A Study of the Characteristics of Firms Undergoing Leveraged Buyouts in Europe

HENNING ELMBERGER

FABIAN MALLY
A Study of the Characteristics of Firms Undergoing Leveraged Buyouts in Europe

by

Henning Elmberger
Fabian Mally
En studie av egenskaperna hos de bolag som genomgår leveraged buyouts i Europa

Henning Elmberger
Fabian Mally
Abstract

In this thesis we examine the shared characteristics of companies that undergo leveraged buyouts from public markets in Europe between 2005-2015 and whether credit markets have an impact on these characteristics. This is done by conducting logistical regressions on public data and through interviews with industry professionals. Our results indicate that companies that undergo leveraged buyouts from public markets have low financial liquidity and are undervalued, while high free cash flow, potential tax savings and pre-acquisition debt levels were found to be insignificant. Credit markets are found to have a profound effect on the characteristics that are sought after by private equity firms, as the statistical analysis give different significant variables depending on the state of the credit market, which is in line with the interview results. In good credit markets, potential financial distress costs are higher for bought out companies than the control group, while in bad credit markets a strong growth potential and undervaluation are the significant characteristics. The interviews also showed that investment professionals focus more on qualitative aspects, e.g. competitive advantage, when evaluating an investment opportunity, while the financial characteristics play a subdued role.

Key-words: leveraged buyouts, LBO, credit markets, private equity, characteristics
Sammanfattning


Nyckelord: leveraged buyouts, LBO, kreditmarknader, riskkapital, egenskaper
## Contents

1 Introduction .................................................. 1  
   1.1 Problem Background ...................................... 1  
   1.2 Problem Description ...................................... 2  
   1.3 Purpose and Research Question .......................... 3  
   1.4 Delimitations ............................................. 3  
   1.5 Expected Contribution .................................... 4  

2 Preliminaries on Leveraged Buyouts and Private Equity .......... 5  
   2.1 Private Equity Firms ...................................... 5  
   2.2 Private Equity Funds ...................................... 5  
   2.3 The Investment Process and Leveraged Buyouts .......... 6  
   2.4 Private Equity Exits, Returns and Fees .................. 6  

3 Literature Review and Theory ................................ 8  
   3.1 Financial Characteristics ................................ 8  
      3.1.1 Free Cash Flow ..................................... 8  
      3.1.2 Tax Savings ......................................... 9  
      3.1.3 Undervaluation ..................................... 10  
      3.1.4 Debt Levels ........................................ 11  
      3.1.5 Financial Liquidity ................................ 12  
      3.1.6 Financial Distress Costs .......................... 13  
      3.1.7 Growth Prospects .................................. 14  
   3.2 Credit Market Conditions ................................ 15  
   3.3 Statistical Theory ....................................... 17  
      3.3.1 Regression Analysis ................................. 17  
      3.3.2 Univariate Analysis ................................. 19  

4 Methodology .................................................. 20  
   4.1 Research Design ......................................... 20  
   4.2 Literature Review ........................................ 20  
   4.3 Variable Selection ....................................... 21  
   4.4 Data ..................................................... 22  
      4.4.1 Quantitative Data .................................. 22  
      4.4.2 Qualitative Data ................................... 25  
   4.5 Empirical Data Analysis .................................. 26  
      4.5.1 Choice of Statistical Method ....................... 26  
      4.5.2 Hypothesis Testing and Model Setup .............. 27
5 Results
   5.1 Descriptive Statistics ................................................. 28
   5.2 Regression Results .................................................. 30
   5.3 Interview Results ..................................................... 32
      5.3.1 Screening ...................................................... 32
      5.3.2 Credit Markets as a Determinant of Sourcing Deals ............. 33
      5.3.3 Evaluating Potential Investments ............................... 35
      5.3.4 Hypotheses .................................................... 37

6 Discussion and Analysis .................................................. 40
   6.1 General Discussion ................................................... 40
   6.2 Interpretation of Hypothesis Tests .................................. 41
   6.3 Robustness and Limitations ......................................... 46
   6.4 Reliability, Validity and Generalizability ......................... 46
      6.4.1 Sample Characteristics and Representativeness ................. 47
   6.5 Sustainability and Ethics ........................................... 48

7 Conclusion ............................................................................ 50
   7.1 Answering the Research Question .................................... 50
   7.2 Implications ............................................................. 51
   7.3 Further Research ....................................................... 51
## List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Private equity structure</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>Private equity activity and the Euribor interest rate</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>Overview of transaction sampling</td>
<td>24</td>
</tr>
</tbody>
</table>
List of Tables

1. Overview of hypotheses ............................................. 15
2. Variables used in the analysis .................................... 23
3. Background information of the interview subjects ............ 26
5. Univariate test results for whole sample ......................... 28
6. Univariate test results for different credit markets .......... 29
7. Correlation matrix for variables included in the regressions 29
8. Output from Logit regressions .................................... 31
9. Summary of hypotheses results .................................. 32
10. Summary of results from interviews ............................. 39
Foreword

This thesis was written for a degree in Industrial Engineering and Management at KTH Royal Institute of Technology.

We would like to thank our supervisor Tomas Sörensson for great advice during our seminars and meetings. We would also like to thank the interviewees that we met with during the spring of 2018; without you this thesis would lack a valuable real-world perspective. Furthermore, thanks to the students in our seminar group for the discussions and thoughtful feedback. Lastly, we would like to thank our families for the support given throughout our studies, without your help we would not have been here today.
List of Abbreviations and Glossary

D&A - Depreciation and amortisation

EBITDA - Earnings before interest, taxes, depreciation and amortisation

FCF - Free Cash Flow

GDP - Gross domestic product

IBO - Institutional buyout

IRR - Internal rate of return

LBO - Leveraged buyout

MBO - Management buyout

MBI - Management buy in

P2P - Public-to-private

PE - Private equity

P/E ratio - Price per share / earnings per share ratio

Financial buyer - A buyer that is an investment firm, e.g. PE firms

Strategic buyer - A buyer that is not a financial buyer, e.g. Atlas Copco or Amazon acquiring a company in their respective industry
1 Introduction

In this chapter the introduction to the thesis is presented. The research question is put into context in the problem background, which is followed by the explicit problem description. With background in this, the purpose and research question is stated. Then, relevant delimitations are brought forward. Lastly, the thesis is put into a wider context and the expected contribution is presented.

1.1 Problem Background

The public corporation is the customary form of running a large company, with a majority of the large companies in Europe and in the world being listed on a stock exchange. Benefits such as new and cheaper sources of financing (Pagano, Panetta, & Zingales, 1998) along with publicity and improved branding (Rydqvist & Högholm, 1995) are some of the reasons for listing on a public market. Nonetheless, there has been a strong trend of public companies going private in the last decades. Proponents claim that going private contributes to more effective managerial control and improved company operations, predicted by e.g. Jensen (1989) as "the eclipse of the public corporation". Companies with certain characteristics are believed to benefit more from going private (e.g. Kaplan (1989) and Jensen (1986)), and several empirical studies have been carried out to verify these characteristics, e.g. Opler and Titman (1993) and Renneboog et al. (2007). This study aims to further expand the empirically investigated universe by focusing on recent transactions in the European market, as well as comparing if the shared characteristics of targets differ depending on the state of credit market.

Public-to-private transactions are usually carried out through LBOs backed by private equity (PE) firms. LBOs are transactions in which the buyer uses a large share of debt, usually between 40-70%, to finance the purchase (Kaplan & Strömberg, 2009). The significant amount of leverage in the transaction amplifies the returns to equity holders, i.e. the PE firm and the investors that have placed money in the PE firm’s funds.

The private equity industry is, for better or worse, a large part of the European, and the world, economy. As the belief in the superiority of public markets has waned and credit funding has become considerably cheap, the private equity industry has experienced a boom similar to that of the 1980s and the one before 2007. According to The Economist (2016), the number of private equity firms has increased from 24 firms worldwide in 1980, to 6,628 in 2015, of which 620 (almost 10%) were founded in 2015 alone. The US LBO market has always been in the forefront, but the European market has picked up its pace, from undergoing 3% of all LBOs worldwide 1985-89 to over 30% since the 2000s (Kaplan & Strömberg, 2009). Today, countries such as the UK, France and Sweden have a substantial
private equity presence. In Sweden for example, the first PE-firms were established in the end of the 1980s, but has since grown to include over 800 portfolio companies, representing 4% of total jobs in Sweden and annual revenues amounting to 8% of Swedish GDP (SVCA, 2018).

At the same time as the number of firms has increased, the average returns of private equity companies have decreased (The Economist, 2016) and there is a talk within the industry of "too much money chasing too few deals", implying that PE-targets have become more expensive. Increasing prices of private equity targets drive up the historically relatively large premiums that shareholders receive when a company is bought. Lehn and Poulsen (1989) and Travlos and Cornett (1993) estimated this premium at around 20% for the companies in the US market, while for European leveraged buyouts the premium has been around 24% (Andres, Betzer, & Weir, 2007). These premiums have further sparked the interest of the specific characteristics of LBO target firms, and have led to the development of several takeover prediction models.

A paramount determinant of buyout activity, prices paid in buyouts and the extent of leverage used in LBOs is the state of the credit market (Axelson, Jenkinson, Strömberg, & Weisbach, 2013). This is due to the large amount of debt raised in LBOs making the interest rate payments a significant cost for target companies, therefore benefiting considerably from low interest rates. Furthermore, debt covenants tend to become less strict when cheap credit is easily available and firms can usually take on higher leverage levels without risking financial distress (Whitehead, 2008). Therefore, the state of the credit market could also impact the shared characteristics of firms that are attractive LBO targets, as for instance cheaper credit could decrease the demands on stable and high free cash flows.

1.2 Problem Description

In previous research and corporate finance literature the characteristics of a good LBO target have been established. Examples of these characteristics are high free cash flows (Lehn & Poulsen, 1989), potential for tax savings (Le Nadant & Perdreau, 2006), relative undervaluation (Hasbrouck, 1985) and low debt levels (Loh, 1992).

The established theory is mainly based on data from the 80’s and 90’s. There is a trade-off between good attributes of an LBO target and a lower purchase price. Given the changed PE landscape, there are now more bidders for any given target and more firms searching for specific characteristics. This competition naturally leads to the characteristic being less valuable all things considered, as some of the value will be priced into the acquisition premium. The question is whether the incumbent theory is able to fully capture today’s environment and an empirical investigation into whether or not this is the case in Europe could prove fruitful.
Furthermore, no previous study has been done on how the LBO characteristics sought after change with the state of the credit market. Thus, there is a possibility that the models that are used today are based on a generalised case that is sub-optimal in specific credit market situations.

The empirical problem is thus the lack of insight into how private equity firms in the recent years actually pick their targets on the European market and how this differs depending on the state of the credit market. The academic problem, accordingly, is the question of the relevance of the incumbent theory in today’s business environment.

1.3 Purpose and Research Question

The purpose of this thesis is to empirically examine if there are any specific characteristics shared among firms that are subject to LBOs from public markets in Europe that differentiate them from the companies that are not chosen as buyout targets. We aim to investigate if the incumbent theory is consistent with European empirics from 2005 until 2015, and discuss the implications of our findings for different stakeholders. Furthermore, we aim to examine whether the acquirers seek different characteristics in LBO targets depending on the state of the credit market, a novel research area. In particular, the research question that we aim to answer in this thesis is formulated as:

1. What are the shared characteristics of firms that undergo leveraged buyouts in Europe with respect to the state of the credit market?

1.4 Delimitations

This study will exclude companies within the financial and the real estate industries, as the financial statements for these types of companies differ considerably from other firms, which would distort the data. The empirics will only include completed transactions, as opposed to announced transactions. The reason for this is that our aim is to establish what differs between firms that are actually bought out and those that are not. It is plausible that there is some commonality between firms that are targeted for LBOs but not actually acquired, e.g. something that allow strategic firms to outbid financial buyers, and thus including these not successful LBOs might introduce sampling bias into the study. The studied transactions will be public-to-private buyouts of whole companies, which limits the number of transactions, but is necessary in order to make it possible to retrieve all relevant financial data. For the statistical analysis, only financial characteristics, i.e. data from the three financial statements and e.g. market value of equity, will be analysed.
1.5 Expected Contribution

A number of studies on the characteristics of firms that have undergone leveraged buyouts have been done. However, most of the studies were done in the 1980s and 1990s, following the 1980s boom in private equity activity. Given the increase in LBO activity until today, leading to more competition for the attractive LBO targets, there is reason to believe that the characteristics of LBO targets have changed. For example, high cash flows were deemed to increase the likelihood of becoming a LBO target in the 1980s, but given the increased competition for high cash flow companies and the following increased valuation, the effect should have become less pronounced or disappear altogether. This study will give an empirical contribution by testing whether the results that were for the most part established on data from the 1980s and 1990s still hold on a more recent set of data.

Furthermore, few studies have been done regarding LBO characteristics on the European market. Previous literature is very focussed on the US, while the few European studies that have been done have used UK (Renneboog et al., 2007) and French data (Le Nadant & Perdreau, 2006). New geographies are interesting to study as there could exist differences between countries. These differences could be based on e.g. differences in tax incentives, ownership structures and corporate governance. Thus, this study will provide an empirical contribution to the existing body of literature by using data from a partly new geography.

Also, to our knowledge, no study has been done on the relationship between LBO target characteristics sought for by buyers and the state of the credit market. The relationship between the credit market and LBO activity has been thoroughly researched, see for example Axelson et al. (2013), Maeseneire and Brinkhuis (2012) and Shivdasani and Wang (2011). It is plausible that the states of the credit market, in setting the boundaries for transactions, e.g. in terms of leverage levels, thus also affect which target characteristics are attractive. That LBO characteristics vary depending on other factors has been established in previous studies, e.g. in relation to size of LBO targets and type of seller (family-owned company versus a division of a firm), see for example Le Nadant and Perdreau (2006). Our study will contribute to the understanding of how the LBO characteristics vary depending on external factors with the study of the relationship to the state of credit markets, which is one of the most interesting relationships to examine given its paramount effect on LBOs in general.

Several stakeholders could find this thesis to be of interest, for instance equity holders, Board of Directors and the management of public companies, as well as private equity firms themselves. In addition, since this thesis seeks to make inferences on subjects that potentially have large impacts on share prices, it could be relevant for any active stock market participant. Considering that the average premium on stocks of buyout targets is around 20-25%, equity holders can benefit considerably from holding companies that are more likely to be acquired in their portfolio.
2 Preliminaries on Leveraged Buyouts and Private Equity

In this chapter, the institutional framework for the thesis is established. Key details regarding the main actors in the study are provided in order to give the reader the basic understanding needed to fully comprehend the thesis.

2.1 Private Equity Firms

PE firms are financial intermediaries that connect mainly institutional investors with investment exposure to the private equity asset class. Typically, private equity firms acquire public or private companies using a relatively large portion of debt, hold them for 5-7 years, and then exit either through a sale of the whole company or an IPO. Private equity firms structure their investments in different private equity funds, often raising new funds every five years as most of the capital in the previous fund has then usually been deployed.

2.2 Private Equity Funds

PE firms raise equity capital from institutional investors, insurance companies, endowments and wealthy individuals in private equity funds. The predominant legal structure is a limited partnership, in which the PE firm is the general partner (GP) and the investors are the limited partners (LP). The GP handles the operational work, i.e. decides which companies to buy, how to manage and govern the companies as well as when and how to sell them. The LPs stand for the lion’s share of the invested capital; the GP provides only a small percentage of the capital in order to align incentives (Kaplan & Strömberg, 2009). The LPs have little to say in how the GP decides to employ the capital while the fund is running. However, the GP has to invest according to the pre-set covenants, often relating to e.g. types of securities and geographies the fund can invest in and the debt at the fund level.

The PE fund is commonly a closed-end fund, which means that the investors cannot withdraw their capital, commonly with a duration of 10 years with possible extensions. This means that the fund typically has to invest its capital during the first 3-5 years, in order to be able to exit its investments within the fund lifetime. In general, a fund will make ca. 7-15 investments per fund (Appelbaum & Batt, 2012).

One important aspect of the investments in a private equity fund is that the private equity funds are not leveraged themselves. Rather, the private equity funds take out the loans on the portfolio companies, making the portfolio companies the debtors and limiting the downside risk of the fund. If a portfolio company defaults it does not affect the whole portfolio as the risk is contained at the portfolio company level (Kaplan & Strömberg, 2009). See Figure 1 for an overview of the private equity fund structure.
2.3 The Investment Process and Leveraged Buyouts

PE firms invest in a wide variety of firms, ranging from small, private companies to the largest listed companies in the world. Commonly, private equity firms use leverage in their purchases in order to put up as little capital as possible initially, amplifying the returns. PE firms commonly use 40-70% debt. The debt is often raised by investment banks and structured into different types of loans: often a senior and secured portion as well as a junior, unsecured portion (Demiroglu and James, 2007). Investors in this debt range from banks, hedge funds and private debt investors to collateralized loan obligation managers.

Private equity acquisitions are often called leveraged buyouts, which is what is described above; the acquisition of a company using a relatively large portion of debt. LBOs are often split into three different categories: management buyouts (MBOs), management buy ins (MBIs) and institutional buyouts (IBOs). A MBO occurs when a company’s incumbent management purchases the company they are working for. A MBI is when an outside management team purchases a company, ousts the incumbent managers and manages the company themselves. An IBO is a buyout initiated by an institutional investor, such as a private equity firm or a venture capital firm. Note that in MBOs and MBIs the management teams often need external financing, and PE funds usually provide equity.

2.4 Private Equity Exits, Returns and Fees

PE firms usually exit their investments within the lifetime of the fund in order to realise the gains and be able to repay the investors their money. Also, longer holding periods make it
difficult to achieve the target rate of return. The type of exit varies: the three most common forms of exit are a sale to a strategic buyer (38%), a sale to a financial buyer (24%) and an IPO (14%) (Strömberg and Kaplan, 2008). Additionally, some portfolio companies enter bankruptcy and some are subject to MBOs. Also, the statistics include a 19% unknown quota.

PE funds typically target an Internal Rate of Return (IRR) of 20-25% (Appelbaum and Batt, 2012). However, Kaplan and Schoar (2005) studied the returns of LPs compared to the S&P 500 and found that LPs earn 93-97% of the S&P 500 returns, indicating worse absolute, i.e. not risk-adjusted, performance for investors in PE despite having to lock up capital for 10 years.

The fees that the GP charges the LP are split into two types: a management fee, approximately 1-2% of the committed capital paid annually by the LPs, and carried interest, circa 20% of the returns over a specified hurdle rate, often around 10% IRR. This fee structure is often referred to as a “2 and 20” structure (Appelbaum & Batt, 2012).
3 Literature Review and Theory

In this chapter, relevant literature and theory for the thesis is presented. First characteristics of LBO targets are treated, in which previous studies and corporate finance theory is presented and hypotheses are formulated. Then the role of credit markets and its interplay with the private equity industry is presented. Lastly, a statistical framework is established.

3.1 Financial Characteristics

Companies that undergo an LBO tend to change notably in the years following the transaction. Changes commonly concern capital structure, operational improvements and corporate governance. This sets demands on the target companies to have certain characteristics as they have to be able to support and sustain the changed business strategy. Furthermore, private equity firms are among the most sophisticated buyers in the financial markets, dedicating a lot of resources to find the right target companies at the right prices. In academic literature as well as according to private equity professionals a vast number of characteristics beneficial to LBOs have been proposed. In this section an overview of the most commonly cited characteristics as well as the rationale behind them and empirical evidence will be presented.

3.1.1 Free Cash Flow

According to agency theory and the principal-agent problem, the interests of company managers and owners are not always aligned. Managers can undertake so-called empire building by retaining resources that could otherwise be distributed to shareholders, in order to grow the company larger than its optimal size, destroying shareholder value (Jensen, 1986). This is commonly linked to an ill designed remuneration system, as managers tend to increase their own compensation when increasing sales or firm size (Murphy, 1985), or to managers seeking more prestige (Stulz, 1990).

Jensen (1986) claimed that the availability of free cash flow, defined as the cash flow in excess of that required to fund all projects with higher returns than the cost of capital, is a key determinant of agency costs such as the amount of wasteful spending by managers. He then proposed that taking on debt decreases these agency costs, as interest payments to creditors decrease company free cash flow, and that the possibility of doing so is one of the major gains of going private. Therefore, taking on additional leverage could increase the value of the company as agency costs and related organisational inefficiencies decrease. Furthermore, conflicts between shareholders and owners are especially prevalent among companies that have large free cash flows (Jensen, 1986). Companies that have large free cash flows could in other words benefit the most from going private and should therefore
be overrepresented in the set of leveraged buyout targets. For the definition of free cash flow used in this thesis, see Section 4.3.

Lehn and Poulsen (1989) found empirical evidence that support Jensen’s free cash flow theory; a large part of the gains in going private is associated with the mitigation of agency problems associated with free cash flow. They investigated 263 transactions between 1980 and 1987 and found a significant relationship between a firm’s free cash flow and its likelihood of going private. They also found that the results are especially strong for firms whose managers own relatively little equity in the company before the transaction, i.e. with a low ownership share, which increases the risk of principal-agent problems. This supports the free cash flow hypothesis and argues for it to be included when evaluating LBO targets.

However, the same empirics were re-examined by Kieschnick (1998), resulting in the rejection of the free cash flow hypothesis. Kieschnick (1998) accounted for particular attributes in the data used by Lehn and Poulsen (1989), such as outliers and potentially incorrectly specified variables, and arrived at an opposing conclusion. He found no support for the free cash flow hypothesis, not as a determinant of the likelihood of going private nor as a determinant of the premium paid to shareholders. Instead, he found potential tax benefits to be a significant determinant of the premiums paid to shareholders when taking a firm private. The results of Renneboog et al. (2007) were in line with this, as they found no support for the free cash flow hypothesis in the UK market.

Overall, the previous studies show inconsistent empirical results regarding the free cash flow hypothesis. This speaks for further examination of the European market, and our hypothesis is formulated, in line with theory but contrary to some empirics, as follows:

\[ \text{H1} \quad \text{Firms with high free cash flow levels are overrepresented in the sample of firms undergoing leveraged buyouts} \]

\[ \text{3.1.2 Tax Savings} \]

Tax savings are a potential incentive in LBOs. As the leverage often increases post-LBO and interest payments are tax deductible, the increased debt in an LBO creates a tax shield. Thus, ceteris paribus, given the interest tax shield, a more leveraged firm has a higher value than a less leveraged firm (Modigliani & Miller, 1958). Furthermore, following an LBO, the firms reap depreciation benefits, as the asset base is often revalued to a higher level (Maupin, 1987). Kaplan (1989) finds, in a study of 76 management buyouts of public companies, that the median value of tax benefits has a lower bound of 21% and an upper bound of 143% of the premium paid to pre-buyout shareholders. This suggests that tax benefits are an important incentive in management buyouts. Newbould et al. (1992) finds that tax incentives are the most frequently discussed motivation for corporate acquisitions. Kosedag and Lane (2002) find supporting evidence, showing that the most frequently cited benefit
of LBOs is reductions in tax payments as a consequence of the tax shield resulting from increased interest payments.

The abovementioned makes the capacity of the firm to take on additional loans that lead to lower income taxes an important investment consideration in an LBO. Furthermore, having the possibility to revalue assets and depreciate from a higher base and thus gain tax benefits is another important consideration. For an interest tax shield or depreciation tax gains to materialise, income taxes must be positive and the higher the income taxes, the larger the potential gains of the tax shield.

Le Nadant and Perdreau (2006) found that LBO-targets have higher income tax expenses than non-LBO firms on a significant level (2.39% of sales for LBO vs. 1.63% for others). Furthermore, Kaplan (1989) and Lowenstein (1985) both show that tax benefits have a positive relation to the premiums paid in an LBO, indicating that potential tax benefits are large in LBOs. A study that contradicts these findings was done by Lehn and Poulsen (1989). They found no significant difference in terms of income taxes paid pre LBO between LBO firms and others.

Studies also show that there are other reasons than tax-benefits for using debt in a leveraged buyout: many firms take on much more debt than what is necessary to eliminate income taxes. Opler (1992) found that circa 50% of the firms post LBOs take on excessive debt, i.e. more debt than what is necessary to eliminate income taxes, indicating motives for debt use in LBOs that are not tax related. In conclusion, our tax savings hypothesis in our model will be:

**H2** Firms with higher levels of income taxes are overrepresented among firms that undergo leveraged buyouts

### 3.1.3 Undervaluation

In agency theory, the principal motive for buyouts is managerial inefficiency. Efficient management is positively reflected in the share price. If the share price is relatively high, reflecting a positive evaluation of incumbent management, the threat of takeover should accordingly be low. This notion is supported by Davis and Stout (1992), who found that American Fortune 500 industrial firms with a higher market-to-book ratio were less subject to takeover attempts.

The concept of asymmetric information is also thought to play a role in leveraged buyouts, especially in management led buyouts. Insiders, with superior information, might have a different view of the value of the firm than the market has. Insiders will then utilize this informational advantage, if they deem the undervaluation to be greater than the purchase premium, and initiate a MBO (Dann, 1981 and Vermaelen, 1981). This can
also be extended to knowledgeable outside investors taking advantage of undervaluation (Renneboog, Simons, et al., 2005). The concept of asymmetric information and buyouts is similar to the well-documented relationship between share repurchases and asymmetric information, where a company buying its own stock is a signal of the company being undervalued.

Rath and Rashid (2016) found that market undervaluation is a dominant factor in private equity takeover rationale. Hasbrouck (1985) found that firms with a lower Tobin’s Q-value, a measure of undervaluation, with a low q indicating undervaluation, were more likely to undergo an LBO, in line with the hypothesis. Fidrmuc et al. (2012), in a study of 205 leveraged buyouts in the US between 1997 and 2006, found that firms with lower market-to-book ratios were more likely to be leveraged buyout targets, supporting the hypothesis.

Palepu (1986), on the other hand found no significant relation between market-to-book ratio and successful takeovers, using a sample of US data. Loh (1992) finds inconclusive evidence for that LBOs are undervalued by the market, drawing the conclusion that there is no reason to believe that there is a significant undervaluation of firms that managers are aware of in the sophisticated capital markets.

The implications of agency theory and asymmetric information in relation to leveraged buyouts lead us to the hypothesis below. For the definition of undervaluation used in this thesis, see Section 4.3.

**H3** Firms that are undervalued are overrepresented in the sample of firms undergoing leveraged buyouts

### 3.1.4 Debt Levels

There are various plausible relationships between debt levels of firms and the probability of being bought out. In relation to agency theory, additional debt limits managerial discretion with cash flows, reducing the agency costs of having cash at hand. In terms of agency costs, paying dividends is an alternative to raising debt to reduce excessive cash, but issuing debt is a more credible promise as missing a debt payment is much more severe than cutting a dividend payment (Jensen, 1986). Thus, additional debt reduces the free cash flow agency problem, and therefore firms with higher levels of debt ought to be less attractive LBO candidates.

Furthermore, debt levels can signal managerial capacity. Managers that are incompetent and inclined to minimize the risk of bankruptcy and/or losing their jobs have incentives to underlever the firm rather than to opt for the optimal capital structure for maximising the
firm’s worth. Accordingly, a low leverage level could be a signal of managerial incompetence, which can increase the likelihood of an LBO, as this indicates that there is room for improvement.

Le Nadant and Perdreau (2006) found that LBO targets are less indebted than their counterparts, supporting the hypothesis. This is corroborated by the results of Davis and Stout (1992), who found that firms with higher debt were less attractive targets for takeover, and this was consistent for all their model specifications. Palepu (1986), in line with this, found that debt-to-equity ratio was negatively related to being taken over.

Contrary to the findings above, Loh (1992) found that LBOs have a higher debt level than non-LBOs prior to the transaction. This could be explained by market signalling: high leverage levels can be interpreted as a signal of high expectations for the future of the firm (Ross, 1977). Also, according to the pecking-order theory, debt is the most attractive form of external financing (Myers & Majluf, 1984). Firms that have high levels of debt can thus be judged to have a better future, as they were able to raise the preferential form of financing, debt, which could be attractive to financial acquirers.

To conclude, higher debt levels are assumed to decrease the probability of undergoing an LBO. Low leverage levels are an indicator for excess capacity of taking on additional debt, which makes an LBO more attractive. Thus, the hypothesis is formulated as:

\[ \text{H4 Firms with lower debt levels are overrepresented in the sample of firms undergoing leveraged buyouts}\]

3.1.5 Financial Liquidity

As companies undergo leveraged buyouts their debt levels are often dramatically increased. In order to be able to raise these large amounts of debt, third-party lenders want to be assured of a company’s ability to service the debt, i.e. pay interest in time. Accordingly, financial liquidity plays a role in an LBO as it increases the ability of the borrower to pay the lenders in time, and improves the borrowers position vis-à-vis the lender. Financial liquidity can also be related to the agency problem of free cash flow, as high financial liquidity enables wasteful spending, inducing agency costs (Jensen, 1986).

Singh (1990) found that firms that undergo MBOs are characterised by higher levels of liquidity than firms from the same industry remaining public. This notion is supported by Desbrieres and Schatt (2002), who showed that acquired firms exhibit much better financial liquidity than industry counterparts. Le Nadant and Perdreau (2006), using a sample of 175 mainly private French LBO targets found that LBO targets have more liquid financial assets. Hasbrouck (1985), on the other hand, found that financial liquidity had no significant effect on LBO-probability when eliminating industry-related mechanisms.

12
Taken together, the increased ability of firms’ to repay lenders and the increased agency costs resulting from high financial liquidity should result in a more attractive leveraged buyout target. For the definition of financial liquidity used in this thesis, see Section 4.3.

**H5** Firms with higher financial liquidity are overrepresented in the sample of firms undergoing leveraged buyouts

### 3.1.6 Financial Distress Costs

High debt levels increase a company’s probability of going into financial distress and has been found to explain why companies that undergo an LBO are more likely to go into financial distress than their peers (Hotchkiss, Strömberg, & Smith, 2014). As financial distress has been found to lead to considerable costs for companies, it can be a clear disadvantage for the bought out company. The average cost of financial distress for firms that were subject to highly levered transactions amounted to 10-20% of firm value (Andrade & Kaplan, 1998). This cost consists of direct and indirect costs, of which indirect costs are the largest part. Direct costs are e.g. costs of legal advise and severance packages, while indirect costs are e.g. costs of lost customers and worsened reputation.

Thus, a company’s potential financial distress costs could have an impact on whether or not it becomes an LBO target. In fact, Tykvová and Borell (2012) found that private equity firms prefer companies that are less financially distressed and have lower financial distress costs. They also found that companies that underwent a leveraged buyout backed by a private equity firm experienced an increased risk of going into financial distress after the transaction. However, despite the higher distress risk, the bankruptcy rates were not higher among the public-to-private companies, than their public peers. This is in line with what Hotchkiss, Smith and Strömberg (2014) found when investigating a sample of 2,151 companies between 1997-2010. They found that when controlling for debt levels, companies that are owned by private equity firms tend to restructure their business faster, and overall resolve the financial distress more efficiently in comparison to their public peers.

During the LBO wave of the 1980s, these financial distress costs became so substantial that over a quarter of all companies that went through an LBO during the 1980s latter half had defaulted by 1992 (Kaplan & Stein, 1993). Furthermore, 23% of all MBOs during the same decade defaulted according to Andrade and Kaplan (1998). This further argues for the importance of financial distress costs among firms that have undergone LBOs.

All in all, considering the previous literature the potential financial distress costs and the risk of incurring them could affect a company’s probability of undergoing an LBO. And since private equity firms strive to maximise returns, they most probably avoid such unnecessary high costs if possible. As the often substantial, indirect costs of financial distress are
hard to quantify, it is important for PE firms to avoid the cumbersome process of financial distress altogether. Therefore, the risk of entering financial distress could be a more important consideration than the actual, difficult to estimate, cost. For the variable used in this thesis to measure this risk, see Section 4.3.

**H6** *Firms with low risk of incurring financial distress costs are overrepresented in the sample of firms undergoing leveraged buyouts*

### 3.1.7 GrowthProspects

The growth prospects of a company could impact the probability of it becoming a buyout target, since companies with high growth prospects indicate a bright future with potential to realise substantial cash flows to the owners. However, these companies tend to be expensive and already well-run businesses, with few possibilities for private equity firms to make any considerable improvements. A company with low growth prospects on the other hand can be acquired cheap and, with the right tools, turned around for significant returns. An extreme form of such an acquisition is what distressed debt firms focus on, but almost all types of private equity firms would find a low growth target in a high growth industry attractive.

In previous literature, the focus of low growth prospects has been on its related agency costs. Jensen (1989) proposes that public companies with low growth prospects have few or no positive net present value projects to invest in, ending up wasting cash in value destroying projects, due to external pressure and expectations on managers to do something. He continues by emphasising that these agency costs for low-growth companies are most prominent if there is also high free cash flow reserves and argues that the related agency costs would decrease in a leveraged buyout.

When Lehn and Poulsen (1989) empirically examined this theory on a dataset of transactions in the 1980s, they found that a firm’s growth prospects had a negative impact on the probability of it becoming an LBO target. However, Kieschnick (1998) revisits their dataset and study, as he did with their free cash flow findings, and opposes their findings as his results show no statistical significance of the growth prospects factor. Neither Halpern (1999) finds support for the low-growth theory when examining the US market, while Evans (2005) does find support for it on the Australian market. The previous literature is thus inconclusive in regards to the low-growth theory and argues for the need to research in other settings. The following hypothesis can thus be formulated to test for low growth prospects:

**H7** *Companies with low growth prospects are overrepresented in the sample of companies undergoing leveraged buyouts*

See Table 1 for an overview of the hypotheses.
Table 1: Overview of hypotheses

<table>
<thead>
<tr>
<th>#</th>
<th>Hypothesis</th>
<th>Relevant theory</th>
<th>Previous studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Firms with higher levels of income taxes are overrepresented among firms that undergo leveraged buyouts</td>
<td>Agency Theory</td>
<td>Mixed</td>
</tr>
<tr>
<td>2</td>
<td>Firms with higher levels of income taxes are overrepresented among firms that undergo leveraged buyouts</td>
<td>Interest tax shield</td>
<td>Mostly supporting</td>
</tr>
<tr>
<td>3</td>
<td>Firms that are undervalued are overrepresented in the sample of firms undergoing leveraged buyouts</td>
<td>Managerial efficiency, Asymmetric information</td>
<td>Mixed</td>
</tr>
<tr>
<td>4</td>
<td>Firms with lower debt levels are overrepresented in the sample of firms undergoing leveraged buyouts</td>
<td>Agency theory, Managerial efficiency</td>
<td>Mostly supporting</td>
</tr>
<tr>
<td>5</td>
<td>Firms with higher financial liquidity are overrepresented in the sample of firms undergoing leveraged buyouts</td>
<td>Debt servicing, Agency theory</td>
<td>Mostly supporting</td>
</tr>
<tr>
<td>6</td>
<td>Firms with low risk of incurring financial distress costs are overrepresented in the sample of firms undergoing leveraged buyouts</td>
<td>Cost of financial distress</td>
<td>Mixed</td>
</tr>
<tr>
<td>7</td>
<td>Companies with low growth prospects are overrepresented in the sample of companies undergoing leveraged buyouts</td>
<td>Agency theory</td>
<td>Mixed</td>
</tr>
</tbody>
</table>

In the overview of hypotheses, the hypothesis number is first presented in the very left column, followed by the actual hypothesis statement. Then, the corporate finance theory that is most relevant to the hypothesis is presented. Lastly, in the very right column, the result from previous studies is deemed either mixed or mostly supporting of the hypothesis.

3.2 Credit Market Conditions

Finding a good capital structure is paramount when executing LBOs as it drives returns in a multitude of ways, for example by reducing agency costs and amplifying positive returns by reducing initial capital invested (Achleitner et al. 2010). The importance of capital structure is exemplified by the theory that the most important factor in buyouts is the ability of PE firms to use relatively cheap credit in transactions, arbitraging debt versus equity through market timing when debt markets are favourable (Ivashina & Kovner, 2011).

The state of the credit market has been found to be very important for many of the key aspects of leveraged buyouts. Strömberg et al (2013) found that credit conditions are the main determinant of leverage levels in buyouts and that credit conditions affect transaction prices and buyout fund returns. Supporting this, Ljungqvist, Richardson and Wolfenzon (2007) found that PE firms invest more when credit market conditions loosen. See Figure 2 for a graph of the European interest rate Euribor and European private equity activity. Moreover, Gorbenko and Malenko (2013) found that financial buyers bid higher in auction processes when credit conditions are favourable.
The relationship between private equity deal activity and Euribor interest rates.

The figure displays an inverse relationship; the level of interest rates are negatively correlated with the number of deals in a given year. Sources: European Money Markets Institute, PitchBook Data.

Also, perhaps most convincingly, Axelson et al. (2013) found that there is no discernible relation between leverage in buyout firms and median leverage of public peers in the same industry, region and year. In other words, the leverage levels used in LBO firms bear no relation to matched public firms. Among public firms, on the other hand, there are a number of documented industry fixed effects that predict leverage levels, such as earnings volatility, profitability and growth opportunities (Axelson et al., 2013). The one important predictor of leverage in LBO firms, on the other hand, was the condition of debt markets, namely an inverse relation between the credit risk premium of leveraged loans and the leverage used in buyout transactions.

When measuring the credit market conditions in relation to LBOs, relevant metrics to use are the spread between High-Yield bonds and a relevant interbank rate, such as LIBOR and EURIBOR, and the spread between leveraged loans and a relevant interbank rate. The reason for this is that most of the debt issued in LBOs is either HY bonds or leveraged loans, and if the issues are floating rate, they are often floating in relation to an interbank rate. Thus, the aforementioned credit spread gives an indication of how favourable the credit markets are specifically for LBO-transactions. Other potential proxies, such as using the interbank rate itself, do not relate as directly to the actual price LBO issuers will pay for the credit. It is important to note that there are other considerations for credit issuers than merely price, such as covenant structure, maturity and duration. However, a low price of debt is indicative of a conducive borrowing environment in general, and is thus deemed a relevant proxy. This is in line with what has been used in previous research for credit
market conditions, see for example Axelson et al. (2013) that used the average spread of leveraged loans over LIBOR as their metric for credit market status.

Concluding from the research presented above, the state of the credit market is very important for many different aspects of LBOs. However, the relationship between the credit market and LBO characteristics has not been researched.

3.3 Statistical Theory

3.3.1 Regression Analysis

Regression analysis is a common statistical tool for deducing relationships between a dependent variable, $Y$, and one or more independent variables, $X$. There are several different regression models, all with different specifications and assumptions that need to be met. One of the most common ones is the multivariate linear regression, which is designed to establish relationships between a continuous dependent variable and several independent variables, where the theoretical relationship between the $Y$ and the $X$ is linear. Applying a regular, multivariate linear regression to a binary dependent variable would produce mathematical errors, as the definition of an ordinary linear regression is:

$$ Y = E[Y|X] = P[Y = 1|X] = \beta X + e $$

(1)

where $\beta X = \beta_1 X_1 + \ldots + \beta_n X_n$, which can take any value in the range $[-\infty, +\infty]$ depending on the values of $X$ and $\beta$ (Harrell, 2013). Since the $Y$ is a binary variable, the expected value of $Y$ given $X$ is equal to the probability of $Y = 1$ given $X$, which produces a mathematical error. The left-hand side cannot take values outside the interval $[0,1]$, while the right-hand side takes any values on the real line. Therefore, for cases where the dependent variable is discrete, and instead takes values in a limited set of different values, logistic regressions are better suited.

Logistic regressions are a subset of regression analysis where the dependent variable is either binary or ordinal. A binary dependent variable either takes the value 0 or 1, while an ordinal variable can take more than two different values, as long as there is a clear order between the values, e.g. taking the values low, medium or high. In this thesis, only the case of a binary dependent variable is interesting, and therefore we will use logistic regression and binary logistic regression interchangeably. The definition of a logistic regression is

$$ P[Y = 1|X] = \frac{1}{1 + \exp(-\beta X)} $$

(2)

where $\beta X$ has the same definition as above (Harrell, 2013). The difference here is that as $\beta X \to \infty \Rightarrow [1 + \exp(-\beta X)]^{-1} \to 1$, and as $\beta X \to -\infty \Rightarrow [1 + \exp(-\beta X)]^{-1} \to 0$. In other words, the right-hand side is bound to the interval between 0 and 1, in line with possible values for the left-hand side probability function.
In contrast to ordinary multivariate linear regression, the logistic regression does not make any distributional assumptions, i.e. none of the variables in the model has to be, for instance, normally distributed. The only two assumptions the logistic regression model makes are:

1. the relationship between the log odds dependent variable and the independent variables is linear
2. the regression model is additive

To see why these assumptions are necessary and to define the log odds, it is best to rewrite equation (2) to the regular regression form, so that it is linear in $\beta X$. Define $P[Y = 1|X] = P$ and use the fact that $1 - P = \exp(-\beta X)/[1 + \exp(-\beta X)]$ to rewrite:

$$\ln\left(\frac{P}{1-P}\right) = \ln\left(\frac{1}{1 + \exp(-\beta X)}\right) = \ln(\exp(\beta X)) = \beta X \quad (3)$$

Rewriting equation (2) to (3), the interpretation of the $\beta$ values becomes easier. The left-hand side is the natural logarithm of the odds of the event $\{Y = 1|X\}$, also called log odds. Thus, a logistic regression is really a linear regression on the log odds of the considered event, where $\beta_j = 0.4$ would mean that a unit’s increase in $X_j$ would increase the log odds of $\{Y = 1\}$ by 0.4. The linear nature of the relationship between $\beta X$ and the log odds shows why the linear assumption is required for the equation to hold, while the additive assumption means that an increase in $x_j$ will not affect the other $\beta_i, i = \{1, 2, \ldots, j-1, j+1, \ldots n\}$.

In comparison to regular multivariate regression models, logistic regression uses maximum likelihood estimation (MLE) as opposed to ordinary least squares (OLS) in estimating the $\beta$ values (Harrell, 2013). The different specifications of the regression model means that measures that normally are reported in the output of a regression model, such as $R^2$ and regular $p$ values based upon the $t$ statistic, have to be substituted with alternative measures (Lang, 2016). For logistic regressions, pseudo $R^2$s are common, as they report goodness of fit in a similar sense to the one in ordinary linear regressions. Different versions are available, such as Cox and Snell’s pseudo $R^2$ (1989), McFadden’s pseudo $R^2$ (1973) and Nagelkerke’s pseudo $R^2$ (1991). No single measure has been found to be better than the others, the McFadden $R^2$ tends to underestimate the goodness of fit, while the Cox and Snell $R^2$ has the disadvantage that it cannot reach its limits 0 or 1, as well as underestimating for certain values (Allison, 2013). The Nagelkerke $R^2$ was proposed as a fix to one of these issues, as it is calculated in the same way as the Cox and Snell, but with adjusted scale, so that the $R^2$ could reach the limits 0 and 1 (Nagelkerke et al., 1991).
3.3.2 Univariate Analysis

Univariate analysis is a form of statistical analysis that involves only one independent variable. As only one variable is studied at a time, univariate analysis does not help with drawing inferences regarding the relationship between various variables. The main purpose of univariate analysis is therefore to describe the data and find patterns within the dataset.

Mann-Whitney U test, also called Wilcoxon rank-sum test, is a non-parametric test, i.e. it does not assume anything regarding the distribution of the sample in question. The null hypothesis in the test is that it is equally likely that a randomly selected value from one sample is less than or greater than a randomly selected value from another sample, i.e. that the two populations are equally distributed (Zar et al., 1999).

The first step in the Mann-Whitney U test is to assign ranks by ordering the data from both of the samples from the smallest value to the largest value. The lowest value is assigned rank 1, the second lowest is assigned rank 2 and the n:th lowest value, the highest value, is assigned rank n. Ties are given average rank values, i.e. if the 4th and 5th lowest values are the same, they are both given the rank 4.5. Following this, the ranks in each sample are summed and denoted $R_1$ and $R_2$. The test statistic for the Mann-Whitney U test is denoted U (Zar et al., 1999). U is defined as the smaller of $U_1$ and $U_2$, defined as:

\[ U_1 = R_1 - \frac{n_1 * (n_1 + 1)}{2} \]  \hspace{1cm} (4)

\[ U_2 = R_2 - \frac{n_2 * (n_2 + 1)}{2} \]  \hspace{1cm} (5)

The U test statistic is then compared to theoretical values that assume equal distributions and for large sample sizes these values are approximated with the normal distribution. Lastly, the null hypothesis is accepted or rejected at a chosen significance level.
4 Methodology

In this chapter, the method by which the study is constructed is presented. The chapter covers research design, literature review, variable selection, data collection and data analysis.

In this study, a literature review, a statistical analysis of financial data and multiple qualitative interviews will be carried out.

4.1 Research Design

In this study, we will be testing if the theory-based hypotheses can be verified or falsified with regards to our dataset, but also take into account the non-financial aspects that are not as well documented in previous literature. The testing of our statistical dataset will be deductive in nature, as the aim is to verify or falsify the hypotheses based on incumbent theory (Blomkvist & Hallin, 2015). Including interviews in our study to gather qualitative data to compensate for the purely financial focus of our statistical analysis, will also be of deductive nature. It will be deductive in the sense that we will use the qualitative data to bring depth into our discussion regarding the theories we statistically test. Furthermore, the interviews will probably bring up empirics that are not covered in the considered previous literature, which would be treated in an inductive research manner, i.e. using theory to understand the answers (Blomkvist & Hallin, 2015). Overall, our study will thus be deductive and inductive in nature. This will require us to research previous literature thoroughly both before the analysis, in order to formulate hypotheses for our statistical analysis, and to some extent during the analysis, in order to understand and discuss the results of our interviews.

4.2 Literature Review

A literature review will be carried out with the purpose of establishing what characteristics previous research has found among firms that have undergone a leveraged buyout. The literature will be searched for in KTHB Primo, SSRN and Google Scholar. The studies that will be used will be published in peer-reviewed journals, to ensure high credibility. The key search words will be search strings, alone or combined, such as:

4.3 Variable Selection

Free cash flow divided by sales is chosen as the metric to test the free cash flow hypothesis, as the free cash flow of a company is specifically the variable of interest in this hypothesis. The definition of FCF used in this thesis is EBITDA minus Taxes (income tax corrected for deferred taxes) minus interest expense minus the dividend paid that year. To divide it with sales is to make sure that the overall size of the company does not induce a bias in the estimation, and is in line with what has been done in previous research, see e.g. Lehn and Poulsen (1989) and Renneboog et al. (2007). An alternative would be to relate the free cash flow to a balance sheet item or for instance company market cap, but this method is not chosen as there is a risk of it becoming a valuation multiple. In line with our free cash flow hypothesis, the expected sign of the coefficient for this variable is positive.

To measure potential tax savings from going private, a company’s taxes divided by sales is chosen as the variable for testing our hypothesis. Taxes are defined as the tax post from the profit and loss statement, corrected for any changes in deferred tax assets and liabilities, to ensure that the actual tax is accounted for. Taxes are then divided by sales to remove size bias, in line with what e.g. Kaplan (1989) as well as Kosedag and Lane (2002) did. The potential issue of different corporate tax rates in different countries in our sample is remedied as we use a matched sample, with respect to country, for our control group, i.e. each LBO’d company is matched against a control group company in the same country. As higher taxes could be indicative of higher potential tax savings, the expected sign of the coefficient for this variable in the regression is positive.

To measure undervaluation and underperformance, Tobin’s Q, defined as market value of assets divided by replacement value of assets, is used. Given that the replacement value of assets is hard to estimate, we proxy it with book value of assets, as is commonly done. As market value of debt is often similar to book value of debt, book value of debt is used in the numerator. Using Tobin’s Q is in line with previous studies, such as Hasbrouck (1985) who used it to assess undervaluation. In general, the lower Tobin’s Q is, the more undervalued is a company, so according to our hypothesis, the expected sign of the coefficient for this variable is negative.

With regards to the debt level hypothesis, the Debt-to-Equity ratio (D/E) is our chosen measure of how levered a company is. Debt is defined as the interest-bearing liabilities that a company has, the only liabilities of interest for this measure. In line with e.g. Le Nedant and Perdreau (2006), debt is then divided by equity to ensure that the measure is not subject to any size bias. In line with our debt-level hypothesis, the expected sign of the coefficient is negative.

The liquidity hypothesis, on the other hand, is measured using the current ratio. De-
fined as current assets divided by current liabilities, it is a common measure of company liquidity and has been used by e.g. Singh (1990) in a similar study. The higher the value of the current ratio, the less likely a company is to have liquidity issues in the short-term future; thus the expected sign of the coefficient is positive. The current ratio is however sensitive to the time at which you measure it, as non-fixed loans in general can be repaid at any time; if the ratio were to be calculated after such a repayment, this could distort the view on the firm’s liquidity. The distortion effect would be mitigated by the reflecting change in the cash position, i.e. a repayment of a loan would decrease both the numerator and the denominator, whereas an increase of a loan would increase both the numerator and the denominator.

The risk of incurring financial distress costs is measured using the Altman Z score. It is an indicator of how likely a company is to enter financial distress, and is defined as the weighted formula \[ Z = 1.2x_1 + 1.4x_2 + 3.3x_3 + 0.6x_4 + 1.0x_5. \] \( x_1 \) is working capital divided by total assets, \( x_2 \) is retained earnings divided by total assets, \( x_3 \) is earnings before interest and tax divided by assets, \( x_4 \) is market value of equity divided by book value of liabilities and \( x_5 \) is sales over total assets (Altman, 1968). This measure is commonly used to measure bankruptcy risk, and has been used in similar studies such as e.g. Gleason et al. (2007). In line with our hypothesis, the expected sign of the coefficient is positive.

Lastly, a company’s growth prospects are proxied by the compounded annual growth rate (CAGR) of the company’s sales the three last years before the transaction. Even if the previous years’ growth might not always be indicative of the future, it is commonly used as a proxy for future growth prospects, see e.g. Lehn and Poulsen (1989) as well as Le Nedant and Perdreau (2006). In line with our growth prospect hypothesis, the expected sign of the corresponding coefficient is thus negative. For a summary of the variables used in the analysis, see Table 2.

4.4 Data

4.4.1 Quantitative Data

The list of LBOs was mainly extracted from the database Capital IQ. First, transaction type was set as Leveraged Buy Out (LBO), Management Buy Out (MBO) or Going Private Transaction. This gave an initial sample of 67878 transactions. Only public-to-private deals were filtered for, reducing the sample to 3669 transactions. The target geographic was set to Sweden, Norway, Denmark, Finland, Germany, United Kingdom, France or Italy, leaving us with 640 transactions. Transaction announcement dates was set to 2005-01-01 to 2015-12-31, reducing the sample to 422 transactions. Target companies within the Real Estate or Financial industry were excluded, resulting in 381 transactions. Then, transaction status is set to closed, decreasing the number of transactions to 289. Lastly, Buyer/Investor was
Table 2: Variables used in the analysis

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Metric</th>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>$fcf$</td>
<td>Free cash flow / Sales</td>
<td>Free cash flow</td>
</tr>
<tr>
<td>$tax$</td>
<td>Taxes / Sales</td>
<td>Tax savings</td>
</tr>
<tr>
<td>$tbq$</td>
<td>Tobin’s q</td>
<td>Underperformance</td>
</tr>
<tr>
<td>$debt$</td>
<td>Debt / Equity</td>
<td>Debt levels</td>
</tr>
<tr>
<td>$liq$</td>
<td>Current ratio</td>
<td>Liquidity</td>
</tr>
<tr>
<td>$fds$</td>
<td>Altman’s Z score</td>
<td>Financial distress costs</td>
</tr>
<tr>
<td>$grw$</td>
<td>2 year CAGR</td>
<td>Growth</td>
</tr>
</tbody>
</table>

Variables used as measures for each hypothesis. Free cash flow is defined as EBITDA (earnings before interest, taxes, depreciation and amortization) minus Taxes (income tax corrected for deferred taxes), interest expense and the dividend paid that year. Tobin’s Q is the market value of company assets divided by the replacement value of assets, where book value is used as a proxy. Debt is the sum of all interest-bearing liabilities, while the current ratio is current assets divided by current liabilities. Altman’s Z Score is a weighted sum of five factors that indicates of bankruptcy risk and CAGR is the compounded annual growth rate of sales.

set to All Investment Firms leaving us with 237 transactions.

Following this, a similar search was performed in the Zephyr database. After conducting this screening and cross-checking with the Capital IQ database, eight new transactions were added, leaving us with 245 transactions. Furthermore, 16 private equity companies portfolio holdings were analysed. In this screening, a total of 51 public-to-private buyouts of whole firms within the relevant geographies and time-limits were found. Out of these 51 transactions, our sample contained all but three. These three were added to our sample, resulting in 248 transactions.

Starting from this list of 248 transactions, the transactions were examined individually to see that they fit the criteria. In this screening, 79 transactions were removed as they were buyouts of divisions of firms rather than whole firms. 10 transactions were removed as the financial data was insufficient. Four transactions were removed as they were strategic acquisitions, while another four were removed as they were acquisitions of financial/real estate firms. Three transactions were removed due to wrong geographic specifications. In total, 100 transactions were removed, resulting in 148 transactions remaining, which was the final sample of transactions. See Figure 3 for an overview of the transaction sampling process.

For every company that had undergone a public-to-private LBO, one corresponding public company was chosen in order to form a matched control group. These control companies
Figure 3: Overview of transaction sampling

were screened for via Capital IQ. A requirement was that the control company had to be listed when the transaction was announced, and remain listed two years after the transaction announcement day. Otherwise, firms that were bought out would have been introduced to the control group, defeating the purpose of it.

The control group was chosen according to three criteria in relation to the company that had been bought out. First, companies were matched geographically to mitigate effects of e.g. different tax codes. Secondly, companies were matched according to SIC Industry Classifications, in order to eliminate any industry effects in our sample. If the sample would be random, there is a risk that what appeared to be characteristics of LBO firms could in fact be disguised industry effects, if LBOs are more common in certain industries. Thirdly, the company with the least percentage deviation in revenues from the target company the year before the transaction was announced was chosen.

The type of matched sampling that is used is in line with previous research, e.g. Lehn and Poulsen (1989) and Le Nadant and Perdreau (2006) that used a similar way of sampling when looking for characteristics of LBO targets. The drawback of the matching method is that the criteria used for sampling cannot be controlled for in the statistical analysis.
After the buy-out firms and the control-group were established, the relevant financial data were extracted from Capital IQ. The financial data was cross-checked with annual reports and deemed of good accuracy.

The credit market status was proxied as the ICE BofAML Euro High Yield Index Option-Adjusted Spread, retrieved from FRED, Federal Reserve Bank of St. Louis webpage. This data constituted the basis for classifying the credit market as good or bad. This way of proxying for credit market status is in line with previous research, see for example Axelson (2013).

4.4.2 Qualitative Data

Five interviews were conducted, primarily with private equity professionals. Interview questions focussed on how the evaluation of potential targets was done at the specific firm and what the firm was looking for in an investment, in order to complement the quantitative data. The main reason for why interviews were chosen instead of e.g. a questionnaire is that interviews tend to contain more explanations, and are favourable when many perspectives and facets of a topic are of interest (Denscombe, 2009). The interviews followed a semi-structured approach. The reason for this was to enable discussion of larger/big-picture areas of inquiry, in which the interviewee to some extent can affect the direction of the interview. The semi-structured form of interview is advantageous as we seek contextual understanding in our interviews (Denscombe, 2009). The interviewees were given the opportunity to reason, analyse and expound upon the topics discussed rather than restricted by questions. See the appendix for the questions that were asked in the interviews.

It is desirable that the interviewees be representative of the market as a whole. In this study, the interviewees ranged from the most junior people at a firm to the most senior, which was important in order to get a broader perspective of the deal process. The interviewees were mostly focussed on the Swedish market, but one of the interviewees had a Nordic focus and another one a UK focus. To look at a broader picture than the Swedish one was important in order to get interview results that reflected the geographies of the quantitative data. This said, it would have been even better to include people from some other geographies as well, such as Germany and France, but this was not possible due to lack of willing interviewees. The interviewees had different backgrounds, but predominantly they came from either an investment banking or a management consulting background, from where they shifted into investment professionals after a few years of work. For an overview of the interviewees, see Table 3.
Table 3: Background information of the interview subjects

<table>
<thead>
<tr>
<th>#</th>
<th>Title</th>
<th>Experience</th>
<th>Firm</th>
<th>Geography</th>
<th>Interview date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Director</td>
<td>10 years</td>
<td>Large PE firm</td>
<td>Nordics</td>
<td>11/4-2018</td>
</tr>
<tr>
<td>2</td>
<td>Associate</td>
<td>5 years</td>
<td>Large PE firm</td>
<td>Sweden</td>
<td>6/4-2018</td>
</tr>
<tr>
<td>3</td>
<td>Associate</td>
<td>7 years</td>
<td>Mid size PE firm</td>
<td>Sweden</td>
<td>5/4-2018</td>
</tr>
<tr>
<td>4</td>
<td>Analyst</td>
<td>2 years</td>
<td>Large PE firm</td>
<td>UK</td>
<td>20/4-2018</td>
</tr>
<tr>
<td>5</td>
<td>Partner</td>
<td>15 years</td>
<td>Small PE firm</td>
<td>Sweden</td>
<td>23/4-2018</td>
</tr>
</tbody>
</table>

Background information of the respondents interviewed in the study. Names are omitted to guarantee anonymity.

4.5 **Empirical Data Analysis**

4.5.1 **Choice of Statistical Method**

With regards to testing statistical hypotheses with a binary dependent variable, there are multiple methods of choice. Some of the most commonly used are the logit and probit regression models, discriminant analysis as well as non-parametric rank tests. The three first mentioned allows for multivariate modelling, i.e. testing several factors at the same time, whereas the latter tests the variables in a univariate setting. As there is reason to believe that the chosen variables in our examination are correlated to some extent, a multivariate analysis is a good choice of method, since some inter-variable effects might be neglected in a univariate analysis. Discriminant analysis requires more assumptions to hold true than the two regression models, a key one being that the independent variables are normally distributed. Thus, the logit or probit should be the best choice of method compared to the others. The two model specifications produce very similar results, with only a small difference for data with fat tails. The probit is based on the cumulative normal probability density function, $P[Y = 1|X] = \Phi(\beta X)$, while the logit is based on the logistic function $P[Y = 1|X] = \left[1 + \exp(-\beta X)^{-1}\right]$ as mentioned in section 3.3 (Lang, 2016). Due to the more efficient computations and the more intuitive interpretation of the $\beta$ values that come with the logit specification, the logistic regression is our choice of statistical method. This method will be complemented with a univariate analysis, as an initial statistical examination of the data.

In order to analyse the financial data and determine any possible shared characteristics, logistic regressions will thus be used. In our case, the companies in our data set that have been bought out will have their lbo variable set to 1, while the firms in the control group will have the variable set to 0. To determine our model’s goodness of fit, we will use Nagelkerke’s pseudo $R^2$, while the reported $p$ values will be based upon Wald’s $z$ statistic, as opposed to the $t$ statistic used in ordinary linear regression. As stated in section 3.3, there is no clear
Table 4: Credit spreads for Euro HY 1998-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit Spread</td>
<td>6.74</td>
<td>6.56</td>
<td>7.50</td>
<td>12.15</td>
<td>11.69</td>
<td>5.77</td>
<td>3.45</td>
<td>3.39</td>
<td>2.91</td>
<td>2.98</td>
</tr>
<tr>
<td>Credit Spread</td>
<td>10.56</td>
<td>14.15</td>
<td>6.64</td>
<td>6.82</td>
<td>7.54</td>
<td>4.84</td>
<td>3.50</td>
<td>4.35</td>
<td>4.64</td>
<td>3.00</td>
</tr>
</tbody>
</table>

In this table, the credit spread of ICE BofAML Euro High Yield Index Option-Adjusted is presented on a yearly basis between 1998 and 2017.

Pseudo $R^2$ that is better than the alternatives, which led us to choose Nagelkerke’s pseudo $R^2$, due to the fact that it was easiest to implement in our statistical software.

### 4.5.2 Hypothesis Testing and Model Setup

In the hypothesis testing of logistic regressions, the null hypothesis $H_0$ is that $\beta_i = 0, i = \{1, ..., 7\}$, i.e. that there are no differences between the LBO group and the control group with respect to the $i$th hypothesis. In this study, the null hypothesis is rejected if the results are significant at a 5% level, a standard significance level in econometric studies.

To classify the credit market as good or bad, the ICE BofAML Euro High Yield Index Option-Adjusted Spread is retrieved for the years 1998-2017. A summary of the average annual credit spreads are presented in Table 4. The median credit spread for the period is 6.17. The investigated years (2005-2015) are then split into two groups: one group for good credit markets, i.e. markets where the average HY spread is lower than the median credit spread, and one group for bad credit markets, i.e. markets where the average HY spread is higher than the median credit spread. The periods of bad credit markets in our sample are, accordingly, 2008-12, and the periods of good credit markets are 2005-07 and 2013-15.

The logistic regressions will be run on target firms and their control group from the entire time period of our sample, 2005-15, from the period with bad credit markets, 2008-12, and from the period with good credit markets, 2005-07 and 2013-15. Therefore, a total of three logistic regressions will be reported. The process of reaching these final three models might however require several iterations until we have models with good fit.
5 Results

In this chapter, the empirical results of the study are put forward. The chapter commences with the results from the statistical analysis and concludes with the results from the interviews.

5.1 Descriptive Statistics

The purpose of this section is to describe the data samples, not to draw inferences regarding the relationship between the variables and probability of undergoing an LBO. As the statistics in this section are based on univariate analysis, i.e. the relationship between different variables is not accounted for, one has to be careful in order to avoid drawing premature conclusions.

The medians, standard errors and p-values related to the null hypothesis of equal distributions between the two samples irrespective of credit market conditions are presented in Table 5. As can be seen in the Table, the financial liquidity is lower, while debt levels are higher, for the LBO sample at a 5% level. Furthermore, the LBO sample has a higher risk of financial distress at a 10% level. For the other variables, the null hypothesis, i.e. that the two samples are of the same distribution, cannot be rejected at a 10% level. The medians,

<table>
<thead>
<tr>
<th></th>
<th>All firms (n=296)</th>
<th>LBO firms (n=148)</th>
<th>Non-LBO (n=148)</th>
<th>p val.</th>
</tr>
</thead>
<tbody>
<tr>
<td>fcf</td>
<td>0.065 0.227</td>
<td>0.068 0.270</td>
<td>0.061 0.176</td>
<td>0.393</td>
</tr>
<tr>
<td>tax</td>
<td>0.012 0.054</td>
<td>0.012 0.056</td>
<td>0.012 0.053</td>
<td>0.603</td>
</tr>
<tr>
<td>tbq</td>
<td>1.355 1.106</td>
<td>1.297 0.782</td>
<td>1.378 1.339</td>
<td>0.220</td>
</tr>
<tr>
<td>debt</td>
<td>0.386 2.390</td>
<td>0.453 3.032</td>
<td>0.268 1.484</td>
<td>0.044**</td>
</tr>
<tr>
<td>liq</td>
<td>1.213 0.856</td>
<td>1.160 0.681</td>
<td>1.257 0.987</td>
<td>0.034**</td>
</tr>
<tr>
<td>fds</td>
<td>2.348 2.868</td>
<td>2.085 2.425</td>
<td>2.532 3.233</td>
<td>0.068*</td>
</tr>
<tr>
<td>grw</td>
<td>0.064 0.255</td>
<td>0.061 0.259</td>
<td>0.066 0.252</td>
<td>0.498</td>
</tr>
</tbody>
</table>

This table provides the median and standard deviation for the variables tested for all 296 firms as well as for the LBO sample of 148 firms and the control group sample of 148 firms individually. The table also provides the p-value for the null hypothesis that the two samples come from the same population based on Mann-Whitney’s U test. For definitions of the variables, see appendix. * indicates significance on a 10% level, ** indicates significance on a 5% level and *** indicates significance on a 1% level.

standard errors and p-values related to the null hypothesis of equal distributions between the LBO and non-LBO samples depending on good and bad credit market conditions are
presented in Table 6. In good credit markets, LBO firms have lower financial liquidity and higher risk of financial distress on a 1% level. Furthermore, LBO firms in good credit markets have higher debt levels and higher Tobin’s Q on a 5% level. In bad credit markets, LBO firms have higher free cash flow on a 10% level. The other variables are insignificant on a 10% level.

Table 6: Univariate test results for different credit markets

<table>
<thead>
<tr>
<th>Good credit markets</th>
<th>Bad credit markets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Median</td>
</tr>
<tr>
<td>LBO firms (n=76)</td>
<td>0.074</td>
</tr>
<tr>
<td>Non-LBO (n=76)</td>
<td></td>
</tr>
<tr>
<td>LBO firms (n=72)</td>
<td>0.466</td>
</tr>
<tr>
<td>Non-LBO (n=72)</td>
<td></td>
</tr>
<tr>
<td>fcf</td>
<td>1.319</td>
</tr>
<tr>
<td>tax</td>
<td>0.012</td>
</tr>
<tr>
<td>tbq</td>
<td></td>
</tr>
<tr>
<td>debt</td>
<td>1.093</td>
</tr>
<tr>
<td>liq</td>
<td>1.879</td>
</tr>
<tr>
<td>fds</td>
<td>0.072</td>
</tr>
<tr>
<td>grw</td>
<td></td>
</tr>
</tbody>
</table>

This table provides the median and standard deviation for the variables tested, with the data split into four samples: LBO firms in good credit markets, non-LBO firms in good credit markets, LBO firms in bad credit markets and non-LBO firms in bad credit markets. The definition of good- and bad credit markets is based on the average High Yield Bond spread for the year in question, see section Empirical Data Analysis for a more thorough description. The table also provides the p-value for the null hypothesis that the two samples come from the same population based on Mann-Whitney’s U test. For definitions of the variables, see appendix. * indicates significance on a 10% level, ** indicates significance on a 5% level and *** indicates significance on a 1% level.

Lastly, a correlation matrix was produced to ensure that there were no inherent, large correlations between any two variables, see Table 7.

Table 7: Correlation matrix for variables included in the regressions

<table>
<thead>
<tr>
<th></th>
<th>fcf</th>
<th>tax</th>
<th>tbq</th>
<th>debt</th>
<th>liq</th>
<th>fds</th>
<th>grw</th>
</tr>
</thead>
<tbody>
<tr>
<td>fcf</td>
<td>1</td>
<td>0.132</td>
<td>0.128</td>
<td>0.073</td>
<td>0.117</td>
<td>0.217</td>
<td>0.207</td>
</tr>
<tr>
<td>tax</td>
<td>0.132</td>
<td>1</td>
<td>0.277</td>
<td>0.013</td>
<td>0.156</td>
<td>0.273</td>
<td>0.133</td>
</tr>
<tr>
<td>tbq</td>
<td>0.128</td>
<td>0.277</td>
<td>1</td>
<td>-0.026</td>
<td>0.060</td>
<td>0.392</td>
<td>0.154</td>
</tr>
<tr>
<td>debt</td>
<td>0.073</td>
<td>0.013</td>
<td>-0.026</td>
<td>1</td>
<td>-0.153</td>
<td>-0.081</td>
<td>-0.078</td>
</tr>
<tr>
<td>liq</td>
<td>0.117</td>
<td>0.156</td>
<td>0.060</td>
<td>-0.153</td>
<td>1</td>
<td>0.383</td>
<td>0.107</td>
</tr>
<tr>
<td>fds</td>
<td>0.217</td>
<td>0.273</td>
<td>0.392</td>
<td>-0.081</td>
<td>0.383</td>
<td>1</td>
<td>0.186</td>
</tr>
<tr>
<td>grw</td>
<td>0.207</td>
<td>0.133</td>
<td>0.154</td>
<td>-0.078</td>
<td>0.107</td>
<td>0.186</td>
<td>1</td>
</tr>
</tbody>
</table>

In this table, the Pearson’s correlation coefficient between the seven chosen financial variables is presented. For variable definitions, see Table 2 or appendix.
5.2 Regression Results

Whereas the univariate testing should not be used to draw conclusions of whether a variable affects the likelihood of undergoing an LBO, this is exactly what the logistic regressions are used for. The results of the logistic regressions paint a different picture than the univariate tests do, as can be seen in Table 8. The reported numbers in the Table show the estimates of the $\beta$ coefficients for each considered variable, along with its corresponding standard error. Since the log odds ratio is the dependent variable in the regression, the natural interpretation of the $\beta$ coefficients is that a $\beta_i > 0$ means that variable $x_i$ has a positive relationship with the likelihood of undergoing an LBO, whereas a $\beta_i < 0$ would mean that an increase in variable $x_i$ decreases the same likelihood.

As can be seen in Table 8, the free cash flow variable is insignificant on a 5% level for the whole sample, good credit markets and bad credit markets. Accordingly, $H_1$: firms with high free cash flows are overrepresented in the sample of firms undergoing leveraged buyouts, is rejected for all-, good- and bad credit markets. In other words, according to the data the level of a firm’s free cash flow cannot be shown to significantly affect the probability of being bought out. The tax hypothesis $H_2$ and the debt hypothesis $H_4$, similarly, were rejected in the whole sample, good credit markets as well as in bad credit markets. In other words, a firm’s level of debt and a firm’s level of taxes cannot be shown to significantly affect the probability of being bought out in any of the credit markets.

The financial liquidity, $liq$, level of a firm had a statistically significant negative relationship to the probability of being bought out in the whole sample (5%-level) and in good markets (10%-level). Thus, the lower the financial liquidity of a firm, the higher the probability of undergoing an LBO. Interestingly, this contradicts $H_2$, that states the opposite effect. Probability of financial distress, $fds$, had a statistically significant (5%) positive relationship to the probability of being bought out in good credit markets. Note that the lower the value on the variable $fds$, the higher the default probability. Quite surprising, this is a result in the opposite direction of $H_6$. Tobin’s Q, $tbq$, is negatively related to the probability of being bought out in all markets and bad markets (5% significance), indicating that the more undervalued a company is, the likelier it is to be bought out. Thus, $H_3$ is accepted for the whole sample and for bad markets. The growth variable, $grw$, was statistically significant (5%-level) in bad markets, with a positive coefficient, i.e. the higher the growth of a firm, the higher the probability of being bought out in a bad credit market. This effect is in the opposite direction of $H_7$. For a summary of the hypotheses and the logit regression results, see Table 9.

Regarding the accuracy of the models, the regression for the whole sample had a pseudo $R^2$ of 7.1%, while the good markets regression had a $R^2$ of 17.4% and the bad markets regression equivalent was 12.3%. This can be compared to an $R^2$ of between 4% and 25%.
for similar studies, see e.g. Le Nadant and Perdreau (2006) or Renneboog et al. (2007). The models for specific states of the credit market had greater explanatory power than the model for the whole sample. This means that the financial characteristics of LBO-firms are better captured in models that consider a specific state of the credit market, as opposed to one that does not discriminate based upon credit market state. This suggests that the state of the credit market plays an important role in buyers’ considerations when evaluating LBO targets.

Table 8: Output from Logit regressions

<table>
<thead>
<tr>
<th>Dependent variable: lbo</th>
<th>Whole sample</th>
<th>Good markets</th>
<th>Bad markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>$fcf$</td>
<td>-0.141</td>
<td>-0.581</td>
<td>1.323</td>
</tr>
<tr>
<td></td>
<td>(0.555)</td>
<td>(0.945)</td>
<td>(1.387)</td>
</tr>
<tr>
<td>$tax$</td>
<td>1.141</td>
<td>3.631</td>
<td>-1.205</td>
</tr>
<tr>
<td></td>
<td>(2.366)</td>
<td>(3.344)</td>
<td>(4.396)</td>
</tr>
<tr>
<td>$tbq$</td>
<td>-0.317**</td>
<td>-0.064</td>
<td>-0.478**</td>
</tr>
<tr>
<td></td>
<td>(0.143)</td>
<td>(0.211)</td>
<td>(0.230)</td>
</tr>
<tr>
<td>$debt$</td>
<td>0.052</td>
<td>0.016</td>
<td>0.088</td>
</tr>
<tr>
<td></td>
<td>(0.054)</td>
<td>(0.068)</td>
<td>(0.087)</td>
</tr>
<tr>
<td>$liq$</td>
<td>-0.368**</td>
<td>-0.466*</td>
<td>-0.116</td>
</tr>
<tr>
<td></td>
<td>(0.163)</td>
<td>(0.253)</td>
<td>(0.240)</td>
</tr>
<tr>
<td>$fds$</td>
<td>-0.002</td>
<td>-0.287**</td>
<td>0.115</td>
</tr>
<tr>
<td></td>
<td>(0.051)</td>
<td>(0.139)</td>
<td>(0.090)</td>
</tr>
<tr>
<td>$grw$</td>
<td>0.744</td>
<td>-0.017</td>
<td>1.576**</td>
</tr>
<tr>
<td></td>
<td>(0.509)</td>
<td>(0.843)</td>
<td>(0.728)</td>
</tr>
<tr>
<td>$Constant$</td>
<td>0.911***</td>
<td>1.522***</td>
<td>0.333</td>
</tr>
<tr>
<td></td>
<td>(0.319)</td>
<td>(0.485)</td>
<td>(0.468)</td>
</tr>
</tbody>
</table>

Pseudo R Sq. | 0.071 | 0.174 | 0.123 |
Observations | 296   | 152   | 144   |

Note: *p<0.1; **p<0.05; ***p<0.01

In the table above, estimates of the $\beta$ coefficients for the different variables are reported, along with the corresponding standard error for each estimate. The $\beta$ coefficient estimates show the effect the corresponding variable has on the log odds of a company undergoing an LBO, where e.g. a positive value indicates a positive relationship between the variable and the likelihood of undergoing an LBO. For definitions of the variables, see table 2 or appendix, and for definitions of good and bad credit markets, see section 3.2.
Table 9: Summary of hypotheses results

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Whole sample</th>
<th>Good market</th>
<th>Bad market</th>
</tr>
</thead>
<tbody>
<tr>
<td>H₁</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Rejected</td>
</tr>
<tr>
<td>H₂</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Rejected</td>
</tr>
<tr>
<td>H₃</td>
<td>Accepted</td>
<td>Rejected</td>
<td>Accepted</td>
</tr>
<tr>
<td>H₄</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Rejected</td>
</tr>
<tr>
<td>H₅</td>
<td>Significant other sign</td>
<td>Rejected</td>
<td>Rejected</td>
</tr>
<tr>
<td>H₆</td>
<td>Rejected</td>
<td>Significant other sign</td>
<td>Rejected</td>
</tr>
<tr>
<td>H₇</td>
<td>Rejected</td>
<td>Rejected</td>
<td>Significant other sign</td>
</tr>
</tbody>
</table>

In this table, an overview of the hypothesis rejection/acceptance is presented, based on the quantitative analysis. Significant other sign means that the chosen variable was statistically significant, albeit in the other direction than hypothesized. Note: Significance level 5%.

5.3 Interview Results

The results from interviews with private equity professionals are presented below in an aggregated format. See appendix for all the interview questions.

5.3.1 Screening

What is your main way of sourcing potential investments and do you perform any quantitative analysis?

There were three main ways that the interviewed private equity firms sourced deals: through structured processes, by their own initiative and via friends and contacts within the business world. We did not get definitive numbers on what percentage of deals were sourced in the different ways, but approximately 40% of the deals were sourced via structured processes, 30% via own initiatives and 30% via contacts or friends in the business world. This however ranged from firm to firm and these are rough numbers, presented to give a sense of the distribution of acquisitions.

In a structured process, advisors to a company that is up for sale contact the private equity firm. These so-called sell-side advisors are often the corporate finance division of a bank or a boutique corporate finance advisory firm. The private equity firm is then invited to partake in the acquisition process, which can be structured in different ways; often the sell-side advisor invites a number of potential strategic- and financial buyers that then compete for the company. Given the competitive dynamics of a structured process, the private equity firms often prefer buying companies in other ways, mentioning that there often is a sort of winner’s curse in a structured process, as the winner of the auction is likely to
overpay for the target. However, buy-outs from the stock markets are often done through structured processes, given that the selling company is often large.

The people that were interviewed from private equity firms unanimously said that buying companies on their own initiative or buying companies via friends and contacts was preferable, as excess competition is then avoided. When buying firms on their own initiative, the private equity professionals usually come up with an idea or a theme that they are interested in. For example, they can work from a belief that there are inefficiencies within an industry, or from a belief in a trend or theme that will be a boon to certain companies or industries. From this belief, the private equity professionals scan the market for companies within the industry that attracts them. The initial scan is often relatively crude, and mostly consists in finding companies that are of the right size for the private equity firm in terms of revenues. From there, the potential due diligence and acquisition process varies a lot from case to case.

Acquiring companies through contacts was also popular according to the people we interviewed, as this could give the acquiring firm an edge in the due diligence process and allow them to avoid excess competition in the acquisition.

All of the private equity professionals interviewed stated that performing quantitative analysis was either non-existent or very sparsely used in order to find targets at their firms. They did not seem to scan the market or a segment of the market on quantitative metrics such as market-to-book value of equity, Tobin’s Q, return on equity and profitability metrics. The only thing resembling this was that the private equity professionals scan the market or certain industries for targets based on revenues. However, the investment idea or theme seems to precede the scan; the private equity professionals believe in a certain idea or theme, and then scan the market for companies in the right size. The private equity professionals said that usually the resulting list is rather short, and the companies can be reviewed individually and no further scan is needed. When the companies then are reviewed individually, quantitative metrics are of course taken into consideration; a firm’s profitability, liquidity, cash flows etc. affects the view that the private equity firm has on the firm and what the private equity firm is willing to pay. However, the private equity professionals interviewed mentioned that these quantitative metrics are of a secondary importance and that any one quantitative metric will seldom affect the willingness to buy a company, although it could affect the price paid.

5.3.2 Credit Markets as a Determinant of Sourcing Deals

What impact does the state of the credit market have on the activities of your firm and your investment strategies?
All of the private equity professionals interviewed agreed that the state of the credit market affected the activities of PE firms’ to a great degree, either implicitly or explicitly and often both. Most notably, in good credit markets, there is an abundance of capital and all private equity firms’ are looking to deploy that capital. Also, other investors, such as strategic buyers, have got more capital at hand as they can borrow money easily. This abundance of capital and the willingness to deploy it rather quickly given the relatively short lifetime of PE funds leads to higher competition for targets with a following higher valuation of targets. The prices of all assets increase. Leverage levels increase as well, partly as it is needed in order for private equity firms to be competitive, and partly since the price of leverage is lower and covenants are more lax.

Some of the private equity professionals mentioned that they believe that the risk-profile of their investments shifts depending on the credit markets. This is partly due to the higher leverage levels that are needed in order to be competitive in bidding process. However, it is also because more risky investments might be needed in good credit markets in order to achieve good returns despite the high acquisition prices. The PE professionals mentioned that their IRR targets usually do not change, and in order to achieve their IRR targets despite paying more for companies, there is a tendency to increase the risk of the investment.

The private equity professionals said that fundamentally, their investment strategies do not change depending on the credit markets, but that there could be some shifts in focus. They still stay true to their firms’ or funds’ strategies and themes. Some of the PE professionals mentioned that given the inherently higher risk profile of expensive targets in good credit markets, they try to stick to areas in which they have a competitive advantage, such as more knowledge gained by previous investments. On the other hand, some of the PE professionals stated that they had to be more creative and open-minded in times of good credit markets, and look at a broader spectrum of investments in order to be able to deploy their capital.

A common remark by private equity professionals was that in times of good credit markets, there was a lower likelihood of achieving multiple expansion in an investment, i.e. to sell a company at a higher multiple than it is bought, given the exorbitant acquisition prices. Instead, the value creation to a larger extent had to come from actually increasing the profitability of the business and from, to a lesser extent, generating free cash flows to repay debt. Thus, some of the private equity professionals put a larger emphasis on potential profitability improvements in good credit markets.

Furthermore, one of the private equity professionals said that he believed that in good credit markets private equity firms became less fastidious, and were willing to do investments that they would never have done in other times.
5.3.3 Evaluating Potential Investments

What are the main things you look for as well as shy away from when evaluating a potential investment?

When evaluating potential investments, the different firms had varying answers regarding the characteristics they look for. This is understandable since each firm had their own strategy and focussed on certain types of investments. Overall, the firms tended to divide characteristics into two categories, one was the type of characteristics that they looked for that could make them invest in a certain object, and the other type was the so-called hygiene factors, i.e. those that had to be fulfilled for an investment to take place. These hygiene factors thus usually made them shy away from investing if they were not fulfilled.

The number one characteristic that most private equity professionals claimed to look for was competitive advantage or uniqueness. By this, they meant something that would give the considered company an advantage in the future compared to its competitors and that the nature of the advantage was company specific and inimitable. Some of the interviewees classified such advantages into fields such as having superior technology, having the best recognised brand in the industry or e.g. having control over an attractive and unique sales channel. What is common however, is the non-replicability and difficulty to generalise such a characteristic, which was why the firms tended to find these investments not by quantitative screening, but through research and networking.

Another thing that the private equity professionals were looking for in an investment was the possibility for them to add value to the company. Most of the interviewees mentioned that all investments were based on a thesis on how they could improve the company. If a company is run near perfectly, it would be difficult for the private equity owners to improve the company and thus to increase the value of the company, which is the main goal for them. Thus, they look for companies in which e.g. their competence and length of holding period can be used to improve and increase the value of the company. Finding these companies that have a lot of unrealized potential is difficult through quantitative screening according to the private equity professionals, who mentioned that you often have to dig rather deep into the business to understand how you can improve it.

When looking at a potential investment, many of the private equity professionals were already hypothesising about how a potential exit would be achieved. For many private equity firms, the optimal sale would be to a strategic buyer, as these buyers tend to offer a significant price premium due to various synergies. Financial buyers or an exit through IPO tend to come with complications such as receiving a lower price or not being able to exit the investment fully. Therefore, a qualitative characteristic that is commonly sought after is the possibility of, after the holding period, selling to a good strategic buyer.
Other characteristics that were sought after tended to be strategy specific. If for instance the firm focussed on cost cutting cases, the investments tended to have unnecessary high costs in e.g. manufacturing, marketing or distribution. The firm could then buy the company, implement certain cost cutting measures and increase profitability, thereby increasing the value in a future sale. If the firm instead focussed on top line growth by increasing revenues, they tended to look for companies that had large growth potential. This was usually connected to market analysis, concluding for instance that the company could increase its market share in its current geographies or expand internationally. Another desirable characteristic for this strategy but applied to tech companies was unit economics or scalability, e.g. that the products of a company preferably should have high margins per unit.

What the private equity professionals shy away from when looking at potential targets was often easier to specify than what they actually look for. This was due to the fact that they were seen as hygiene factors, i.e. if they were not fulfilled, the investment could not take place. In the interviews the one risk factor that was most commonly mentioned was customer dependency or buyer power. If a company looked perfect on the outset, with healthy margins and great growth trajectory, but only served one large client, say for instance being a subcontractor to a large automotive company, this would deter the firm from investing in the company. The downside of losing that one client is then deemed as too high of a risk for the investment to take place. Another characteristic or factor that was mentioned in several interviews, was how dependent the company was on external factors for success. If a company was dependent on a major trend to start, or for instance legislative change, this would often deter firms from investing in a certain company. Substantial dependencies on external factors means that the fate of the company’s success is more due to uncontrollable factors than to what the owners themselves actually can influence. Therefore, many of the firms also mentioned that they avoid companies in cyclical industries, as the accompanying risk factors are difficult to control.

Finally, one of the most important factors deciding whether or not a company could be invested in or not, was the requirements from the firm’s limited partners. These requirements were agreed upon before the limited partners (LPs) contribute their capital and ratified in their contract with the general partner, i.e. the firm. Some investors, e.g. Swedish pension funds, might require that the money does not go towards any company active in e.g. the tobacco or arms industry. This extends the list of hygiene factors that have to be fulfilled in order for an investment to take place. Interestingly enough, this is one of the major ways that the private equity firms are required to work with sustainability, as the LPs usually are institutional investors, backed by e.g. the government, and have sustainability requirements for what their money can be used for.
5.3.4 Hypotheses

What are your thoughts on the following characteristics in relation to an investment’s attractiveness?

Free cash flow
Overall, the private equity professionals did not put too much emphasis on the importance of free cash flow. It is not something that they specifically look for in their investments, but it is part of the overall assessment of the case. Thus, a company that has a very bad cash flow profile, e.g. losing substantial amounts of money several years in a row, could deter firms from investing. This was however also dependent on firm strategy, as for instance high growth companies tend to exhibit relatively bad cash flow profiles, as these companies spend substantial amounts of cash in order to grow. Looking for certain cash flow characteristics in order to be able to pay interest on loans or as a proxy for agency problems described in Jensen (1986) was however not what the firms did, and overall the free cash flow did not matter significantly in their investment decisions.

Tax savings
Regarding tax savings, the interviewees all said that it was not something that they explicitly looked for in their investments. This was due to the fact that it had, according to them, a negligible impact on the bottom line of the company. Tax savings were more connected to the financial engineering that the investment firms did, as an extra value increase to the company, but was never a deciding factor or a major part of the case assessment.

Undervaluation
Undervaluation was a characteristic that most firms indirectly looked for in their assessments, as they all strive to make an as successful acquisition as possible. However, even if it was an important consideration, they rarely succeeded in buying something undervalued, due to the markets effectively pricing companies fairly. The extent to which undervaluation was a characteristic of interest to them also depended on the type of buying process, as a structured auction for instance tends to drive up the price and makes it practically impossible to acquire an undervalued company. On the other hand, if the investment firm initiates a process themselves, in which they are the only interested party, undervaluation becomes more possible and therefore a more interesting characteristic.

Debt levels
The overall consensus regarding the debt levels of a potential target was that it did not make any importance for the investment firms. This was due to the fact that the pre-acquisition debt levels did not make much difference for the firm, as they theoretically could set any capital structure that they would prefer after the acquisition. The interviewees also did not use company debt levels and capital structure as a proxy for management competence,
as it could vary quite considerably for different industries. The one time the investment firms did consider debt levels is when they are dangerously high and indicate of a coming bankruptcy, which then usually deters them from investing.

Financial liquidity
The private equity professionals claimed to consider high financial liquidity as something that made the investment more attractive. Overall, it was seen as a something that signalled of good management and financial stability in a potential target company. However, it was never a deciding factor for the firms in the buying process, as the financial liquidity could be improved upon by for instance replacing management with new and more competent managers after the acquisition.

Financial distress costs
The potential financial distress costs and risks tended to be quite important for the private equity professionals in their investment decision. It was never a characteristic that would make the firms buy a certain company, but it could definitely serve as a deterring factor. The firms tended to take these costs under consideration in their overall risk assessment of the potential target, which ultimately could deter the investment completely if the risk-return level became unacceptable.

Growth prospects
The firms all agreed that strong growth prospects were something that increased the investment attractiveness of a potential target company. This characteristic was, understandably, very important for growth and expansion investment cases. Growth prospects tended to be regarded as a characteristic which ensured long term potential and value creation, as opposed to the cost cutting strategy, which was more short term focussed.
Table 10: Summary of results from interviews

<table>
<thead>
<tr>
<th>Topic</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening</td>
<td>The private equity firms source deals through structured processes, by their own initiative driven by an idea or trend and via contacts in the business world. They preferred buying companies on their own initiative and via contacts as this often resulted in favourable competitive dynamics. The private equity firms did not perform scans on quantitative financial metrics in order to find targets.</td>
</tr>
<tr>
<td>Credit markets and deals</td>
<td>The state of the credit market affects private equity activity in various ways. A good credit market leads to an abundance of capital, which leads to increased competition for targets. Prices of assets increase. Leverage levels increase, partly as it is needed to stay competitive, and partly thanks to better borrowing conditions. Some PE professionals mentioned that PE firms’ become less fastidious in good credit markets and look at targets that they would normally not look at, at least not at a similar price point.</td>
</tr>
<tr>
<td>Evaluating investments</td>
<td>When evaluating investments, the PE professionals focused on qualitative aspects such as competitive advantage, uniqueness, the possibility and extent of potential to add value to the company’s operations, the viable exit-strategies and the requirements of the limited partners’. The PE professionals shied away from external risk factors/dependencies, such as dependence on one customer and legislation. They also shied away from deals in which they as a firm had no possibility to add operational value.</td>
</tr>
<tr>
<td>Hypotheses</td>
<td>The PE professionals stated that undervaluation and growth prospects could be important considerations when investing. The other five hypotheses were of little consideration in an investment for the professionals, and were often treated as hygiene factors rather than investment attractions.</td>
</tr>
</tbody>
</table>
6 Discussion and Analysis

In this section the meaning and importance of the findings will be discussed and related to previous literature and theory. Alternative explanations for the findings will be expounded upon and reliability, validity and generalizability will be discussed.

6.1 General Discussion

Perhaps the most novel and important result of the quantitative part of the study is the increase in explanatory power when LBOs are split into good and bad credit markets, as Pseudo $R^2$ increases from 7.1% to 17.4% and 12.3% for good and bad credit markets respectively. Also, the differences in significant variables depending on the state of the credit market is an important and novel result, indicating that the state of the credit market affects what private equity firms are looking for. This is an interesting finding as it adds new empirical evidence of the vast importance that the state of the credit market has for the private equity industry. Thus, it seems like the commonalities shared between LBO targets are easier to find, when discriminating based upon credit market state. This could be of use in studies that try to establish takeover prediction models, as the models could be enhanced if they take into account the state of the credit market. Furthermore, it could serve as an explanation for why private equity firms underperform during times of good credit markets; e.g. they do not seem to be as focussed on undervaluation as during bad credit markets.

As our study suggests that the characteristics of companies that are bought out differ between different credit markets, it is interesting to theorise about the underlying reason for this. One possible explanation is that the preferences of private equity firms change when the credit markets change, perhaps due to soaring equity markets and higher prices. This is something that was echoed in the interviews with professionals, but with an emphasis on that it was more the possibilities of PE firms than the preferences that changed due to the higher transaction prices. The PE professionals mentioned that due to the higher transaction volumes- and prices in good credit markets, they had to change their way of operating, and look at targets that they normally would not consider at the given price point. Constraints in borrowing could be another reason; perhaps private equity firms would like to purchase companies with the same characteristics irrespective of credit market status, but are simply not able to do so during bad credit markets. Yet another explanation could be that the target companies themselves change with the credit markets. For example, in good credit markets, listed companies might have ample sources of financing and bright prospects, decreasing the allure of being bought out.

Several of the different characteristics found in previous literature are found to be insignif-
significant in our study. For example, free cash flow was not found to be a characteristic that distinguished LBO targets from other companies. These results were corroborated by the interviewees, who stated that they do not give much consideration to most of the hypotheses when they are looking at an investment. Instead, they look at factors such as competitive advantage, possibility to add value to the company, mega-trends and risk factors that are hard to capture in a number. As discussed in section 1, private equity activity has increased and the industry has matured since the majority of the previous studies were conducted. In the introduction, we theorised about this leading to a more efficient private equity market, which could diminish some of the strong relationships previously found. For example, if free cash flow were an important incentive for private equity firms, this should drive up the prices for targets with high free cash flows, hollowing out the benefits of high free cash flow in a target. Further to this, it is possible that the public markets as an ownership form has improved since the 80's and 90's, resulting in lower agency costs of for example high debt levels, which would decrease the incentive to take firms private on these grounds.

Our findings, and their difference compared to previous studies, could be due to the fact that we are investigating a new geography, since most previous studies have focussed on the US. On the other hand, the difference in characteristics could also be due to the fact that we are investigating a new time frame. A third, and perhaps the most likely explanation, has to do with the nature of the subject studied. Previous research has been inconclusive, as there has not been any clear consensus regarding the hypotheses. Often there are as many studies that support a specific characteristic as there are studies discarding it. There is a wide range of private equity firms applying an equally wide range of strategies, which could mean that there is no specific characteristic that all firms look for. Also, these investment strategies tend to change with time. This was something that was supported in the interviews, as most of the interviewees claimed that when looking for a potential investment, they tended to follow the strategy of the firm, as this is what they had high competency in. For example, one of the interviewees mentioned that his/her firm focusses on buying companies that already are successful, in order to mitigate risk. Another interviewee, on the other hand, mentioned that they look less successful companies, in which there is a large room for improvement. Furthermore, if there were a winning strategy the potential returns from it would be arbitraged away relatively quickly, an argument along the lines of the efficient market hypothesis. Thus, what might actually be a favourable characteristic in a specific point of time might be too costly a few years later.

6.2 Interpretation of Hypothesis Tests

Regarding hypothesis one (H$_1$), a rejection in all three regressions was quite surprising given that free cash flows are often cited in literature as an important factor for private equity firms. Our result, that the level of free cash flows cannot be shown to significantly affect the probability of being bought out, is in line with Kieschnick (1998), Servaes (1994) and
Renneboog et al. (2007) but contradicts Lehn and Poulsen (1989). From what we gathered in the interviews, the rejection of the hypothesis is less of a surprise, as the interviewees did not mention free cash flow as being a differentiating factor in an investment case, even though it was of some importance. The interviewees mentioned that the levels of free cash flow were reflected in the acquisition price, which made it hard to base an investment case on the FCF, as you had to pay for it.

The theory underlying hypothesis one ($H_1$) is Jensen’s free cash flow hypothesis, that high levels of free cash flow lead to wasteful spending and the undertaking of negative net present value projects. A possible explanation for our result is the developments in corporate governance that have occurred since the 1980’s when the free cash flow hypothesis was put forward. Corporate governance structures have since then become more oriented towards long-term company performance in an attempt to re-align the incentives of management and owners, which should lead to a mitigation of the agency problems of free cash flow (Anthony, Govindarajan, Hartmann, Kraus, & Nilsson, 2014). An example of this development is the proliferation of long-term equity linked incentives as a large part of management remuneration. Another possible explanation for our result is that it is mainly the stability, rather than the size, of the free cash flows that attract PE firms. High levels of free cash flow might be priced into the market value of companies to a greater extent than the stability of free cash flows. Arguably, on a relative benefit basis, given the excessive debt load that is used post-LBO, the difference in assigned value is higher for stable than for high free cash flows between a PE-firm and the public markets. An alternative explanation of the result is a potentially inadequate variable. As the $fcf$ variable is defined as free cash flow over revenues, the variable could be seen as a measure of profitability rather than high free cash flows. In previous studies, there is no consensus regarding the relation between profitability and probability of being bought out, which could be reflected here.

The rejection of the tax savings hypothesis in all regressions suggests that the potential tax savings, such as the interest rate tax shield, do not make a company more likely to undergo an LBO. This is in line with the interview results, as none of the interviewees stated that potential tax savings was a consideration during the screening process, while however some said that it might have an effect on the margin. A potential explanation for this is that the interest rate tax shield, a substantial part of the potential tax savings, rarely is larger than a minor part of the firm’s total tax expense, thus making this factor relatively unimportant for potential buyers. Our results contradict the findings of Le Nedant and Perdreau (2006); that French LBO firms have larger potential tax savings than non-LBO firms. It also opposes Kaplan (1989) and Kieschnick (1998) and their conclusion that potential tax savings are significant characteristics of LBO firms. On the other hand, it supports the findings of Lehn and Poulsen (1989), as neither they found taxes to be a significant characteristic among LBO firms. Perhaps most surprising is the contradiction with regards to the French study, as it was the most recent one and the only one treating
a European sample. A potential explanation could be that their study considers a time frame up until 2005, whereas our study covers 2005 through the financial crisis, up until 2015. The difference cannot, however, be attributed to the bad credit market conditions that came with the financial crisis, as the results were no different when discriminating based on credit market state. Another possible explanation for what seems to be a lower importance of tax considerations in today’s private equity market is that the corporate tax rate has decreased significantly in most countries. This decreases the potential savings from the corporate tax shield. For example, the Swedish corporate tax rate has decreased from 52% in 1989 to 22% in 2013, and in UK it has decreased from 52% in 1982 to 19% in 2017.

We found support for hypothesis three ($H_3$), that undervalued companies are overrepresented in the sample of firms undergoing leveraged buyouts, in the whole sample and in bad credit markets, but not in good credit markets. Noteworthy is that the sign in the regression of undervaluation in good credit markets was the same as according to the hypothesis, but it was not statistically significant. The overrepresentation of undervalued companies is in line with most previous research, e.g. Rath and Rashid (2016), Fidrmuc et al. (2012) and Hasbrouck (1985). It contradicts e.g. Loh (1992), who found no statistical significance of undervaluation in LBO targets. Our results corroborate the notions of asymmetric information and managerial inefficiency in relation to LBO motives. Investors that are better informed than the market utilize this informational advantage and buy undervalued companies and investors replace inefficient management that might be the cause of the undervaluation.

It is interesting that undervaluation seems to be a less important criterion for private equity firms in good credit markets. A possible explanation for this is that since in good credit markets capital is more easily accessible to PE-firms, they become less fastidious in their investment selection process and are willing to pay over and above prevailing prices in public markets as well as using less stringent investment criteria. This is in line with Axelson et al. (2013), who found that lax credit conditions make private equity firms prone to overpaying for deals through being able to use more and cheaper leverage. This is also in line with our interview results. The interviewees mentioned that undervaluation was an important part of their assessment, but they also stated that they had to be less fastidious in their investment process in good credit markets in order to be able to deploy capital despite the high level of competition. Furthermore, one of the interviewees mentioned that in order to achieve the target IRR in good credit markets when they pay more for their targets, it is plausible that the private equity firms target higher risk companies, such as growth companies that are usually expensive. This could be an explanation for the lower focus on undervalued companies in good credit markets that we established in our quantitative results.

Hypothesis four ($H_4$), that firms with lower debt levels are overrepresented in the sam-
ple of firms undergoing leveraged buyouts, is rejected in all three regressions. No statistical significance is found for the debt variable. The results from previous studies regarding debt levels for LBOs are inconclusive; e.g. Le Nadant and Perdreau (2006), found that LBO targets are less indebted than their counterparts whereas Loh (1992) found that LBO firms have higher debt levels than non-LBOs prior to the transaction. On the one hand, low debt levels could lead to agency costs due to managerial discretion with cash flow, and low debt levels could be a signal of a non-value optimizing management team that instead focuses on avoiding bankruptcy and keeping their jobs. On the other hand, a high debt level is a testimony for that the firm can actually sustain a high debt burden, which might make the investors more comfortable with acquiring the firm in an LBO. In our sample, it seems like the effects cancel out. Furthermore, this is supported by that today, the conditions for borrowing money from banks are often better from the borrower’s perspective. The most likely explanation for the result, however, was mentioned in the interviews; namely that pre-transaction debt levels of the firm rarely matter, as the new owners can set almost any capital structure that they want after the acquisition.

Hypothesis five (H5), that firms with higher financial liquidity are overrepresented in the sample of firms undergoing leveraged buyouts, was rejected in our regression analysis. The opposite relationship was found for the whole sample, whereas no statistical significance was found for good and bad credit markets. These results contradict Singh (1990) and Desbrieres and Schatt (2002). A possible explanation for our results could be that there is a big difference between pre- and post transaction financial liquidity. Potentially, the acquiring firm could boost the financial liquidity rather easily, for example through infusing cash into the company. Thus, bad financial liquidity might not be that much of a deterrent. However, it is hard to come up with a plausible story for the preference of firms with low financial liquidity. It could also be that the firms’ with low financial liquidity trade at a discount, which might make them attractive. This should, however, be captured to some extent by the undervaluation variable. This result was contradicted by the interviewees, who mentioned that they preferred companies with higher financial liquidity. However, they remarked that it was never a deciding factor in the investment case.

The logistic regression gave interesting results considering hypothesis six (H6), regarding potential financial distress costs. The fact that the risk of incurring financial distress costs is positively related to the likelihood of undergoing an LBO in good credit markets contradicts our hypothesis, since it means that LBO firms are more likely to incur financial distress costs than non-LBO firms. A potential explanation could be that during times of good credit markets, the risk attitude of private equity investors change as credit funding becomes easy to receive along with less stringent covenants. This increased risk taking makes the average deal riskier. Thus, an increased focus on risky firms might explain the more lax view towards companies that are more likely to incur financial distress costs. This result could also be explained if one considers that the potential financial distress
costs are factored in the target company price. Since private equity held companies less often default than their peers (Hotchkiss et al., 2014), the buying firm might feel more secure in buying a risky company, and therefore take advantage of the discount on the market.

Hypothesis six being rejected in the bad credit markets could be explained by the fact that financial distress costs risk is less important in a setting where the overall risk for all companies is quite high, decreasing the inter-firm deviation. This is a stretch however, as financial distress costs should, intuitively, matter more in times of bad credit markets. The variable chosen as a measurement of potential financial distress costs could also be a factor behind our surprising results, as the Altman Z-score really measures the risk of entering financial distress, and not the magnitude of the potential costs. However, there is no trivial measurement of such costs, e.g. measuring the cost of an arbitrary lost customer with accounting data. Thus, any included variable would not properly mirror the corresponding characteristic. According to the interviewees, they often assessed the risk of financial distress and thought a lot about the worst case scenario. However, they mentioned that the way they assessed the potential financial distress costs was mostly by looking at the number of customers, the cyclical nature of the business, technology risk or unfavourable mega-trends, rather than at the static image of balance sheet- and income statement metrics reflected in the Altman’s Z-score.

The insignificance of hypothesis seven ($H_7$) in the whole sample and the good market, in contrast to the significant positive relationship in the bad market, suggests that buyers look more at growth prospects when credit is expensive. One possible explanation for this is that buyers’ set even higher demands on their potential investments in times of bad credit markets, thus targeting only those with high future growth possibilities. Our findings of the whole sample are in line with Kieschnick (1998) and Halpern (1999), both investigating the US market, while it opposes Evans (2005), which treated a sample of Australian firms. That growth prospects are found to be insignificant in the whole sample regression could be explained e.g. by the variable used, which was based on previous growth rates, and might thus not fully capture the future growth possibilities. Another reason could be the fact that there are two opposing views on how growth affects the likelihood of undergoing an LBO, and that these effects cancel out. The low growth theory has its basis in agency theory, which as mentioned earlier, might have lost some of its relevance due to enhanced corporate governance practices during the last decades. The high growth argument is based on what industry professionals mentioned as an important factor and has an intuitive appeal, as buyers should be more interested in a firm with a high potential growth. Our results suggest that the latter could be even more prevalent during bad credit markets, due to higher requirements from buyers on target companies’ future growth possibilities. The interviewees stated that, ceteris paribus, high growth prospects was always good, but that it came at the cost of a higher acquisition price. The fact that we did not receive significant importance of the growth variable in the whole sample, could be because the variable used,
based on previous growth rates, might not fully capture the future growth possibilities.

### 6.3 Robustness and Limitations

In the statistical analysis, only data from the three financial statements and market value of equity of a company are analysed. This is a limitation as there are many other plausible common characteristics in LBO targets, such as pre-LBO ownership stakes, market share and industry growth rates. The reason for not including these other variables are simply that we could not get the data within our timeframe.

An important limitation accompanies the analysis of LBO characteristics with respect to credit market conditions, namely that we can infer correlation but not causality. This is especially important to point out as credit market conditions are highly correlated with other important variables for LBOs. For example, good credit market conditions can affect the valuation of equities positively. Thus, one has to be careful when interpreting these results. For example, we found that undervaluation was not a shared characteristic among LBO firms in good credit markets, but given the correlation between the credit- and equity markets, an alternative explanation is that this is driven by an exuberant equity market in which it is difficult to find undervalued targets.

When working with statistical models, it is always important to check for robustness and accuracy of the models. Due to the fact that several of the variables have relationships to each other, e.g. sales are a part of free cash flow, it is paramount to check that none of the independent variables have too high correlation to each other, as this could induce excessive multicollinearity and a weak model. As can be seen in Table 7 none of the variables have a correlation higher than 0.39, which is not close to any alarming level. For example, Berry and Feldman (1985) state 0.8 as a common cut-off point for excessive collinearity. Note that the highest correlations are between Tobin’s Q and financial distress and between liquidity and financial distress. This is no surprise, given that measures of undervaluation and liquidity are in a way elements of the Altman Z-score, the variable used for financial distress.

### 6.4 Reliability, Validity and Generalizability

Reliability and validity are important concepts in research. The data- and research method must be reliable and valid if the study is to hold any value. According to Paulsson (1999) validity is a measure of to what extent you are measuring what you actually want to measure. Reliability is a measure of the exactness of the measuring. In other words, reliability concerns the repeatability of the findings: if the same study were to be done again, how similar would the result be?
In terms of the interviews that are conducted in the study, there are some problems with reliability. Mainly, it would be difficult to reconstruct the interviews, and given the complex problem and semi-structured form of the interviews, interviewing other people would likely give slightly different results. Also, given the qualitative nature of the interviews, we as the researchers will affect the results. While studying the phenomenon, e.g. the way we frame the questions and choose the interviewees will affect the results and our subjectivity will also affect the way we assess the responses we get (Hansson, 2007). Holding a large number of interviews mitigates the weight any one interview carries, and thus increases the reliability and generalizability.

Using both qualitative interviews and statistical analysis increases the reliability and validity of the study. It is probable that the quantitative data does not contain all the information that is important in LBO-transactions, and if qualitative interviews can shed light on what is missing in this data, it would increase the validity. Also, getting the practitioners’ opinion on the role of financial data in assessing LBO targets will give a more nuanced perspective on the research question. Furthermore, the statistical analysis in combination with the interviews alleviates the problem of low reliability and generalizability that is a common problem in qualitative research.

6.4.1 Sample Characteristics and Representativeness

In terms of the validity and generalizability of the statistical analysis, it is important that the data used is representative for the phenomenon that is to be studied, and to eliminate potential biases as far as possible.

In the decision to focus on public-to-private transactions, it is likely that the sample emphasises large deals, as public-to-private transactions in general are larger than private-to-private transactions. Another phenomenon that exacerbates this problem is that the larger the firm being taken over, the larger is the probability that the takeover is documented and that there is sufficient financial data on the target. However, the fact that only 3 out of 51 transactions found to be public-to-private through scanning private equity firms’ portfolios were missing is a testimony to that the representativeness of the data is sufficient.

In constructing the control group, we set the criteria that the control company be listed at the announcement date of the transaction and for at least two years after. This is done to reduce the impact of right censoring, i.e. that some of the buy-outs will occur after the sample period is over. However, this introduces another bias as this means that defaulted companies are removed from the sample. It is plausible that defaulted companies for example have higher debt levels than other companies, reducing the representativeness of our control group. However, the number of defaulted firms during a two year period is low; Moody’s estimation of default rate among corporate issuers was 1.3% (Moody’s, 2011).
Another problem is the issue of left-censoring: as the study starts with data from 2005 all the events prior to 2005 are excluded. This results in sampling bias, as only the firms that survived until 2005 are accounted for in the sample. There is no remedy for this issue given that this study seeks to focus on novel data.

6.5 Sustainability and Ethics

Sustainability
While sustainability has not been a main focus in this study, sustainability is an important consideration within the private equity industry, which became evident during the interview phase of the study.

The limited partners in private equity funds, i.e. the investors that contribute the lion’s share of the capital in a fund, are becoming more and more sustainability focussed according to the private equity professionals interviewed. The limited partners are increasingly demanding that there be a sustainability focus in the investment activities of the private equity firm, and that the private equity firm strictly avoids some types of investments that are not in accordance with sustainability.

Furthermore, sustainability is an interesting megatrend that the private equity professionals mentioned often generated good investment opportunities, and they believed that sustainability would become an even more important megatrend in the future. Thus, the private equity industry is using the increased focus and need of sustainability to generate economically sound investments. In addition to this, they try to implement sustainability practices in the portfolio companies that they do own, as they see a range of benefits form doing this, for example increased employee satisfaction and retention.

Also, some of the private equity professionals claimed that sustainability practices in a company could be important for risk-mitigation, as it could decrease the risk of bad reputation, brand damage, fines and penalties, etc.

Apart from the abovementioned extrinsic motivations for thinking about and incorporating sustainability practices into private equity, many of the interviewees spoke about their intrinsic motivation of having a good impact on the world. The interviewees mentioned that given their great responsibility that follows from having an important role in large companies, they felt that they were in a great position to actually affect sustainability practices in the world at a larger scale, and that were very motivated in doing this purely intrinsically.
Ethics
Considering ethical aspects in connection to our thesis, both the ethics of our research method or the ethical implications of our findings could be discussed. We focus on the aforementioned, since the latter would be more speculative in nature and is beyond the scope of this thesis. The qualitative part of our study and the semi-structured interviews that were conducted entailed ethical implications as for instance our interviewees might have discussed firm secrets or expressed views of personal nature, not to be shared with others in the firm. Furthermore, as we present the interview data in an aggregated form, the interviewees might feel like their view on a specific subject was neglected or misunderstood. Another potential ethical issue is on the subject of biases in the statistical analysis, which is further discussed in Section 6.4.

In order to minimise the potential ethical issues mentioned, we followed the guidelines of the Swedish Research Council, as presented in Blomkvist and Hallin (2015). They state that the researchers should follow the four codes: information requirement, consent requirement, confidentiality requirement and good use requirement. To ensure adherence to the first principle, we informed the interviewees of the purpose of our study, in connection with our initial contact as well as in the beginning of each interview. As all the people we interviewed also gave their consent to partake in our study and to be recorded, given that we allowed them anonymity, the second principle was also adhered to. The anonymity given to the interviewees, along with the fact that their answers were aggregated as a whole, also ensured that our method followed the confidentiality requirement. Finally, the data collected in our interviews were only used for the purpose that we informed the interviewees on, ensuring adherence to the good use requirement. As a final note on the issue of aggregating our interview answers, these aggregated answers meant to present what the majority of our respondents replied to our questions. If there were large differences in response to a question, we also made sure to present both views of the interviewees’ answers and thereby we minimised the risk of neglecting any views that where mentioned in the interviews.
7 Conclusion

In this final section, the research question will be answered by concluding the analysis and discussion of our results. Implications for different stakeholders will then be discussed and will be followed by suggestions for further research in the field.

7.1 Answering the Research Question

The shared characteristics of firms that undergo leveraged buyouts in Europe are that they have low financial liquidity and are undervalued, according to our statistical analysis. In good credit markets, high potential financial distress costs were found to be an attraction for private equity firms, something that was not supported by the interviews. In bad credit markets, undervaluation was yet again found to be a common characteristic, as well as strong growth prospects. As the characteristics found in different credit markets differed, we conclude that credit markets have an impact on what characteristics and types of companies that private equity buyers look for. This last conclusion was supported in the interviews, as the consensus was that the state of the credit market had a profound impact on the PE firms' activities. Namely, in good credit markets, there is an abundance of capital that needs to be deployed, which leads to increased competition and more expensive targets. This has an impact on what buyers are looking for; for example, some buyers need to look at a broader scope of targets than normally, whereas others tend to stick to their fields of expertise even more.

According to the private equity professionals interviewed, what makes an attractive investment is very seldom financial characteristics. Instead, they focus on the company's competitive advantage, barriers to entry, the opportunity for the fund to make a large positive impact on the company, avoidance of large risk factors, a plausible exit strategy and favourable mega-trends. These non-financial characteristics are difficult to systematically translate into financial characteristics, decreasing the possibilities of a fully quantitative analysis. Overall, the qualitative results resonate with the quantitative results, as many of the financial characteristics turned out to be insignificant in the analysis. That the PE professionals cited non-financial characteristics to be the most important factors when deciding on an investment does not necessarily imply that all financial characteristics should be insignificant. For example, there could be correlating factors between the more qualitative aspects that the PE-firms cited as being very important and the financial characteristics. Furthermore, even though the PE professionals stated that the financial characteristics were not very important, they were not to be totally disregarded. This could have an effect when many transactions are looked at in aggregate, as it is easier to spot small differences from a large data set. This said, it is plausible that if it were possible to look at some of the factors that the PE professionals stated as being important, such as competitive advantage,
it would have a much stronger statistical significance in relation to buyout probability.

7.2 Implications

The results of this thesis could impact several different stakeholders. Equity holders that try to profit from buying stocks in acquisition candidates can benefit by using the distinction between good- and bad credit markets, as it has vast implications for the private equity firms. Private equity firms themselves can benefit by the empirical contribution on how their behaviour differs depending on the credit market. For example, the quantitative results indicates that the private equity firms to a larger extent buy overvalued companies in good credit markets. Private equity professionals could benefit from this external perspective on their activities, and use it to analyse their own behaviour.

7.3 Further Research

Further research could focus on expanding the empirical universe investigated, as this thesis has focussed on the importance of credit markets when choosing an LBO target in Europe. It would be interesting to examine the US LBO market, as it is more mature and more homogeneous than the European market. Even if the vast majority of studies investigating characteristics of LBO targets have been conducted in the US, none has focussed on the importance of credit market conditions. Furthermore, if the available data allow for it, extending the empirics to emerging markets could provide intriguing results. This would also decrease the issue of left censoring, as many companies that are undergoing LBOs in these markets are among the first ones, i.e. the prime targets for highly levered transactions.

It would be interesting to study other ratios than accounting ratios, such as previous ownership structure (e.g. % institutional ownership), company market share and industry growth rate, as these are things that professionals seem to assess in their investment evaluation process. Another interesting thing to study are the characteristics of companies that are bought out with respect to returns on the investment. The question is what characteristics, if any, differ between successful investment and unsuccessful ones. This could be of great use to private equity firms. However, this would require data that is hard to access.

It would also be interesting to see whether it is credit markets or equity markets that drive differences in characteristics that financial buyers look for in buyout targets. In other words, the interaction effect between the status of the credit- and the equity market on firm characteristics would be an interest topic of inquiry. On another note, it would be interesting to add strategic acquisitions to the sample. Then, the rationale behind financial acquisitions and strategic acquisitions could be contrasted.
References


52


Appendix

Interview Questions

Note that as the interviews were semi-structured the interview template was not followed to the letter.

Screening

- What is your main way of sourcing potential investments?
- Do you perform any kind of quantitative analysis in order to find targets (e.g. scanning the market for certain key metrics), and if so, which and why?

Credit market as a determinant of sourcing deals

- What impact does the state of the credit market have on the activities of your firm?
  - How does it affect your investment strategies?
  - Does your evaluation criteria change with the state of the credit market, and if so, in which way?

Evaluating potential investments

- What are the main things you look for when evaluating a potential investment?
  - Regarding financial characteristics
  - Regarding other characteristics (market, management, valuation etc.)
- What are the main things you shy away from when evaluating a potential investment?
  - Regarding financial characteristics
  - Regarding other characteristics (market, management, valuation etc.)

Hypotheses

- What are your thoughts on the following characteristics in relation to investment attractiveness?
  - High free cash flow
  - Potential to benefit from tax savings (e.g. in the form of a interest tax shield)
  - Undervaluation
• The target company’s current debt level
• Financial liquidity
• Potential financial distress costs (i.e. the risk that the company enters financial distress and the magnitude of the costs that would incur if it happened)
• The target company’s growth prospects

Miscellaneous

• Are there any salient common characteristics among your firm’s portfolio companies, and if so, which?
• Could you describe what you think is one of the best investments that has been done in PE, and explain why it is so good according to you?
• Is there anything essential that relates to what we have spoken about that you think we have missed asking you about? In that case, what?

Definitions of variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>fcf</td>
<td>Free cash flows / sales</td>
</tr>
<tr>
<td></td>
<td>Free cash flow is defined as EBITDA minus income tax corrected for deferred taxes, interest expense and the dividend paid that year</td>
</tr>
<tr>
<td>tax</td>
<td>Taxes / sales</td>
</tr>
<tr>
<td></td>
<td>Taxes defined as income taxes paid adjusted for changes in deferred taxes</td>
</tr>
<tr>
<td>tbq</td>
<td>market value of assets / replacement value of assets</td>
</tr>
<tr>
<td></td>
<td>Book value is used as a proxy for replacement value of assets as well as for market value of debt</td>
</tr>
<tr>
<td>debt</td>
<td>Total debt / Total equity</td>
</tr>
<tr>
<td></td>
<td>Debt defined as interest bearing liabilities, equity as book value of equity</td>
</tr>
<tr>
<td>liq</td>
<td>Current ratio (Current assets/Current liabilities)</td>
</tr>
<tr>
<td>grw</td>
<td>2 year compounded annual growth rate</td>
</tr>
<tr>
<td>fds</td>
<td>Altman Z score</td>
</tr>
<tr>
<td></td>
<td>Defined as Z= 1.2<em>A + 1.4</em>B + 3.3<em>C + 0.6</em>D + 1.0*E, A is working capital divided by total assets, B is retained earnings divided by total assets, C is EBIT divided by assets, D is market value of equity divided by book value of liabilities and E is sales over total assets</td>
</tr>
</tbody>
</table>