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in finance

**Does ownership structure explain the zero-leverage
puzzle?**

Evidence from the Swedish stock market

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Abstract

Title/Research question: Does ownership structure explain the zero-leverage puzzle?

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Theoretical framework: Modigliani and Miller Theorems, Trade-off Theory, Pecking Order Theory, Market Timing Theory, Agency theory, theories regarding ownership structure.

Method: Quantitative approach using logit model regressions with panel data to interpret the relationship between ownership structure and zero- and almost zero-leverage.

Conclusion: The results confirm that the zero-leverage phenomenon does indeed exist on the Swedish market and that the characteristics of these firms are largely consistent with research from other countries. The main finding of this thesis is that ownership structure can partly explain the zero-leverage puzzle in financially constrained firms only.

Key words: Zero-leverage puzzle, zero-leverage, almost zero-leverage, ownership structure, concentrated ownership, diffuse ownership, owner identity, institutional owners, private owners.

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1 Introduction

This chapter provides a background and problem discussion that forms the basis for the thesis. Additionally the purpose and the research contribution will be presented along with the research question. Finally, the chapter ends with the thesis outline.

1.1 Background

The zero-leverage puzzle is a mystery in the field of corporate finance, since, according to capital structure theories such as the Modigliani and Miller Theorems, the Trade-off Theory, the Pecking Order Theory, and the Market Timing Theory, companies should have at least some debt on their balance sheet (Modigliani & Miller, 1958, 1963; Kraus & Litzenberger, 1973; Myers & Majluf, 1984; Baker & Wurgler, 2002). However, that is not always the case as well-known companies worldwide, such as Apple, H&M and Amazon.com, have been known for being debt free. But how can this possible lack of debt in a firm's capital structure be explained? This is a question researchers all over the world have been trying to answer but none have, to our knowledge, been able to fully explain this puzzle (Strebulaev & Yang, 2013; Dang, 2013; Bessler, Drobetz, Haller & Meier, 2013).

The zero-leverage puzzle has been widely reported by the financial press in the United States, and at the end of the last fiscal year 25 firms out of the S&P 500 index were debt free (Krantz, 2014). Contrastingly, even though this phenomenon also exists in the European market, media evidence is much harder to come by. Nevertheless, Bessler et al. (2013) conducted an international research on the zero-leverage phenomenon where 15 out of the 20 countries they researched were European. They conclude that zero-leverage exists in all 20 countries they studied, where the lowest percentage of zero-leverage firms was found in the United Kingdom (2,58%), while the highest was in Australia (38,13%). An interesting fact is that Norway, Finland and Denmark were included in their study, while Sweden was left out. Therefore, a search for zero-leverage information on the Swedish market was conducted without any luck, which triggered an interest in researching the zero-leverage puzzle in Sweden.

When researching the zero-leverage phenomenon, the fact that zero-leverage may not be voluntary needs to be addressed. In many cases firms would like to have some debt on their balance sheet, but due to certain firm characteristics they possess, they simply cannot. This is more likely for smaller, younger firms with more volatile earnings and less tangibility (Strebulaev & Yang, 2013; Dang, 2013; Bessler et al., 2013). Generally, this applies to firms on smaller markets that are usually excluded from this type of research. In this research, however, the smaller exchanges in Sweden will be included, and therefore it is essential to see if the firms examined here hold zero-leverage willingly or not.

1.2 Problem discussion

The phenomenon in question was first referred to as the zero-leverage puzzle by Strebulaev and Yang in their working paper from 2006 which was later published in the *Journal of Financial Economics* in 2013. In their research two dependent variables were used, zero-leverage and almost zero-leverage. In this research, however, the dependent variable will be a combination of both.

In recent years interest in the zero-leverage phenomenon has increased which is evident when considering the number of published articles addressing this puzzle (Devos, Dhillon, Jagannathan and Krishnamurthy, 2012; Bessler et al., 2013; Byoun & Xu, 2013; Dang, 2013; Strebulaev & Yang, 2013). Existing literature addresses the puzzle from many different angles, such as managerial features and governance characteristics (Devos et al., 2012; Byoun & Xu, 2013; Strebulaev & Yang, 2013), firm specific factors such as age, size, profitability, tangibility, industry etc. (Bessler et al., 2013; Dang, 2013; Strebulaev & Yang, 2013), and macroeconomic factors, like GDP growth rate (Dang, 2013).

Despite this growing literature none have, as far as we have observed, tried to explain the zero-leverage puzzle primarily with ownership structure, though Devos et al. (2012) use block ownership as a proxy for external governance mechanism in a study on the relationship between zero-leverage and management entrenchment. Ownership is believed to influence corporate governance and firm specific factors, such as capital structure (Shleifer & Vishny, 1997; Thomsen & Pedersen, 2000). Therefore, it is not unlikely that ownership structure could explain the zero-leverage puzzle.

When further examining ownership structure, the focus will be on two types of ownership distinctions: diffuse ownership and concentrated ownership. When ownership

is diffuse no single investor has incentive to monitor, and therefore the manager may end up with excessive power (Holderness, 2009). Due to the manager's risk aversion he may use his power to limit risk in the capital structure, possibly resulting in zero-leverage. However, when ownership is concentrated large investors have more incentive to monitor, limiting the free-rider problem, and therefore the opportunistic behaviour of managers which should reduce the probability of a firm having zero-leverage (Shleifer & Vishny, 1986). Furthermore, ownership identity will be examined as well, since it is known that the identity of the largest controlling owner may affect capital structure. It is worth noting, however, that when ownership is diffuse owner identity is irrelevant since no single investor has decisive power (Thomsen & Pedersen, 2000).

The ownership structure in Sweden differs from the much researched Anglo-Saxon model, in that ownership in Sweden is much more concentrated, and even supported by the government. The concentration is a result of extensive use of dual class shares and pyramidal structures, which generates a large gap between cash-flow rights and control rights (Agnblad, Berglöf, Högfeldt & Svancar, 2002). Moreover, the Swedish civil law legal system promotes ownership concentration since it is known to have weaker investor protection than common law countries such as the United States (La Porta, Lopez-de-Silanes, Shleifer & Vishny, 2000). The Swedish model promotes institutional ownership where large commercial banks, such as SEB and Svenska Handelsbanken (SHB), are often block owners in successful Swedish corporations, supporting them financially. Furthermore, block ownership is also common among Swedish families such as the Wallenberg family and the Kamprad family (Agnblad et al., 2002). This high degree of ownership concentration makes researching the zero-leverage phenomenon in the Swedish market really interesting.

The purpose of this research is to fill the gap in this field of research by testing the relationship between ownership structure and zero-leverage. Which leads to the research question:

Does ownership structure explain the zero-leverage puzzle?

1.3 Research contribution

This study contributes to the research field in at least two ways. Firstly, it is unique since, to our knowledge, there has not been any previous research attempting to explain the puzzle primarily with ownership structure. Secondly, this research will be conducted on listed Swedish firms on the NASDAQ OMX, First North, NGM and AktieTorget stock exchanges. In this regard, the research distinguishes itself from other related work on the zero-leverage puzzle, since it not only examines the largest stock exchange but also considers the smaller markets.

1.4 Outline

This paper is organized as follows: after the introduction, section 2 will provide the theoretical background, which forms the foundation for the thesis. Section 3 then describes the data and methodology of the study and section 4 presents the univariate analysis. Section 5 then reports and discusses the multivariate analysis and finally, section 6 presents the concluding discussion.

2 Literature review and hypotheses

In the subsequent chapter theoretical framework and relevant previous literature will be reviewed and hypotheses constructed. The purpose is to provide the reader with sufficient understanding of the theoretical foundation that will be used to form the hypotheses of the thesis. Furthermore, this chapter provides a framework for analysing the results of the research.

2.1 Theoretical Framework

In the following section the theoretical foundation will be reviewed. Starting with theories from the capital structure field, moving on to agency problems, and finishing with ownership structure theories. At the end of each subchapter, theoretical implications for zero-leverage are explored.

2.1.1 Capital structure

2.1.1.1 *Modigliani & Miller Theorems*

In 1958 Modigliani and Miller set forth the first capital structure theory, in which they state that there exists no such thing as an optimal structure. It is called the irrelevance proposition theorem, suggesting that capital structure is irrelevant when it comes to firm value. However, due to their strict assumptions; (1) the firm's investment decisions are pre-determined, (2) no corporate or personal taxes, (3) no financial distress costs, (4) information is symmetric to all market participants and (5) no transactions or issuance costs, their theory only holds in a perfect market.

In 1963 they published a correction of their earlier propositions, and relaxed the assumption of no taxes. In doing so, they withdrew their statement of no optimal capital structure, and instead proposed that there exists an optimal capital structure and it consists of only debt. The logic being that interest payments are tax deductible, while dividends are not, resulting in a higher firm value when including more debt.

2.1.1.2 *Trade-off Theory*

Relaxing the assumption of no financial distress costs, in addition to the no tax assumption, many researchers have shown that the value of the firm is affected by its

capital structure (Kraus & Litzenberger, 1973; Bradley, Jarrell & Kim, 1984, etc.). The Trade-off Theory posits that the optimal capital structure is where the marginal tax benefits of increasing leverage is equal to the expected marginal cost of financial distress. This suggests that the company should be financed somewhere between sole equity and sole debt where each firm has a unique optimum. However, due to the difficulty of estimating the cost of financial distress, as will be explained below, a unique optimum is hard to detect, so instead researchers identify an optimal leverage range (Brigham & Daves, 2007).

Graham (2000) was the first to estimate the tax benefits of debt by quantifying the marginal tax rate for each firm individually. Tax benefits of debt are obtained by deducting interest payments from earnings and thus reducing tax paid. Graham (2000) estimates the value of these tax benefits to be 9,7 percent of market value of the typical firm. Furthermore he estimates that most firms are greatly under levered and on average, by adding leverage up to the optimum point, would add 15 percent to firm value in tax benefits.

Direct expected cost of financial distress was first quantified by Warner in 1977, where he estimated it to be on average 5,3 percent of market value of the firm in the month bankruptcy petition was filed. The indirect cost was quantified by Andrade and Kaplan in 1998, and was estimated to be between 10 and 23 percent of firm value at default. However, as can be seen by the size of the interval, the estimation is rather imprecise. The reason for this large interval is the difficulty of estimating these indirect costs. That is, it is difficult to estimate the cost in case of bankruptcy, and even harder to estimate the likelihood of a given firm becoming bankrupt. Since total bankruptcy cost consists of both direct and indirect costs, the estimation of the total expected cost of financial distress is hard to quantify prior to actual bankruptcy.

2.1.1.3 Pecking Order Theory

When Myers and Majluf (1984) constructed the Pecking Order Theory, they relaxed an additional assumption, symmetric information. Asymmetric information is when information is unevenly distributed among market participants, causing buyers to require discount when they cannot confirm the quality of the seller's product (Akerlof, 1970). This happens in the market when firms issue securities, where firms are sellers and investors

are buyers. Due to information asymmetries, which are persistent in real capital markets, firms prefer to use the financing that is available to them that bears the least asymmetric information costs. That is, they prefer internal funds to debt, and issue equity only as a last resort. Therefore, according to their theory there is no optimal capital structure, firms simply choose their financing in the aforementioned order. At least, if there exists an optimum, the cost associated with diverging from that optimum must be immaterial compared to the cost of adjusting back to it (Baker & Wurgler, 2002).

2.1.1.4 Market Timing Theory

Baker and Wurgler in 2002, like Myers and Majluf (1984), relaxed the assumption of symmetric information and introduced the Market Timing Theory. They argued that managers, believing that investors are irrational, can exploit the asymmetries between investors and the firm by timing the market. This involves issuing equity when it is overvalued, and repurchasing when undervalued. Thus, the Market Timing Theory suggests that there is no optimal capital structure, rather it results from managers' past attempts to time the market. However, this theory, originating from the behavioural finance field, has been questioned by traditionalists, since according to the efficient market hypothesis, the market is efficient, and therefore, any attempts to time the market should not be value creating (Fama, 1970).

2.1.1.5 Theoretical implications of capital structure regarding zero-leverage

The Modigliani & Miller Theorems, even though not empirically reliable, form the basis for the majority of capital structure theories. The former theorems could possibly explain the zero-leverage puzzle, but, since capital structure decisions are not made in a perfect market, there is still a need for an alternative explanation. Moreover, the second set of theorems clearly cannot be an explanation for the puzzle, since, in the presence of taxes, they propose the firm to be financed solely with debt (Modigliani & Miller, 1958, 1963).

Moving onward, zero-leverage could possibly be justified with the Trade-off Theory. That is, when the company is already exploiting tax benefits through non-debt tax shields, such as depreciation and investment tax credits, resulting in limited benefit when adding debt. Also, if the firm is over-burdened with off-balance sheet liabilities the expected financial distress costs become too high when adding debt. So, by adding debt in these circumstances the expected marginal cost of debt would be higher than its benefits (Kraus

& Litzenger, 1973). However, these situations are rare and do not explain all zero-leverage cases, and therefore the Trade-off Theory does not fully explain the puzzle.

The Pecking Order Theory holds when zero-leverage firms use internally generated funds to finance their investment opportunities. Nevertheless, zero-leverage goes against the pecking order in cases where companies issue equity as a source of financing although possessing debt capacity (Myers & Majluf, 1984). Thus, the pecking order does not universally apply either.

Consistent with the Market Timing Theory, it is likely that firms with overvalued equity take advantage of that situation, and are therefore likely to become debt free, especially companies with a strong cash flow. However, companies that need external financing regularly are not likely to be constantly overvalued, and should therefore have at least some debt on their balance sheet (Baker & Wurgler, 2002). Hence, again the Market Timing Theory cannot fully explain the puzzle, even though in some cases it might. In summary, capital structure theories cannot explain the zero-leverage puzzle entirely and therefore a need to search beyond the capital structure field arises.

2.1.2 Agency problems

Agency cost was first set forth by Jensen and Meckling in 1976. According to them, agency problems arise when there is a separation between ownership and control. Since rational agents are assumed to be utility maximizing, it is not certain that managers will always have the owners' best interest at heart.

Agency problems affect the capital structure since it depends on the firm's characteristics if it needs more or less debt. Too much free cash flow, due to low or no debt, can tempt the manager to misuse the firm's resources (Jensen, 1986). On the other hand, if the company has too much debt it can result in, due to financial inflexibility, an underinvestment problem which is referred to as residual loss (Myers, 1977).

Managers have substantial wealth and future income invested in the firm and they are thus considerably more undiversified than shareholders. Since debt makes the company's equity more risky, it is not surprising that managers opt for less debt than shareholders due to managerial risk aversion (Ju, Parrino, Poteshman & Weisbach, 2002).

2.1.2.1 *Theoretical implications of agency problems regarding zero-leverage*

Agency problems may arise with zero-leverage if firms are exposed to the free cash flow problem since they do not pay any interests (Jensen, 1986). This problem could be alleviated by paying dividends. However, some companies prefer to be debt free and pay no dividends to mitigate the underinvestment problem, and to be able to exploit future investment opportunities without having to rely on external financing. Furthermore, if managers have substantial power over shareholders, for example when the ownership is highly distributed among many investors, then it is likely that managers can influence the capital structure in their favour, possibly explaining zero-leverage with that ownership structure (Jensen & Meckling, 1976; Ju et al., 2002; Myers, 1977).

2.1.3 Ownership structure

2.1.3.1 *Diffuse ownership*

The first to identify the problematic nature of diffuse ownership were Berle and Means in *The Modern Corporation and Private Property* in 1932. They point out that in the presence of diffuse ownership each investor is too small to be incentivised to monitor the manager's behaviour. Since the managers interests are not perfectly aligned with that of shareholders, managers might be tempted to shirk. Rational small investors know that their independent actions will most likely not make a difference. This results in the well-known free-rider problem where no investor performs the monitoring duties, leaving the manager both unconstrained and unsupervised. As the diffuseness of ownership increases, so does the free-rider problem. Even though there are obvious disadvantages to diffuse ownership, according to Demsetz and Lehn (1985), there must be some advantages weighing against them, since diffuse ownership is common. However, these advantages are not explicitly stated. Shleifer and Vishny (1997), on the other hand, state that the benefits of diffuse ownership are that it limits the costs resulting from concentrated ownership.

2.1.3.2 *Concentrated ownership*

Large shareholders, as opposed to small, have an incentive to monitor managers due to their large stake in the firm and therefore provide a partial solution to the free-rider problem (Shleifer & Vishny, 1986). Furthermore, when ownership is concentrated reaching consensus is relatively uncomplicated resulting in a more efficient decision

making process. However, there are also costs associated with concentrated ownership. It can, for example, lead to decisions that do not coincide with small shareholders' interests, since large shareholders tend to represent their own interests. Andersson and Reeb (2003) identify the most common costs of concentrated ownership to be that large shareholders can expropriate or redistribute wealth through, for example, special dividends, excessive compensation packages, and risk avoidance. It is known that the identity of the owner in a concentrated ownership is important, since different types of investors have different preferences (Thomsen & Pedersen, 2000). Two distinct categories of concentrated shareholders are large private investors and institutional investors.

2.1.3.2.1 Large private investors

The most prominent cost of large private investors is that they tend to be undiversified and thus bear excessive risk (Shleifer & Vishny, 1997). Due to their undiversified nature, large private investors have the incentive to reduce firm specific risk, and combined with the power resulting from their size, they usually can. This could potentially hurt minority shareholders that are fully diversified since they have accounted for firm specific risk in their portfolio (Culp, 2002).

Family firms are a relatively well researched field and can be classified as large private investors. However, research in this field cannot generally be applied to large private investors since it is a narrower term. This is unfortunate since zero-leverage is known to be highly concentrated among family firms and therefore nothing can be inferred in this research about the relationship between family firms and zero-leverage (Anderson & Reeb, 2003).

2.1.3.2.2 Institutional investors

Institutional investors as opposed to large private shareholders are assumed to be well diversified and are thus not overly exposed to firm specific risk. When investigating institutional investors in 1988 Brickley, Lease and Smith found that institutional investors tend to vote with value increasing proposals, and against value destroying proposals, or sell if their opinions are not in line with that of management. Furthermore, monitoring costs are lower for institutional investors, since they have the expertise and coordination devices allowing them to aggregate ownership positions, and thereby resisting

opportunistic behaviour of management. Pound (1988) agrees that institutional investors have the motivation and the ability to monitor management but they identify a conflict of interest between the company and the institutional investors. This conflict of interest arises when the institution is more likely to vote with the management, though value decreasing, because of an existing business relation between the institution and the firm they do not want to jeopardize. However, due to increasing minority shareholder protection it is likely that this sort of behaviour is regulated in established markets.

2.1.3.3 *Theoretical implications of ownership regarding zero-leverage*

Diffuse ownership can lead to zero-leverage in cases where shareholders are powerless against the manager, who serves his own interest by reducing risk in the capital structure, due to the undiversified nature of his current and future wealth (Agrawal & Nagarajan, 1990).

Concentrated ownership should decrease the likelihood of firms adopting a zero-leverage policy since it increases shareholders incentives to monitor managers' behaviour, and thus reduces the free-rider problem (Shleifer & Vishny, 1986).

When researching the zero-leverage phenomenon the risk avoidance of large private undiversified shareholders is the most relevant cost of concentrated ownership. Due to their undiversified nature their future wealth depends disproportionately on the continuity of the firm, and so they might opt for the least risky capital structure form, zero-leverage, to reduce the probability of default (Thomsen & Pedersen, 2000).

High institutional ownership should result in at least some debt in the capital structure since adding initial debt is value increasing, as it reduces the cost of capital, and when they have the power they oppose to opportunistic behaviour of managers such as pursuing low risk capital structure forms. This makes zero-leverage in firms with high institutional ownership unlikely (Brickley et al., 1988; Thomsen & Pedersen, 2000).

2.2 Literature review on zero-leverage

The zero-leverage phenomenon and debt conservatism has been addressed by several researchers, though under different titles and definitions. In the following section previous literature will be reviewed.

2.2.1 Managerial features and governance characteristics

One strand of literature regarding the zero-leverage puzzle, and perhaps the most researched, is the one concerning managerial features and governance characteristics. Strebulaev and Yang (2013) were the first to focus on zero-leverage in their working paper from 2006, which was later published in 2013. Their main focus was on internal governance, and to exclude financially constrained firms, since they may have adopted zero-leverage policy involuntarily, the researchers concentrated on firms who pay dividend. They found that firms with large CEO ownership, firms with small and less independent boards and family firms are more likely to follow a zero-leverage policy. If the CEO has a large ownership stake, then he has more formal power over the board and thus it is more likely that he can influence the capital structure decision. Furthermore, if the board is small and less independent it is more likely that board members reach consensus on unorthodox solutions in favour of the manager, like zero-leverage capital structure. Lastly, in the case of family firms, family members are likely to be undiversified and care about survival and legacy of the firm, and since debt increases risk and the probability of default, family firms are more likely to follow a zero-leverage policy. Devos et al. conducted a similar research in 2012 where they, however, focused on both internal and external governance mechanisms but they found contradicting results. Their findings suggested that the reason for zero-leverage is that firms are financially constrained. Furthermore, managerial entrenchment is not an explaining factor and governance structure is not weaker in firms with zero-leverage. Similar findings were reported by Byoun and Xu (2013). These results are perhaps not surprising since both do not filter out firms that are financially constrained, like Strebulaev and Yang, but include it as an explanatory variable. A large fraction of firms that follow a zero-leverage policy actually do so because they do not have a choice, firms with no debt capacity cannot lever up. Thus, in this paper financial constraints will be regarded as a control variable.

2.2.2 Other firm characteristics

Another strand of the literature tries to explain the zero-leverage puzzle with firm characteristics other than those discussed above. Dang (2013) researched companies in the UK and found that zero-leverage firms can be divided into two groups, one where the firms pay dividend and one where the firms do not. He discovers that non-dividend paying

firms have characteristics that generally characterise firms that are constrained. That includes, small growth firms young in age, negative profitability, and both low tangibility and Z-scores. Contrastingly, firms with higher dividend pay-out ratios, that are therefore unconstrained according to Dang, are older, profitable and larger in size. According to Dang (2013) constrained firms follow zero-leverage policy because of their limited exposure to the debt market, while unconstrained firms deliberately choose zero-leverage to mitigate the underinvestment problem and maintain financial flexibility for future investment opportunities. Bessler et al. researched zero-leverage companies around the world in 2013 and largely came to the same conclusion as Dang (2013) regarding firm characteristics. Finally, Strebulaev and Yang (2013) conduct a study on public nonfinancial US firms and come to the same conclusion as the two aforementioned studies when it comes to firm characteristics. Therefore, it can be concluded that firms that follow a zero-leverage policy all have similar, if not the same, characteristics depending on their financial flexibility.

2.2.3 Industry

The articles discussed above all conclude that zero-leverage cannot be explained by industry alone since zero-leverage is apparent in most industries, though more in some than others. In these studies different industries are identified as having high concentration of zero-leverage firms. Dang (2013) and Bessler et al. (2013) report extreme debt conservatism in the energy-, technology- and healthcare industries, while Strebulaev and Yang (2013) only find high concentration in technology and healthcare. This is fairly intuitive since technology and healthcare are high growth industries with valuable growth opportunities. However, even though energy is not a high growth industry, energy companies, as well as companies from the other two industries generally hold high cash reserves reducing the incentive to borrow (Dang, 2013).

2.2.4 Macroeconomic factors

In 2013 Dang researched among other things, if macroeconomic conditions could affect firm's decision to have zero-leverage. In this purpose three macroeconomic variables were included in his model. The first being real GDP growth rate, where they expect leverage to decline with increasing GDP. Furthermore, they assume that this should have more effect on constrained firms than unconstrained. The second and third are the term structure of

interest rates and equity premium. When the term structure of interest rates expands the cost of borrowing increases compared to equity and therefore companies are likely to eschew debt. Concerning equity premium, Dang states that it has an ambiguous impact on the firm's capital structure and thus he does not interpret it further. His main conclusion is that zero-leverage decisions are significantly impacted by macroeconomic conditions, especially for firms that are relatively unconstrained.

2.2.5 Ownership structure

Even though some researchers have researched ownership structure from many perspectives e.g. firm value (Demsetz & Lehn, 1985; De Miguel, Pindado & De la Torre, 2004; etc.), corporate governance (Brickley et al., 1988; Pound, 1988; Shleifer & Vishny, 1997; etc.), performance (Thomsen & Pedersen, 2000), none have, to our knowledge, tested the relationship between ownership structure and the zero-leverage phenomenon.

2.3 Hypotheses

As discussed above researchers have not been able to fully explain why some firms adopt a zero-leverage policy. Therefore we will try an alternative approach, using ownership structure to see whether it explains the zero-leverage puzzle. Below, three hypotheses, derived from theory and previous literature, will be proposed.

2.3.1 Hypothesis 1

H0: Companies with diffuse ownership are more likely to follow a zero- or almost zero-leverage policy

When ownership is diffuse no single investor is big enough to have the incentive to monitor the manager's behaviour. Therefore, due to agency problems and managerial risk aversion, we expect firms with diffuse ownership to be more likely to follow a zero- or almost zero-leverage policy.

2.3.2 Hypothesis 2

H0: Companies with concentrated ownership are less likely to follow a zero- or almost zero-leverage policy

When ownership is concentrated, zero- or almost zero-leverage is less likely, since large investors have more incentive to monitor, limiting the free-rider problem and therefore preventing managerial risk aversion.

2.3.3 Hypothesis 3

H0: Companies where the maximum voteholder is an institutional investor are less likely to follow a zero- or almost zero-leverage policy

When ownership is concentrated in the hands of institutional investors, due to their diversified nature, value creating activities are supported while value decreasing activities are not. Therefore we expect zero- or almost zero-leverage to be less likely in firms where the maximum voteholder is an institutional investor.

3 Methodology

In this chapter the methodological framework is introduced. The purpose is to provide transparency to the research design and make it replicable. The chapter starts off by introducing the data and sample along with the data collection process. Next, the variables are introduced, defined and explained. Additionally the regression model is introduced and its validity and reliability is discussed.

3.1 Data and sample

The initial sample consists of all listed firms in Sweden on all stock exchanges from the period 2000 to 2013. In this research two databases were used to gather the necessary data, Thomson Reuters Datastream, henceforth Datastream, to collect financial information on the sample firms and SIS Ägarservice (SIS) to gather ownership structure data on those firms. The aforementioned sample period was chosen since the majority of information could be extracted from both databases in this period, as SIS has limited data before 2000.

SIS Ägarservice, which translates to SIS Ownership Service, was used to acquire ownership data on companies on all the Swedish stock exchanges. The database provides unique information on ownership and voting rights, for up to 200 largest share- and voteholders, not only on the large NASDAQ OMX exchange but also the smaller markets, NGM, First North and AktieTorget. However, information on the 50 largest share- and voteholders were only used since the rest only owns a negligible share. Furthermore, investors can be grouped into spheres and information about who are the 500 biggest institutional investors in Sweden is available. By grouping investors into spheres, such as families and other connected investors, it is easier to see who really controls the companies. This information is especially valuable for the research and makes it somewhat unique.

NASDAQ OMX Stockholm is the largest stock exchange in Sweden, with 267 companies listed. The stock exchange divides companies into three segments depending on their market value; Large Cap, Mid Cap and Small Cap. Companies listed in this stock exchange

are more advanced compared to the other three markets (Corporate Actions Stockholm, n.d.). In the SIS database information is only available for 248 companies so 19 firms were lost there and additional 9 were eliminated since information in Datastream is not available. Thus, in total there are 239 companies from NASDAQ, with 2345 observations.

First North, with 158 companies listed, is better suited for smaller and developing companies since rules and regulations are not as demanding and complex as on NASDAQ OMX Stockholm (Shares, n.d.). In the SIS database information is only available for 115 companies so 35 firms were lost there and additional 8 were eliminated since information in Datastream is not available. Thus, in total there are 107 companies from First North, with 510 observations.

Nordic Growth Market (NGM) is the smallest stock exchange in Sweden, with only 12 listed companies. This market is intended for small and medium sized businesses though they are leading in exchange traded products, such as warrants, certificates and structured products (NGM, n.d.). In the SIS database information is only available for 10 companies so 2 firms were lost there and additional 1 was eliminated since information in Datastream is not available. Thus, in total there are 9 companies from NGM, with 83 observations.

AktieTorget is different from the other three since it only exists in Sweden and exclusively lists Swedish firms, or 129. Resembling First North, companies listed on AktieTorget are either small or in their growing phase (AktieTorget, n.d.). In the SIS database information is only available for 94 companies so 35 firms were lost there and additional 38 were eliminated since information in Datastream is not available. Thus, in total there are 56 companies from AktieTorget, with 309 observations. The loss of observations from this market has a logical explanation. The companies are young, often less than a year old, and therefore it is not surprising that data is not available for these companies.

In summary, the dataset is thus a panel including 411 companies that sums up to 3247 observations over this 14 year period. Panel dataset can be either balanced or unbalanced, balanced if all firms have time series observations for the whole sample period and unbalanced if they do not (Brooks, 2008). In this research, not all the firms have observations for the whole period, and therefore the panel is unbalanced.

3.1.1 Data collecting procedures

The first step in collecting and structuring the data involved collecting data from the SIS database on ownership structure. This involved creating one file for every firm and one sheet for each year within that file. Since this database does not deliver ready-to-use output, every sheet needed to be structured to fit so that a set of formulas could be applied to every single sheet.

The second and the third step included extracting information on the 500 biggest institutional investors in Sweden from SIS and adding the necessary financial data from Datastream to every work file, each in a separate sheet.

The fourth step was to make a sample sheet within in every work file that summarized the data needed from every year sheet. Therefore, the sample sheet now includes ready-to-use variables from each year for the firm in question. The variables were constructed by using the formulas provided in chapter 3.2 *Variables*.

The fifth step was to merge the sample sheets from all the firms into a single large panel, in a separate work file. This panel was then used to run the necessary tests in EViews.

3.2 Variables

3.2.1 Dependent variable

In the model used, one dependent variable will be tested. The dependent variable is binary and is a combination of two variables. The first is zero-leverage, defined as firms with no debt in their balance sheet, neither short nor long term. In Datastream we use the Worldscope codes to obtain values for our variables e.g. for total debt the code is WC03255 and for total book value of assets it is WC02999.

$$ZL_{it} = \frac{\text{Short Term Debt} + \text{Long Term Debt}}{\text{Total Book Value of Assets}} = \frac{\text{Total debt}}{\text{Total Book Value of Assets}} = 0$$

The second is almost zero-leverage (AZL) and it will be defined as firms with book leverage lower than 5%. Excluding these firms from our research would be too strict since often financial liabilities are considered to be debt from an accounting stand point.

$$AZL_{it} = \frac{\text{Total debt}}{\text{Total Book Value of Assets}} < 0,05$$

By summing them together we obtain value 1 for firms with book leverage lower than 5% and 0 for the rest. The reason for initially separating them was to see how many firms have purely zero-leverage. Thus, the final dependent variable is as follows:

$$ZL/AZL_{it} = ZL_{it} + AZL_{it}$$

3.2.2 Independent variables

Three independent variables are of interest in this study. They all serve to explain different ownership structure characteristics. Below these independent variables are presented and explained.

Diffuse ownership (Diffuse_{it}): The proxy used for diffuse ownership is a binary variable taking the value one if the shareholder holding the maximum votes has less than 5% voting rights, meaning that no shareholder has more than 5% voting rights, and zero otherwise. In a firm that takes value one for this variable, ownership is diffuse. Even though in most cases continuous variable has more explanatory power, a binary variable is used since any summing of voting rights below 5% would not be logical. The 5% threshold is selected since research such as Brickley et al. (1988), Holderness (2009) and Shleifer and Vishny (1986) use the same threshold to define concentrated ownership, which is the inverse of diffuse.

Concentrated ownership (Concen_{it}): The proxy used for concentrated ownership is a continuous variable representing sum of the voting rights of block holders owning more than 5% of outstanding voting rights. Similar variable was used in a study by Brickley et al. (1988), Devos et al. (2012) and Holderness (2009).

Institutional investor (Inst_{it}): The proxy used for institutional investor with concentrated ownership is a dummy variable, taking the value one if the investor, or a sphere of investors, is institutional and zero otherwise. In the reference case, where the variable takes the value zero, the investor is private or a sphere of private investors. Similar variable was used by Anderson and Reeb (2003), Ang, Cole and Lin (2000) and Thomsen and Pedersen (2000).

3.2.2.1 Control variables

Capital structure has been widely researched throughout the years. The control variables used in this study are those that have gained general consensus in explaining capital structure in firms and are also considered to explain firm characteristics. There is no standard set of variables generally used and the number of variables varies between studies (Harris & Raviv, 1991). Below, the control variables used are listed and explained.

Bankruptcy probability (Z_{it}): Bankruptcy probability is used to address potential financial constraints of firms in the sample. It is more likely for firms with high probability of financial distress to have low debt levels in their capital structure, that is, companies with high operating risk are less likely to have debt in their capital structure. This suggests a negative relation between probability of default and debt (Marsh, 1982).

In 1968, Altman created a ratio to determine the probability of default called the Altman Z-score. In 2002 he revisited this model and modified it, and it is used here as a proxy for bankruptcy probability like in other studies (Dang, 2013). The lower (higher) the score, the higher (lower) the probability of default:

$$Z_{it} = 1,2X_1 + 1,4X_2 + 3,3X_3 + 0,6X_4 + X_5$$

where,

X_1 = Working Capital (WC03151) / Total Assets

X_2 = Retained Earnings (WC03495) / Total Assets

X_3 = EBIT (WC18191) / Total Assets

X_4 = Market Capitalization (WC08001) / Total Liabilities (WC03351)

X_5 = Sales (WC01001) / Total Assets

Dividend payout ratio (Div_{it}): Leverage should be lower in firms that pay dividends. According to the Pecking Order Theory, firms prefer internally generated funds over external financing and therefore firms would not maintain a high dividend payout ratio if they needed those funds for investments (Frank & Goyal, 2009). This has been shown in several research (Bessler et al., 2013; Strebulaev & Yang, 2013). Here, the dividend payout ratio is calculated by dividing cash dividend paid (WC04551) with total book value of assets:

$$Div_{it} = \frac{\text{Total Cash Dividend Paid}}{\text{Total Book Value of Assets}}$$

Investment opportunities (MB_{it}): Jensen (1986) states that firms with scarce investment opportunities carry less debt than others. Like many other researchers have done before, the market-to-book ratio is used as a proxy for investment opportunities (Rajan & Zingales 1995; Minton & Wruck, 2002). The ratio is calculated by dividing market value of equity, here using market capitalization, with its book value (WC03501).

$$MB_{it} = \frac{\text{Market Capitalization}}{\text{Common Equity}}$$

Non-debt tax shield (NDTS_{it}): Non-debt tax shield is expected to be negatively related to debt since in the presence of high non-debt tax shield the tax benefits of adding additional debt are low, or nonexistent (DeAngelo & Masulis, 1980). Brailsford, Oliver & Pua in 2002, use one single measure as a proxy for non-debt tax shield, annual depreciation expenses scaled by total assets. Titman and Wessels (1988), however, define non-debt tax shield with three different measures; investment tax credits (WC04101) over total assets, depreciation (WC01151) over total assets and a direct estimate of non-debt tax shield over total assets. For convenience, in this study, non-debt tax shield are proxied only by the former two and combined in a single measure.

$$NDTS_{it} = \frac{\text{Depreciation} + \text{Deferred Income Taxes \& Investment Tax Credit}}{\text{Total Book Value of Assets}}$$

Profitability (Profit_{it}): According to the Pecking Order Theory, profitability should be accompanied by low leverage, since profitable firms should have higher internal funds available (Myers & Majluf, 1984). The proxy for profitability is here obtained by dividing earnings before interest, taxes and depreciation (WC18198) with total assets (Minton & Wruck, 2002; Strebulaev & Yang, 2013).

$$Profit_{it} = \frac{EBITD}{\text{Total Book Value of Assets}}$$

Size: Leverage should increase with size, since larger firms are generally less likely to become bankrupt. Size is here determined as the natural logarithm of total book value of assets (Rajan & Zingales, 1995; Brailsford et al., 2002; Strebulaev & Yang, 2013).

Tangibility (Tangi_{it}): Tangibility is generally associated with higher leverage, since it is an indicator for the collateral available in the firm. Some research only use fixed assets (WC02501), but here property, plant and equipment (PP&E) are used as a proxy for fixed

assets and standardize by dividing with totals assets to facilitate cross-sectional comparison (Rajan & Zingales, 1995; Strebulaev & Yang, 2013).

$$Tangi_{it} = \frac{PP\&E}{Total\ Book\ Value\ of\ Assets}$$

3.2.2.2 **Categorical variables**

In addition, two categorical variables will be included to account for cross-sectional differences within the sample. These are industry and stock exchanges. To include them in the regression, one category of each variable will be excluded to avoid the dummy variable trap. In doing so, the excluded variable becomes the reference case to which the others will be compared. Therefore, these two variables will only be examined in the univariate analysis.

Industry: It has been shown that companies within certain industries have lower debt than others, and are therefore more likely to be zero- or almost zero-leveraged. This has been shown in several studies (Minton & Wruck, 2001; Bessler et al., 2013; Strebulaev & Yang, 2013). In all these research, SIC codes were used to divide companies between industries, but in this study the two-digit Industry Benchmark Classification (IBC) code is used to form a binary variable for each industry.

Stock Exchange (Exchange_{it}): It may depend on the stock exchange whether firms have debt on their balance sheet, since it is more likely that less advanced firms, younger, smaller and with less tangibility, are listed on the smaller markets. A binary variable is introduced for each exchange.

3.3 **The regression model**

The logit model, which is used in the regression analysis, is a well-known type of limited dependent variable model, where the dependent variable is binary. It was chosen over the similar probit model, since it is more convenient and has been used in previous studies on zero-leverage (e.g. Strebulaev & Yang, 2013; Bessler et al., 2013). The logit model is similar to the OLS linear regression, although the assumptions of the model are different. The logit model is based on the cumulative logistic probability distribution function, for any variable z_i (Brooks, 2008):

$$F(z_i) = \frac{1}{1 + \exp(-z_i)}$$

Due to the non-linearity of the logit model, it uses the maximum likelihood method to estimate its parameters. Therefore, the interpretation of the coefficients is not as straight forward as in OLS. That is, one unit increase in the independent variable does not result in an increase/decrease in the dependent variable, corresponding to the value of the coefficient of the independent one. Instead, a one unit increase in the independent variable will cause an increase/decrease in the probability that the outcome of the dependent variable is one. These probabilities are obtained by calculating the marginal effects. However, calculating the marginal effects is not necessary for the purpose of this research, since only the sign and the significance levels of the parameters are of interest in this study, and therefore no further explanations on the marginal effects will be provided.

Care needs to be taken when analysing the coefficients in the logit model. The sign on the coefficients can, however, be interpreted normally, a positive sign indicates an increase in the likelihood of zero-leverage and almost zero-leverage while a negative sign reduces it. Furthermore, the z-statistic and p-value still report significance.

3.3.1 Empirical models

In the following section three empirical models will be introduced. The control variable regression represents the base regression and in the three remaining regressions relevant variables are added to test the hypotheses of interest.

3.3.1.1 Control variable model

The following equation represents the control variable regression:

$$ZL/AZL_{i,t} = \beta_0 + \beta_1 Z_{i,t-1} + \beta_2 Div_{i,t-1} + \beta_3 MB_{i,t-1} + \beta_4 NDT S_{i,t-1} + \beta_5 Profit_{i,t-1} + \beta_6 Size_{i,t-1} + \beta_7 Tangi_{i,t-1} + Industry_{i,t-1} + Exchange_{i,t-1} + p_t + \varepsilon_{i,t}$$

Here β_0 is a constant, p_t represents the period fixed effects and $\varepsilon_{i,t}$ represents the error term. *Industry* and *Exchange* represent set of categorical variables for the industries and the exchange respectively. To avoid the dummy variable trap one of each had to be omitted. The variables omitted become the reference case which the other variables in that category are compared to (Brooks, 2008). In this study, NASDAQ OMX and Industrials have been omitted since they are by far the largest variables in their category. The remaining variables have been explained in section 3.2.2.1 *Control Variables*. If the variables have been lagged the notation t-1 is added.

3.3.1.2 Diffuse ownership model

The following equation represents the regression that will be used to test hypothesis 1 regarding diffuse ownership:

$$ZL/AZL_{i,t} = \beta_0 + \beta_1 Z_{i,t-1} + \beta_2 Div_{i,t-1} + \beta_3 MB_{i,t-1} + \beta_4 NDT S_{i,t-1} + \beta_5 Profit_{i,t-1} + \beta_6 Size_{i,t-1} \\ + \beta_7 Tangi_{i,t-1} + \beta_8 Diffuse_{i,t-1} + Industry_{i,t-1} + Exchange_{i,t-1} + p_t + \varepsilon_{i,t}$$

Here, the same variables are used as in the control regression, except the variable *Diffuse* is added. Like stated above, ownership is diffuse if no shareholder, or group of shareholders, has more than 5% voting rights. The variable *Diffuse* is a binary, taking the value one if the ownership is diffuse, and zero otherwise.

3.3.1.3 Concentrated ownership model

The following equation represents the regression that will be used to test hypothesis 2 on the subject of concentrated ownership:

$$ZL/AZL_{i,t} = \beta_0 + \beta_1 Z_{i,t-1} + \beta_2 Div_{i,t-1} + \beta_3 MB_{i,t-1} + \beta_4 NDT S_{i,t-1} + \beta_5 Profit_{i,t-1} + \beta_6 Size_{i,t-1} \\ + \beta_7 Tangi_{i,t-1} + \beta_8 Concen_{i,t-1} + Industry_{i,t-1} + Exchange_{i,t-1} + p_t + \varepsilon_{i,t}$$

Again, the control variable regression remains the base. Additionally, the variable *Concen* is included in the model, representing ownership concentration. Where, as mention earlier, ownership concentration is defined as the sum of voting rights of all shareholders with more than 5% voting rights.

3.3.1.4 Institutional ownership model

The following regression will be run to test hypothesis 3 regarding ownership concentration in the hands of institutional investors:

$$ZL/AZL_{i,t} = \beta_0 + \beta_1 Z_{i,t-1} + \beta_2 Div_{i,t-1} + \beta_3 MB_{i,t-1} + \beta_4 NDT S_{i,t-1} + \beta_5 Profit_{i,t-1} + \beta_6 Size_{i,t-1} \\ + \beta_7 Tangi_{i,t-1} + \beta_8 Concen_{i,t-1} + \beta_9 Inst_{i,t-1} + Industry_{i,t-1} + Exchange_{i,t-1} + p_t \\ + \varepsilon_{i,t}$$

Now, the concentrated ownership is extended to also include, *Inst*, for investor type. *Inst* is a binary variable taking the value one if the primary owner is an institution, and zero if he is private.

3.4 Model validity and reliability

It is of great concern that the data collection techniques and analysis is reliable. In this research secondary data was used, and since it may be gathered for a different purpose, it

presents a possibility that the data may be inaccurate (Saunders, Lewis & Thornhill, 2009). However, the databases used in this research, Datastream and SIS, are both considered reputable, and have been validated by other researchers, and therefore the data set used can be considered trustworthy. Furthermore, statistical software, EViews, was used to run the regressions and perform the necessary tests, leaving minor room for human error. However, when categorizing investors into spheres, the sphere name was not on the list of institutional investors, so the type of investors, private or institutional, had to be manually marked. It cannot be ruled out for certain that mistakes were made, but the procedure was repeated twice in effort to make sure nothing was overlooked.

Another concern is the validity of the research. When variables are measuring what they should be measuring, and the results actually report what they appear to be reporting, then the model is considered to be valid (Saunders et al., 2009). The dependent variable, used in this research, is a binary variable, similar to those that have been used in most research on zero-leverage. Furthermore, the control variables are those generally used to explain capital structure. It can therefore be concluded that these variables are highly valid. However, since a research of this type has not been conducted before, the validity of the ownership structure variables may be called into question, even though they have been used in different studies.

To ensure validity and reliability, the following robustness tests were conducted, and the relevant measures taken, to improve the model.

3.4.1 Goodness of fit

McFadden R squared is an indicator of how well specified the model is. This measure is similar to R squared in OLS regression, but the difference is that it does not report as high values, but the same logic applies, the higher the better. The McFadden R squared for the models in this study, is approximately 0,3, meaning that the models have a relatively good fit. Furthermore, when generating the percentage of correct predictions the models deliver a value around 78%, indicating again that these models are a good fit (see table 21 in appendix B) (Brooks, 2008).

3.4.2 Autocorrelation

When observations are collected over time, such as in time series data, the observations are not always random, but correlated over time, this is called autocorrelation. Since panel data is made up from time series and cross sectional data, autocorrelation may be present. If autocorrelation is present, it may cause erroneous inference of the coefficients. Ljung Box Q-statistics can be used to detect autocorrelation in EViews. When running the model, without lagging the independent variables, the Q-statistic reports no autocorrelation (see table 22 in appendix B).

3.4.3 Heteroscedasticity

Heteroscedasticity is common in limited dependent model such as logit. It is present when the residuals are correlated with the independent variables. Heteroscedasticity can make the inference misleading, since the standard errors are inaccurate. No built-in test exists in EViews for heteroscedasticity when using panel data, but with an OLS model it is possible to conduct a manual Breusch-Pagan test. Since the test involves regressing the explanatory variables against the squared residuals, it is not possible to conduct when using a logit model, because the squared residuals are not binary. Nevertheless, it is possible to ensure that the standard error estimates are robust, by making the covariances robust with the Huber/White function in EViews. Thus, that option is selected for all the models to take care of potential heteroscedasticity problems (Brooks, 2008).

3.4.4 Multicollinearity

Multicollinearity is when the independent variables are excessively correlated with one another. This can be a problem since having collinear variables in a regression can make the conclusion of the model imprecise and therefore makes it difficult to draw inference. Multicollinearity is often identified with correlation matrices, since doing a proper test is a wearisome task (Brooks, 2008).

When making correlation matrix for all the independent variables together, none of the variables have more than 0,8 correlation with each other, indicating no multicollinearity problems (Brooks, 2008). This can be seen in table 23 in appendix B. Furthermore, panel data helps alleviate multicollinearity problems, so even if high correlation was present, it would not be considered problematic (Brooks, 2008).

3.4.5 Winsorizing of outliers

The variables with extreme outliers were winsorized at the 1st and 99th percentile. This procedure transforms outliers in these percentiles to be equal to the value corresponding to these percentiles. This procedure was performed since extreme outliers can greatly increase the variance of a variable, and can therefore affect the significance level (Brooks, 2008).

3.4.6 Endogeneity

When there is correlation between independent variables and the error term, an endogeneity problem arises. When endogeneity is present in a model, it may result in biased and inconsistent coefficients, and therefore, it is important to control for it. Using panel data models, like fixed effects or random effects, can decrease the endogeneity problem. There are two ways of dealing with endogeneity in the cross section and period dimension with the fixed effect model, either using the least square dummy variables (LSDV) or the within transformation. The within transformation is preferred, since it is more efficient than the LSDV. It saves degrees of freedom by demeaning the variables instead of adding a dummy variable for each unit (Brooks, 2008).

The logit model, used in this study, is incompatible with panel data models in EViews and therefore, these models cannot be used to address the endogeneity problem. However, fixed effects can be thought of as having a dummy variable for each dimension, cross sectional, period or both. Therefore, including dummy variables in our regression can improve the model. In this study, the cross section consists of 411 firms and adding a dummy variable for each firm, to account for cross sectional fixed effects, would severely reduce the number of degrees of freedom, and thereby affect the precision of the model. Instead, the industry dummy variables are used to account for cross sectional differences, and period fixed effects dummies are added as well to reduce the endogeneity problem.

4 Univariate analysis

In this chapter the univariate analysis is presented. The chapter starts with descriptive statistics. Then it is verified whether or not the zero-leverage phenomenon exists in the Swedish market, potential financial constraints are addressed, and the Swedish ownership structure is analysed.

4.1 Descriptive statistics

Table 1: Descriptive statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
Zero-leverage/Almost zero-leverage	0,34	0,00	1,00	0,00	0,47	2977
Bankruptcy probability	5,58	2,94	80,19	-13,05	11,45	2977
Dividends	0,02	0,01	0,23	0,00	0,04	2977
Investment opportunities	3,03	1,83	25,00	0,25	3,74	2977
Non-debt tax shield	0,04	0,03	0,27	0,00	0,04	2977
Profitability	0,02	0,09	0,46	-1,28	0,26	2977
Size	5,91	5,82	9,81	2,74	1,10	2977
Tangibility	0,19	0,08	1,00	-0,07	0,25	2977
AktieTorget	0,08	0,00	1,00	0,00	0,27	2977
First North	0,14	0,00	1,00	0,00	0,35	2977
NGM	0,03	0,00	1,00	0,00	0,16	2977
NASDAQ OMX	0,75	1,00	1,00	0,00	0,43	2977
Basic Materials	0,06	0,00	1,00	0,00	0,24	2977
Consumer Goods	0,08	0,00	1,00	0,00	0,26	2977
Consumer Services	0,11	0,00	1,00	0,00	0,31	2977
Financials	0,15	0,00	1,00	0,00	0,35	2977
Health Care	0,12	0,00	1,00	0,00	0,33	2977
Industrials	0,29	0,00	1,00	0,00	0,46	2977
Oil & Gas	0,03	0,00	1,00	0,00	0,17	2977
Technology	0,14	0,00	1,00	0,00	0,35	2977
Telecommunications	0,01	0,00	1,00	0,00	0,12	2977
Utilities	0,00	0,00	1,00	0,00	0,07	2977
Concentrated Ownership	49,41	50,70	90,60	0,00	21,58	2977
Institutional Investor	0,39	0,00	1,00	0,00	0,49	2977
Diffuse Ownership	0,01	0,00	1,00	0,00	0,12	2977

In table 1 the descriptive statistics are presented. Since variables with outliers have been winsorised, both the mean and the median are reliable. Since majority of the variables in the model are categorical binary variables, their standard deviations represent the proportion of firms belonging to that category. The standard deviations on the remaining variables seem rather reasonable except for the bankruptcy probability and concentrated

ownership. The high standard deviation on concentrated ownership is not considered problematic, since other researchers using this variable report a similar value (Devos et al., 2012; Earle, Kucsera & Telegdy, 2005). Furthermore, the high standard deviation on bankruptcy probability is not perplexing since the proxy, Z-score, can vary greatly between firms, especially since the sample includes a broad variety of firms in all four exchanges in Sweden. To make sure this variable is not problematic, the regressions in the multivariate analysis were ran without this variable, and it did not affect the results.

4.2 Zero-leverage in Sweden

Using a pivot table zero-leverage and almost zero-leverage observations for each year, market and industry are extracted. When reviewing the data from the Swedish market, as presented in table 2, it is clear that the zero-leverage phenomenon is present in the market. Out of the 3247 observations, 22% report zero-leverage and 13% report almost zero-leverage. So jointly 35% of the observations, or 1151, have zero- or almost zero-leverage.

Table 2: Zero-leverage in Sweden by year

Year	Observations	ZL			AZL			ZL / AZL		
		# of obs	% of total	% of year	# of obs	% of total	% of year	# of obs	% of total	% of year
2000	76	16	0,5%	21,1%	10	0,3%	13,2%	26	0,8%	34,2%
2001	107	16	0,5%	15,0%	21	0,6%	19,6%	37	1,1%	34,6%
2002	118	16	0,5%	13,6%	23	0,7%	19,5%	39	1,2%	33,1%
2003	122	20	0,6%	16,4%	24	0,7%	19,7%	44	1,4%	36,1%
2004	128	22	0,7%	17,2%	21	0,6%	16,4%	43	1,3%	33,6%
2005	147	30	0,9%	20,4%	21	0,6%	14,3%	51	1,6%	34,7%
2006	172	37	1,1%	21,5%	26	0,8%	15,1%	63	1,9%	36,6%
2007	200	42	1,3%	21,0%	22	0,7%	11,0%	64	2,0%	32,0%
2008	319	84	2,6%	26,3%	30	0,9%	9,4%	114	3,5%	35,7%
2009	340	81	2,5%	23,8%	42	1,3%	12,4%	123	3,8%	36,2%
2010	360	80	2,5%	22,2%	53	1,6%	14,7%	133	4,1%	36,9%
2011	380	83	2,6%	21,8%	49	1,5%	12,9%	132	4,1%	34,7%
2012	388	97	3,0%	25,0%	42	1,3%	10,8%	139	4,3%	35,8%
2013	390	92	2,8%	23,6%	51	1,6%	13,1%	143	4,4%	36,7%
Total	3247	716	22%		435	13%		1151	35%	

When looking at zero-leverage and almost zero-leverage observations in table 2 each year as a percentage of the total observations, it seems like the phenomenon is increasing over the sample period. However, when examining the zero- and almost zero-leverage observations, each year as a percentage of each year's total observations, the percentage is fairly stable over time. Therefore, it can be concluded that the zero-leverage is a substantial and persistent phenomenon in the Swedish stock market (See figure 1).

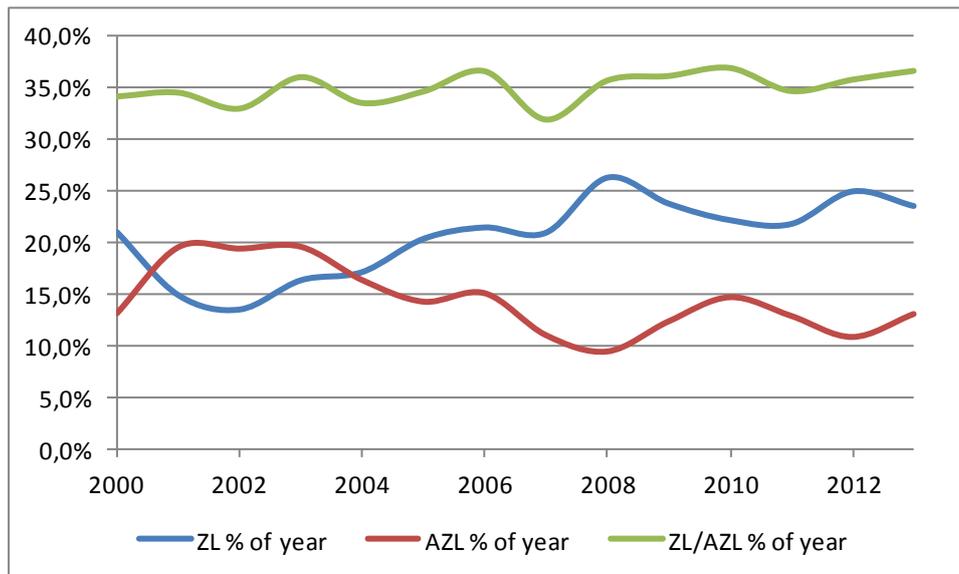


Figure 1: Zero-leverage in Sweden by year

In a research conducted by Bessler et al. (2013) on all industrial firms in twenty different countries, they report mixed results on the percentage of zero-leverage firms in each country. The Scandinavian countries; Denmark, Finland and Norway, that are comparable to Sweden, report 8,13%, 16,94% and 3,7% zero-leverage firms, respectively. The reason why Sweden reportedly has greater percentage may be that Bessler et al. (2013) use a longer time period, or 1988 to 2011, and their research is only conducted on industrial firms. Furthermore, in this study on the Swedish market, smaller exchanges are also researched and they report relatively higher percentage of zero-leverage firms compared to the NASDAQ OMX Stockholm. Due to its size, OMX has the largest percentage of both zero-leverage firms of total observations, or 12,4%, and 56,4% of zero-leverage firms on the market. However, observing the percentage of zero-leverage firms on each market separately, OMX has the lowest, or 17,2%. This can be seen in the last column in table 3, and was expected since firms in the smaller stock exchanges are usually younger, smaller in size, and are less profitable, and are therefore possibly constrained in their debt capacity.

Table 3: Zero-leverage by market

Market	Observations	Size	ZL			
			# of obs	% of total	% on market of total	% of ZL on market
NASDAQ OMX	2345	72,2%	404	12,4%	56,4%	17,2%
First North	510	15,7%	161	5,0%	22,5%	31,6%
NGM	83	2,6%	29	0,9%	4,1%	34,9%
AktieTorget	309	9,5%	122	3,8%	17,0%	39,5%
Total	3247	100,0%	716	22%	100%	

When looking at how zero- and almost zero-leverage firms are distributed among industries, it can be seen that firms within the technology, health care and oil and gas industries have higher percentage of zero- and almost zero-leverage firms, or 64,1%, 54,1%, 40,2%, respectively (See table 4 below and figure 2 in appendix B). This is consistent with Bessler et al. (2013), Dang (2013) and Strebulaev and Yang (2013), though in the last zero-leverage is only concentrated in technology and health care, but this difference may be due to different industry classifications. There may be a reason why these industries seem to have a higher percentage of zero-leverage firms. Again, the reason may be that companies in these industries have attributes that usually characterise firms that are constrained in their debt capacity. Furthermore, assets in these industries are usually more volatile and illiquid and thus do not serve as a good collateral (Bessler et al., 2013).

Table 4: Zero-leverage by industry

Industry	Observation	ZL / AZL			
		# of obs	% of total	% in industry of total	% of ZL/AZL in industry
Oil & Gas	112	45	1,4%	3,9%	40,2%
Basic Materials	206	51	1,6%	4,4%	24,8%
Industrials	922	225	6,9%	19,5%	24,4%
Consumer Goods	240	54	1,7%	4,7%	22,5%
Consumer Services	395	135	4,2%	11,7%	34,2%
Health Care	353	191	5,9%	16,6%	54,1%
Telecommunications	43	10	0,3%	0,9%	23,3%
Utilities	14	5	0,2%	0,4%	35,7%
Financials	514	148	4,6%	12,9%	28,8%
Technology	448	287	8,8%	24,9%	64,1%
Total	3247	1151	35%	100%	

4.3 Characteristics of firms in Sweden

In this section the characteristics of firms that hold zero- or almost-zero leverage are compared to those that are levered. In this research the variables that explain firm characteristics are regarded as control variables.

Table 5: Characteristics of levered and un-levered firms

	Levered	ZL/AZL
Bankruptcy probability	2,568	27,717
Dividends	0,019	0,035
Investment opportunities	2,745	3,668
Non-debt tax shield	0,046	0,048
Profitability	0,032	-0,031
Size	6,163	5,294
Tangibility	0,242	0,076

In table 5 the comparison of the two groups of firms is presented. On average, zero- and almost zero-leverage firms are smaller, have lower probability of becoming bankrupt, lower tangibility and profitability, have greater investment opportunities, higher non-debt tax shield, and pay higher dividends than their levered counterparts. Largely these results are comparable to theory, except investment opportunities and profitability. Investment opportunities should be greater for levered firms since internally generated funds are usually not sufficient when firms have substantial investment opportunities, and if firms issue equity to fund their investments they are violating the Pecking Order Theory. Profitability is not in line with theory either, since it is expected that firms with high profitability have higher internally generated funds. However, it is possible to report profits without having positive cash flow, so these two do not always go hand in hand.

Furthermore, these results are largely comparable to previous literature, such as Dang (2013) and Strebulaev and Yang (2013), even though there are some deviations. According to Strebulaev and Yang (2013) there is no difference between the two groups of firms in size, but profitability is higher for firms following a zero-leverage policy. In the research conducted by Dang (2013) dividends are lower on average in firms with zero-leverage.

4.3.1 Are zero-leverage firms constrained?

Most researchers studying the zero-leverage puzzle have addressed the fact that some firms following a zero-leverage policy may be doing so involuntarily. That is, for one reason or another they may not be able to obtain debt financing even though they would prefer to do so. Some researchers simply control for financial constraints by adding proxies for them to their regression analysis (Byoun & Xu, 2013; Devos et al., 2012), while others have dealt with the problem by dividing firms into two groups depending on whether they are constrained or not (Dang, 2013; Strebulaev & Yang, 2013). Both Dang (2013) and Strebulaev and Yang (2013) divide firms into dividend payers and non-payers. They argue that zero-leverage dividend paying firms are not financially constrained since they use funds that otherwise could be used to service interest payments to compensate shareholders. According to this ideology, dividend paying zero-leverage firms are opting for zero-leverage for strategic reasons. Others, such as Bessler et al. (2013), use measures like S-A index and debt capacity to divide these firms into two groups. Making these measures, however, is more complicated. Furthermore, it has been shown by Farre-Mensa

and Ljungqvist (2013) that none of these measures can estimate with high accuracy which firms are constrained, and which are not. In this research, bankruptcy probability is included to account for potential financial constraints. In addition, the simple dividend paying approach will be conducted to confirm the results, and it will be presented in the multivariate analysis chapter.

When looking at the Swedish market as a whole, and using dividends to distinguish between constrained and unconstrained firms, it can be seen that 41,7% of zero- or almost zero-leverage firms seem to have adopted zero-leverage policy voluntarily since they are paying dividends. This can be observed in table 6. Moreover, when the market is broken down into different stock exchanges, it becomes clear that the smaller exchanges are more constrained in their debt capacity than NASDAQ OMX, as expected.

Table 6: Dividend paying firms

Market	Observations	# of DP obs	% of DP on market	ZL/AZL		
				# of obs	# of DP obs	% of DP on market
NASDAQ OMX	2345	1488	63,5%	710	370	52,1%
First North	510	108	21,2%	215	68	31,6%
NGM	83	5	6,0%	44	2	4,5%
AktieTorget	309	62	20,1%	182	40	22,0%
Total	3247	1663	51,2%	1151	480	41,7%

Furthermore, zero- and almost zero-leverage firms are divided into dividend payers and non-dividend payers to see whether the characteristics of the dividend paying group are in fact the same as the characteristics of unconstrained firms in previous studies. (Table 15 in appendix A reports characteristics on the two groups by market).

Table 7: Characteristics of zero-leverage dividend and non-dividend paying firms

	ZL/AZL	
	DP	NDP
Bankruptcy probability	11,373	39,665
Dividends	0,081	0,000
Investment opportunities	3,387	3,871
Non-debt tax shield	0,031	0,061
Profitability	0,158	-0,171
Size	5,711	4,995
Tangibility	0,084	0,070

As can be seen from table 7 dividend paying zero- and almost zero-leverage firms are by average larger, have higher dividend paying ratios, tangibility and profitability, have

lower non-debt tax shields and investment opportunities and greater probability of becoming bankrupt than firms that do not pay dividends. These results are to a large extent in line with those of Strebulaev and Yang (2013), Dang (2013) and Bessler et al. (2013). However, bankruptcy probability is not according to expectations. Theory predicts that it should be analogous to the research by Dang (2013) where bankruptcy probability, proxied by Z-score, is lower for non-dividend paying firms. The reason for this deviation in the bankruptcy probability could be that firms on the Swedish market have a higher dividend pay-out ratio than firms in the UK (Dang, 2013). Retained earnings decrease when dividends are paid and the Z-score decreases with it since this measure is comprised of retained earnings. Typical unconstrained firms are more profitable, distribute higher dividends, are larger, and with greater tangibility, as well as having lower investment opportunities than their constrained peers (Bessler et al., 2013). Since the dividend paying zero-leverage and almost zero-leverage firms in Sweden possess these characteristics it is concluded that there are two groups of zero-leverage and almost zero-leverage firms, constrained and unconstrained, depending on their dividend paying nature. As stated earlier Bessler et al. (2013) use a more complicated measures to divide firms into constrained and unconstrained firms but seeing that it results in the same characteristics it justifies the use of this simple method. To summarize, it appears that dividend paying firms are deliberately remaining debt free while firms that do not pay dividends are forced to adopt a zero-leverage policy.

4.4 Ownership structure in Sweden

Ownership structure in Sweden is known to be concentrated, and that fact is evident when the data from the Swedish market is reviewed (Agnblad et al., 2002). In table 8 it can be seen that the average sum of voting rights of the block holders is 49,06%, and the concentration is similar among the four exchanges. Unfortunately, no direct comparison was found for the Swedish market with the same variable for ownership concentration but research from other civil law countries show even more ownership concentration or 64,31% in Spain (De Miguel et al., 2004), a French civil law country and 60,9% in Hungary (Earle, et al., 2005), a German civil law country (La Porta, Lopez-de-Silanes & Shleifer, 2007). However, when the result from the Swedish market is compared to research in common law countries that study ownership structure, the numbers are lower, or 43% in

a study with data from 1995 by Holderness (2009), and 38,17% in a study with data from 2008 by Devos et al. (2012). The reason for the lower concentration may be that common law legal systems have greater investor protection (La Porta et al., 2000). Furthermore, when separating institutional and private ownership with respect to the largest voteholder there is a notable difference where the average ownership of the block is larger when the largest owner is private. The difference between the ownership types increases in the smaller markets where private investors dominate. This indicates more ownership concentration when the largest investor is private.

Table 8: Average voting rights of block holders

Market	Block Ownership	Private	Institutional
OMX	49,42%	52,78%	45,47%
First North	47,80%	49,88%	36,93%
NGM	44,91%	46,91%	26,19%
AktieTorget	49,46%	51,61%	37,78%
Total	49,06%	51,80%	44,46%

The average of the sum of voting rights of block holders in zero-leverage and almost-zero leverage firms does not differ greatly from the average of the whole sample, and neither does owner identity (see table 9). This analysis is largely inconclusive since it is difficult to detect a clear difference in concentration between the zero-leverage and almost zero-leverage firms and the whole sample.

Table 9: Average voting rights of the largest owner in ZL/AZL firms

Market	ZL/AZL		
	Block Ownership	Private	Institutional
OMX	46,99%	48,36%	44,37%
First North	45,55%	47,44%	37,01%
NGM	47,79%	50,29%	28,28%
AktieTorget	46,96%	48,78%	36,97%
Total	46,75%	48,33%	42,55%

It is apparent from table 10 that there are very few firms in the Swedish market that have diffuse ownership structure, or only 1,39% of firms observations aggregated over all four markets. This was expected due to the relatively low investor protection within in the Swedish market (La Porta et al., 2000). However, when looking at how many of the diffuse firm observations are also zero- or almost zero-leveraged, the percentage, 48,89%, is

striking. Therefore, a relation between diffuseness and zero- and almost zero-leverage policies seems to be present in the Swedish market.

Table 10: Diffuse ownership in Sweden

Market	Observations	Diffuse ownership 5% obs	% of total	ZL/AZL	
				Diffuse 5% obs	% of Diffuse ZL
OMX	2345	26	1,11%	8	30,77%
First North	510	15	2,94%	10	66,67%
NGM	83	0	0,00%	0	-
AktieTorget	309	4	1,29%	4	100,00%
Total	3247	45	1,39%	22	48,89%

5 Multivariate analysis

In this chapter the multivariate analysis is reported. It starts by presenting the empirical results, followed by an analysis and discussion. Then, the robustness of the results is tested, and finally the research question is answered.

5.1 Empirical results

In the following section the results from the empirical models will be presented.

5.1.1 Control variable regression

Table 11: Control variable regression

***, ** and * stand for statistical significance, 1%, 5% and 10% respectively. All continuous variables were winsorized at the 1% and 99% percentile except Size and Tangibility. All independent variables are lagged one year. For the three categorical variables one dummy variable of each is excluded to circumvent the dummy variable trap these are NASDAQ OMX, industrials and the year 2000.

	Expected	Reality	St.dv.	Coefficient
Bankruptcy probability	-	+	0,016	0,085***
Dividends	+	+	1,535	10,119***
Investment opportunities	-	-	0,018	-0,033*
Non-debt tax shield	+	-	1,417	-3,413**
Profitability	+	-	0,252	-0,472*
Size	-	-	0,086	-0,976***
Tangibility	-	-	0,461	-3,311***
Constant			0,599	4,853***
Exchanges			Yes	
Industries			Yes	
Period			Yes	
McFadden R-squared			0,306	
Observations			2597	

Four of the control variables in table 11 are significant and in line with theory, these are dividends, investment opportunities, size and tangibility. The coefficient on dividends is positive, so when dividends increase the probability of zero- and almost zero-leverage increases as well. The proxy for investment opportunities, market-to-book, has a negative coefficient so when firms have more investment opportunities it is less likely that they hold zero- or almost zero-leverage. The coefficient on size is also negative, meaning that when firms grow, it is less likely that they will have zero- or almost zero-leverage. Finally,

the proxy for tangibility has a negative coefficient, meaning that when firms have greater tangibility they are less likely to have zero- or almost zero-leverage.

The remaining three variables are significant but not in line with theory, these are bankruptcy probability, non-debt tax shield, and profitability. The coefficient on the proxy for bankruptcy probability, Z-score, is positive, meaning that when the probability of bankruptcy decreases the probability of zero- and almost zero-leverage increases. The coefficient on non-debt tax shield is negative, meaning that when NDTs increases the probability of zero- and almost zero-leverage decreases, which is not consistent with theory. The coefficient on profitability is negative, contradicting theory, since profitable firms should have higher internal funds available and therefore should not require debt financing.

Furthermore, a Wald test is conducted for each of the categorical variables; exchanges, industries and periods. The coefficients on exchanges and industries are jointly significant as expected from the univariate analysis where there was a clear clustering of zero-leverage and almost zero-leverage firms within certain industries and exchanges. However, the coefficients on the year dummies were not jointly significant, as could have been predicted from the univariate analysis, as it showed that zero- and almost zero-leverage is persistent and consistent over time. To adhere to convention, the period fixed effects are not excluded despite their insignificance.

Based on the above analysis on the control variables, it can be concluded that the underlying model used to control for capital structure decisions is valid. In addition, it shows that these capital structure variables that are used in international context also hold for the Swedish market.

5.1.2 Diffuse ownership regression

As can be seen in column one in table 12, the diffuse ownership variable is significant at the 10% level. The coefficient is positive, as expected, and therefore the likelihood of firm having a zero- or almost zero-leverage policy is greater since diffuse ownership gives managers more room to shirk. The coefficients and significance levels of the control variables vary only marginally from the previous control variable regression and are thus not reported. Since the 5% threshold could be considered too severe, another variable was constructed and tested. This variable is similar to the one used before, the only

difference being that the threshold defining diffuse ownership was moved up to 10%. Now, firms in which the largest shareholder holds less than 10% of voting rights are considered diffuse, resulting in more observations taking the value one for this variable than before. When testing this variable the significance level increases to 1% as opposed to 10% for the original variable.

Table 12: Diffuse ownership regression

Coefficients, z-statistics (in parenthesis) and standard deviation are reported. ***, ** and * stand for statistical significance, 1%, 5% and 10% respectively. All continuous variables were winsorized at the 1% and 99% percentile except Size and Tangibility. All independent variables are lagged one year. For the three categorical variables one dummy variable is excluded from each to circumvent the dummy variable trap these are NASDAQ OMX, industrials and the year 2000.

	(1)	(2)	(3)	(4)
Diffuse Ownership 5%	0,736* (1,945) 0,378		0,709* (1,719) 0,413	0,746** (2,070) 0,361
Diffuse Ownership 10%		0,599*** (3,625) 0,165		
Constant	4,880*** (8,090) 0,603	4,766*** (7,888) 0,604	5,494*** (9,742) 0,564	4,694*** (8,718) 0,538
Control Variables	Yes	Yes	Yes	Yes
Exchanges	Yes	Yes	Yes	Yes
Industries	Yes	Yes	No	Yes
Period	Yes	Yes	Yes	No
McFadden R-squared	0,307	0,31	0,278	0,304
Observations	2597	2597	2597	2597

Furthermore, when the fixed effects are excluded one at a time, as can be seen in columns three and four, the results still hold. Therefore, it can be concluded that the diffuse ownership measure is consistent and that hypothesis one is not rejected.

*H0: Companies with diffuse ownership are **more likely** to follow a zero- or almost zero-leverage*

5.1.3 Concentrated ownership regression

As can be seen from column one in table 13 the concentrated ownership variable is highly significant. The coefficient is negative, indicating that when ownership concentration increases the probability of zero- and almost zero-leverage decreases. This is in line with theory and previous literature, since concentrated ownership increases investors'

incentive to monitor and therefore limits managers' possibility to misbehave. The coefficients and significance levels of the control variables are not reported since they vary only marginally from the previous control variable regression, with the exception of profitability that loses its significance. As with the diffuse ownership variable a 5% threshold may be considered too low since it includes too many firm observations. To address this concern, an additional variable is constructed and tested. The new variable is constructed the same way as the current concentrated ownership variable except the threshold for block ownership has been raised to 10%. Despite this change in the variable, it is still highly significant.

Table 13: Concentrated ownership regression

Coefficients, z-statistics (in parenthesis) and standard deviation are reported. ***, ** and * stand for statistical significance, 1%, 5% and 10% respectively. All continuous variables were winsorized at the 1% and 99% percentile except Size and Tangibility. All independent variables are lagged one year. For the three categorical variables one dummy variable is excluded from each to circumvent the dummy variable trap these are NASDAQ OMX, industrials and the year 2000.

	(1)	(2)	(3)	(4)
Concentrated Ownership 5%	-0,009*** (-3,419) 0,003		-0,011*** (-4,179) 0,003	-0,009*** (-3,300) 0,003
Concentrated Ownership 10%		-0,006*** (-2,879) 0,002		
Constant	5,412*** (8,656) 0,625	5,151*** (8,460) 0,609	6,102*** (10,414) 0,586	5,217*** (9,230) 0,565
Control Variables	Yes	Yes	Yes	Yes
Exchanges	Yes	Yes	Yes	Yes
Industries	Yes	Yes	No	Yes
Period	Yes	Yes	Yes	No
McFadden R-squared	0,310	0,309	0,283	0,306
Observations	2597	2597	2597	2597

Furthermore, when the fixed effects are excluded one at a time, as can be seen in column three and four, the results still hold. Therefore, it can be concluded that the concentrated ownership measure is consistent and that hypothesis two is not rejected.

*H0: Companies with concentrated ownership are **less likely** to follow a zero- or almost zero-leverage*

5.1.4 Institutional ownership regression

Table 14: Institutional ownership regression

Coefficients, z-statistics (in parenthesis) and standard deviation are reported. ***, ** and * stand for statistical significance, 1%, 5% and 10% respectively. All continuous variables were winsorized at the 1% and 99% percentile except Size and Tangibility. All independent variables are lagged one year. For the three categorical variables one dummy variable is excluded from each to circumvent the dummy variable trap these are NASDAQ OMX, industrials and the year 2000.

	(1)	(2)	(3)	(4)
Concentrated Ownership 5%	-0,009*** (-3,369) 0,003		-0,011*** (-4,176) 0,003	-0,009*** (-3,283) 0,003
Concentrated Ownership 10%		-0,006*** (-2,830) 0,002		
Institutional investors	-0,013 (-0,105) 0,125	-0,004 (-0,030) 0,125	-0,063 (-0,519) 0,122	-0,038 (-0,307) 0,122
Constant	5,400*** (8,450) 0,639	5,148*** (8,232) 0,625	6,042*** (10,051) 0,601	5,186*** (9,013) 0,575
Control Variables	Yes	Yes	Yes	Yes
Exchanges	Yes	Yes	Yes	Yes
Industries	Yes	Yes	No	Yes
Period	Yes	Yes	Yes	No
McFadden R-squared	0,310	0,309	0,283	0,306
Observations	2597	2597	2597	2597

The variable for institutional ownership is insignificant, even though it has the expected negative sign at all conventional significance levels. However, the variable for concentrated ownership is still highly significant. Therefore, it seems that owner identity does not influence zero- and almost zero-leverage decisions. The coefficients and significance levels of the control variables are not reported since they vary only marginally from the previous control variable regression, with the exception of profitability that loses its significance. The variable for institutional investor is indisputable, since it is not a proxy but a real measure of whether or not the maximum owner is an institution, and therefore it is neither possible nor necessary to find a broader measure to test its consistency. Furthermore, when the period and industry fixed effects are excluded, as can be seen in

column three and four in table 14, the results still hold. Therefore, it can be concluded that hypothesis three is rejected.

*H0: Companies where the maximum voteholder is an institutional investor are **less likely** to follow a zero- or almost zero-leverage policy*

As mentioned earlier, in this research there are only two categories for investors, institutional and private. If an investor is not institutional, he is private. Therefore, the relationship between private investors and zero- and almost zero-leverage should be inverse to the same relationship for institutional investors. In fact, if the institutional ownership variable is switched out for a dummy variable representing private ownership instead, the results are exactly the same but with an opposite sign on the coefficient.

5.2 Analysis and discussion

In this section the empirical results from the multivariate regressions will be analysed, discussed, and compared to the univariate analysis.

5.2.1 Discussion on control variables

In the regressions, presented in *5.1 Empirical results*, the bankruptcy probability is expected to have a negative coefficient, meaning that when the Z-score increases (bankruptcy probability decreases) the probability of a firm being zero- or almost zero-leverage decreases. This is expected since this measure is used to account for financial constraints and when a firm has high operating risk, like the zero- and almost zero-leverage firms are expected to be, the debt level should be low. However, the coefficient turns out to be positive in the multivariate regressions, opposite to prediction. This contrast between expectation and reality may be attributed to the proxy itself, since one component of the Z-score divides by total liabilities, and in the case of zero- and almost zero-leverage firms, liabilities are likely to be zero as well. Since it is not possible to divide by zero, these observations are lost, resulting in an upwardly biased Z-score. Due to the inaccuracy in this measure, it is possible that it is not accounting for financial constraints as initially was anticipated. However, even though they contradict theory, these results are in line with that of Dang (2013), who reports no explanations of his contradicting findings.

The coefficient on the dividend pay-out ratio is positive as expected and in line with previous research, that is, when the dividend pay-out ratio increases, the probability of zero-leverage and almost zero-leverage increases as well (Bessler et al., 2013; Dang, 2013; Strebulaev & Yang, 2013). This was anticipated since firms that pay dividends would not do so if they needed those funds for investments, since using internally generated funds to pay dividends while requiring debt financing for investments, violates the Pecking Order Theory.

The probability of zero- or almost zero-leverage decreases with greater investment opportunities since investments often need to be financed with debt. Therefore, the coefficient on investment opportunities, proxied by market-to-book, is expected to be negative. This is the case in all the multivariate regressions, and contradicts results from previous research by Bessler et al. (2013), and Strebulaev and Yang (2013), but they do not comment on the validity of their results.

Non-debt tax shields are expected to be positively related to zero-leverage and almost zero-leverage policies. If firms enjoy tax shields from other sources than debt then there is no incentive to add debt to the capital structure. However, the coefficient from the multivariate regressions is negative. The reason may be that this proxy depends on both depreciation and deferred income taxes and investment tax credits. Nevertheless, deferred income taxes and investment tax credits are rarely reported, and zero-leverage and almost zero-leverage firms tend to have less fixed assets so the tax shield from depreciation is lower for these firms. Therefore, the non-debt tax shield mainly consists of depreciation which is lower for zero- and almost zero-leverage firms. Moreover, this is not the only research reporting the unexpected negative sign since both Bessler et al. (2013) and Dang (2013) report the same.

The coefficient on profitability is expected to be positive since greater profitability should generate internal funds and thus reduce the need for debt financing. That is, when profitability increases, the likelihood of a firm being zero- or almost zero-leveraged increases as well. This relationship has been found in previous research (Bessler et al., 2013; Strebulaev & Yang, 2013). In the multivariate regressions, however, the coefficient is negative. This is perhaps not unexplainable since in reality cash flows do not always

match profits and firms may need external financing even though they are highly profitable.

If companies grow, the probability of a firm being zero-leveraged or almost zero-leveraged decreases since then the likelihood of becoming bankrupt decreases so debt financing should be less expensive. This implies a negative coefficient on the size variable which is the case in all the multivariate regressions. These results are in line with previous research (Bessler et al., 2013; Dang, 2013; Strebulaev & Yang, 2013).

Increasing tangibility decreases the probability of a firm being zero- or almost zero-leveraged. If the amount of fixed assets, which can serve as collateral, increases so does the probability of being levered. The multivariate regressions report a negative coefficient on this variable, as expected, and is in line with previous research (Bessler et al., 2013; Strebulaev & Yang, 2013).

The results from the above multivariate regression on the control variables are largely consistent with the univariate analysis with two exceptions. From the univariate analysis there was evidence that zero-leverage and almost zero-leverage firms had greater investment opportunities than their levered peers. The multivariate analysis, however, reveals that with increasing investment opportunities the probability of being zero- or almost zero-leveraged decrease, which is in line with theory. Furthermore, the non-debt tax shield changes from being in line with theory in the univariate analysis, and becomes theoretically incorrect in the multivariate analysis. However, as stated above, this is not an uncommon result.

5.2.2 Discussion on ownership structure

The coefficient on the diffuse ownership structure variable is positive, as expected, since according to theory, if ownership is diffuse managers have excessive power due to the limited monitoring caused by the free-rider problem. Therefore, if the ownership structure becomes more diffuse, the probability of a firm being zero- or almost zero-leveraged increases since a risk-averse manager is expected to take advantage of his power and limit the risk in the capital structure by reducing, or even eliminating debt. In the multivariate analysis the diffuse ownership structure variable is significant at the 10% significance level. Therefore, it can be concluded that hypothesis one is not rejected and Swedish companies with diffuse ownership are more likely to follow a zero-leverage or almost zero-leverage

policy. However, since the variable is only significant at the 10% significance level, there is only weak evidence supporting the null hypothesis, suggesting that it may not be generally applicable.

If a company's ownership concentration increases the probability of a firm being zero- or almost zero-leveraged decreases. The reason is that when investors own a greater stake in a firm, and thus have more wealth invested, they have greater incentives to monitor managers. By monitoring, managers are encouraged to act in investors' best interest. This suggests a negative coefficient on the concentrated ownership structure variable. The multivariate analysis reports this expected negative relationship at the 1% significance level between concentrated ownership structure and zero- and almost zero-leverage. It can thus be concluded that Swedish companies with concentrated ownership are less likely to follow a zero- or almost zero-leverage policy.

In a research conducted by Devos et al. (2012) on management entrenchment in zero-leverage firms, 5% block ownership was one of the variables used as a proxy for external governance. In their research, no significant relationship was found between this variable and zero-leverage policy in firms. This proxy for external governance is the same as the measure used in this study for concentrated ownership, which enables comparison. The sample in Devos et al. (2012) is constructed from companies in a common law country, the US, where there is more investor protection, and thus less need for ownership concentration to preserve rights. Sweden, on the other hand, is a civil law country where investor protection is not as extensive and as a result relies more heavily on ownership concentration. This is a potential reason for why a significant relationship between ownership concentration and zero-leverage and almost zero-leverage policies is found in the Swedish market, whereas a similar relationship was not found in the US market. Another potential reason may be that in this study the dependent variable includes both zero- and almost zero-leverage firms while Devos et al. (2012) strictly include zero-leverage firms.

The coefficient on institutional ownership should be negative since when ownership is concentrated in the hands of institutional owners they are likely to support value creating activities due to their diversified nature. In the same way they are likely to fight managers' risk-reducing behaviour or sell their shares if they do not agree with managers' decisions.

Either way, zero- or almost zero-leverage should be less likely in the presence of institutional investors compared to the reference case, private investors. The multivariate analysis reports the expected negative sign on the institutional ownership coefficient, it is however, not significant. It can therefore be concluded that hypothesis three is rejected, that is, companies where the maximum voteholder is an institutional investor are not significantly less likely to follow a zero- or almost zero-leverage policy.

Since the institutional variable can be interpreted inversely for private investors, we expect the coefficient to be positive for private investors. This is theoretically correct since private investors tend to be undiversified and thus prefer lower firm specific risk. Therefore, the likelihood of a firm being zero- or almost zero-levered is greater if the maximum voteholder is private, compared to institutional. As with institutional investors the sign of the coefficient is correct, but not significant. Thus, it can be concluded that investor type has no effect on firms' zero- or almost zero-leverage decisions.

The results from the multivariate regressions on the ownership structure are to some extent in line with the univariate analysis. The diffuse ownership is clearly more prominent in zero- and almost zero leverage firms as predicted by the univariate analysis. However, the univariate analysis was inconclusive for concentrated ownership and investor type.

5.3 Robustness

To test the robustness of the results the sample was restricted in three different ways. Firstly, the sample was reduced to contain only firm observation from the NASDAQ OMX exchange. This was done since the univariate analysis revealed that smaller markets are possibly constrained in their debt capacity. Secondly, the industries that include firms that have attributes that usually characterise constrained firms; technology, health care and oil and gas, are excluded from the sample. Finally, to further address financial constraints the sample is divided into dividend payers and non-payers, since that has been done in previous research (Dang, 2013; Strebulaev & Yang, 2013). The results are presented in tables 17, 18 and 19 in appendix A, respectively. Additionally, the regressions for the whole sample are presented again in table 16 in appendix A to facilitate comparison.

Four of the control variables in all regressions; bankruptcy probability, dividends, size and tangibility, are always highly significant when they are run with the restricted samples, while the remaining three of the previously significant variables; investment

opportunities, non-debt tax shield and profitability, become insignificant in some of them. Despite the loss in significance, the McFadden R-squared increases. The reason for this is most likely that when the sample is restricted, it becomes more homogeneous than before and thus the model can more easily make correct predictions.

5.3.1 Restriction 1: only NASDAQ OMX firm observations

In the diffuse ownership regression the variable representing diffuse ownership becomes insignificant at the 5% threshold, but remains highly significant at the 10% threshold (see table 17 in appendix A). A possible reason for the insignificance on the more severe variable is that, as stated earlier, the NASDAQ OMX can be considered less financially constrained than the other three exchanges so when the constrained firms have been excluded from the sample the variable becomes insignificant.

In the concentrated variable regression and the institutional ownership regression the variables remain the same as in the original model, that is, concentrated ownership is still highly significant in both while institutional ownership is not. The significance on the concentrated ownership variable indicates that financial constraints may not affect the relationship between zero-leverage and almost zero-leverage and concentrated ownership.

5.3.2 Restriction 2: financially constrained industries excluded

In the diffuse ownership regression both proxies defined by the two thresholds become insignificant (see table 18 in appendix A). Again, it becomes clear that financial constraints severely affect this variable since now the three most constrained industries have been removed from the original sample.

The concentrated ownership variables that were significant in the concentrated ownership regression and the institutional ownership regression remain significant though the level decreases to 10%. Moreover, the institutional ownership variable is still insignificant. Now, some evidence that financial constraints also affect the concentrated ownership variable have emerged.

5.3.3 Restriction 3: Non-dividend paying firm observations excluded

When the regression models are run only on the dividend paying firms, that is, unconstrained firms, none of the ownership structure variables turn out to be significant

at any conventional significance levels (see table 19 in appendix A). Thereby, the suspicion that financial constraints affect the relationship between zero-leverage and ownership structure has increased. This result is especially surprising since it shows that the bankruptcy probability variable that was included in the models to account for differences in debt capacity seems to have failed its task as is discussed in section 5.2 *Analysis and discussion* above.

In an attempt to confirm the suspicion that financial constraints affect the relationship between zero-leverage and almost zero-leverage and ownership structure, the regression is now run only on firms that do not pay dividends, constrained firms. The results from this regression can be seen in table 20 in appendix A. The results confirm the aforementioned suspicion, since now all ownership structure variables are significant, except institutional ownership variable, like it was in the original model. It is thus confirmed that financial constraints facilitate a relationship between zero-leverage and almost zero-leverage and ownership structure in the original sample.

5.4 Does ownership structure explain the zero-leverage puzzle?

The original ownership structure regressions report a statistically significant relationship between diffuse and concentrated ownership and zero- or almost zero-leverage policy within Swedish firms. Based on this analysis alone the answer to the research question would be that ownership structure can, at least partly, explain the zero-leverage puzzle.

However, in light of the result from the robustness testing, the relationship can be called into question. The reasons for the significant relationship in the original multivariate regression can be attributed to financial constraints since the relationship progressively decreases in significance with every restriction applied to the sample. Furthermore, there is no relationship between owner identity and zero- and almost zero-leverage, neither in general nor for constrained firms.

In summary of the multivariate regression analysis and the robustness testing the research question cannot be answered in the same way as before. Ownership structure can partly explain the zero-leverage puzzle in constrained firms, but not generally. This is consistent with the results of Devos et al. (2012) that financial constraints have an important role in explaining why firms remain zero-leveraged.

6 Conclusion

This study set out to assess the relationship between ownership structure and zero- and almost zero-leverage on the Swedish market. The univariate analysis revealed that the zero-leverage phenomenon does indeed exist on the Swedish market. It showed that 35% of the firm year observations were zero- or almost zero-leverage in the sample period, 2000-2013. Moreover, there is a clear clustering of zero- and almost zero-leverage firms in certain industries; health care, oil and gas and technology, and on the smaller stock exchanges; First North, NGM and AktieTorget. Furthermore, the characteristics of the zero- and almost zero-leveraged firms on the Swedish market were largely consistent with previous research from other countries. That is, zero- and almost zero-leverage Swedish firms are on average smaller, have lower probability of becoming bankrupt, lower tangibility and profitability, have greater investment opportunities, higher non-debt tax shield and pay higher dividends than their leveraged counterparts.

The main finding of the multivariate analysis is that it supports two out of the three hypotheses. Firstly, hypothesis one is not rejected, that is, when ownership is diffuse firms are more likely to follow a zero- or almost zero-leverage policy. The reason for this is that when ownership is diffuse no single investor has incentive to monitor managers and to prevent managerial risk aversion. Secondly, hypothesis two is not rejected either, that is, when ownership is concentrated firms are less likely to follow a zero- or almost zero-leverage policy. This result indicates that when ownership concentration increases, investors become larger and consequently have more incentive to monitor. Finally, no support is found for hypothesis three, indicating that owner identity does not affect zero- and almost zero-leverage policy in firms.

These findings can perhaps not be considered generalisable since when restricting the sample, with different level of financial constraints, the results do not always hold. The main finding of this thesis is therefore that ownership structure can partly explain the zero-leverage puzzle in financially constrained firms only.

6.1 Limitations

Two possible limitations of this study are worth mentioning. Firstly, firms can move from being zero- or almost zero-leveraged from one year to another. Here only firm year observations are examined and thus this transformation is not taken into account. Therefore, the persistency of a firm being zero- or almost zero-leveraged is not considered. This may prove to be problematic since an unaccompanied zero- or almost zero-leveraged observation in a firm may not be deliberate. If this is the case for many firms in the sample, an erroneous relationship may be drawn between zero- and almost zero-leverage and ownership structure, which does not exist. This limitation could be overcome by, for example, including only firms that have zero- or almost zero-leverage observations for at least half of the sample period. However, this procedure would result in other limitations, such as loss of information. Secondly, in this thesis only two owner identities are examined, institutional- and private investors. This may be problematic since the two groups are so broadly defined and therefore heterogeneous. If investors are divided into narrower categories the groups would be more internally homogenous, and therefore a significant relationship cannot be ruled out when using more owner identity types. This problem could possibly be overcome by adding insiders and family firms as an additional owner type. Unfortunately, the SIS database did not allow for facile extraction of this information.

6.2 Further research

As previously stated, none have, to our knowledge, combined these two fields of research: capital structure and ownership structure, in attempt to explain the puzzle. Therefore, due to the different amount of investor protection between legal systems, a similar research could be conducted in different countries to see if these results hold for other civil law countries, and if the results would be different for common law countries. Another potential research subject would be to explore previously mentioned limitations regarding few owner identity types. It would be interesting to see if a relationship exists, between zero- and almost zero-leveraged firms and owner identity, when the number of categories is increased.

It is evident that further research in this area is necessary since the zero-leverage puzzle remains unsolved. Thus, there is a need to conduct further research on this topic, but it is unclear where the answers can be found.

Reference list

- Agnblad, J., Berglöf, E., Högfeldt, P., & Svancar, H. (2002). Ownership and control in Sweden: Strong owners, weak minorities, and social control. *The Control of Corporate Europe*, 228-258.
- Agrawal, A., & Nagarajan, N. J. (1990). Corporate Capital Structure, Agency Costs, and Ownership Control: The Case of All-Equity Firms. *The Journal of Finance*, 45(4), 1325-1331.
- Akerlof, G. A. (1970). The market for "lemons": Quality uncertainty and the market mechanism. *The Quarterly Journal of Economics*, 488-500.
- AktieTorget. (n.d.). *About AktieTorget*. Retrieved 9. March 2015 from <http://www.aktietorget.se/AboutGeneral.aspx>
- Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *The Journal of Finance*, 23(4), 589-609.
- Altman, E.I. (2002). *Revisiting credit scoring models in Basel 2 environment*. Working Paper. Stern School of Business New York University.
- Anderson, R. C., & Reeb, D. M. (2003). Founding-family ownership and firm performance: evidence from the S&P 500. *The Journal of Finance*, 58(3), 1301-1327.
- Andrade, G., & Kaplan, S. N. (1998). How costly is financial (not economic) distress? Evidence from highly leveraged transactions that became distressed. *The Journal of Finance*, 53(5), 1443-1493.
- Ang, J. S., Cole, R. A., & Lin, J. W. (2000). Agency costs and ownership structure. *The Journal of Finance*, 55(1), 81-106.
- Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *The Journal of Finance*, 57(1), 1-32.
- Berle, A. A., & Means, G. C. (1932). *The modern corporation and private property*. New York: Macmillan Co.
- Bessler, W., Drobetz, W., Haller, R., & Meier, I. (2013). The international zero-leverage phenomenon. *Journal of Corporate Finance*, 23, 196-221.
- Bradley, M., Jarrell, G. A., & Kim, E. (1984). On the existence of an optimal capital structure: Theory and evidence. *The Journal of Finance*, 39(3), 857-878.
- Brailsford, T. J., Oliver, B. R., & Pua, S. L. (2002). On the relation between ownership structure and capital structure. *Accounting & Finance*, 42(1), 1-26.

- Brickley, J. A., Lease, R. C., & Smith, C. W. (1988). Ownership structure and voting on antitakeover amendments. *Journal of financial economics*, 20, 267-291.
- Brigham, E., & Daves, P. (2007). *Intermediate financial management*. Cengage Learning.
- Brooks, C. (2008). *Introductory econometrics for finance*. Cambridge University Press.
- Byoun, S., & Xu, Z. (2013). Why do some firms go debt free? *Asia-Pacific Journal of Financial Studies*, 42(1), 1-38.
- Corporate Actions Stockholm (n.d.). *Corporate Actions Stockholm - Changes to the list*. Retrieved 9. March 2015 from <http://www.nasdaqomx.com/transactions/markets/nordic/corporate-actions/stockholm/changes-to-the-list>
- Culp, C. L. (2002). *The risk management process: Business strategy and tactics* (Vol. 103). John Wiley & Sons.
- Dang, V. A. (2013). An empirical analysis of zero-leverage firms: New evidence from the UK. *International Review of Financial Analysis*, 30, 189-202.
- DeAngelo, H., & Masulis, R. W. (1980). Optimal capital structure under corporate and personal taxation. *Journal of financial economics*, 8(1), 3-29.
- De Miguel, A., Pindado, J., & De la Torre, C. (2004). Ownership structure and firm value: New evidence from Spain. *Strategic Management Journal*, 25(12), 1199-1207.
- Demsetz, H., & Lehn, K. (1985). The structure of corporate ownership: Causes and consequences. *The Journal of Political Economy*, 1155-1177.
- Devos, E., Dhillon, U., Jagannathan, M., & Krishnamurthy, S. (2012). Why are firms unlevered? *Journal of Corporate Finance*, 18(3), 664-682.
- Earle, J. S., Kucsera, C., & Telegdy, Á. (2005). Ownership Concentration and Corporate Performance on the Budapest Stock Exchange: do too many cooks spoil the goulash?. *Corporate Governance: An International Review*, 13(2), 254-264.
- Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work*. *The Journal of Finance*, 25(2), 383-417.
- Farre-Mensa, J., & Ljungqvist, A. (2013). *Do measures of financial constraints measure financial constraints?* (No. w19551). National Bureau of Economic Research.
- Frank, M. Z., & Goyal, V. K. (2009). Capital structure decisions: which factors are reliably important?. *Financial management*, 38(1), 1-37.
- Graham, J. R. (2000). How big are the tax benefits of debt?. *The Journal of Finance*, 55(5), 1901-1941.

- Harris, M., & Raviv, A. (1991). The theory of capital structure. *the Journal of Finance*, 46(1), 297-355.
- Holderness, C. G. (2009). The myth of diffuse ownership in the United States. *Review of Financial Studies*, 22(4), 1377-1408.
- Jensen, M., (1986). Agency cost of free cash flow, corporate finance, and takeovers, *American Economic Review*, 76, 323-329.
- Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
- Ju, N., Parrino, R., Poteshman, A. M., & Weisbach, M. S. (2002). *Horses and rabbits? Optimal dynamic capital structure from shareholder and manager perspectives* (No. w9327). National bureau of economic research.
- Krantz, M. (2014, 29. May). 26 U.S. companies with no long-term debt. *USA TODAY*. Retrieved 2. April from <http://americasmarkets.usatoday.com/2014/05/29/debt-free-26-u-s-companies-shun-debt/>
- Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance*, 28(4), 911-922.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. (2000). Investor protection and corporate governance. *Journal of financial economics*, 58(1), 3-27.
- La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2007). *The economic consequences of legal origins* (No. w13608). National Bureau of Economic Research.
- Marsh, P. (1982). The choice between equity and debt: An empirical study. *The Journal of Finance*, 37(1), 121-144.
- Minton, B. A., & Wruck, K. H. (2002). Financial conservatism: Evidence on capital structure from low leverage firms.
- Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. *The American Economic Review*, 261-297.
- Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: a correction. *The American Economic Review*, 433-443.
- Myers, S. (1977). Determinants of Corporate Borrowing. *Journal of Financial Economics*, 5(2), 147–175.
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187-221.
- NGM. (n.d.). *Welcome to Nordic Growth Market – NGM*. Retrieved 9. March 2015 from <http://www.ngm.se/om-ngm/?lang=en>

- Pound, J. (1988). Proxy contests and the efficiency of shareholder oversight. *Journal of financial economics*, 20, 237-265.
- 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.
- Saunders, M., Lewis, P., and Thornhill A. (2009). *Research Methods for Business Students*. Pearson Education Limited.
- Shares. (n.d.). *NASDAQ First North Information*. Retrieved 9. March 2015 from <http://www.nasdaqomxnordic.com/shares>
- Shleifer, A., & Vishny, R. W. (1986). Large shareholders and corporate control. *The Journal of Political Economy*, 461-488.
- Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, 52(2), 737-783.
- Strebulaev, I. A., & Yang, B. (2013). The mystery of zero-leverage firms. *Journal of Financial Economics*, 109(1), 1-23.
- Thomsen, S., & Pedersen, T. (2000). Ownership structure and economic performance in the largest European companies. *Strategic Management Journal*, 21(6), 689-705.
- Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *The Journal of Finance*, 43(1), 1-19.
- Warner, J. B. (1977). Bankruptcy costs: Some evidence. *The Journal of Finance*, 32(2), 337-347.

Appendix A

Table 15: Characteristics of firms by market

	ZL/AZL - DP				ZL/AZL - NDP			
	NASDAQ OMX	First North	NGM	AktieTorget	NASDAQ OMX	First North	NGM	AktieTorget
Bankruptcy probability	11,364	14,348	25,615	4,936	59,276	6,899	34,959	25,820
Dividends	0,073	0,109	0,012	0,118	0,000	0,000	0,000	0,000
Investment opportunity	3,496	3,201	5,431	2,596	3,846	3,471	6,027	3,694
Non-debt tax shields	0,030	0,029	0,002	0,052	0,059	0,057	0,068	0,066
Profitability	0,162	0,179	-0,184	0,103	-0,097	-0,255	-0,285	-0,230
Size	5,946	4,999	4,633	4,802	5,444	4,786	4,633	4,245
Tangibility	0,082	0,063	0,007	0,141	0,063	0,066	0,043	0,099
	Levered - DP				Levered - NDP			
	NASDAQ OMX	First North	NGM	AktieTorget	NASDAQ OMX	First North	NGM	AktieTorget
Bankruptcy probability	3,030	2,573	0,989	3,519	2,326	1,273	1,110	2,010
Dividends	0,031	0,051	0,025	0,041	0,000	0,000	0,000	0,000
Investment opportunity	2,063	1,494	1,438	3,472	3,096	4,315	7,957	3,355
Non-debt tax shields	0,033	0,070	0,009	0,037	0,054	0,072	0,086	0,076
Profitability	0,116	0,091	-0,252	0,147	-0,018	-0,138	-0,137	-0,205
Size	6,801	5,161	5,585	5,741	5,920	4,971	4,897	4,296
Tangibility	0,275	0,240	0,029	0,275	0,238	0,169	0,073	0,147

Table 16: Regressions for the whole sample

Coefficients, z-statistics (in parenthesis) and standard deviation are reported. ***, ** and * stand for statistical significance, 1%, 5% and 10% respectively. All continuous variables were winsorized at the 1% and 99% percentile except Size and Tangibility. All independent variables are lagged one year. For the three categorical variables one dummy variable is excluded from each to circumvent the dummy variable trap these are NASDAQ OMX, industrials and the year 2000.

	Control Variable Regression	Diffuse ownership regression	Concentrated ownership regression	Institutional ownership regression
Bankruptcy Probability	0,085*** (5,301) 0,016	0,085*** (5,278) 0,016	0,085*** (5,314) 0,016	0,085*** (5,306) 0,016
Dividends	10,119*** (6,594) 1,535	10,086*** (6,576) 1,534	10,587*** (6,758) 1,567	10,590*** (6,760) 1,567
Investment Opportunities	-0,033** (-1,852) 0,018	-0,032* (-1,795) 0,018	-0,036** (-2,042) 0,018	-0,036** (-2,033) 0,018
Non-debt tax shield	-3,413** (-2,408) 1,417	-3,528** (-2,517) 1,402	-3,535** (-2,502) 1,412	-3,530** (-2,496) 1,414
Profitability	-0,472* (-2,408) 1,417	-0,429* (-1,696) 0,253	-0,315 (-1,239) 0,254	-0,317 (-1,239) 0,255
Size	-0,976*** (-11,384) 0,086	-0,987*** (-11,405) 0,087	-1,007*** (-11,669) 0,086	-1,004*** (-10,974) 0,092
Tangibility	-3,311*** (-7,185) 0,461	-3,293*** (-7,169) 0,459	-3,115*** (-6,874) 0,453	-3,114*** (-6,877) 0,453
Constant	4,853*** (8,105) 0,599	4,880*** (8,090) 0,603	5,412*** (8,656) 0,625	5,400*** (8,450) 0,639
Diffuse ownership		0,736* 1,945 0,378		
Concentrated ownership			-0,009*** (-3,419) 0,003	-0,009*** (-3,369) 0,003
Institutional investors				-0,013 (-0,105) 0,125
Exchanges	Yes	Yes	Yes	Yes
Industries	Yes	Yes	Yes	Yes
Period	Yes	Yes	Yes	Yes
McFadden R- squared	0,306	0,307	0,310	0,310
Observations	2597	2597	2597	2597

Table 17: Regressions for restriction 1

Coefficients, z-statistics (in parenthesis) and standard deviation are reported. ***, ** and * stand for statistical significance, 1%, 5% and 10% respectively. All continuous variables were winsorized at the 1% and 99% percentile except Size and Tangibility. All independent variables are lagged one year. The sample in these regressions only consists of NASDAQ OMX firms. For the two categorical variables one dummy variable is excluded from each to circumvent the dummy variable trap these are industrials and the year 2000. Furthermore, due to the loss of observations when the sample is restricted utilities had to be excluded as well.

	Control Variable Regression	Diffuse ownership regression 5%	Diffuse ownership regression 10%	Concentrated ownership regression	Institutional ownership regression
Bankruptcy Probability	0,093*** (4,631) 0,020	0,093*** (4,630) 0,020	0,093*** (4,679) 0,020	0,093*** (4,663) 0,020	0,093*** (4,663) 0,020
Dividends	10,444*** (5,871) 1,779	10,442*** (5,870) 1,779	10,938*** (6,026) 1,815	11,114*** (6,116) 1,1817	11,116*** (6,120) 1,816
Investment Opportunities	-0,026 (-0,883) 0,030	-0,026 (-0,883) 0,030	-0,031 (-1,050) 0,030	-0,034 (-1,154) 0,029	-0,035 (-1,178) 0,029
Non-debt tax shield	-0,551 (-0,227) 2,431	-0,553 (-0,227) 2,431	-0,488 (-0,201) 2,426	-0,614 (-0,253) 2,425	-0,653 (-0,269) 2,428
Profitability	-0,589 (-1,606) 0,367	-0,587 (-1,591) 0,369	-0,496 (-1,343) 0,369	-0,402 (-1,083) 0,371	-0,396 (-1,066) 0,372
Size	-0,967*** (-9,750) 0,099	-0,967*** (-9,747) 0,099	-0,976*** (-9,833) 0,099	-0,997*** (-10,019) 0,100	-1,008*** (-9,457) 0,107
Tangibility	-4,420*** (-6,786) 0,651	-4,419*** (-6,787) 0,651	-4,249*** (-6,634) 0,641	-4,178*** (-6,590) 0,634	-4,182*** (-6,585) 0,635
Constant	4,865*** (6,895) 0,706	4,864*** (6,893) 0,706	5,094*** (7,117) 0,716	5,424*** (7,337) 0,739	5,473*** (7,236) 0,756
Diffuse ownership 5%		0,036 (0,067) 0,536			
Diffuse ownership 10%			-0,005* (-1,933) 0,003		
Concentrated ownership				-0,009*** (-2,738) 0,003	-0,009*** (-2,635) 0,003
Institutional investors					0,043 (0,295) 0,145
Industries	Yes	Yes	Yes	Yes	Yes
Period	Yes	Yes	Yes	Yes	Yes
McFadden R- squared	0,352	0,352	0,353	0,355	0,355
Observations	2007	2007	2007	2007	2007

Table 18: Regressions for restriction 2

Coefficients, z-statistics (in parenthesis) and standard deviation are reported. ***, ** and * stand for statistical significance, 1%, 5% and 10% respectively. All continuous variables were winsorized at the 1% and 99% percentile except Size and Tangibility. All independent variables are lagged one year. The industries that include firms that have attributes that usually characterise constrained firms; technology, health care and oil & gas, are excluded from the sample. For the three categorical variables one dummy variable is excluded from each to circumvent the dummy variable trap these are NASDAQ OMX, industrials and the year 2000.

	Control Variable Regression	Diffuse Ownership Regression 5%	Diffuse Ownership Regression 10%	Concentrated Ownership Regression	Institutional Ownership Regression
Bankruptcy probability	0,127*** (3,882) 0,856	0,127*** (3,865) 0,033	0,129*** (3,868) 0,033	0,128*** (5,671) 0,896	0,128*** (3,879) 0,033
Dividends	7,292*** (3,668) 1,988	7,277*** (3,664) 1,986	7,289*** (3,669) 1,986	7,485*** (3,731) 2,003	7,499*** (3,738) 2,006
Investment opportunities	0,026 (0,951) 0,027	0,027 (0,973) 0,027	0,023 (0,857) 0,027	0,02 0,744 0,027	0,022 0,809 0,027
Non-debt tax shield	-5,634** (-2,340) 2,408	-5,657** (-2,359) 2,398	-5,556** (-2,316) 2,399	-5,766** (-2,385) 2,417	-5,681** (-2,337) 2,431
Profitability	0,335 (0,733) 0,457	0,371 (0,807) 0,46	0,372 (0,811) 0,459	0,478 (1,036) 0,462	0,466 (1,010) 0,466
Size	-1,066*** (-9,027) 0,118	-1,075*** (-9,023) 0,119	-1,068*** (-9,029) 0,118	-1,089*** (-9,155) 0,119	-1,062*** (-8,317) 0,128
Tangibility	-3,743*** (-6,340) 0,59	-3,738*** (-6,330) 0,591	-3,719*** (-6,314) 0,589	-3,591*** (-6,163) 0,583	-3,593*** (-6,170) 0,582
Constant	4,693*** (5,482) 0,856	4,730*** (5,494) 0,861	4,655*** (5,440) 0,856	5,083*** (5,671) 0,896	4,969*** (5,400) 0,920
Diffuse ownership 5%		0,419 (0,847) 0,495			
Diffuse ownership 10%			0,242 (0,971) 0,249		
Concentrated ownership 5%				-0,006* (-1,805) 0,003	-0,006* (-1,861) 0,003
Institutional investors					-0,103 (-0,598) 0,172
Exchanges	Yes	Yes	Yes	Yes	Yes
Industries	Yes	Yes	Yes	Yes	Yes
Period	Yes	Yes	Yes	Yes	Yes
McFadden R-squared	0,330	0,330	0,331	0,332	0,332
Observations	1807	1807	1807	1807	1807

Table 19: Regressions for restriction 3

Coefficients, z-statistics (in parenthesis) and standard deviation are reported. ***, ** and * stand for statistical significance, 1%, 5% and 10% respectively. All continuous variables were winsorized at the 1% and 99% percentile except Size and Tangibility. All independent variables are lagged one year. The sample is restricted to only include dividend paying firm observations. For the three categorical variables one dummy variable is excluded from each to circumvent the dummy variable trap these are NASDAQ OMX, industrials and the year 2000. Furthermore, due to the loss of observations when the sample is restricted NGM and oil & gas had to be excluded as well.

	Control Variable Regression	Diffuse Ownership Regression 5%	Diffuse Ownership Regression 10%	Concentrated Ownership Regression	Institutional Ownership Regression
Bankruptcy probability	0,117** (2,128) 0,055	0,117** (2,125) 0,055	0,117** (2,117) 0,055	0,118** (2,086) 0,057	0,118** (2,101) 0,056
Dividends	9,572*** (3,891) 2,46	9,536*** (3,871) 2,464	9,563*** (3,881) 2,464	9,828*** (3,838) 2,482	9,835*** (3,930) 2,502
Investment opportunities	0,025 (0,473) 0,053	0,027 (0,498) 0,054	0,025 (0,460) 0,053	0,024 0,442 0,053	0,025 0,463 0,053
Non-debt tax shield	-8,839* (-1,914) 4,618	-8,923* (-1,933) 4,612	-8,713* (-1,874) 4,650	-8,873* (-1,933) 4,590	-8,927* (-1,948) 4,583
Profitability	0,309 (0,225) 1,372	0,306 (0,224) 1,369	0,315 (0,231) 1,364	0,337 (0,247) 1,366	0,313 (0,230) 1,362
Size	-1,053*** (-8,216) 0,128	-1,052*** (-8,227) 0,128	-1,054*** (-8,206) 0,128	-1,072*** (-8,102) 0,132	-0,983*** (-6,763) 0,145
Tangibility	-4,492*** (-5,662) 0,793	-4,494 (-5,650) 0,795	-4,494 (-5,670) 0,793	-4,420*** (-5,525) 0,800	-4,468*** (-5,578) 0,802
Constant	5,052*** (5,239) 0,964	5,064*** (5,268) 0,961	5,047*** (5,223) 0,966	5,287*** (5,079) 1,041	4,912*** (4,574) 1,074
Diffuse ownership 5%		-0,581 (-0,919) 0,632			
Diffuse ownership 10%			0,115 0,348 0,33		
Concentrated ownership 5%				-0,003 (-0,547) 0,005	-0,004 (-0,764) 0,005
Institutional investors					-0,283 (-1,307) 0,217
Exchanges	Yes	Yes		Yes	Yes
Industries	Yes	Yes		Yes	Yes
Period	Yes	Yes		Yes	Yes
McFadden R-squared	0,420	0,420	0,420	0,420	0,421
Observations	1358	1358	1358	1358	1358

Table 20: Regressions for non-dividend payers

Coefficients, z-statistics (in parenthesis) and standard deviation are reported. ***, ** and * stand for statistical significance, 1%, 5% and 10% respectively. All continuous variables were winsorized at the 1% and 99% percentile except Size and Tangibility. All independent variables are lagged one year. The sample is restricted to only include non-dividend paying observations. For the three categorical variables one dummy variable is excluded from each to circumvent the dummy variable trap these are NASDAQ OMX, industrials and the year 2000. Furthermore, due to the loss of observations when the sample is restricted utilities had to be excluded as well. For obvious reasons, dividends are also excluded.

	Control Variable Regression	Diffuse Ownership Regression 5%	Diffuse Ownership Regression 10%	Concentrated Ownership Regression	Institutional Ownership Regression
Bankruptcy probability	0,057*** (4,781) 0,012	0,058*** (4,767) 0,012	0,058*** (4,837) 0,012	0,058*** (4,879) 0,012	0,058*** (4,897) 0,012
Investment opportunities	-0,033** (-2,230) 0,015	-0,032** (-2,132) 0,015	-0,034** (-2,313) 0,015	-0,033** (-2,237) 0,015	-0,036** (-2,352) 0,015
Non-debt tax shield	-1,603 (-1,258) 1,274	-1,775 (-1,417) 1,253	-1,574 (-1,256) 1,253	-1,614 (-1,283) 1,258	-1,628 (-1,283) 1,269
Profitability	-0,612*** (-2,610) 0,234	-0,551** (-2,317) 0,238	-0,491** (-2,092) 0,235	-0,453* (-1,931) 0,235	-0,439* (-1,866) 0,235
Size	-0,622*** (-4,366) 0,142	-0,653*** (-4,548) 0,144	-0,666*** (-4,660) 0,143	-0,664*** (-4,602) 0,144	-0,697*** (-4,824) 0,145
Tangibility	-2,67*** (-4,522) 0,586	-2,583*** (-4,414) 0,582	-2,538*** (-4,323) 0,587	-2,459*** (-4,193) 0,586	-2,493*** (-4,155) 0,600
Constant	2,886*** (3,166) 0,911	2,988*** (3,240) 0,922	2,806*** (3,033) 0,925	3,440*** (3,668) 0,938	3,570*** (3,813) 0,936
Diffuse ownership 5%		1,081** (2,229) 0,485			
Diffuse ownership 10%			0,742** (3,682) 0,201		
Concentrated ownership 5%				-0,011*** (-3,136) 0,003	-0,010*** (-2,993) 0,003
Institutional investors					0,269 (1,609) 0,167
Exchanges	Yes	Yes		Yes	Yes
Industries	Yes	Yes		Yes	Yes
Period	Yes	Yes		Yes	Yes
McFadden R-squared	0,200	0,202	0,208	0,205	0,207
Observations	1166	1166	1166	1166	1166

Appendix B

Table 21: Percentage of correct predictions

Concentrated ownership model	Dep. Variable = 0	Dep. Variable = 1	Total
% Correct	88,02%	59,95%	78,63%
% Incorrect	11,98%	40,05%	21,37%

Institutional ownership model	Dep. Variable = 0	Dep. Variable = 1	Total
% Correct	88,02%	59,95%	78,63%
% Incorrect	11,98%	40,05%	21,37%

Diffuse ownership model	Dep. Variable=0	Dep. Variable=1	Total
% Correct	87,96%	58,80%	78,21%
% Incorrect	12,04%	41,20%	21,79%

Table 22: Ljung-Box Q statistics

Concentrated ownership model						
Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	0.008	0.008	0.1775	0.673
		2	-0.00...	-0.00...	0.2488	0.883
		3	-0.00...	-0.00...	0.4881	0.921
		4	-0.00...	-0.00...	0.6337	0.959
		5	0.005	0.005	0.7095	0.982
		6	0.004	0.004	0.7622	0.993
		7	0.002	0.002	0.7734	0.998
		8	0.000	0.000	0.7737	0.999
		9	0.000	0.000	0.7740	1.000
		1...	0.000	0.000	0.7743	1.000
		1...	0.000	0.000	0.7745	1.000
		1...	0.000	-0.00...	0.7745	1.000

Institutional ownership model						
Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	0.007	0.007	0.1469	0.702
		2	-0.00...	-0.00...	0.2166	0.897
		3	-0.00...	-0.00...	0.4433	0.931
		4	-0.00...	-0.00...	0.5810	0.965
		5	0.005	0.005	0.6505	0.986
		6	0.004	0.004	0.6993	0.995
		7	0.002	0.002	0.7096	0.998
		8	0.000	0.000	0.7098	1.000
		9	0.000	0.000	0.7100	1.000
		1...	0.000	0.000	0.7103	1.000
		1...	0.000	0.000	0.7104	1.000
		1...	0.000	-0.00...	0.7104	1.000

Diffuse ownership model						
Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1	0.026	0.026	1.8808	0.170
		2	-0.00...	-0.00...	1.9095	0.385
		3	-0.01...	-0.01...	2.2202	0.528
		4	-0.01...	-0.00...	2.4988	0.645
		5	0.008	0.009	2.6923	0.747
		6	0.007	0.006	2.8309	0.830
		7	0.005	0.005	2.9129	0.893
		8	0.000	0.000	2.9131	0.940
		9	0.001	0.001	2.9144	0.968
		1...	0.001	0.001	2.9159	0.983
		1...	0.001	0.001	2.9169	0.992
		1...	-0.00...	-0.00...	2.9169	0.996

Table 23: Correlation Matrix

	Bank.	Div	Invest.	NDTS	Profit	Size	Tangi	AktieT.	NGM	First N.	Basic M.	Con. G.	Con. S.	Fin.	Health	O & G	Tech.	Telec.	Utili.	Conc.	Inst.	Diffus.	
Bankruptcy probability	1,00																						
Dividends	0,13	1,00																					
Investment opportunities	0,23	0,09	1,00																				
Non-debt tax shield	-0,15	-0,10	0,15	1,00																			
Profitability	0,07	0,35	-0,17	-0,24	1,00																		
Size	-0,13	0,09	-0,24	-0,32	0,38	1,00																	
Tangibility	-0,16	-0,03	-0,14	-0,01	0,14	0,27	1,00																
AktieTarget	0,03	-0,06	0,06	0,09	-0,18	-0,39	-0,04	1,00															
NGM	0,12	-0,09	0,13	0,10	-0,14	-0,17	-0,09	-0,05	1,00														
First North	-0,01	-0,05	0,05	0,13	-0,15	-0,36	-0,09	-0,12	-0,07	1,00													
Basic Materials	-0,05	-0,03	-0,06	0,03	0,02	0,03	0,25	-0,01	-0,04	0,07	1,00												
Consumer Goods	-0,04	0,03	0,00	-0,02	0,05	0,05	0,01	0,00	-0,05	0,00	-0,07	1,00											
Consumer Services	0,04	0,10	0,04	0,10	0,05	-0,04	0,01	0,00	0,05	0,13	-0,09	-0,10	1,00										
Financials	0,05	-0,02	-0,18	-0,31	0,02	0,33	0,18	-0,06	0,06	-0,09	-0,11	-0,12	-0,15	1,00									
Health Care	0,13	-0,13	0,15	0,00	-0,18	-0,19	-0,15	0,10	0,02	-0,02	-0,10	-0,11	-0,13	-0,15	1,00								
Oil & Gas	0,05	-0,09	0,02	0,06	-0,09	-0,11	0,09	0,06	0,08	0,07	-0,05	-0,05	-0,06	-0,07	-0,07	1,00							
Technology	-0,04	0,04	0,03	0,06	-0,01	-0,19	-0,23	-0,04	-0,07	0,06	-0,10	-0,11	-0,14	-0,17	-0,15	-0,07	1,00						
Telecommunications	-0,02	0,09	-0,01	0,15	0,05	0,10	0,02	0,00	-0,02	-0,05	-0,03	-0,03	-0,04	-0,05	-0,04	-0,02	-0,05	1,00					
Utilities	-0,02	-0,01	-0,02	-0,02	0,02	-0,01	0,11	0,10	-0,01	0,02	-0,02	-0,02	-0,02	-0,03	-0,02	-0,01	-0,03	-0,01	1,00				
Concentrated ownership	-0,02	0,12	-0,08	-0,05	0,21	-0,05	0,08	0,06	-0,04	-0,02	-0,06	0,03	0,08	0,03	-0,01	-0,19	-0,06	0,03	-0,03	1,00			
Institutional Investor	-0,05	0,05	-0,04	-0,10	0,10	0,46	0,05	-0,17	-0,10	-0,19	0,03	0,01	-0,01	0,08	-0,09	-0,05	-0,08	0,06	-0,01	-0,17	1,00		
Diffuse ownership	0,01	-0,03	-0,02	0,01	-0,10	0,02	0,04	0,00	-0,02	0,05	0,05	-0,02	-0,04	0,08	-0,02	0,05	-0,01	-0,01	-0,01	-0,27	0,06	1,00	

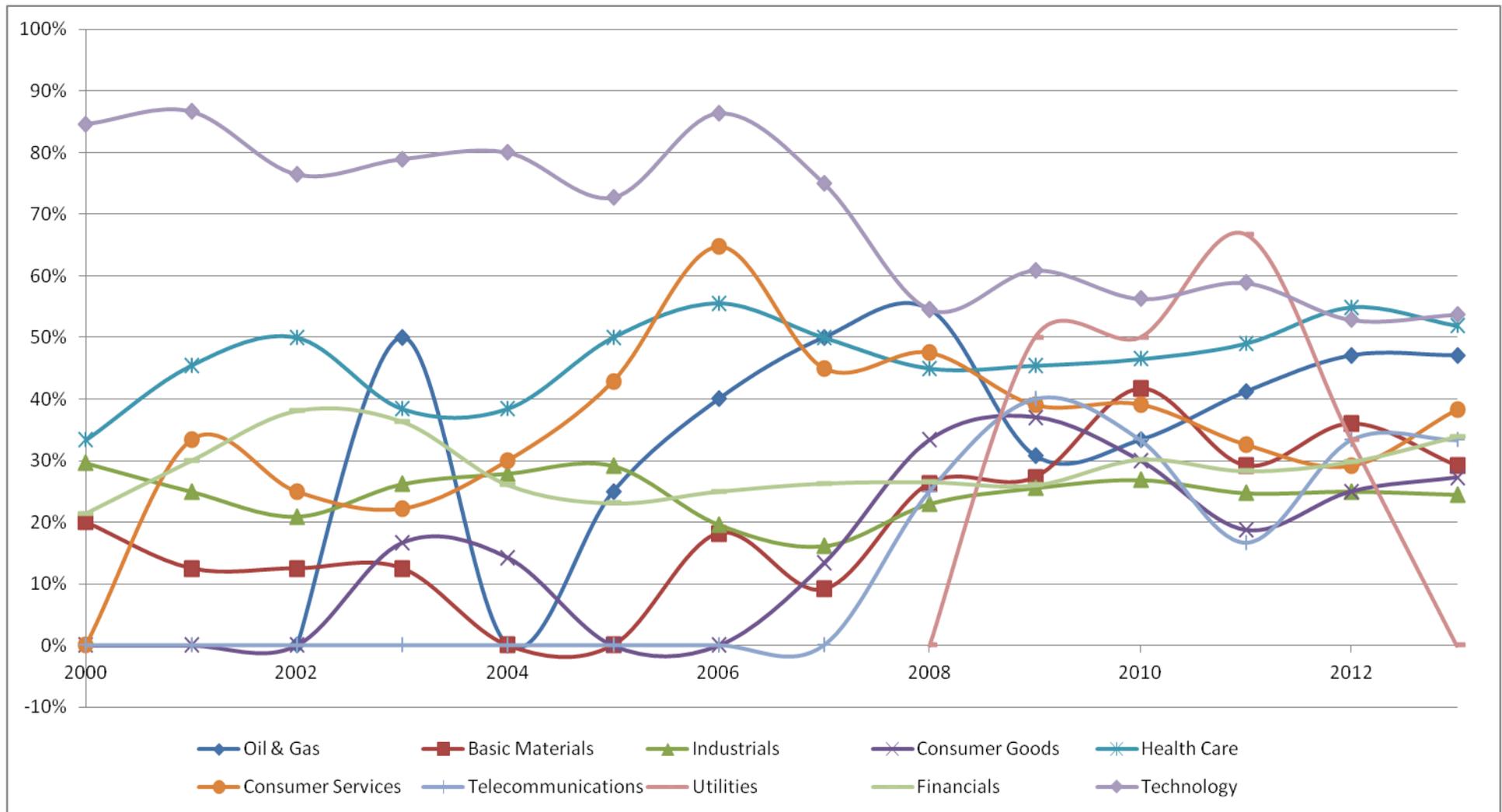


Figure 2: Zero-leverage in Sweden by industry

