2013). There are some outliers due to financial distress, restructuring, or particular events influencing assets and/or debt. For example, Ensurge Micropower had substantially higher debt than total assets. The same is true for the Leverage Market Value, where there are some outliers, such as Dof Installer, Prosafe, Havila Shipping, RAK Petroleum and Solstad Offshore who have been close to insolvency.

Median values for salary (M 3.090) and total remuneration (M 4.657) are smaller than what is found in previous research on US firms (Coles et al., 2006; Flammer et al., 2019). The mean of CEO ownership is 2.7 percent, in line with findings from the U.S Strebulaev and Yang (2013), and the median is 0.1 percent, indicating that the mean is skewed by certain outliers, such as the Bygma CEO, who owns approximately 89 percent of the company´s shares. As with previous studies, the CEO ownership variable is skewed, with a few CEOs having large equity shares, whilst most CEOs have small equity stakes. 78.4 percent of the observations have an equity stake below 1 percent, whilst 14.1 percent own more than mean, 4.3 percent own above 20 percent, and the max value is 88.7 percent.

The mean of Options to Shares is 0.5 percent, in line with findings from the US (John & Litov, 2010). There are certain outliers for the options to shares variable. For instance, the CEO of Seabird Exploration has an Options to Shares ratio of 33.5 percent, which skews the mean. The median of the Options to Shares variable is zero, as fewer CEOs in the sample hold options than those who do not. The large number of zero-values hence decreases the mean.

The Delta variable is also influenced by large outliers due to unusually high stock prices in certain years, often combined with a high ownership percentage and/or low total remuneration. One of the reasons for the outliers of the Delta variable is the end-of-year stock price that is reported for companies that have gone through restructurings. These restructurings have made the stock price included in the Refinitiv Eikon database in certain years higher than it actually was at the time since changes in capital structure and stock splits were not taken into account. Such examples include Norwegian Air Shuttle, Prosafe, and Solstad Offshore. The median for the Delta variable is 0.006, while the mean is 1.918. The mean is heavily skewed by outliers such as Gustav Witzøe, the founder of Salmar, who is also the CEO in most of the sample period. The same goes with Bjørn Kjos, the founder of Norwegian Air Shuttle, who also was the CEO in a large part of the sample period. These CEOs had large ownership stakes, combined with high stock prices, and moderate total remuneration, leading to delta variables we believe are not representative of the dataset.

Female CEOs account for 6.2 percent of the sample observations. This is higher, in percentage terms, than for a study by Frank, Murray Z. and Goyal, Vidhan K. (2007) on US firms, who found 1.3 percent female CEOs in the sample. However, it should be noted that the sample consists of only 64 observations of female CEOs. The median age and tenure are, respectively, 53 and 4 years, which appear to be quite similar to what is found in the literature (Coles et al., 2006; Frank, Murray Z. and Goyal, Vidhan K., 2007).

The mean Board Size is approximately 6, which is lower than for studies from the US, where the mean is approximately 9 (John & Litov, 2010). In our sample, there are, on average, 65.1 percent outside directors on the board; slightly higher than findings from the US (John & Litov, 2010). The average number of blockholders is around 3.

Finally, we take a look at the control variables. We find a mean value of MTB of 3.243 and a median of 1.716. The mean of MTB is in line with studies in the US John and Litov (2010) and other stock indices such as the Standard and Poors 500 but higher than the mean all-share index of Oslo-børs (Oslo Børs, 2023). Regarding the MTB ratio, there are some outliers, such as REC Silicon, which has a very high ratio one year due to a low book value of equity; other firms have high valuations, which push up the mean. On the other hand, we have some companies with very negative MTB due to negative book values of equity and positive market caps.

Regarding Total Assets, we have some outliers for Equinor and Aker BP. When it comes to Research and Development, the mean is notably influenced by certain companies that invest heavily in research and development. The mean of Research and Development is in line with Berger et al. (1997). There are also some large outliers when it comes to ROA due to either low asset bases and high results or low asset bases and negative results. We have used Net CAPEX in our data, which explains why we have several negative CAPEX variables for Total Assets. CAPEX is negative if the selling and depreciation of capital assets exceeds investment in new capital assets. The mean and median of CAPEX is around 3-4 percent, which is lower than what is found in studies from the US (Coles et al., 2006).

Table 4.2: Descriptive Statistics on Variables Used in Empirical Analysis

The table presents the descriptive statistics for the set of variables used in our analysis. The variables are grouped in four categories for which they are included in our analysis: Dependent variables, Governance Variables, CEO variables, and Firm Variables. For each variable, the table provides the number of observations (N), mean, standard deviation (St.Dev.), minimum (Min), median, and maximum (Max) values.

Variable	N	Mean	St. Dev.	Min	Median	Max
Dependent Variables						
Leverage Book Value	1,018	0.277	0.280	0	0.219	3.390
Leverage Market Value	1,023	0.290	0.279	0	0.211	0.993
Governance Variables						
Salary (NOK 1000)	1,023	3,608.521	2,819.564	0	3,090.000	33,072.140
Total Rem. (NOK 1000)	1,023	6,386.366	6,404.638	0	4,657.157	83,054.260
Ownership	1,023	0.027	0.089	0	0.001	0.887
Options to Shares	1,023	0.005	0.024	0	0	0.335
Delta	1,013	1.918	17.906	0	0.006	280.344
Board Size	1,008	6.280	2.015	3	6	12
Per. Outside Dir.	1,008	0.651	0.211	0	0.625	1
Blockholders	1,009	2.824	1.448	0	3	9
CEO Variables						
CEO Age	1,019	52.358	7.292	28	53	73
CEO Tenure	1,023	6.381	5.910	1	4	32
CEO Gender	1,023	0.938	0.241	0	1	1
Firm Variables						
Total Assets (MNOK)	1,023	23,150.040	101,791.800	9.935	3,114.900	1,548,053
CAPEX	1,023	0.036	0.335	−9.788	0.030	0.677
MTB	1,016	3.243	6.818	−85.032	1.716	106.705
ROA	1,023	−0.057	0.399	−8.125	0.013	1.700
R&D	1,023	0.018	0.074	0	0	1.014

In Table 4.3, we have divided the data into industry groups and looked at the number of firms in each industry and their respective average, median, and Std of Ownership and Leverage Book Value. As one could expect, the median value of Ownership and Options to Shares is highest for the technology sectors such as Software and Services, Semiconductors, and Technology Hardware and Equipment. This could be due to more early-stage and high-growth companies being in these sectors, where equity compensation is more widespread than in low-growth and less volatile sectors.

The leverage ratio is highest in sectors such as Energy, Transportation, and Real Estate.

This could naturally be due to the characteristics of such sectors with high collateral value, long contracts, and stable revenue (Rajan & Zingales, 1995). Other sectors, such as Pharmaceuticals, Biotechnology and Life Sciences, Healthcare and Equipment Services, Software and Services, and Media and Entertainment, have relatively low leverage ratios. This could again be due to the characteristics of these industries, where there are higher growth opportunities and less collateral, making it harder and/or riskier to finance with debt (W. S. Kim & Sorensen, 1986; Myers, 1977). Furthermore, there are large differences in the number of firms in each sector, which poses a challenge for sub-sector analysis and the generalizability of potential results.

Table 4.3: Descriptive Statistics on Ownership and Leverage per Industry Group

The table provides descriptive statistics for ownership and leverage book value across various Global Industry Classification Standard (GICS) Industry Groups. The table includes statistics of observations (N), mean, median, and the standard deviation (Std).

		Ownership			**Leverage Book Value**		
GICS Industry Group	**N**	**Mean**	**Median**	**Std**	**Mean**	**Median**	**Std**
Automobiles & Components	1	0.001	0.001	0.002	0.368	0.364	0.035
Capital Goods	14	0.026	0.001	0.121	0.180	0.168	0.119
Commercial & Professional Services	9	0.056	0.002	0.063	0.251	0.231	0.183
Consumer Services	2	0.030	0.002	0.042	0.512	0.611	0.253
Energy	39	0.025	0.001	0.097	0.356	0.275	0.317
Food, Beverage & Tobacco	10	0.035	0.000	0.101	0.233	0.229	0.083
Health Care Equipment and Services	5	0.026	0.001	0.092	0.068	0.047	0.080
Materials	8	0.018	0.001	0.057	0.228	0.211	0.177
Media & Entertainment	4	0.001	0.001	0.002	0.137	0.131	0.097
Pharma, Biotech & Life Sciences	9	0.037	0.002	0.098	0.077	0.011	0.122
Real Estate	6	0.034	0.000	0.092	0.348	0.384	0.191
Retailing	4	0.006	0.003	0.005	0.301	0.309	0.126
Semiconductors	2	0.006	0.008	0.005	0.243	0.131	0.246
Software & Services	9	0.060	0.005	0.107	0.122	0.107	0.123
Technology Hardware & Equipment	13	0.012	0.004	0.026	0.267	0.131	0.563
Telecommunication Services	1	0.000	0.000	0.000	0.473	0.466	0.099
Transportation	12	0.035	0.001	0.106	0.460	0.470	0.178
Utilities	1	0.011	0.010	0.001	0.444	0.579	0.244

When de divide the sample based on CEO Ownership in Table 4.4, several patterns emerge. The subsample with less than 1 percent ownership includes 802 observations, showing a leverage book value of 0.272 and a leverage market value of 0.294, with ZL and AZL percentages at 0.107 and 0.187, respectively. The above-mean ownership subsample has 144 observations with a leverage book of 0.303 and a leverage market value of 0.294, and ZL and AZL percentages at 0.069 and 0.132, respectively. Furthermore, the subsample with above 20 percent ownership has 44 observations, higher leverage book value of 0.354 and leverage market value of 0.430, but noteworthy lower ZL and AZL percentages at 0.0 and 0.046, respectively. These numbers indicate that higher CEO Ownership correlates with increased leverage and reduced presence of ZL and AZL.

When we divided the sample based on Options to Shares in Table 4.4, we also find some interesting insights. For the subsample below the mean of Options to Shares, we have 858 observations, an average leverage book value of 0.294, and an average leverage market value of 0.310. For this group, the percentage of ZL and AZL firms are 0.087 and 0.157, respectively. The subsample above the mean has 165 observations, a leverage book value of 0.185, and a leverage market value of 0.189. The percentage of ZL- and AZL firms for this group are 0.194 and 0.321 respectively. These numbers indicate that CEOs with more options are associated with lower leverage and are more often zero- or almost-zero leverage. This could naturally be due to the industry and firm characteristics in firms that use more stock options.

Table 4.4: Descriptive Statistics on Ownership and Options to Shares

The table presents leverage statistics across different criterion for ownership and options to shares. The table presents the number of observations (N) for ownership and options to shares within each criterion, average Leverage (Book Value), average Leverage (Market Value), percentage share that has zero leverage (leverage book value below 0.5%) and almost zero leverage (leverage book value below 5%)

Category	Criteria	N	Leverage (BV)	Leverage (MV)	ZL	AZL
Ownership	Below 1%	802	0.272	0.296	0.107	0.187
	Above mean	144	0.303	0.294	0.069	0.132
	Above 20%	44	0.353	0.340	0.000	0.046
Options to Shares	Below mean	858	0.294	0.310	0.087	0.157
	Above mean	165	0.185	0.189	0.194	0.321

From Table 4.5 we can see that there are significant percentages of Zero-leverage (ZL) and Almost Zero-leverage (AZL) firms in each of the years in our dataset. The high percentage of ZL and AZL firms as can be seen in Columns 2 and 3 goes against classical capital structures such as the pecking order and tradeoff theories. Furthermore, the percentage of ZL and AZL firms has been rising over the years in our dataset, despite historically low interest rates. These figures make it interesting to investigate further what the determinants of such policies could be.

Table 4.5: Percentage and Number of Zero and Almost Zero Leverage Firms

The table presents the percentage and number of Zero-leverage firms (leverage book value below 0.5%) and Almost Zero-leverage firms (leverage book value below 5%) for each year in the data sample, as well as the mean and total number of Zero-leverage and Almost Zero-leverage firms for the entire dataset. Columns 2 and 3 show the percentage of Zero-leverage and Almost Zero-leverage firms respectively. Columns 4 and 5 show the number of Zero-leverage and Almost Zero-leverage firms respectively

Year	**ZL Percent**	**AZL Percent**	**N (ZL)**	**N (AZL)**
2015	6.5%	14.2%	13	28
2016	7.1%	14.8%	14	29
2017	7.3%	15.1%	15	30
2018	7.8%	15.4%	16	31
2019	8.0%	15.7%	17	32
2020	8.3%	16.0%	18	33
2021	8.1%	16.2%	17	34
2022	8.0%	16.1%	17	34
Mean	7.8%	15.4%	127	251

Pearson´s Pairwise correlation between the variables is presented in Appendix C.3. A relatively high positive correlation of 0.6 is found between the Ownership and Delta variables. However, after conducting Variance Inflation Factor (VIF) tests on different model specifications in Appendix C.2, multicollinearity is not found to be a large concern for these variables. We also find strong positive correlations between total assets, total remuneration, and board size. After conducting VIF tests, these correlations do not seem to be an issue.

4.3.1 Treatment of Outliers

As presented throughout this section, several of the variables included in our study have noteworthy outliers. We want to control for observations that could be due to errors or those that we do not consider economically reasonable or not representative of the general dataset. According to Mitton (2020), the most common approach to dealing with outliers is to winsorize them at the 1st and 99th percentiles. Hence, to deal with the issue of outliers we winsorize Options to Shares, Delta, MTB, and Total Assets at the 1st and 99th percent. We winsorize Options to Shares, Delta, and Total Assets due to the presence of large outliers, as presented in the summary statistics in Table 4.2. Furthermore, in line with Coles et al. (2006), we winsorize MTB and Total remuneration.

5 Methodology

In the following section, we present methodological considerations. First, we will introduce the applied econometric methods and discuss their appropriateness. Next, we present the basis of our main regression model build-up and the regression models used in the empirical analysis.

5.1 Econometric Methods

We aim to evaluate the impact of variations in CEO equity incentives and characteristics, as well as governance mechanisms such as board size and composition, and blockholders, on leverage levels using panel data. Panel datasets are well suited for examining policies such as capital structure due to the ability to control for unobserved heterogeneity by observing the same cross-sectional units over time (Wooldrigde, 2019). In this case, the cross-sectional units are the companies and the industries in which they operate. These cross-sectional units have unique characteristics and time effects; hence a pooled OLS regression is unsuitable (Bester & Hansen, 2016). This is confirmed by a Breusch-Pagan test for heteroskedasticity, indicating that the variance across entities is not zero, further suggesting the need for a panel data approach (see Appendix C.1).

5.1.1 Fixed Effects Model

When choosing between fixed-effects (FE) and random-effects (RE) models, we evaluate their suitability for the characteristics of our data. The Fixed Effects model accounts for potential correlations between unobserved, invariant characteristics and the time-varying independent variables, making it well-suited for analyzing within-entity variations over time (Wooldrigde, 2019). The FE model is preferred if time-invariant characteristics do not correlate with other company characteristics. The results from a Hausman test (see Appendix C.1) suggest that the FE model is preferred when using leverage market value as the dependent variable. However, for leverage book value, the test indicates no significant difference between the FE and RE models, potentially making the RE model preferred for its efficiency by using both within and between entity variations.

We construct the FE models to investigate how the independent variables influence leverage policies among the sample of Norwegian firms. Since we are analyzing different industries, we must include industry-fixed effects to control for the differences between the industries in the sample. When using the FE model, we only consider within-entity variations and discard differences between entities. Control variables such as company-specific characteristics and time effects are also included, with year indicators included for all but the base year, 2015, to avoid the dummy variable trap (Wooldrigde, 2019).

5.1.2 Random Effects Model

We include Random Effects (RE) models in our analysis to further validate the robustness of our results and to efficiently utilize both within-entity and between-entity variations in the data. The RE model assumes that entity-specific effects are random and uncorrelated with the independent variables, which allows for a more efficient use utilization of the data variance (Wooldrigde, 2019). This approach can result in a higher R-squared, suggesting a better statistical. However, this does not necessarily mean that the model is more accurate or appropriate; rather, it reflects the model´s ability to utilize both within-group and between-group variations.

RE models are generally more efficient than Fixed Effects (FE) models because they use both between-group and within-group variations to estimate the effects of variables. This can be particularly advantageous when there are noteworthy variations between entities, but not within, and they can be assumed to be uncorrelated with the explanatory variables (Wooldrigde, 2019). Unlike FE models, which are limited to within-entity variations, RE models can include time-invariant variables, offering advantages in scenarios where some explanatory variables do not change over time within entities but do vary between them. While RE models can handle unbalanced panel data with flexibility and potentially offer more generalizable results across entities, this generalizability is dependent on the validity of the random effects assumption (Wooldrigde, 2019).

5.1.3 Method Selection

When deciding between fixed-effects (FE) and random-effects (RE) models, the decision should be based on the characteristics of the data and the trade-offs between variance and bias. Fixed-effects models control unobserved, time-invariant characteristics that may correlate with the explanatory variables, providing unbiased estimates. However, the estimates might be subject to high sample dependence. On the other hand, random-effects models can introduce bias if the entity-specific effects are correlated with the independent variables, but can reduce the variance of the coefficient estimates, potentially providing more efficient estimates.

Clark and Linzer (2015) argue that one should not overly emphasize either bias or variance alone but should consider the trade-off between the two. Even though there is some correlation between the entity-specific effects and the independent variables, it does not necessarily mean that fixed effects should always be preferred. The choice should instead be guided by the extent of the bias and the variance.

The usual objection to using random effects – that the independent variables and entity-specific effects are uncorrelated – rarely holds in practice. Clark and Linzer (2015) find that even with significant violations of this assumption, the random-effects model can still be as good as or better than the fixed-effects model. The choice between FE and RE models should be based on the variation in the independent variables. If the variation is primarily within units, the model choice is less critical unless there is a high correlation between the entity-specific effects and independent variables. In such cases, the research goal should guide the model choice. When the independent variables show low within-unit variation, the RE model often produces superior estimates when there are few entities or observations per entity and a low correlation between the independent variable and entity-specific effects (Clark & Linzer, 2015). Otherwise, the fixed-effects model may be preferable. The results from a Hausman test (as detailed in Appendix C.1) indicate that the FE model is preferred when using leverage market value as the dependent variable. However, the test indicates no significant differences between the FE and RE models for leverage book value, potentially making the RE model preferred when using leverage book value as the dependent variable.

Based on the characteristics of the data, the Hausman test, and to some degree varying recommendations on which model specification to use, we decide to use both a fixed-effects and random-effects model. This dual approach allows us to leverage the strengths of each model, providing a detailed analysis while accounting for the potential biases and variance in each method. This approach also allows us to compare the estimates across the different model specifications to check if they yield similar results (Wooldrigde, 2019).

5.1.4 Logistic Regression Model

We are interested in exploring how our independent variables influence the likelihood of a given firm being zero-leverage (ZL) or almost zero-leverage (AZL). Given that ZL and AZL are binary dependent variables, a logistic regression model is more suitable than a standard linear regression model, which has several shortcomings when applied to binary dependent variables. In addition to the control variables used throughout our study, we follow Strebulaev and Yang (2013) by including a dummy variable that takes the value of 1 if the first observation of a firm in the dataset is an AZL firm. We include this variable in the belief that firms with low leverage initially, tend to maintain this capital structure. We also include industry and time-fixed effects to account for unobserved heterogeneity.

In a logistic regression model, the coefficients represent the change in the log-odds of the dependent variable per unit change in the explanatory variable. The exponential of these coefficients gives the odds ratios, which indicate the likelihood of a firm being ZL or AZL relative to not being ZL or AZL. Due to the non-linear nature of the logistic function, the marginal effects are not constant (Wooldrigde, 2019).

We focus on the general direction and significance of the coefficients in our Logit models. Previous studies indicate that the incentive effects of equity ownership are non-linear and vary at different levels (Benson & Davidson, 2009; Carpenter, 2000; Devers et al., 2008; Frank, Murray Z. and Goyal, Vidhan K., 2007; Friend & Lang, 1988; McConnell & Servaes, 1990; Morck et al., 1988). For example, among CEOs with lower stock ownership levels, increased stock ownership is associated with increased risk-taking and higher leverage, whilst there are risk-aversion effects for higher levels of stock ownership. Similar non-linear effects are seen with Delta and Options to Shares, where CEOs are generally incentivized by equity incentives, but where CEOs experience risk-aversion effects at higher levels of personal risk exposure. Logit models are more sensitive to non-linearity in predictors than Fixed Effects (FE) and Random Effects (RE) models due to the non-linear logit transformation (Wooldrigde, 2019). Non-linear relationships in a logistic regression model can lead to inflated coefficients and standard errors. To address this, we transform the equity incentive variables – Ownership, Options to Shares, and Delta – into binary variables that take the value of 1 if the observation is above the mean. This binary transformation allows us to focus on the direction of the relationship, which is our primary interest. Furthermore, interpreting the coefficients is easier when transforming the variables into binary independent variables (Box & Tidwell, 1962). With this binary transformation, the coefficients represent the increase in log-likelihood that the dependent variable equals 1 of moving from below the mean to above the mean. Box and Tidwell (1962) argue that when investigating the relationship between a binary dependent variable and a number of explanatory variables, it is preferred, when possible, to use a simpler functional form instead of the original values, such as binary independent variables.

5.2 Presentation of Models

This section presents an overview of the regression models used to explore the relationships of interest. We use Fixed Effects (FE) and Random Effects (RE) models to capture the variations within and across firms. The FE model controls for all unobserved invariant characteristics over time, thus focusing on within-firm variations. In contrast, the RE model treats the differences between firms as random variations, allowing us to utilize the full variance in the dataset more efficiently. Additionally, in all models, we include year-fixed effects and industry-fixed effects. The general structure of the first regression models is illustrated in Equation 5.1

In developing our main regression models, we follow the approach of Berger et al. (1997), including equity incentive variables such as CEO stock ownership and CEO option holdings, and governance variables such as the presence of share blockholders, board- size and composition, as well as control variables such as ROA, total assets, and R&D. We deviate slightly from Berger et al. (1997) by including Delta, CEO age and gender, and certain widely used control variables such as CAPEX and the MTB-ratio. For the Logit regression model, we follow Strebulaev and Yang (2013) and Berger et al. (1997) by including the same compensation and equity incentive variables (CEO stock ownership, option holdings, and total remuneration), and governance variables (board size- and composition), as well as the abovementioned control variables. In line with Strebulaev and Yang (2013) we include the Initial AZL indicator variable, whilst some of their control variables are excluded due to data limitations. We also include Delta, CEO age, and the share blockholders indicator in the logit regression. The reasoning behind the inclusion of all these variables is presented earlier in section 4.2.

$$\text{Leverage} = \beta_0 + \sum_{i=1}^{n} \beta_{i,\text{Incentive}} + \sum_{i=1}^{n} \beta_{i,\text{Governance}} + \sum_{i=1}^{n} \beta_{i,\text{CEO Char.}} + \sum_{i=1}^{n} \beta_{i,\text{Control}} + \varepsilon_{it} \quad (5.1)$$

Furthermore, we utilize a binary logistic regression to model the likelihood of a given firm being zero or almost zero leverage. Unlike linear regression where coefficients indicate the change in the dependent variable for a one unit change in the regressors, coefficients in a logistic regression express changes in the log odds of the binary dependent variable being equal to one, which is typically transformed to odds ratios for clearer interpretation. This model aims to provide insights into potential predictors of financial conservatism amongst firms. Equation 5.2 illustrates the general structure of the Logit regression model.

$$\text{ZL/AZL} = \beta_0 + \sum_{i=1}^{n} \beta_{i,\text{Incentive}} + \sum_{i=1}^{n} \beta_{i,\text{Governance}} + \sum_{i=1}^{n} \beta_{i,\text{CEO Char.}} + \sum_{i=1}^{n} \beta_{i,\text{Control}} + \varepsilon_{it} \quad (5.2)$$

The logit model is a binary response model as shown in Equation 5.3. This logit model estimates the probability of the binary dependent variable being equal to 1, given the explanatory variables. The explanatory variables have coefficients (β_1 to β_k) and G(z) is a function that ensures that the predicted probabilities are between zero and one for all values of z.

The logistic regression model is given by:

$$\begin{aligned} P(y = 1 \mid x) &= G(\beta_0 + \beta_1 x_1 + \ldots + \beta_k x_k) \\ \text{where } G(z) &= \frac{e^z}{1 + e^z} \end{aligned} \quad (5.3)$$

We have used the statistical software program R to perform the empirical analysis. In the following sections we will present and discuss the results.

6 Analysis

We present the results from our empirical analysis in three sections below. First, we examine the relationship between leverage and equity incentives and compensation, board and shareholder variables, and CEO characteristics. Next, we divide the data sample into leverage- and industry subsamples to investigate leverage-specific and sector-specific characteristics. These regression models test the hypothesis that entrenched CEOs seek to avoid leverage. Finally, we present the logit models used to investigate the hypothesis that entrenched CEOs are more likely to adopt zero- or almost-zero leverage policies.

6.1 CEO Entrenchment and Capital Structure

In the following section, we first present the results from our main regression model. Next, we examine the relation between various incentive and compensation variables on leverage, before we explore the relationship between governance variables and leverage, followed by how CEO characteristics and leverage are related. Lastly, we discuss the influence of the control variables on leverage.

The regression estimates of our Fixed Effects (FE) and Random Effects (RE) models on the entire sample, controlled for industry and time effects, are presented in Table 6.1. Columns 1 and 2 show the FE regression with Leverage Market Value and Leverage Book Value as dependent variables. Columns 3 and 4 show the RE regression with leverage book value and leverage market value as dependent variables, respectively.

The results in Table 6.1 generally support the hypothesis that entrenched CEOs seek to avoid leverage, however, some results are contrary, and others are insignificant, making it hard to draw definitive conclusions. The Ownership variable is positive and significant whilst the Delta variable is negative and significant across all model specifications. The Board Size variable is negative and significant for Leverage Book Value for both the FE and RE models in Columns 1 and 3, whilst the Blockholder Indicator is positive and significant across all model specifications. Most of the financial control variables have signs generally in line with previous studies.

Table 6.1: Determinants of Capital Structure Levels - Full Sample

The table presents the results of Fixed Effects and Random Effects regression on the data sample, controlled for industry and time effects. The estimations includes the use of robust standard errors. Column 1 and 2 presents the Fixed Effects regression with Leverage Book Value and Leverage Market Value as dependent variables, respectively. Column 3 and 4 presents the Random Effects regression with Leverage Book Value and Leverage Market Value as dependent variables, respectively. One star, two stars, and three stars indicate statistical significance at 10%, 5% and 1%, respectively. For detailed variable description see Appendix B.1.

	Fixed Effects		Random Effects	
	Leverage Book Value	Leverage Market Value	Leverage Book Value	Leverage Market Value
Total Remuneration	0.0148	-0.0148	0.0066	-0.0271**
	(0.0228)	(0.0141)	(0.0228)	(0.0135)
Ownership	0.4033*	0.2684***	0.3704*	0.2731***
	(0.2353)	(0.1020)	(0.2025)	(0.0995)
Options to Shares	-3.4963	-2.6754	-3.3695	-1.7042
	(2.3317)	(2.0385)	(2.3891)	(1.8540)
Delta	-0.2040*	-0.1336***	-0.1647*	-0.1223***
	(0.1205)	(0.0276)	(0.0974)	(0.0257)
Board Size	-0.1770**	0.0035	-0.2124***	-0.0454
	(0.0777)	(0.0708)	(0.0658)	(0.0583)
Percent of Outside Directors	-0.0804	-0.0128	-0.0697	-0.0168
	(0.0855)	(0.0697)	(0.0681)	(0.0588)
Blockholder Indicator	0.0785***	0.1077**	0.0877***	0.1139**
	(0.0277)	(0.0507)	(0.0250)	(0.0471)
CEO Age	-0.0018	-0.0012	-0.0020	-0.0016
	(0.0020)	(0.0020)	(0.0018)	(0.0017)
CEO Tenure	0.0064	0.0159	0.0095	0.0219
	(0.0195)	(0.0149)	(0.0167)	(0.0134)
CEO Gender	0.0017	-0.0324	0.0165	-0.0248
	(0.0274)	(0.0292)	(0.0272)	(0.0287)
Total Assets	0.0219	0.0831***	0.0376***	0.0694***
	(0.0218)	(0.0178)	(0.0125)	(0.0117)
MTB	0.0004	-0.0083***	-0.0009	-0.0108***
	(0.0052)	(0.0029)	(0.0053)	(0.0029)
ROA	-0.1696	-0.0622***	-0.1820	-0.0575***
	(0.1306)	(0.0189)	(0.1407)	(0.0203)
CAPEX	0.0326	0.0291*	0.0334	0.0301*
	(0.0314)	(0.0153)	(0.0335)	(0.0158)
R&D	-0.1071	-0.0362	-0.1906	-0.0447
	(0.1026)	(0.0526)	(0.1319)	(0.0536)
Constant			-0.1069	-0.5197
			(0.3506)	(0.3590)
Time effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Observations	986	987	986	987
R^2	0.2196	0.1980	0.2380	0.2715
Adjusted R^2	0.0545	0.0286	0.2066	0.2415

6.1.1 Effects of CEO Equity Incentives and Compensation

The Ownership variable in Table 6.1 is positive and significant across all models for both leverage book and market value. These findings align with the theory that managers with financial incentives aligned with shareholders will pursue more leverage in the capital structure to raise the firm's value (Berger et al., 1997; W. S. Kim & Sorensen, 1986). On the other hand, these findings could also align with Stulz (1988) who notions that managers may increase leverage to strengthen their own voting control. Furthermore, these findings align with the theory proposed by Holmstrom and Milgrom (1991), suggesting that the higher the share of the CEO's wealth depends on firm performance, the less monitoring is necessary. When we divide the sample by the highest and lowest percentiles of Options to Shares (see Appendix A.1), we find that the Ownership variable is positive and significant only for the low options subsamples in Columns 1 and 3. This indicates that the incentive effects of stock ownership are reduced when the CEO holds a high level of options. Our findings for CEO stock ownership generally indicate that CEOs with higher ownership stakes, tend to seek higher leverage levels and that there are incentive effects from stock ownership to increase leverage.

The Options to Shares variable is negative but insignificant across all models in Table 6.1. A negative coefficient in front of the Options to Shares variable contradicts previous studies that have found a positive relationship between options and leverage (Berger et al., 1997; Coles et al., 2006; K. Kim et al., 2017; Williams & Rao, 2006). However, the coefficient is not significant, and there could be several explanations for the negative coefficient. Firstly, there are 643 observations with zero options, which could limit the variability needed to detect the effects of the Options to Shares variable on capital structure. Another possible explanation is that CEOs with high personal exposure to the company's risk may be incentivized to reduce personal risk by reducing company risk (Carpenter, 2000). Lambert et al. (1991) suggests that differences in risk aversion and managerial preferences should be accounted for when valuing options and that options could be both negatively and positively associated with risk.

A weakness with our Options to Shares variable is that it does not consider whether the options are vested or unvested, the value of the options, or when they expire. Hence, the incentive effect of the options could vary largely. For instance, a CEO with unvested options holdings deep in the money may have incentives to reduce leverage and risk to ensure the options can be exercised. It could also be that the incentives to make value-maximizing decisions regarding capital structure decrease when the options are deep in the money (Lewellen, 2006). On the other hand, the incentive effects of out-of-the-money options could incentivize managers to make value-maximizing decisions regarding leverage (Berger et al., 1997; Coles et al., 2006; K. Kim et al., 2017; Williams & Rao, 2006). This variation in potential incentive effects from stock options makes it hard to draw any specific conclusions regarding the effect of stock options on capital structure. Additionally, the variable is not significant.

A possible explanation for the negative Options to Shares variable could also be that entrenched managers with compensation that is not sensitive to firm value actually have better access to credit markets due to their tendency to seek less risky investments (John & Litov, 2010).

We find negative and significant coefficients for the Delta variable across all models in Table 6.1. Delta indicates both alignment with shareholders and exposure of the CEO's wealth to the idiosyncratic risk of the company, hence providing both a measure of incentives and risk aversion. The negative coefficients we find could be due to risk aversion from the CEO and a preference to reduce firm- leverage, and risk to reduce personal risk (Benson & Davidson, 2009; Coles et al., 2006; Devers et al., 2008; Eisenhard, 1989; Friend & Lang, 1988; Hayes et al., 2012; Jensen, 1986; Williams & Rao, 2006). Hence a possible explanation could be that CEOs with high equity stakes in the company, in terms of the value of a percentage change in the shareholdings relative to the total annual remuneration, make decisions to mitigate risk as their personal wealth is directly affected by the share price. Hayes et al. (2012) note that whilst a higher delta indicates a closer relationship between the CEO's wealth and increases in firm value, the related increase in personal risk for the CEO also provides incentives for reducing risk.

The coefficients for the Total Remuneration variable are mixed. The only significant coefficient for the total remuneration variable is in column 4 in the RE regression model in Table 6.1, showing a negative direction. This finding could indicate that CEOs tend to reduce leverage when Total Remuneration increases, perhaps to reduce risk and protect their position (Armstrong & Vashishtha, 2012; Berger et al., 1997; Coles et al., 2006).

6.1.2 Effects of Blockholders, the Board, and CEO Characteristics

The Blockholders indicator variable is positive and significant across all the main regression models in Table 6.1. These findings align with Berger et al. (1997) and Cremers and Nair (2005), indicating that the presence of blockholders is associated with stricter monitoring and higher levels of leverage. These findings suggest that managers are forced to increase leverage when influential monitors are present.

In line with Berger et al. (1997) and Strebulaev and Yang (2013), we find a negative and significant coefficient for the Board Size variable, as shown in Columns 1 and 3 in Table 6.1. These findings could indicate that larger boards provide less effective monitoring, allowing CEOs to adopt lower and more comfortable leverage ratios.

The literature suggests that a high share of outside directors on the board indicates that management is likely to be subject to more active monitoring (Berger et al., 1997; Strebulaev & Yang, 2013). The coefficient in front of the Outside Directors variable is negative but insignificant for the main models as shown in Table 6.1, making it difficult to draw any specific conclusions.

The CEO Age variable is negative but not significant, whilst the CEO Tenure variable is positive but not significant across the main models in Table 6.1. The lack of significance makes it difficult to draw any specific conclusions for these variables. The CEO gender variable shows mixed coefficients and is not significant for the main regression model in Table 6.1, also making it difficult to draw any specific conclusions.

6.1.3 Control Variables

As shown in Table 6.1 and consistent with Berger et al. (1997) and Rajan and Zingales (1995), we find a positive and significant relationship between both firm size (Total Assets) and leverage (see Columns 2-4), and tangibility (CAPEX) and leverage (see Columns 1 and 3). Larger firms often have better access to debt financing due to their size, lower bankruptcy costs, diversified revenue streams, reputation, and established track record (Barclay & Smith Jr., 1995; De Jong et al., 2011). Their diversification reduces bankruptcy risk, and their bankruptcy costs are usually a smaller share of their assets. Additionally, larger firms and those with higher CAPEX have more collateral, making debt financing more accessible (Rajan & Zingales, 1995).

Consistent with Coles et al. (2006) and Rajan and Zingales (1995), we find a negative and significant coefficient for the MTB ratio, as shown in Columns 2 and 4 in Table 6.1. This could be due to companies issuing equity when their stock price is high relative to book value, or since firms in financial distress are discounted at a higher rate due to the added risk, leading to a lower MTB ratio. As suggested by Myers (1977), highly levered firms are more likely to pass up on profitable investments. Hence, firms with higher growth opportunities often use a higher share of equity financing.

The R&D variable in Table 6.1 is negative but not significant. However, its direction is in line with the literature suggesting that high-growth firms with more intangible assets use less debt (Berger et al., 1997). When using lagged variables, as detailed in Appendix A.5, we find a negative and significant coefficient for the R&D variable with Leverage Book Value in Columns 1 and 3, supporting the idea that firms with more intangible assets and a focus on growth tend to have less leverage in the capital structure (Berger et al., 1997; Frank & Goyal, 2009; Myers, 1977).

In line with Berger et al. (1997), De Jong et al. (2011), Eckbo and Kisser (2021), and Rajan and Zingales (1995), we find negative and significant coefficients for the ROA variable, as shown in Columns 2 and 4 in Table 6.1. Contrary to Pecking Order and Static Tradeoff theories, which suggest that leverage should increase with profitability, our results show a negative correlation between profitability and leverage. An explanation could be that as companies become more profitable, their assets and market valuation increase, leading to lower leverage ratios. Eckbo and Kisser (2021) also finds a significant negative relationship between leverage and profitability, even after controlling for the rebalancing that occurs after profitable periods.

Table 6.2: Determinants of Capital Structure Levels - Leverage Subsamples

The table presents the results of Fixed Effects regression on subsamples for Low and High Leverage Book Value (25th and 75th percentile). In column 1 and 2 we run the FE regression on the option subsamples with Leverage Book value as dependent variable. In column 3 and 4 we run the FE models on the subsamples with Leverage Market Value as dependent variable. All regressions are controlled for time effects. One star, two stars, and three stars indicate statistical significance at 10%, 5% and 1%, respectively. For detailed variable description see Appendix B.1.

	Dependent variable:			
	Leverage Book Value		Leverage Market Value	
	Low Leverage	High Leverage	Low Leverage	High Leverage
Total Remuneration	0.0056	−0.0460	0.0025*	0.0042
	(0.0063)	(0.0309)	(0.0015)	(0.0242)
Ownership	0.0664	0.3572	0.0218**	0.3315
	(0.0688)	(0.3993)	(0.0096)	(0.2573)
Options to Shares	1.0898**	−2.8067	0.3822***	−6.2895**
	(0.5558)	(5.6992)	(0.1204)	(2.7352)
Delta	0.0448	−0.0492	−0.0049	−0.0533
	(0.0356)	(0.0867)	(0.0079)	(0.0472)
Board Size	−0.0043	−0.0636***	−0.0009	−0.0321***
	(0.0038)	(0.0222)	(0.0009)	(0.0120)
Percent of Outside Directors	−0.0416*	−0.1166	−0.0067	−0.0020
	(0.0240)	(0.2698)	(0.0051)	(0.0661)
Blockholder Indicator	0.0076	0.1188***	0.0010	0.0166
	(0.0122)	(0.0359)	(0.0032)	(0.0210)
CEO Age	0.0011	−0.0083	0.0003	−0.0009
	(0.0009)	(0.0052)	(0.0002)	(0.0027)
CEO Tenure	−0.0230**	0.0922**	−0.0030	0.0365
	(0.0110)	(0.0454)	(0.0028)	(0.0252)
CEO Gender	0.0359***	−0.0581	0.0089***	−0.0650
	(0.0123)	(0.0641)	(0.0023)	(0.0464)
Total Assets	0.0060	−0.0285	0.0007	0.0652***
	(0.0073)	(0.0517)	(0.0017)	(0.0183)
CAPEX	−0.0025	−0.1486	0.0003	−0.2106*
	(0.0024)	(0.0920)	(0.0005)	(0.1092)
MTB	0.0017	−0.0118	−0.0008**	−0.0109
	(0.0011)	(0.0157)	(0.0003)	(0.0096)
ROA	−0.0112	−0.3205***	−0.0027	−0.0860***
	(0.0101)	(0.1140)	(0.0024)	(0.0233)
R&D	0.0123	−0.2486	0.0049	−0.3421
	(0.0166)	(0.9499)	(0.0043)	(0.6800)
Time effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Observations	243	246	244	246
R^2	0.4395	0.3443	0.2592	0.3412
Adjusted R^2	0.1415	0.0145	−0.1321	0.0098

In Table 6.2, we run the Fixed Effects (FE) regressions on the Low and High subsamples of Leverage Book Value (25th and 75th percentile), controlled for industry and time effects. Columns 1 and 2 show the Low Leverage and High Leverage subsamples with Leverage Book Value as the dependent variable. Columns 3 and 4 show the Low Leverage and High Leverage subsamples with Leverage Market Value as the dependent variable.

Table 6.2 provides interesting insights for the Options to Shares variable. We find that the Options to Shares variable is positive and significant for low levels of leverage, as shown in Columns 1 and 3, but negative and significant for high levels of leverage in Column 4. These findings align with previous studies suggesting that options provide incentives for risk-taking through higher leverage, but that these incentives might be less effective in high-leverage companies due to the risk of the underdiversified human capital of the CEOs (Carpenter, 2000).

6.1.4 Industry Analysis

To further investigate the relationship between CEO equity incentives, governance, and capital structure, we have divided the dataset into subsets consisting of the largest industries, to investigate whether we find differences across industries. Due to the lack of significant results for the Options to Shares variable in the main regression, we want to investigate if there are significant results in specific industries that align with general literature. In Table 6.3, we run the Fixed Effects regression on the eight largest industries with Leverage Book Value as the dependent variable. In Appendix A.2, we run the same model but with Leverage Market Value as the dependent variable as a robustness measure.

We find a positive coefficient for Options to Shares in the sectors where we have many observations of this variable, such as Pharmaceutical & Biotechnology (Column 6) and Software & Services (Column 8). The positive relation is in line with the general literature and suggests that CEOs who's compensation is more tied to firm value tend to take on greater debt and increase firm risk. We find a positive relation between Percent of Outside Directors and Leverage across most of the sectors, suggesting that stricter monitoring is associated with higher levels of leverage, in line with the literature. Additionally, we observe a negative relation between CEO Tenure and leverage, suggesting that longer-tenured CEOs tend to seek lower debt, consistent with previous studies.

Table 6.3: Determinants of Capital Structure Levels - Industry Subsamples (Book)

The table presents the results of Fixed Effects regression with Leverage Book Value as dependent variable on subsets of the largest industries in the data sample. The regressions are controlled for time effects and includes the use of robust standard errors. Blank spaces indicates no observations. One star, two stars, and three stars indicate statistical significance at 10%, 5% and 1%, respectively. For detailed variable description see Appendix B.1

	Dependent variable: Leverage Book Value							
	Cap. Goods	Energy	Food & Bev	Tech	Transport	Pharma and bio	Comm. Services	Software
Total Remuneration	0.0091	0.0100	0.0099	-0.0211	0.0086	-0.0242	0.1377**	0.0285
	(0.0274)	(0.0271)	(0.0088)	(0.0438)	(0.0142)	(0.0197)	(0.0603)	(0.0227)
Ownership	0.3722***	0.1532	-0.2416**	-17.1423***	-1.1764*	3.6168	-1.9764	1.3682**
	(0.0712)	(0.2587)	(0.1100)	(6.4304)	(0.6785)	(4.0838)	(1.6106)	(0.6685)
Options to Shares	-9.7858**	-5.0235	-2.8904	-4.9136	-1.9034	1.8917*	-13.4588***	4.1247*
	(4.2769)	(6.4790)	(2.4721)	(6.1834)	(5.2976)	(0.9884)	(5.0537)	(2.2538)
Delta	-0.0497*	-0.0703	0.0339*	-0.7868***	0.3506	1.4045	-0.2167*	-0.0004
	(0.0275)	(0.0796)	(0.0202)	(0.1878)	(0.2336)	(1.2581)	(0.1278)	(0.1054)
Board Size	0.0147	-0.0452***	-0.0014	-0.0616*	-0.0330*	0.0130**	-0.0366	-0.0260
	(0.0134)	(0.0170)	(0.0067)	(0.0330)	(0.0186)	(0.0056)	(0.0231)	(0.0245)
Percent of Outside Directors	0.3252**	-0.1019	0.2586***	-0.1178	0.3435***	-0.0498*	-0.0744	-0.0623
	(0.1606)	(0.2180)	(0.0786)	(0.2650)	(0.1322)	(0.0270)	(0.2771)	(0.1448)
Blockholder Indicator	0.1196***	0.0676				0.0128		
	(0.0440)	(0.0620)				(0.0443)		
CEO Age	0.0037*	-0.0070**	0.0024	0.0153	-0.0108	0.0064**	0.0105	0.0179**
	(0.0022)	(0.0029)	(0.0027)	(0.0155)	(0.0079)	(0.0030)	(0.0135)	(0.0077)
CEO Tenure	-0.0513**	0.0672**	-0.0670***	0.0345	-0.0043	-0.0231*	-0.0954**	-0.0586
	(0.0243)	(0.0339)	(0.0096)	(0.1326)	(0.0323)	(0.0118)	(0.0441)	(0.0395)
CEO Gender	-0.0590*	-0.0082		0.2280	-0.1594	0.3082*	-0.0481	0.0112
	(0.0354)	(0.0524)		(0.2164)	(0.1055)	(0.1615)	(0.0934)	(0.1054)
Total Assets	0.0441*	0.0040	0.0297	0.0823	-0.0844	0.0324**	0.1582**	0.2431***
	(0.0261)	(0.0235)	(0.0195)	(0.0831)	(0.0930)	(0.0153)	(0.0617)	(0.0474)
CAPEX	0.2713	0.0134	0.3179***	0.1708	0.0055	0.1042	0.1162	0.4089
	(0.2052)	(0.0082)	(0.0982)	(0.1986)	(0.1392)	(0.2154)	(0.2008)	(0.2491)
MTB	-0.0127*	-0.0084	0.0027	-0.0036	0.0327***	-0.0011	-0.0053	-0.0059
	(0.0074)	(0.0076)	(0.0099)	(0.0158)	(0.0109)	(0.0024)	(0.0056)	(0.0098)
ROA	-0.0904	-0.0389	-0.3094***	-0.5086***	-0.3237***	-0.0158	-0.3353***	-0.1825
	(0.1476)	(0.0322)	(0.0945)	(0.0494)	(0.0936)	(0.0160)	(0.0383)	(0.1936)
R&D	3.8903	-1.5183	-19.9895***	-0.8488		0.0559*	0.3488	-3.6854
	(2.4116)	(2.2901)	(5.5132)	(0.5574)		(0.0292)	(0.7359)	(6.9989)
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	108	261	69	79	78	55	46	45
R^2	0.5265	0.2075	0.8510	0.8936	0.4863	0.5701	0.9031	0.9128
Adjusted R^2	0.2964	-0.0251	0.7402	0.8155	0.1400	0.0328	0.7436	0.7442
F Statistic	3.6395***	2.3919***	11.1359***	17.9897***	2.1769**	1.4468	7.9261***	7.4775***

The Options to Shares variable is negative and significant in Table 6.3 for the Pharmaceutical & Biotechnology (Column 6) and Software & Services (Column 8) sectors. This is in line with previous studies Berger et al. (1997) and Coles et al. (2006) and suggests that CEOs who face financial pressure from compensation tied to firm value tend to take on greater debt. It is also in line with Smith Jr. and Watts (1992), who find that stock options may motivate managers to increase firm risk. These sectors tend to be more high-growth and use more equity-based compensation in the form of stocks and options as present in Figure 4.3 and 4.4, which also can be a reason that we find more significant results in these sectors. In such high-growth sectors, the incentive effects from options are stronger, compared to more stable sectors where the stock price, to a larger extent, reflects exogenous changes. Additionally, a large share of our observations for the Options to Shares variable are in these sectors, perhaps providing greater statistical power to detect effects.

The coefficient for the Percent of Outside Directors is positive and strongly significant for several of the industry subsamples in Columns 1, 3, and 5 in Table 6.3. These findings are in line with the literature, suggesting that a higher share of outside directors is associated with stricter monitoring and thus higher levels of leverage (Berger et al., 1997; Rosenstein & Wyatt, 1990; Strebulaev & Yang, 2013; Weisbach, 1988).

We find significant negative coefficients for CEO Tenure across several of the sectors in Table 6.3, see Columns 1, 3, 7, and 8. This is line with the general literature Berger et al. (1997), Coles et al. (2006), Frank, Murray Z. and Goyal, Vidhan K. (2007), and Strebulaev and Yang (2013) indicating that longer tenure is associated with less risk and lower leverage. Possible explanations could be that CEOs with longer tenures have greater risk aversion and control over internal governance mechanisms, inducing them to avoid the performance pressures that come with higher leverage.

6.2 CEO Entrenchment and Zero-leverage Behaviour

Similar to Strebulaev and Yang (2013), a large share of our sample observations have zero- or almost-zero leverage: 7.8 percent have zero leverage and 15.4 percent have leverage below 5 percent, as shown in Table 4.4. Leverage ratios below 5 percent are opposed to what traditional capital structure theories predict. Studying the determinants of zero- or almost zero-leverage policies can perhaps shed light on the mechanisms that induce firms to have low leverage, as such mechanisms are likely important determinants of zero-leverage firms and are thus easier to identify To investigate these leverage policies, we employ logit regression models, defining Zero-leverage (ZL) firms as those with Leverage Book Value below 0.5 percent and Almost Zero-leverage (AZL) firms as those with below 5 percent. These models indicate how the independent variables influence the likelihood of a given firm having zero- or almost-zero leverage.

In this section, we first present the results from the logistic regression model. Next, we examine the impacts of various incentive and compensation variables. We then investigate the relationship between share blockholders and the board of directors, as well as the impacts of CEO characteristics. Finally, we present the relationship between various control variables and zero-leverage policies.

Table 6.4 presents the results of the logit regressions, in which the dependent variable equals one if a firm-year observation is Almost Zero-leverage (Column 1), i.e., has a leverage book value of 5% or less or Zero-leverage (Column 2), i.e., has a Leverage Book Value of 0.5% or less. The results are controlled for industry- and time fixed effects.

The results in table 6.4 generally support the hypothesis that entrenched CEOs are more likely to be Zero-leverage or Almost Zero-leverage. The coefficient for Total Remuneration in the Zero Leverage regression (Column 2) is positive and significant. The coefficient for Ownership is negative and significant for both model specifications. The coefficient for CEO Age is positive and significant for the Zero Leverage regression in Column 2, and the coefficient for CEO Tenure is positive and significant for both model specifications. The control variables are omitted from the output in table 6.4, however, the direction of the control variables are generally in line with previous studies, as detailed in Appendix A.6.

Table 6.4: Determinants of Zero-leverage Policy

The table presents the results of our logistic regressions. Column 1 illustrates how the independent variables influence the likelihood of a firm being almost zero leverage (AZL). Column 2 illustrates how the independent variables influence the likelihood of a firm being zero-leverage (ZL). Both regressions are controlled for time and industry effects. We have also controlled for Total Assets, CAPEX, MTB, ROA, R&D and First AZL Indicator, but they are omitted in the output. McFadden‘s R-squared is used as a measure of goodness of fit for the models, and is calculated as 1 subtracted by the log-likelihood of the null model divided by the log-likelihood fitted model. One star, two stars, and three stars indicate statistical significance at 10%, 5% and 1%, respectively. For detailed variable description see Appendix B.1

	Dependent variable:	
	Almost Zero Leverage	Zero Leverage
Total Remuneration	0.410	0.685**
	(0.267)	(0.344)
Ownership	−1.743***	−2.806***
	(0.573)	(0.699)
Options to Shares	−0.224	0.218
	(0.290)	(0.412)
Delta	0.286	1.217
	(0.658)	(0.942)
Board Size	−0.791	−1.267
	(0.697)	(1.053)
Percent of Outside Directors	1.562**	1.212
	(0.617)	(0.769)
Blockholder Indicator	−0.494	16.089***
	(1.115)	(0.839)
CEO Age	0.006	0.103***
	(0.021)	(0.026)
CEO Tenure	0.487**	0.749***
	(0.206)	(0.273)
CEO Gender	−1.033**	−2.801***
	(0.442)	(0.677)
Constant	−20.976***	−22.973***
	(4.096)	(4.913)
Time effects	Yes	Yes
Industry effects	Yes	Yes
Control variables	Yes	Yes
McFadden’s R-squared	0.4916	0.5425
Observations	986	986

6.2.1 Effects of Equity Incentives and Compensation

The Ownership variable is negative and significant in both models in Table 6.4, suggesting that firms with higher CEO equity ownership are less likely to adopt zero- or almost-zero leverage policies. These findings indicate that CEOs with higher equity stakes are more aligned with shareholders and are thus more likely to implement higher levels of leverage (Berger et al., 1997; W. S. Kim & Sorensen, 1986). However, this goes against the findings of Strebulaev and Yang (2013), who find that higher CEO equity ownership increases the likelihood of ZL or AZL, pointing at managerial entrenchment and risk aversion as possible explanations.

We find a positive but not significant coefficient for Delta in Table 6.4, making it hard to draw any specific conclusions. However, these coefficients point in the direction that CEOs with high personal risk exposure may prefer lower leverage levels (Benson & Davidson, 2009; Frank, Murray Z. and Goyal, Vidhan K., 2007; Friend & Lang, 1988; Strebulaev & Yang, 2013).

For the ZL model in Column 2 in Table 6.4, we find a positive and significant coefficient for Total Remuneration, suggesting that higher CEO cash compensation is associated with zero-leverage policies. This may reflect entrenched CEOs desire to reduce risk, adopt a more comfortable capital structure, and safeguard their position (Berger et al., 1997; Coles et al., 2006).

6.2.2 Effects of Blockholders, the Board, and CEO Characteristics

The positive and significant coefficient for the Percent of Outside Directors in Column 1 in Table 6.4 indicates that a higher share of outside directors is associated with an increased likelihood of AZL policies. This finding contradicts our initial intuition and previous studies finding that a higher share of outside directors is associated with higher leverage (Berger et al., 1997; Rosenstein & Wyatt, 1990; Strebulaev & Yang, 2013; Weisbach, 1988). The coefficient for the blockholders is strongly positive and significant for the ZL model in Column 2 in Table 6.4, suggesting that more blockholders increase the likelihood of a firm being ZL. These findings also contradict our initial intuition and previous findings and the literature suggesting that the presence of blockholders is associated with stricter monitoring and thus higher levels of leverage (Berger et al., 1997; Cremers & Nair, 2005). A possible issue with the Blockholders Indicator is that we have few observations with zero blockholders, which could lead to large and unstable coefficients, potentially reducing the reliability of the results (Wooldrigde, 2019). The coefficients for Board Size in Table 6.4 are negative but not significant, making it difficult to draw any specific conclusions.

CEO Age and Tenure are positively and significantly related to ZL and AZL policies, as shown in Columns 1 and 2 in Table 6.4. These findings indicate that older CEOs and those with longer tenures are more likely to adopt zero-leverage policies, possibly due to higher risk-aversion and influence over internal governance mechanisms (Berger et al., 1997; Strebulaev & Yang, 2013). The negative and significant coefficient for CEO Gender in Columns 1 and 2 in Table 6.4, suggests that male CEOs are less likely to adopt ZL or AZL policies, potentially reflecting higher risk appetites amongst males (Faccio et al., 2016; Martin et al., 2009).

6.2.3 Control Variables

The control variables are generally in line with previous research as detailed in Appendix A.6. In line with Lemmon et al. (2008) and Strebulaev and Yang (2013), we find positive and significant coefficients for the Initial AZL Indicator across both models as shown in Columns 1 and 2 in Appendix A.6. These findings indicate that firms who initially have low-leverage policies, tend to stick with these policies. In line with others, we find a negative and significant coefficient for Total Assets in Appendix A.6, indicating that larger firms are less likely to adopt low-leverage policies (Berger et al., 1997; Eckbo & Kisser, 2021; Myers, 1977; Rajan & Zingales, 1995; Strebulaev & Yang, 2013). Similarly, the negative and significant coefficient for CAPEX in the ZL model in Column 2, indicates that firms with more tangible assets are less likely to have zero- or almost-zero leverage. Finally, positive and significant coefficient for MTB and in the AZL model in Column 1, suggests that firms with higher growth opportunities and valuations tend to have lower leverage, consistent with previous findings (Frank & Goyal, 2009; Graham, 2000; Myers, 1977; Rajan & Zingales, 1995; Strebulaev & Yang, 2013).

7 Discussion

In this section, we provide an overview of and discuss the main findings from our empirical analysis in Section 6. Furthermore, we evaluate whether our findings correspond with our initial hypotheses as presented in section 3. For the purpose of this study, we have defined managerial entrenchment as the degree to which CEOs are insulated from the full range of corporate governance and control mechanisms. Characteristics expected to be associated with managerial entrenchment are compensation not sensitive to firm value, relaxed governance mechanisms (e.g., larger boards and the absence of share blockholders), and greater influence over internal controls, potentially reflected by longer tenures and greater age. Our discussion will focus how CEO entrenchment impacts capital structure and zero-leverage policies, highlighting the main findings for each aspect.

7.1 CEO Entrenchment and Capital Structure

The Ownership variable is positive and significant across all the main regression models in Table 6.1, indicating that CEOs with higher ownership stakes tend to have higher leverage levels. This could be due to the incentive alignment effects that come with equity ownership, inducing managers to engage in value-maximizing decisions, which could be to increase leverage (Berger et al., 1997; W. S. Kim & Sorensen, 1986). However, it could also be that CEOs with higher ownership stakes, increase leverage to bolster their voting power and position (Stulz, 1988).

For the Delta variable, we find a negative and significant coefficient across all the main regression models in Table 6.1, suggesting that CEOs with higher wealth-performance sensitivity and risk exposure to the company's idiosyncratic risk tend to have lower leverage levels in the capital structure. Hence, the variable indicates a potentially strong risk-aversion effect from high personal exposure to the company's risk (Benson & Davidson, 2009; Hayes et al., 2012; Williams & Rao, 2006).

The findings for the Ownership and Delta variables could be in line with previous studies suggesting that there are positive incentive effects from equity ownership, but that for high levels of personal risk exposure, managers tend to reduce risk, often by reducing leverage (Carpenter, 2000). Hence, the findings are not necessarily opposed but could indicate that the effects of ownership incentives depend on the manager's personal exposure to the risk of the company.

In our main regression model in Table 6.1, the Options to Shares variable shows negative coefficients, generally contrary to the literature; however, these coefficients are not significant. Several factors could explain the lack of findings. Our sample includes 643 observations with zero options, potentially limiting the variability needed to detect any effects from this variable. Additionally, our sample primarily comprises of firms in sectors like Energy, Capital Goods, and Food, Beverage & Tobacco, which are more conservative and use options compensation to a lesser extent than high-growth companies. Finally, the variable does not account for whether the options are vested or unvested, their value, or expiration dates, which limits its ability to fully capture the potential incentive effects provided to CEOs.

When we divide the data based on leverage levels in Table 6.2, the Options to Shares variable is positive and significant for low leverage levels but negative and significant for high leverage levels in Columns 1 and 2. This aligns with previous studies indicating that options provide risk-taking incentives through higher leverage, but that these incentives are less effective in high-leverage companies due to the risk associated with the CEO´s underdiversified human capital (Carpenter, 2000).

Furthermore, we find positive and significant coefficients in the Software & Services and Pharmaceutical & Biotech sectors in Table 6.3 and Appendix A.2. These high-growth sectors normally involve more risk and extensive use of equity incentives, as shown in Figure 4.4. The significant positive findings in these sectors could be due to their high-growth nature, which enhances the effects of equity incentives. Another possible explanation is that these sectors are the only sectors in our sample with sufficient option data to yield significant results.

In the main regression model in 6.1, we find a significant and negative relationship between Board Size and Leverage Book Value in Columns 1 and 3, and a positive and significant coefficient for the Blockholder indicator. These findings generally align with the literature and suggest that CEOs who face stricter monitoring due to a smaller board and the presence of share blockholders tend to have higher leverage levels in the capital structure (Berger et al., 1997; Strebulaev & Yang, 2013).

Our findings indicate that CEOs with lower equity ownership and less stringent monitoring measured by board size and the absence of share blockholders, tend to have lower levels of leverage in the capital structure. Additionally, we find that CEOs with high-risk exposure to the company, as measured by Delta, tend to opt for lower levels of leverage. The general findings support the hypothesis that entrenched CEOs seek to avoid leverage.

7.2 CEO Entrenchment and Zero-leverage Behavior

In line with our previous findings, we find a negative and significant coefficient for the Ownership variable in Table 6.4, indicating that CEOs with higher ownership stakes are less likely to implement zero- or almost-zero leverage policies. Furthermore, we find that CEOs with higher Total Remuneration are more likely to employ zero-leverage policies, suggesting that higher fixed compensation is associated with greater risk aversion and a preference for low leverage.

Our results in 6.4 indicate that older CEOs with longer tenures are more likely to adopt zero- or almost-zero leverage policies. These findings align with the notion that entrenched CEOs, characterized by higher age and longer tenure, prefer lower leverage to mitigate personal risk and perhaps reduce the performance pressures that come with high debt (Berger et al., 1997; Coles et al., 2006).

We find that a higher percentage of outside directors is associated with an increased likelihood of adopting almost zero-leverage policies in Table 6.4, contrary to previous studies suggesting a positive relationship between a higher share of outside directors and leverage (Berger et al., 1997; Rosenstein & Wyatt, 1990; Strebulaev & Yang, 2013; Weisbach, 1988). Similarly, we find that the presence of share blockholders is associated with a greater likelihood of being Zero-leverage, opposing the anticipated effect of stricter monitoring (Berger et al., 1997; Cremers & Nair, 2005).

Our findings suggest that older CEOs with low equity ownership, high total remuneration, and longer tenures are more inclined to adopt zero or almost-zero leverage policies. Despite some mixed evidence, the findings support the hypothesis that entrenched CEOs are more likely to have zero- or almost-zero leverage.

8 Robustness

To investigate the robustness of our results, this section analyzes the exposure of our models to statistical issues and discusses how we can approach them. We also address issues related to causal interpretation and endogeneity. Detailed robustness tests are provided in Appendix section C.

8.1 Heteroscedasticity

Heteroscedasticity occurs when the variance of the residuals is not constant across levels of the independent variables, which can lead to unreliable standard error estimates and hypothesis tests (Wooldrigde, 2019). We conduct both a Modified Wald Test for groupwise heteroscedasticity and a Breusch-Pagan test, indicating heteroscedasticity in our models (detailed in Appendix C.1). The Modified Wald Test detects whether the variance of error terms differs across groups in panel data, whilst the Breusch-Pagan test checks if the variance of the error terms varies with the levels of the independent variables. Significant results from both tests suggest the presence of heteroscedasticity making it necessary to use robust standard errors. We apply Arrelano-type robust standard errors, particularly well-suited for panel data since they account for both autocorrelation within panels and heteroscedasticity across cross-sectional units, thus providing more reliable confidence intervals and hypothesis tests (Arellano, 1987).

For the logit regression models, we also account for heteroscedasticity. Although logistic regression inherently controls for changing variance in the residuals through the link function, we further safeguard our coefficient estimates against potential biases by using robust standard errors (Wooldrigde, 2019). This strengthens the robustness of our logistic regression findings.

8.2 Multicollinearity

Multicollinearity occurs when two or more independent variables in a regression model are highly correlated, complicating the separation of each variable´s influence on the dependent variable. Such correlations can inflate the standard errors of the regression coefficients, potentially leading to unreliable coefficient estimates. We apply a Variance Inflation Factor (VIF) test to assess multicollinearity in Appendix C.2. The results, along with a correlation matrix in Appendix C.3, indicate unproblematic levels of multicollinearity. Noteworthy correlations, such as between Ownership and Delta (0.6), did not significantly distort our model, as supported by the VIF tests. These results support the robustness of our regression findings, indicating that multicollinearity does not seem to undermine the findings of our study.

8.3 Causal Interpretation

Causal interpretations between explanatory and dependent variables in regression models must be approached cautiously. The literature on CEO equity incentives, corporate governance, leverage, and risk frequently discusses potential causal relationships and endogenous effects (Coles et al., 2006; Hayes et al., 2012; K. Kim et al., 2017; Lemmon et al., 2008; Strebulaev & Yang, 2013). The validity of causal interpretations depends on several assumptions, including exogeneity of the explanatory variables, correct model specification, and sufficient variation in data over time (Wooldrigde, 2019).

Furthermore, there must be linearity in parameters, sample variance in the independent variables, random sampling, and the error term should have a constant variance across levels of the independent variables, with an expected value of zero (Wooldrigde, 2019). The last assumption, the zero conditional mean assumption (ZCMA), says that the independent variables must be endogenous, meaning they cannot correlate with any of the unobserved determinants of leverage, captured in the error term. The fixed effects specification applied in our models removes some of this unobserved heterogeneity. This increases the likelihood that the ZCMA holds, potentially making our estimates more unbiased compared to, for instance, pooled OLS regressions. However, the use of a fixed-effects model is not sufficient in itself to state that the ZCMA holds. The biggest threat to violation of the ZCMA and causal interpretations is endogeneity (Wooldrigde, 2019). We have taken several additional robustness measures to deal with the issues of endogeneity and unobserved heterogeneity, as detailed in section 8.5.

Lemmon et al. (2008) emphasizes the importance of accounting for unobserved heterogeneity in leverage, suggesting that without accounting for entity-fixed effects (through, for instance, within-transformation) and autocorrelation (through, for instance, lagged variables and robust standard errors), causal interpretations remain unsupported. The FE model controls for unobserved heterogeneity by using within-unit variations over time, strengthening the potential validity of the ZCMA. The RE model, while efficient if its assumptions hold, requires that unobserved effects are uncorrelated with the independent variables. To tackle potential endogeneity in our study, we incorporate robustness checks with lagged independent variables, as detailed in Appendix A.5. These methods, including the use of lagged variables and robust standard errors, help mitigate concerns about reverse causality and strengthen the statistical reliability of our findings. However, we acknowledge that these measures do not prove causality.

8.3.1 Logit models

Making causal interpretations from logit models in panel data requires careful consideration of key assumptions, particularly due to the binary nature of the dependent variable and the structure of panel data. According to Aldrich and Nelson (1984), it is key that the independent variables are not highly correlated, to avoid multicollinearity. However, observations across entities over different time periods may be correlated. We therefor implement robust standard errors to adjust for within-entity autocorrelation. We have ensured that the included variables are not highly correlated, as shown in the Pearson Pairwise correlations in Appendix C.3 and VIF-tests in Appendix C.2.

Basic assumptions for the logistic regression include the independence of error terms, linearity for the continuous variables, absence of multicollinearity, and a lack of large and influential outliers (Aldrich & Nelson, 1984; Wooldrigde, 2019). Additionally, there should be a sufficient number of observations per independent variable to avoid overfitting (minimum 10-20 observations per variable). The model´s overall fit is assessed using various goodness-of-fit measures, such as the McFadden R-squared, where a better fit is indicated by a smaller difference between the observed and predicted values.

To address potential non-linearity, we transformed certain continuous variables into binary predictors, such as CEO Ownership, Options to Shares, and Delta. We have controlled that multicollinearity is not a significant issue by utilizing a covariance matrix and VIF-tests. Furthermore, we have controlled for outliers by winsorizing and log-transforming certain variables, as detailed in section 4.3.1. Additionally, the number of observations per independent variable exceeds the general threshold, as proposed by Aldrich and Nelson (1984) and Wooldrigde (2019), strengthening model stability. The overall fit of the models, measured by the McFadden R-squared, indicates a good fit, as detailed in Table 6.4. We still remain highly cautious in making any causal interpretations for the logistic regression model due to potential endogeneity and ommitted variable bias.

8.4 Endogeneity

Endogeneity presents a significant challenge when attempting to causally interpret the relationship between leverage levels and equity incentives, governance mechanisms, and CEO characteristics. Studies suggest that compensation incentives and capital structure decisions might not be independent, which poses potential endogeneity issues due to reverse causality or omitted variable bias (Armstrong & Vashishtha, 2012; Chava & Purnanandam, 2010; Coles et al., 2006; K. Kim et al., 2017). For instance, equity incentives and debt can be seen as alternative mechanisms to mitigate agency problems, where the former aligns CEO and shareholder interests, whilst the latter provides disciplinary effects.

Reverse causality occurs when the dependent variable influences the independent variable, contrary to our initial hypothesis. As a robustness test, we use lagged variables to assess the impact of the previous year´s independent variables on the current year's dependent variables (results detailed in Appendix A.5).

Even though instrumental variable (IV) regression is useful in addressing endogeneity, identifying a valid instrument that meets all the required criteria (no direct impact on the dependent variable, exogeneity, and relevance) has proven difficult. As a result, we have not implemented IVs in our model but have rather explored other robustness checks and methods to enhance the credibility of any potential causal claims.

8.5 Additional Robustness Measures

Several robustness tests have been performed to validate our analysis. Lemmon et al. (2008) suggests that firms tend to maintain their initial capital structures over time, and that much of the variation in leverage levels is driven by unobserved time-invariant effects, such as initial leverage. Strebulaev and Yang (2013) find that firms with zero- or almost-zero leverage initially tend to continue this policy. Both studies also find a negative relationship between dividend paying companies and leverage.

To account for these findings, we conducted an additional regression, detailed in Appendix A.3, which includes a proxy for initial firm leverage, defined as the leverage ratio in the firm´s first observation in our dataset. For this variable to have meaningful implications, we require at least three observations for a given firm. We also include an initial AZL dummy, as in the logit regressions, and a Dividend payer dummy, which equals 1 if a firm has paid dividends in any observation within our dataset.

The results of this additional regression, as shown in Appendix A.3, align with Lemmon et al. (2008). We find a strong and positive coefficient for the Initial Leverage Book Value variable, indicating that initial leverage levels are strongly related to current leverage levels. Moreover, firms with low initial leverage tend to move towards higher levels of leverage, as suggested by the positive and significant coefficient for the Initial AZL Indicator. Consistent with Lemmon et al. (2008) and Strebulaev and Yang (2013), we find a negative and significant coefficient for the Dividend Payer variable, indicating that dividend-paying firms tend to have lower leverage. Including these variables increases the explanatory power of our RE models in Appendix A.3, confirming that these variables influence leverage levels. However, the significance and coefficients of the other variables in the model remain largely unchanged, indicating that the findings in our main regression models are robust to the inclusion of these additional variables.

To further investigate the robustness of our results, we include additional regressions using lagged variables as Shown in Appendix A.5, following Lemmon et al. (2008) and Strebulaev and Yang (2013). These regressions use the previous year´s independent variables to predict the current year´s dependent variables, accounting for potentially delayed effects. As detailed in Appendix A.5, the model's explanatory power and the coefficients' direction and significance remain consistent when using lagged variables. This consistency further enhances the robustness of our coefficient estimates. Running the model with additional control variables as shown in Appendix A.4, as specified above, also shows higher explanatory power while maintaining similar results in terms of coefficients and significance.

9 Conclusion

This thesis investigates the influence of CEO entrenchment on capital structure within Norwegian firms, employing a dataset covering 2015-2022. Our analysis is driven by two main research questions: (1) How does managerial entrenchment influence the leverage levels of firms? (2) Are entrenched CEOs more likely to adopt zero- or almost-zero leverage policies?

Our empirical results indicate that entrenched CEOs, measured by low equity ownership, high fixed compensation, less stringent governance mechanisms (e.g. large boards and the absence of share blockholders), and longer tenures, tend to opt for lower levels of leverage.

Notably, the Options to Shares variable did not yield significant results across the dataset, perhaps due to the lack of detailed information on the options portfolio and the relatively small number of observations for this variable within our sample. However, industry-specific analysis in high-growth sectors like Software & Services and Pharmaceutical & Biotech reveal a positive relationship between Options to Shares and leverage, more in line with the literature.

The results from our logistic regression model are in line with our other empirical findings, indicating that older CEOs with lower equity ownership, higher fixed compensation, and longer tenures, are more likely to adopt zero- or almost-zero leverage policies.

To address endogeneity concerns, we have incorporated several robustness checks, including lagged variables and firm- and year-fixed effects, to strengthen the validity of our results. Despite these measures, we remain cautious in making any causal claims.

For future research, it could be interesting to collect more detailed data on the CEO options portfolio and the share blockholders. Exploring more advanced econometric methods, such as instrumental variable regression and exogenous shocks, could further highlight the potential causal relationships between the relationships of interest. Finally, exploring how the equity incentives provided to other key personnel influence capital structure would be interesting.

References

Aldrich, J. H., & Nelson, F. D. (1984). *Linear probability, logit, and probit models* (Vol. 45). SAGE Publications, Inc.

Arellano, M. (1987). Computing robust standard errors for within-groups estimators. *Oxford Bulletin of Economics and Statistics*, *49* (4), 431–434.

Armstrong, C. S., & Vashishtha, R. (2012). Executive stock options, differential risk-taking incentives, and firm value. *Journal of Financial Economics*, *104* (1), 70–88.

Baker, G. P., & Hall, B. J. (2004). Ceo incentives and firm size. *Journal of Labor Economics*, *22* (4), 767–798.

Barclay, M. J., & Smith Jr., C. W. (1995). The maturity structure of corporate debt. *The Journal of Finance*, *50* (2), 609–631.

Benson, B. W., & Davidson, W. N. (2009). Reexamining the managerial ownership effect on firm value. *Journal of Coporate Finance*, *15* (5), 573–586.

Berger, P., Opek, E., & Yermack, D. (1997). Managerial enctrenchment and capital structure decisions. *The Journal of Finance*, *52* (4), 1411–1438.

Bester, C. A., & Hansen, C. B. (2016). Grouped effects estimators in fixed effects models. *Journal of Econometrics*, *190* (1), 197–208.

Box, G. E. P., & Tidwell, P. W. (1962). Transformation of the independet variables. *Technometrics*, *4* (4), 531–550.

Brennan, M. J., & Schwartz, E. S. (1984). Optimal financial policy and firm valuation. *The Journal of Finance*, *39* (3), 593–607.

Carpenter, J. N. (2000). Does option compensation increase mangerial risk appetite? *The Journal of Finance*, *55* (5), 2311–2331.

Chava, S., & Purnanandam, A. (2010). Ceos versus cfos: Incentives and corporate policies. *Journal of Financial Economics*, *97* (2), 263–278.

Clark, T. S., & Linzer, D. A. (2015). Should i use fixed or random effects? *Political Science Research and Methods*, *3* (2), 399–408.

Coles, J. L., Daniel, N. D., & Naveen, L. (2006). Managerial incentives and risk-taking. *Journal of Financial economics*, *79* (2), 431–468.

Cremers, K. J. M., & Nair, V. B. (2005). Governance mechanisms and equity prices. *The Journal of Finance*, *60* (6), 2859–2894.

De Jong, A., Verbeek, M., & Verwijmeren, P. (2011). Firms debt-equity decisions when the static tradeoff theory and the pecking order theory disagree. *Journal of Banking and Finance*, *35* (5), 1303–1314.

DeAngelo, H., DeAngelo, L., & Whited, T. M. (2011). Capital structure dynamics and transitory debt. *Journal of Financial Economics*, *99* (1), 235–261.

DeAngelo, H., & Roll, R. (2015). How stable are corporate capital structures? *The Journal of Finance*, *70* (1), 373–418.

Devers, C. E., McNamara, G., Wiseman, R. M., & Arrfelt, M. (2008). Moving closer to the action: Examining compensation design effects on firm risk. *Organization Science*, *19* (4), 548–566.

Eckbo, B. E., & Kisser, M. (2021). The leverage-profitability puzzle resurrected. *Review of Finance*, *25* (4), 1089–1128.

Edmans, A., Gabaix, X., & Landier, A. (2009). A multiplicative model of optimal ceo incentives in market equilibrium. *The Review of Financial Studies*, *22* (12), 4881–4917.

Eisenhard, K. M. (1989). Agency theory: An assessment and review. *The Academy of Management Review*, *14* (1), 57–74.

European Commission. (2022). *EU trade relations with Norway. Facts, figures and latest developments* [Retrieved 18th of April 2024, from: https://www.norskpetroleum.no/en/production-and-exports/exports-of-oil-and-gas/].

Faccio, M., Marchica, M.-T., & Mura, R. (2016). Ceo gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of Corporate Finance*, *39* (1), 193–209.

Fama, E. F. (1980). Agency problems and the theory of the firm. *Journal of Political Economy*, *88* (2), 288–307.

Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, *47* (2), 427–465.

Flammer, C., Hong, B., & Minor, D. (2019). Corporate governance and the rise of intergrating corporate social responsibility criteria in executive compensation: Effectiveness and implications for firm outcomes. *Strategic Management Jounral*, *40* (7), 1097–1122.

Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: Which factors are reliably important? *Financial Management*, *38* (1), 1–37.

Frank, M. Z., & Goyal, V. K. (2015). The profits-leverage puzzle revisited. *Review of Finance*, *19* (4), 1415–1453.

Frank, Murray Z. and Goyal, Vidhan K. (2007). *Corporate Leverage: How Much Do Managers Really Matter?* [Available at SSRN: https://ssrn.com/abstract=971082].

Friend, I., & Lang, L. H. P. (1988). An empirical test of the impact of managerial self-interest on corporate capital structure. *The Journal of Finance*, *43* (2), 271–281.

Gaver, J. J., & Gaver, K. M. (1993). Additional evidence on the association between the investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Accounting and Economics*, *16* (1), 125–160.

Graham, J. R. (2000). How big are tax benefits of debt? *The Journal of Finance*, *55* (5), 1901–1941.

Graham, J. R., & Leary, M. T. (2011). A review of empirical capital structure research and directors for the future. *Annual Review of Financial Economics*, *3* (1), 1–59.

Grossman, Sanford J. and Hart, Oliver D. (1983). *Corporate Financial Structure and Managerial Incentives* [Available at SSRN: https://ssrn.com/abstract=578641].

Guay, W. R. (1999). The sensitivity of ceo wealth to equity risk: An analysis of the magnitude and determinants. *Journal of Financial Economics*, *53* (1), 43–71.

Harris, M., & Raviv, A. (1988). Corporate control contests and capital structure. *Journal of Financial Economics*, *20* (1), 55–86.

Harris, M., & Raviv, A. (1990). Capital structure and the informational role of debt. *The Journal of Finance*, *45* (2), 321–349.

Harris, M., & Raviv, A. (1991). The theory of capital structure. *The Journal of Finance*, *46* (1), 297–355.

Hayes, R. M., Lemmon, M., & Mingming, Q. (2012). Stock options and managerial incentives for risk taking: Evidence from fas 123r. *Journal of Financial Economics*, *105* (1), 174–190.

Holmstrom, B., & Milgrom, P. (1991). Multitask principal-agent analyses: Incentive contrasts, asset ownership, and job design. *Journal of Law, Economics and Organization*, *7* (1), 24–52.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate fincance, and takeovers. *The American Economic Review*, *76* (2), 323–329.

Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance*, *48*(3), 831–880.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behaviour, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360.

Jensen, M. C., & Murphy, K. J. (1990). Performance pay and top-management incentives. *Journal of Political Economy*, *98*(2), 225–264.

John, K., & Litov, L. (2010). Managerial entrenchment and capital structure: New evidence. *Journal of Empirical Legal Studies*, *7*(4), 693–742.

Kim, E. H., & Lu, Y. (2011). Ceo ownership, external governance, and risk-taking. *Journal of Financial Economics*, *102*(2), 272–292.

Kim, K., Patro, S., & Pereira, R. (2017). Option incentives, leverage, and risk-taking. *Journal of Corporate Finance*, *43*(1), 1–18.

Kim, W. S., & Sorensen, E. H. (1986). Evidence on the impact of the agency costs of debt on corporate debt policy. *The Journal of Financial and Quantative Analysis*, *21*(2), 131–144.

Kraus, A., & Litzenberger, R. (1983). On the distributional conditions for a consumption-oriented three moment capm. *The Journal of Finance*, *38*(5), 1381–1391.

Kwon, S. S., & Yin, Q. J. (2006). Executive compensation, investment oppurtunities, and earnings management: High-tech firms versus low-tech firms. *Journal of Accounting, Auditing and Finance*, *21*(2), 119–148.

Lambert, R. A., Larcker, D. F., & Verrecchia, R. E. (1991). Portfolio considerations in valuing executive compensation. *Journal of Accounting Research*, *29*(1), 129–149.

Lemmon, M. L., Roberts, M. R., & Zender, J. F. (2008). Back to the beginning: Persistence and the cross-section of corporate capital structure. *The Journal of Finance*, *63*(4), 1575–1608.

Lewellen, K. (2006). Financing decisions when managers are risk averse. *Journal of Financial Economics*, *82*(3), 551–589.

Lipton, M., & Lorsch, J. W. (1992). A modest proposal for improved corporate governance. *The Business Lawyer*, *48*(1), 59–77.

Martin, A. D., Nishikawa, T., & Williams, M. A. (2009). Ceo gender: Effects on valuation and risk. *Quarterly Journal of Finance and Accounting*, *48*(3), 23–40.

McConnell, J. J., & Servaes, H. (1990). Additional evidence on equity ownership and corporate value. *Journal of Financial Economics*, *27*(2), 595–612.

Milidonis, A., & Stathopoulos, K. (2014). Managerial incentives, risk aversion, and debt. *The Journal of Financial and Quantitative Analysis*, *49*(2), 453–481.

Mitton, T. (2024). Economic significance in corporate finance. *The Review of Corporate Finance Studies*, *13*(1), 38–79.

Morck, R., Shleifer, A., & Vishny, R. W. (1988). Management ownership and market valuation: An empirical analysis. *Journal of Financial Economics*, *20*(1), 293–315.

Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, *5*(2), 147–175.

Myers, S. C. (1984). The capital structure puzzle. *The Journal of Finance*, *39*(3), 575–592.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment descisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221.

Norsk Petroleum. (2024). *Exports of Oil and Gas* [Retrieved 18th of April 2024, from: https://www.norskpetroleum.no/en/production-and-exports/exports-of-oil-and-gas/].

Novaes, W. (2003). Capital structure choice when managers are in control: Entrenchment versus efficiency. *The Journal of Business*, *76*(1), 49–82.

Oslo Stock Exchange. (2022). *The Oslo Børs Code of Practice for IR* [Retrieved 5th of April 2024, from: https://www.euronext.com/sites/default/files/2021-03/52118_Oslo-Bors-Code-of-practice-IR_2021.pdf].

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? some evidence from international data. *The Journal of Finance*, *50*(5), 1421–1460.

Rosenstein, S., & Wyatt, J. G. (1990). Outside directors, board independence, and shareholder wealth. *Journal of Financial Economics*, *26*(2), 175–191.

Shleifer, A., & Vishny, R. W. (1986). Large shareholders and corporate control. *Journal of Political Economy*, *94*(3), 461–488.

Smith Jr., C. W., & Watts, R. L. (1992). The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics*, *32*(3), 263–292.

Strebulaev, I. A. (2007). Do tests of capital structure theory mean what they say? *The Journal of Finance*, *62*(4), 1747–1787.

Strebulaev, I. A., & Yang, B. (2013). The mystery of zero-leverage firms. *Journal of Financial Economics*, *109*(1), 1–23.

Stulz, R. M. (1988). Managerial control of voting rights: Financing policies and the market for corporate control. *Journal of Financial Economics*, *20*(1), 25–54.

Titman, S., & Wessel, R. (1988). The determinants of capital structure choice. *The Journal of Finance*, *43*(1), 1–19.

Verdipapirforetakenes Forbund. (2021). *Beskrivelse av hvordan OTC-systemet fungerer* [Retrieved 5th of April 2024, from: https://www.notc.no/content/download/1804/10775/version/2/file/Hvordan+OTC-systemet+fungerer.pdf].

Weisbach, M. S. (1988). Outside directors and ceo turnover. *Journal of Financial Economics*, *20*(1), 431–460.

Welch, I. (2004). Capital structure and stock returns. *Journal of Political Economy*, *112*(1), 106–131.

Williams, M. A., & Rao, R. P. (2006). Ceo stock options and equity risk incentives. *Journal of Business Finance and Accounting*, *33*(1-2), 26–44.

Wooldrigde, J. M. (2019). *Introductory econometrics: A modern approach* (7th ed.). South-Western College Publishing.

Yermack, D. (1995). Do corporations award ceo stock options effectively? *Journal of Financial Economics*, *39*(2-3), 237–269.

Yermack, D. (1996). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics*, *40*(2), 185–211.

Zwiebel, J. (1996). Dynamic capital structure under managerial entrenchment. *The American Economic Review*, *86*(5), 1197–1215.

Appendices

A Additional regressions

Table A.1: Determinants of Capital Structure Levels - Options Subsamples

The table presents the results of Fixed effects regression on subsamples for Low and High Options stakes (25th and 75th percentile). In column 1 and 2 we run the FE regression on the option subsamples with Leverage Book value as dependent variable. In column 3 and 4 we run the FE models on the subsamples with Leverage Market Value as dependent variable. All regressions are controlled for time effects and includes the use of robust standard errors. Blank spaces indicates no observations. One star, two stars, and three stars indicate statistical significance at 10%, 5% and 1%, respectively. For detailed variable description see Appendix B.1.

	Dependent variable:			
	Leverage Book Value		Leverage Market Value	
	Low Options	High Options	Low Options	High Options
Total Remuneration	0.0448	0.0053	−0.0228	−0.0256
	(0.0396)	(0.0124)	(0.0189)	(0.0162)
Ownership	0.5502*	0.2963	0.2600***	0.7126
	(0.3022)	(0.7031)	(0.0958)	(0.7635)
Options to Shares		−0.6638		0.7328
		(2.4642)		(2.0233)
Delta	−0.3124**	−0.2369**	−0.1463***	−0.3459***
	(0.1543)	(0.0955)	(0.0287)	(0.1253)
Board Size	−0.0229	−0.0089	0.0009	−0.0076
	(0.0149)	(0.0080)	(0.0125)	(0.0101)
Percent of Outside Directors	−0.1715	0.0871	−0.1053	0.0691
	(0.1368)	(0.1251)	(0.0956)	(0.0780)
Blockholder Indicator	0.0967***	0.0694*	0.1028*	0.1236**
	(0.0201)	(0.0355)	(0.0537)	(0.0609)
CEO Age	−0.0032	0.0010	−0.0051**	0.0055**
	(0.0030)	(0.0015)	(0.0021)	(0.0026)
CEO Tenure	0.0110	−0.0035	0.0350*	−0.0092
	(0.0289)	(0.0231)	(0.0192)	(0.0244)
CEO Gender	0.0220	−0.0159	−0.0581	0.0374
	(0.0398)	(0.0267)	(0.0396)	(0.0276)
Total Assets	0.0453	0.0199	0.0988***	0.0546*
	(0.0302)	(0.0322)	(0.0187)	(0.0282)
CAPEX	0.6971**	0.0109	0.2482**	0.0210
	(0.3039)	(0.0257)	(0.1038)	(0.0306)
MTB	−0.0063	0.0163***	−0.0111***	−0.0022
	(0.0057)	(0.0059)	(0.0033)	(0.0048)
ROA	−0.2798**	−0.0504	−0.0976***	−0.1085*
	(0.1340)	(0.0476)	(0.0229)	(0.0559)
R&D	−0.1344	−0.2031	−0.0178	−0.1729
	(0.0975)	(0.1735)	(0.0437)	(0.2089)
Time effects	Yes	Yes	Yes	Yes
Observations	651	243	652	243
R^2	0.3534	0.3683	0.2632	0.2931
Adjusted R^2	0.1661	0.0262	0.0502	−0.0896

Table A.2: Determinants of Capital Structure Levels - Industry Subsamples (Market)

The table presents the results of Fixed effects regression with leverage market value as dependent variable on subsets of the largest industries in the data sample. The regressions are controlled for time effects and includes the use of robust standard errors. Blank spaces indicates no observations. One star, two stars, and three stars indicate statistical significance at 10%, 5% and 1%, respectively. For detailed variable description see Appendix B.1

	Dependent variable: Leverage Market Value							
	Cap. Goods	Energy	Food & Bev	Tech	Transport	Pharma and bio	Comm. Services	Software
Total Remuneration	0.0701*	-0.0021	0.0079	-0.0291	0.0393	-0.0259	0.0256	0.0440*
	(0.0362)	(0.0307)	(0.0138)	(0.0179)	(0.0454)	(0.0173)	(0.0900)	(0.0251)
Ownership	0.2506**	0.4692	0.0618	-2.5623	-0.6013	3.9552	-2.4348	0.3281
	(0.1081)	(0.3443)	(0.0856)	(2.3877)	(0.7859)	(2.5116)	(1.6868)	(0.6954)
Options to Shares	-6.9055	-5.7622	2.6095	-4.1409*	-6.3696	2.2955**	-8.0387	0.5940
	(4.5788)	(6.3000)	(3.3311)	(2.5029)	(5.6285)	(1.0895)	(6.4212)	(1.7326)
Delta	-0.1083***	-0.0396	0.0299	-0.0285	0.1287	0.2108	-0.2016	-0.0015
	(0.0402)	(0.0655)	(0.0251)	(0.0663)	(0.2672)	(0.9316)	(0.1267)	(0.0827)
Board Size	0.0479**	-0.0324**	-0.0030	-0.0079	-0.0165	0.0123	-0.0170	0.0427
	(0.0209)	(0.0139)	(0.0109)	(0.0146)	(0.0281)	(0.0098)	(0.0191)	(0.0401)
Percent of Outside Directors	0.2303	-0.0401	0.2443***	-0.3189**	0.4571***	0.0307	0.1565	-0.0737
	(0.2309)	(0.1414)	(0.0593)	(0.1324)	(0.1386)	(0.0254)	(0.2197)	(0.1444)
Blockholder Indicator	0.2706***	0.1633*				0.0517		
	(0.0707)	(0.0884)				(0.0318)		
CEO Age	0.0053*	-0.0020	-0.0031	0.00003	-0.0050	0.0047*	0.0130	0.0128**
	(0.0030)	(0.0036)	(0.0020)	(0.0049)	(0.0061)	(0.0028)	(0.0102)	(0.0062)
CEO Tenure	-0.0721*	0.0265	-0.0436***	-0.0143	0.0060	-0.0210	-0.1067***	-0.0666*
	(0.0402)	(0.0323)	(0.0117)	(0.0368)	(0.0417)	(0.0143)	(0.0299)	(0.0382)
CEO Gender	-0.0341	-0.0865		0.1522***	-0.0858	0.3406***	0.0228	0.1820
	(0.0673)	(0.0775)		(0.0554)	(0.1169)	(0.1214)	(0.1442)	(0.1300)
Total Assets	0.1473***	0.0831***	-0.0072	0.0239	-0.0084	0.0254*	0.1126	0.0846***
	(0.0490)	(0.0191)	(0.0293)	(0.0260)	(0.0901)	(0.0132)	(0.0834)	(0.0241)
CAPEX	-0.1393	0.0112	0.2669**	0.9403***	0.0563	0.2474	-0.1385	0.7290*
	(0.2363)	(0.0071)	(0.1095)	(0.1387)	(0.1958)	(0.1571)	(0.1223)	(0.3786)
MTB	-0.0374***	-0.0056	-0.0593***	-0.0132**	-0.0515**	0.0004	-0.0118**	-0.0226*
	(0.0120)	(0.0094)	(0.0059)	(0.0053)	(0.0244)	(0.0015)	(0.0049)	(0.0124)
ROA	-0.4257***	-0.0459***	-0.0516	-0.0362	-0.3805***	-0.0105	-0.3264***	-0.1616
	(0.1435)	(0.0143)	(0.1868)	(0.0365)	(0.1238)	(0.0122)	(0.0862)	(0.2590)
R&D	4.1510*	-1.8514	-17.4231***	-0.1749		0.0339*	-0.3704	-20.8187**
	(2.2506)	(1.9199)	(5.5495)	(0.1536)		(0.0204)	(1.2679)	(9.7509)
Time effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	108	261	69	79	78	55	46	45
R^2	0.7160	0.3329	0.8670	0.6758	0.6414	0.6881	0.8315	0.8627
Adjusted R^2	0.5780	0.1370	0.7681	0.4381	0.3998	0.2982	0.5540	0.5973
F Statistic	8.2525***	4.5587***	12.7145***	4.4669***	4.1144***	2.4068**	4.1944***	4.4892***

Table A.3: Additional Determinants of Capital Structure

The table presents the Fixed Effects and Random Effects regressions with added proxies for initial leverage level, initial AZL and a dividend payer dummy variable to test the robustness of our main regression. The regressions are controlled for time effects and includes the use of robust standard errors. One star, two stars, and three stars indicate statistical significance at 10%, 5% and 1%, respectively. For detailed variable description see Appendix B.1

	Fixed Effects		Random Effects	
	Leverage Book Value	Leverage Market Value	Leverage Book Value	Leverage Market Value
Total Remuneration	0.0145	-0.0142	0.0105	-0.0255*
	(0.0229)	(0.0142)	(0.0225)	(0.0133)
Ownership	0.4033*	0.2686***	0.3362*	0.2792***
	(0.2354)	(0.1021)	(0.1825)	(0.0980)
Options to Shares	-3.5014	-2.6712	-3.4663	-1.6873
	(2.3341)	(2.0379)	(2.5196)	(1.7925)
Delta	-0.2041*	-0.1335***	-0.1415*	-0.1207***
	(0.1206)	(0.0276)	(0.0841)	(0.0254)
Board Size	-0.1771**	0.0037	-0.1565**	-0.0148
	(0.0782)	(0.0712)	(0.0625)	(0.0550)
Percent of Outside Directors	-0.0809	-0.0122	-0.0523	-0.0088
	(0.0857)	(0.0699)	(0.0645)	(0.0573)
Blockholder Indicator	0.0786***	0.1079**	0.0923***	0.1161**
	(0.0278)	(0.0509)	(0.0284)	(0.0501)
CEO Age	-0.0018	-0.0012	-0.0020	-0.0015
	(0.0021)	(0.0020)	(0.0016)	(0.0016)
CEO Tenure	0.0064	0.0155	0.0103	0.0243*
	(0.0195)	(0.0149)	(0.0145)	(0.0125)
CEO Gender	0.0017	-0.0325	0.0137	-0.0260
	(0.0274)	(0.0292)	(0.0244)	(0.0273)
Total Assets	0.0219	0.0828***	0.0265**	0.0585***
	(0.0218)	(0.0178)	(0.0107)	(0.0113)
CAPEX	0.0325	0.0292*	0.0344	0.0308*
	(0.0315)	(0.0153)	(0.0349)	(0.0157)
MTB	0.0003	-0.0082***	-0.0025	-0.0116***
	(0.0053)	(0.0029)	(0.0055)	(0.0030)
ROA	-0.1696	-0.0622***	-0.1849	-0.0528***
	(0.1306)	(0.0188)	(0.1464)	(0.0198)
R&D	-0.1063	-0.0351	-0.2279	-0.0630
	(0.1025)	(0.0519)	(0.1550)	(0.0709)
Initial Leverage			0.8331***	0.6768***
			(0.0819)	(0.0889)
Initial AZL Indicator			0.0691*	0.0429
			(0.0379)	(0.0436)
Dividend Paid			-0.0020	-0.0904***
			(0.0348)	(0.0332)
Constant			-0.3563	-0.5355*
			(0.3202)	(0.3173)
Time effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Observations	970	971	970	971
R^2	0.2197	0.1963	0.3217	0.3656
Adjusted R^2	0.0620	0.0340	0.2909	0.3369

Table A.4: Additional Determinants of Capital Structure - Lagged

The table presents our Fixed effect and Random effects models, but all variables are lagged with one year. There is also added proxies for initial leverage level, initial AZL and a dividend payer dummy variable. The regressions are controlled for time effects and includes the use of robust standard errors. One star, two stars, and three stars indicate statistical significance at 10%, 5% and 1%, respectively. For detailed variable description see Appendix B.1

	Fixed Effects		Random Effects	
	Leverage Book Value	Leverage Market Value	Leverage Book Value	Leverage Market Value
Total Remuneration	0.0023	-0.0085	0.0002	-0.0200*
	(0.0137)	(0.0112)	(0.0141)	(0.0108)
Ownership	0.5682*	0.1971*	0.4476**	0.1967**
	(0.2960)	(0.1076)	(0.2137)	(0.1002)
Options to Shares	-2.3976	-1.3677	-2.7069	-0.6947
	(2.2898)	(2.1480)	(2.4501)	(1.9213)
Delta	-0.2710*	-0.0681**	-0.1683	-0.0506**
	(0.1591)	(0.0285)	(0.1029)	(0.0223)
Board Size	-0.1206*	0.0522	-0.1218**	0.0252
	(0.0672)	(0.0483)	(0.0573)	(0.0378)
Percent of Outside Directors	-0.0406	0.0194	-0.0224	0.0098
	(0.0605)	(0.0426)	(0.0500)	(0.0377)
Blockholder Indicator	0.0173	0.0119	0.0467	0.0313
	(0.0381)	(0.0442)	(0.0406)	(0.0508)
CEO Age	-0.0004	0.0006	-0.0013	-0.0002
	(0.0019)	(0.0024)	(0.0015)	(0.0019)
CEO Tenure	0.0059	0.0052	0.0123	0.0166
	(0.0139)	(0.0155)	(0.0111)	(0.0132)
CEO Gender	-0.0053	-0.0121	0.0133	-0.0060
	(0.0315)	(0.0146)	(0.0297)	(0.0159)
Total Assets	0.0234	0.0734***	0.0279***	0.0507***
	(0.0196)	(0.0177)	(0.0094)	(0.0106)
CAPEX	0.0202*	0.0105	0.0201	0.0106
	(0.0117)	(0.0110)	(0.0139)	(0.0103)
MTB	0.0041	-0.0038*	-0.0010	-0.0081***
	(0.0079)	(0.0022)	(0.0074)	(0.0020)
ROA	-0.2171***	-0.0450	-0.2592**	-0.0424
	(0.0676)	(0.0293)	(0.1007)	(0.0263)
R&D	-0.1368**	0.0496	-0.2722*	-0.0077
	(0.0616)	(0.0350)	(0.1475)	(0.0500)
Initial Leverage			0.7969***	0.6652***
			(0.0920)	(0.0893)
Initial AZL Indicator			0.0774*	0.0582
			(0.0415)	(0.0442)
Dividend Paid			0.0035	-0.0877***
			(0.0299)	(0.0341)
Constant			-0.3052	-0.5767**
			(0.2432)	(0.2680)
Time effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Observations	832	833	832	833
R^2	0.2276	0.1304	0.3112	0.3299
Adjusted R^2	0.0405	-0.0798	0.2755	0.2952

Table A.5: Determinants of Capital Structure - Lagged

The table presents our Fixed effect and Random effects models, but all variables are lagged by one year. The regressions are controlled for time effects and includes the use of robust standard errors. One star, two stars, and three stars indicate statistical significance at 10%, 5% and 1%, respectively. For detailed variable description see Appendix B.1

	Fixed Effects		Random Effects	
	Leverage Book Value	Leverage Market Value	Leverage Book Value	Leverage Market Value
Total Remuneration	0.0023	-0.0085	-0.0048	-0.0207*
	(0.0137)	(0.0112)	(0.0142)	(0.0110)
Ownership	0.5682*	0.1971*	0.5016**	0.1995*
	(0.2959)	(0.1076)	(0.2378)	(0.1022)
Options to Shares	-2.3976	-1.3677	-2.7068	-0.8648
	(2.2896)	(2.1477)	(2.3126)	(1.9628)
Delta	-0.2710*	-0.0681**	-0.2012*	-0.0540**
	(0.1591)	(0.0285)	(0.1192)	(0.0240)
Board Size	-0.1206*	0.0522	-0.1750***	-0.0055
	(0.0672)	(0.0483)	(0.0590)	(0.0401)
Percent of Outside Directors	-0.0406	0.0194	-0.0312	0.0034
	(0.0605)	(0.0426)	(0.0492)	(0.0384)
Blockholder Indicator	0.0173	0.0119	0.0356	0.0260
	(0.0381)	(0.0442)	(0.0405)	(0.0490)
CEO Age	-0.0004	0.0006	-0.0012	-0.0004
	(0.0019)	(0.0024)	(0.0016)	(0.0020)
CEO Tenure	0.0059	0.0052	0.0126	0.0149
	(0.0139)	(0.0155)	(0.0124)	(0.0138)
CEO Gender	-0.0053	-0.0121	0.0151	-0.0032
	(0.0315)	(0.0146)	(0.0319)	(0.0158)
Total Assets	0.0234	0.0734***	0.0407***	0.0616***
	(0.0196)	(0.0177)	(0.0118)	(0.0112)
CAPEX	0.0202*	0.0105	0.0194	0.0100
	(0.0117)	(0.0110)	(0.0125)	(0.0102)
MTB	0.0041	-0.0038*	0.0016	-0.0068***
	(0.0079)	(0.0022)	(0.0076)	(0.0021)
ROA	-0.2171***	-0.0450	-0.2504***	-0.0487*
	(0.0675)	(0.0293)	(0.0901)	(0.0279)
R&D	-0.1368**	0.0496	-0.2391**	0.0125
	(0.0616)	(0.0350)	(0.1208)	(0.0363)
Constant			-0.0941	-0.5733*
			(0.2705)	(0.3011)
Time effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Observations	839	840	839	840
R^2	0.2276	0.1304	0.2396	0.2365
Adjusted R^2	0.0325	-0.0889	0.2034	0.2002

Table A.6: Determinants of Zero-leverage Policy with Control Variables

The table presents the results of our logistic regressions. Column 1 illustrates how the independent variables influence the likelihood of a firm being almost zero leverage (AZL). Column 2 illustrates how the independent variables influence the likelihood of a firm being zero-leverage (ZL). Both regressions are controlled for time and industry effects. We have also controlled for Total Assets, CAPEX, MTB, ROA, R&D and First AZL Indicator. McFadden‘s R-squared is used as a measure of goodness of fit for the models, and is calculated as 1 subtracted by the log-likelihood of the null model divided by the log-likelihood fitted model. One star, two stars, and three stars indicate statistical significance at 10%, 5% and 1%, respectively. For detailed variable description see Appendix B.1

	Dependent variable:	
	Almost Zero Leverage	Zero Leverage
Total Remuneration	0.410	0.685**
	(0.267)	(0.344)
Ownership	−1.743***	−2.806***
	(0.573)	(0.699)
Options to Shares	−0.224	0.218
	(0.290)	(0.412)
Delta	0.286	1.217
	(0.658)	(0.942)
Board Size	−0.791	−1.267
	(0.697)	(1.053)
Percent of Outside Directors	1.562**	1.212
	(0.617)	(0.769)
Blockholder Indicator	−0.494	16.089***
	(1.115)	(0.839)
CEO Age	0.006	0.103***
	(0.021)	(0.026)
CEO Tenure	0.487**	0.749***
	(0.206)	(0.273)
CEO Gender Indicator	−1.033**	−2.801***
	(0.442)	(0.677)
Initial AZL Indicator	37.778***	2.711***
	(0.736)	(0.818)
Total Assets	−0.941***	−1.145***
	(0.143)	(0.192)
CAPEX	−0.739	−1.202*
	(0.660)	(0.645)
MTB	0.097**	0.074
	(0.044)	(0.059)
ROA	0.009	0.207
	(0.753)	(0.908)
R&D	3.060	0.786
	(1.943)	(2.194)
Constant	−20.976***	−22.973***
	(4.096)	(4.913)
Time effects	Yes	Yes
Industry effects	Yes	Yes
McFadden's R-squared	0.4916	0.5425
Observations	986	986

B Variable description

Table B.1: Variable Description

The table presents a description of the variables that is used in our empirical analysis.

Variable	**Description**
Leverage Book Value	Total debt (book) divided by total assets (book value)
Leverage Market Value	Total debt (book value) divided by (total debt (book value) + equity (market value))
Total Remuneration	Natural logarithm of salary + Non-equity compensation for the CEO
Ownership	CEO stock holdings divided by total shares outstanding
Options to Shares	CEO option holdings divided by total shares outstanding
Blockholder Indicator	Indicator variable. Takes the value 1 if there is a presence of at least one 5 percent blockholder, 0 otherwise
Delta	Measure of CEOs wealth-performance sensitivity. Measures NOK change in CEOs wealth of a one percent change in share price
Board size	Natural logarithm of total directors in the board the given year
Percent of Outside Directors	The ratio of outside directors present in the board
CEO Age	The age of the CEO measured in years
CEO Tenure	Number of years the CEO has had in the role
CEO Gender	Indicator variable. Takes the value 1 if the CEO is male, 0 if female
Total Assets	Natural logarithm of the book value of total assets
CAPEX	Capital expenditures divided by total assets
MTB	Market to book ratio
ROA	Return on assets. Income before discontinued operations and extraordinary items divided by average total assets
R&D	Research and development expenditures divided by total assets.
Low options	Below 25th percentile of Options to Shares
High Options	Above 75th percentile of Options to Shares
Almost Zero Leverage(AZL)	Firm with below 5% leverage book value
Zero Leverage(ZL)	Firm with below 0.5% leverage book value
Initial AZL Indicator	Indicator variable. Takes the value 1 if the first observation of a firm in the sample is Almost Zero Leverage (AZL)
Initial Leverage	Leverage ratio in the first observation (the first year) in our data sample (Book Value)
Dividend Paid	Indicator variable. Takes the value 1 if the firm paid out dividend in any of the years in our data sample, 0 otherwise

C Robustness tests

Table C.1: Summary of Statistical Tests

The table presents results from Wald and Breusch-Pagan tests to indicate heteroscedasticity in the Fixed Effects and Random Effects models. At last we have conducted a Hausman test which suggest whether the Fixed Effects or Random Effects model fits better when using Leverage Book Value and Leverage Market Value as dependent value, respectively.

Test	Statistic	p-value	Model
Wald	103.986001	0.0000000	Fixed Effects BV
Wald	50.479028	0.0000000	Fixed Effects MV
Wald	167.104776	0.0000000	Random Effects BV
Wald	106.829810	0.0000000	Random Effects MV
Breusch-Pagan	63.694209	0.0000000	Fixed Effects BV
Breusch-Pagan	8.861765	0.0029121	Fixed Effects MV
Breusch-Pagan	151.706460	0.0000000	Random Effects BV
Breusch-Pagan	27.211863	0.0000002	Random Effects MV
Hausman	29.623760	0.1278993	Book Value
Hausman	51.901721	0.0003225	Market Value

Table C.2: Variance Inflation Factors to assess Multicollinearity

The table presents Variance Inflation Factor (VIF) tests to assess multicollinearity. In order to do so we run a linear model for the Fixed Effects and Random Effects Regressions with Leverage Book Value (BV) and Leverage Market Value (MV) as dependent variable.

Variable	VIF for BV	VIF for MV	1/VIF for BV	1/VIF for MV
Total Remuneration	1.778325	1.781816	0.5623270	0.5612253
Ownership	1.682276	1.682417	0.5944329	0.5943828
Options to Shares	1.101201	1.100678	0.9080997	0.9085307
Delta	1.885922	1.886035	0.5302447	0.5302129
Board Size	1.672741	1.673233	0.5978213	0.5976453
Percent of Outside Directors	1.242000	1.240399	0.8051533	0.8061920
Blockholder Indicator	1.129019	1.129864	0.8857246	0.8850624
CEO Age	1.148030	1.147846	0.8710572	0.8711973
CEO Tenure	1.223146	1.224319	0.8175641	0.8167807
CEO Gender	1.047677	1.047187	0.9544924	0.9549389
Total Assets	2.520461	2.527162	0.3967528	0.3957007
CAPEX	1.014993	1.014943	0.9852289	0.9852766
MTB	1.235044	1.235048	0.8096877	0.8096854
ROA	1.161067	1.161303	0.8612768	0.8611015
R&D	1.199355	1.199148	0.8337815	0.8339252

Table C.3: Correlation matrix

The table presents the Pearson´s Pairwise correlations between the variables that is used in the empirical analysis. Correlations marked with one star are significant at 5% level

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Total remuneration (1)	**1.00**														
Ownership (2)	-0.13*	**1.00**													
Options to Shares (3)	-0.03	-0.07*	**1.00**												
Delta (4)	-0.23*	0.60*	-0.11*	**1.00**											
Board Size (5)	0.40*	-0.11*	-0.11*	-0.07*	**1.00**										
Percent of Outside Directors (6)	0.01	0.03	0.14*	0.08*	-0.32*	**1.00**									
Blockholder Indicator (7)	-0.17*	-0.02	0.06	0.08*	-0.14*	0.00	**1.00**								
CEO Age (8)	0.13*	0.23*	-0.07*	0.24*	-0.02	0.02	0.01	**1.00**							
CEO Tenure (9)	-0.00	0.08*	-0.04	0.02	0.12*	-0.05	-0.06*	0.27*	**1.00**						
CEO Gender (10)	0.09*	0.07*	-0.04	0.09*	-0.00	0.11*	-0.00	0.13*	0.02	**1.00**					
Total Assets (11)	0.54*	-0.08*	-0.25*	0.03	0.52*	-0.17*	-0.28*	0.03	0.06*	0.08*	**1.00**				
CAPEX (12)	0.01	0.02	-0.02	0.04	0.03	-0.00	-0.05	0.02	0.01	0.00	0.07*	**1.00**			
MTB (13)	-0.01	0.09*	0.07*	0.09*	0.04	0.02	0.11*	0.04	0.05	-0.03	-0.27*	0.03	**1.00**		
ROA (14)	0.07*	0.05	-0.15*	0.05	0.13*	-0.08*	-0.08*	0.11*	-0.04	0.00	0.27*	0.09*	-0.06*	**1.00**	
R&D (15)	-0.04	-0.06	0.07*	-0.06	-0.01	0.14*	0.07*	0.07*	0.10*	-0.01	-0.24*	0.01	0.25*	-0.18*	**1.00**