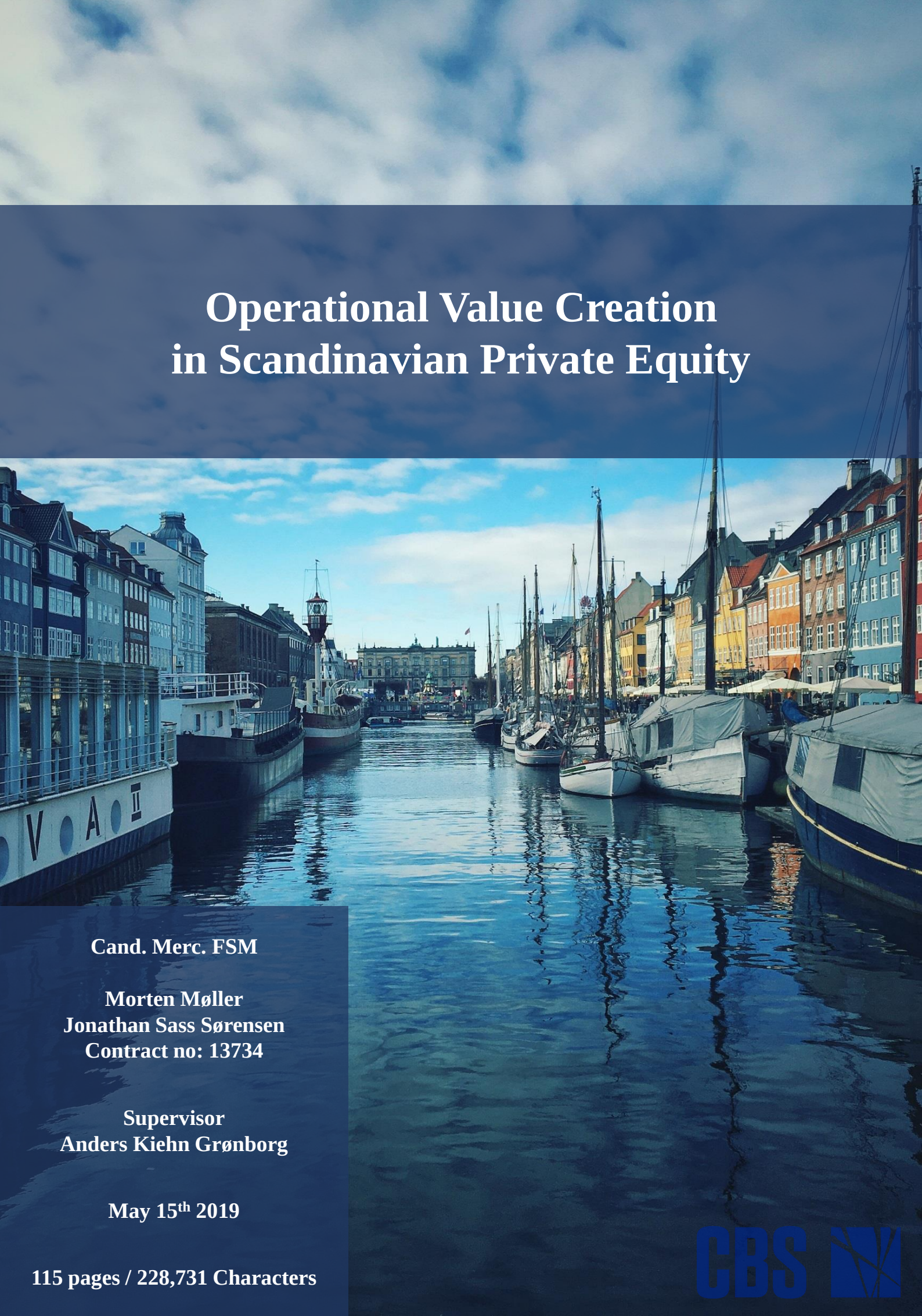
Operational Value Creation in Scandinavian Private Equity



Cand. Merc. FSM

Morten Møller
Jonathan Sass Sørensen
Contract no: 13734

Supervisor
Anders Kiehn Grønborg

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Abstract

Utilizing firm-specific financial data on 188 buyouts from 2011 – 2016 this thesis investigates whether superior operational performance is observed in Scandinavian portfolio companies of Private Equity (PE) funds, relative to a constructed control group. Moreover, the scope of existing literature in the region is extended by exploring potential drivers of value creation. Specifically, the impact of firm- and fund-specific characteristics is explored in the second part of the study.

In answering the research questions, the thesis applies a twofold econometric approach. The initial analysis on relative performance in buyouts is analysed using the Difference in Difference estimation technique. The magnitude of value creation is measured using two different event windows and econometric specifications. For the subsequent investigation on drivers of value creation, various specifications of the Linear Probability Model are performed. In both layers of the analysis the dependent variables are grouped into three categories, namely: Growth measures, Return measures and Efficiency measures.

Partial support is found in favour of superior value creation in PE-owned companies. Most compelling evidence is found on the Growth measure. Ambiguous evidence is found on the impact of firm- and fund-specific characteristics. A short-term positive effect of CEO replacement is found, though a convergence towards the mean is observed over time. Suggestive evidence is found for a differential operational focus, contingent on the geographical scope of the acquiring fund. Similarly, the impact of investment experience is found to be positive, though the magnitude and sensitivity differs across the investigatory parameters.

The thesis acknowledges that inherent measurement errors may prevail as a consequence of the designed empirical study. Despite this, the study contributes to the existing literature on three parameters. First, indicative evidence is found of superior performance amongst PE-backed firms in the Scandinavian region. Second, a foundation is established for further research on the impact of firm- and fund-specific characteristics. Third, PE practitioners may reap insights about how the focus and experience of the fund alter the operational value creation.

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1. Introduction

Utilizing firm-specific financial data, this thesis investigates whether superior operational performance is observed in Scandinavian portfolio companies of Private Equity funds, relative to a constructed control group. The magnitude of value creation is measured using two different event windows and econometric specifications. Moreover, we expand the scope of existing literature on the subject in this region by exploring potential drivers of value creation. Specifically, the second layer of the study explores the impact of firm- and fund-specific characteristics.

Our study is motivated by the scarce existing literature on PE value creation in the Scandinavian region Whilst much literature has been devoted to investigating the impact of PE ownership in the Anglo-Saxon countries (e.g. Kaplan, 1989; Cressy et al., 2007) the empirical evidence in Scandinavia remains underdeveloped. However, the Scandinavian region does provide an attractive research platform, for numerous reasons. First, the public disclosure duty of financial statements for private companies allows for the establishment of a comprehensive dataset of high quality. Second, due to increased investor appetite, the industry has witnessed increased activity in recent years, fuelled by local as well as international funds. The heterogeneity of market participants encourages a multidimensional analysis of fund-specific factors. Third, distinctive governance mechanisms that characterize the region could influence the conclusions reached on the effect of PE ownership.

The theoretical scope of the thesis builds on the work of Berg and Gottschalg (2005), who introduce a three-dimensional framework of value creation in PE. Attention is predominantly devoted to operational, strategic and governance levers which are argued to fuel value creation during the holding period. The empirical strategy of the study is deduced from existing literature in the field (e.g. Boucly et al., 2011; Acharya et al., 2013). We apply a twofold econometric approach. The initial investigation of operational value creation in PE-owned companies relative to the control group is performed using the Difference in Difference estimation technique. For the subsequent investigation on drivers of value creation, various specifications of the Linear Probability Model are performed.

The empirical tests are conducted on various sub-samples of the full dataset, contingent on the event window and the research question studied. The full dataset consists of 188 buyouts from Scandinavia in the period 2011–2016, and 613 comparable control firms. The dependent variables, used for measuring the relative performance of buyouts and the impact of firm- and fund-specific

characteristics, are grouped into three categories: Growth measures, Return measures and Efficiency measures.

The results of our empirical study show partial support in favour of superior operational value creation in PE-owned companies. Most compelling evidence was found on the Growth measures. The impact of firm- and fund-specific characteristics was mostly ambiguous. Concerning the latter, suggestive evidence was found for a differential operational focus, contingent on the geographical scope of the acquiring fund. Similarly, the impact of experience was found to be positive, though the magnitude and sensitivity differed across the investigatory parameters. We argue that the scattered results found in the first stage of the study has a blurring trickle-down effect on the subsequent tests on the drivers of value creation. Likewise, we question whether our results are subject to measurement errors related to i) the treatment of outliers, ii) the uniformity of our sample and iii) the exclusion of exited/defaulted buyouts. Finally, we discuss the extent to which operational value creation in buyouts is influenced by a "picking the winner" bias.

1.1 Problem Statement and Research Questions

As described above, this thesis investigates operational value creation in two distinctive layers. The first layer examines whether PE ownership generates superior operational performance relative to a control group of non-PE-backed firms. The second layer investigates whether firm- and fund-specific factors influence the value creation. Specifically, this thesis strives to complement the existing literature by putting forward the following three interrelated research questions:

Research question 1:

Do PE portfolio companies exhibit superior financial performance compared to non-PE backed companies?

Research question 2:

To what extent do certain firm-specific characteristics of the target company drive value creation?

Research question 3:

To what extent do certain fund-specific characteristics of the acquiring PE fund influence value creation?

1.2 Delimitations

The following section outlines the inherent delimitations in the design of the empirical study. Three perspectives are considered, namely, i) measuring value creation, ii) explanatory variables and iii) investigatory sample and event windows.

Value creation in buyouts can be measured in multiple ways: at a fund level (Internal Rate of Return or Money Multiple), at a socioeconomic level (Employment and Tax), and at a portfolio company level. We focus on the portfolio level by utilizing five commonly used accounting measures as proxies for operational value creation. While the inclusion of additional measures may yield more nuanced results, we argue that collectively these are exhaustive in providing a proxy for operating value creation. As this study focuses on *value creation* during PE ownership, the empirical analysis does not consider the potential value capturing at the entry and exit phase of an Leveraged Buyout (LBO).

To identify sources of value creation, we use numerous firm- and fund-specific variables. By no means exhaustive, our list of explanatory variables is selective due to limited data availability. Further, endogenous factors may influence the buyout decision, impeding the establishment of causal relationships.

The sample is comprised exclusively of majority buyouts, which ensures undisputed implementation of value creating initiatives. Divisional buyouts are excluded unless separate financials are available. "Buy and Merge" transactions are excluded, as the establishment of pro forma financials comes with great uncertainty for outsiders. As a consequence of data availability, the sample consists exclusively of Scandinavian buyouts during a relatively short time period. Thus, caution should be taken before generalizing the results. Finally, as this thesis utilizes specific event windows, the results are not representative of value creation throughout the entire LBO process.

1.3 Structure of the Thesis

Figure 1 on the following page depicts the structure of this master's thesis. Part 1 establishes the applied conceptual framework and presents the research questions of the thesis. Part 2 introduces the theoretical background and reviews previous research, from which the hypotheses of this paper are derived. Part 3 comprises all sections concerning the empirical part of the study, including methodology, data description and the analysis. Lastly, Part 4 discusses the validity of our results, including robustness tests, and presents the conclusions and the managerial implications of the study.

Figure 1: Master's Thesis Structure

Part	Section	Sub-section
1. Introductory	1. Introduction	● *Introduction* ● *Problem Statement and Research Questions* ● *Delimitations* ● *Structure of the Thesis*
	2. Conceptual Framework	● *Basics of Private Equity* ● *The Structure and Process of Private Equity Funds* ● *A Historical Examination and Overview of the Scandinavian Markets*
2. Establishment of Theoretical Foundation	3. Theoretical Background	● *Introduction of Value Enhancing Levers* ● *Development of Value Creating Levers Over Time*
	4. Literature Review	● *Private Equity Ownership and Financial Performance* ● *Firm Specific Characteristics and Post-Buyout Performance* ● *Fund Specific Characteristics and Post-Buyout Performance*
	5. Hypotheses Development	● *Private Equity Ownership and Financial Performance* ● *Firm Specific Characteristics and Post-Buyout Performance* ● *Fund Specific Characteristics and Post-Buyout Performance*
3. Empirical Testing	6. Methodology	● *Sample Selection* ● *Variables* ● *Empirical Model*
	7. Data Description and Sample Statistics	● *Sample data* ● *Dependent Variables Used in the Second Layer of Analysis* ● *Descriptive statistics*
	8. Results and Analysis	● *Relative Operational Value Creation in Buyouts* ● *Impact of Firm Specific Characteristics on Performance Measures* ● *Impact of Fund Specific Characteristics on Performance Measures*
4. Interpretation of Results and Conclusion	9. Validity of Results	● *Winsorization Robustness Test* ● *Uniformity of Sample, Early Exits and Bankruptcies* ● *Picking the Winner Explanation*
	10. Limitations	● *Data Validity* ● *Methodological Limitations*
	11. Conclusion	● *Conclusions*
	12. Managerial Implications and Suggestions for Further Research	● *Managerial and Academic Implications* ● *Areas of Future Research*

2. The Conceptual Framework

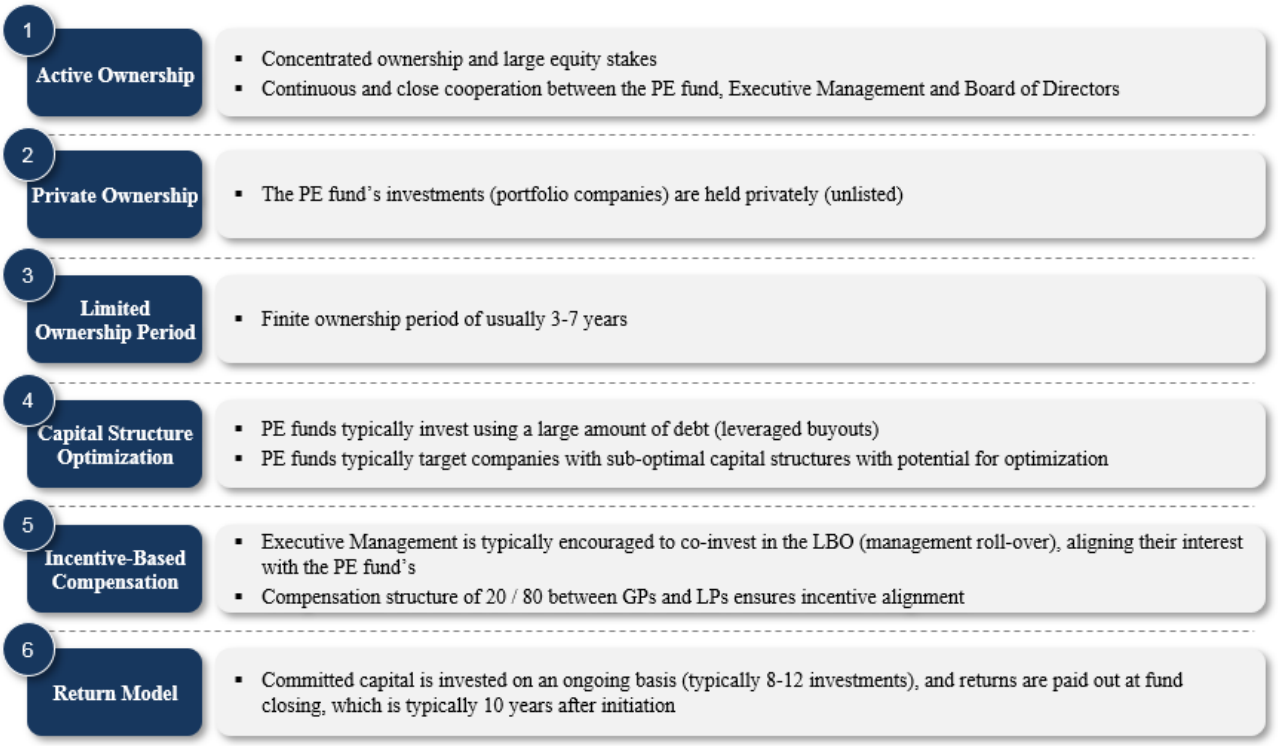
The following chapter outlines the conceptual framework of this master's thesis, entailing the primary concepts and terms within PE theory. The chapter thus lays the requisite theoretical foundation for the remaining sections of the thesis. Firstly, we define the concept of PE. Secondly, the structure and process of PE funds are discussed. Third, a historical overview of PE is provided, including separate examinations of the Scandinavian countries in the context of PE.

2.1 Basics of Private Equity

PE is an alternative investment class consisting of equity capital not listed on a public securities exchange. The PE market comprises funds and investors who invest directly in private companies or engage in buyouts of public companies that are subsequently delisted. A PE fund is a collective investment scheme that obtains capital commitments from investors, also known as Limited Partners (LPs), which is drawn upon to finance the acquisition of portfolio companies. The fund is managed by a team of experienced investment professionals, also known as General Partners (GPs), from the PE Firm that incorporates the fund. The funds are typically incorporated as limited partnerships with a customary fixed term of 10–15 years, with the option to extend[1]. A PE fund commonly undertakes medium-term equity investments, with the ambition of developing the portfolio companies by implementing various value-enhancing initiatives during the holding period. After having developed the portfolio company, the PE fund divests the company with a, potential, profit to be shared on a pre-defined basis between the GPs and LP. Inspired by Spliid (2007) and Bennedsen et al. (2008), we argue that PE funds have six distinctive characteristics that separate them from other investment vehicles, presented in Figure 2 on the following page.

[1] The Limited Partnership Agreement (LPA) sets forth the terms for potential extensions of the lifetime. The option is typically exercised when the GPs argue that additional value-creating potential prevails in the portfolio companies or exiting the final investments in a desirable manner requires additional time.

Figure 2: Defining Characteristics of the PE Fund

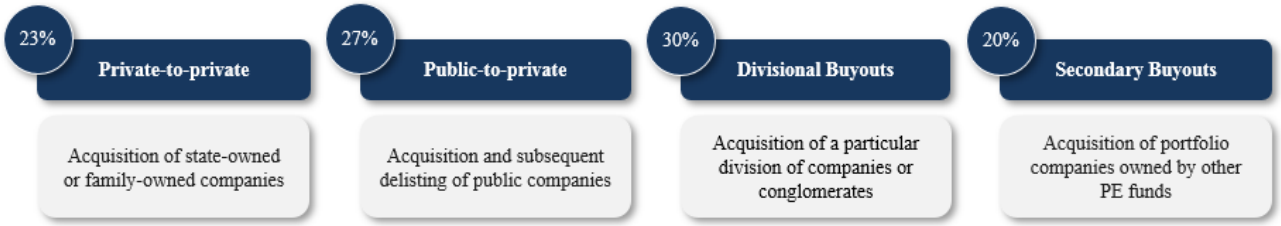


Source: Authors' own creation based on Spliid (2007) and Bennedsen et al. (2008).

The basic premise of PE funds is the assumption that they will provide investors with a higher return than equivalent investment alternatives. To do so, generating operational value creation (the focus of this thesis) is instrumental. PE funds fuel this value-creation process by utilising a range of initiatives, discussed in section 3. These include operational improvements, capital structure optimisation and strategic initiatives. PE funds typically acquire a controlling interest in the companies in which they invest, as this allows them the full decision-making authority, which is crucial in avoiding conflicts of interest in the implementation of value-enhancing initiatives. The initiatives are implemented through active ownership, typically by the fund taking a seat on the board of directors and sustaining a close collaboration with executive management (Spliid, 2007).

Acquisitions by PE funds are typically of four distinct types: i) private-to-private, ii) public-to-private, iii) divisional buyouts, and iv) secondary buyouts. These are briefly explained in Figure 3 on the next page, along with the proportional split of the transaction types from the 1970s to 2007.

Figure 3: LBO Transaction Types



Source: Authors' own creation based on Kaplan & Strömberg (2009)

2.2 The Structure of the Private Equity Fund

PE funds are incorporated as limited liability companies, characterised by a finite lifespan. A PE fund comprises three main actors: i) General Partners, ii) Limited Partners and iii) Debt Providers. Figure 4 on the following page shows that at first glance, the structure of a PE fund may seem somewhat complex. To mitigate this, we briefly review the primary mechanisms and actors.

(1) **General Partners**

As the managers of the fund, GPs administer the underlying funds, including everything in relation to acquisitions, value creation during the ownership period and the eventual exit processes. In addition, the GPs spend a considerable amount of time fundraising for new funds. Given the long time horizon for each fund (generally 10–15 years), GPs being active in more than one fund at a time within the same PE firm is customary. If the GPs are active in multiple funds simultaneously, the funds will be at different stages of their lifecycle. For instance, GPs cannot manage two funds in the investment phase at the same time, as the funds will be competing against each other.

(2) **Limited Partners**

LPs are the investors in the PE fund. Typical investors include institutional investors (e.g. pension funds, fund-of-funds), industrial investors, and high net-worth individuals (Nationalbanken, 2006). Typically, LPs invest at a fund level, but in some acquisitions, specific co-investors may be brought onboard directly at a transaction level[2].

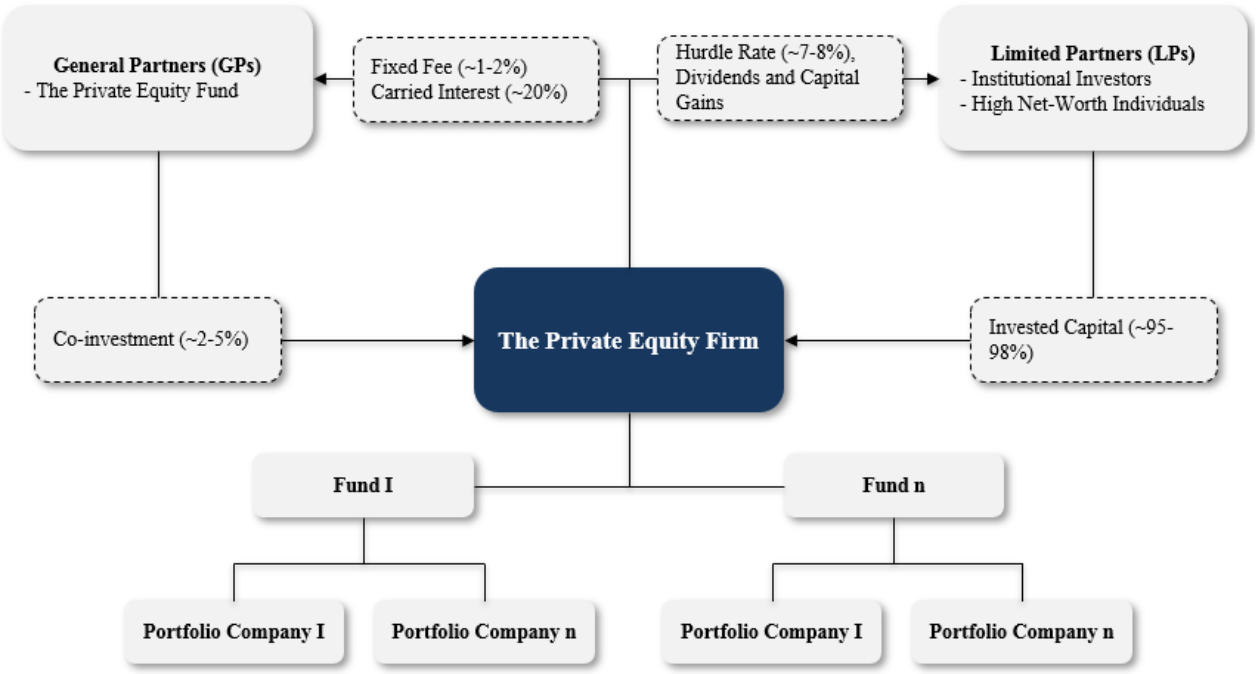
(3) **Debt Providers**

The debt providers are typically banks that provide the substantial amount of debt used in the LBOs. Within the banks, the structuring of transaction debt is typically done in the Leveraged Finance department that specialises in the field. Depending on the ticket size, specialised lenders

[2] A recent example of a co-investor investing at a transaction level is the Danish foundation Chr. Augustinus Fabrikker, which invested alongside Axcel in the buyout of GUBI in 2018. Chr. Augustinus Fabrikker took a non-controlling minority stake of around 24%.

may provide more sophisticated debt vehicles, such as Mezzanine Debt or High Yield Debt, to reach a higher level of gearing.

Figure 4: Simplified Structure of a PE Fund



Source: Authors' own creation based on Spliid (2007) and DVCA (2018)

As the fund managers of the PE fund, the GPs are responsible for the investment of the committed capital. It is common practice for the GPs managing the specific fund to co-invest in the fund, to ensure incentive alignment and avoid agency issues (Spliid, 2007). The managers who constitute the GP group are normally highly skilled investment professionals with both financial and operational expertise. The PE fund is generally compensated by two means: i) a fixed, yearly management fee of ~1-2%, and ii) a variable fee of 20% following the realisation of a hurdle rate of ~7-8%, which is guaranteed to the investors. This so-called 80/20 model dictates that the LPs have claim on 80% of the remaining profits, while GPs have claim on 20%. This profit-sharing scheme provides the GPs with substantial incentive to accomplish superior profits, further aligning the incentives of the main actors of the PE fund (Nationalbanken, 2006).

Once the PE fund has generated returns, there are generally two methods of paying out proceeds to the investors, namely, i) the European distribution waterfall and ii) the American distribution waterfall. The European waterfall is a payout method based on an aggregate fund level, where returns are distributed to the GPs only when the hurdle rate has been satisfied. Thus, the GPs must wait several years before realising any investment income, except for the fixed management fee

that is typically payed each year. In contrast, the American distribution waterfall takes a deal level approach. Following this approach, returns are distributed on a deal-by-deal basis, where GPs realise returns before LPs have received the minimum return on their investment. In practice, the European distribution model is the more popular, as this method ensures incentive alignment throughout the lifespan of the fund (Prahl et al., 2017).

2.3 The Process of the Private Equity Fund

Having explained the basic structure and actors in a PE fund, we will next briefly review the process of a PE fund. Taking a lifecycle perspective, a PE fund consists of four phases: i) fundraising, ii) sourcing deal flow, iii) managing the portfolio, and iv) exiting the investments. The focus of this thesis is exclusively on the operational stage, but understanding the other aspects is useful for fully grasping the analysis in the thesis. Thus, we review the entry and exit process in the following section.

2.3.1 The Entry Process

Once the GPs have succeeded in raising capital, the process of sourcing attractive buyout opportunities embarks. Initially, PE funds focused on conglomerate companies with large and stable cash flows. PE funds were the first to realise that conglomerates often implied unfocused and ineffective management. A higher value could be realised by splitting up the business divisions and selling them separately, a practice known as ‘asset stripping’. Over time PE evolved to not only be concerned about asset stripping, rather the focus is on operational improvements and implementation of strategic initiatives. Thus, the concept of LBOs has evolved to a state where there are few limits for potential acquisition targets of PE funds. Typical investment criteria include strong management teams, protected industries, stable cash flows and attractive competitive positions (Spliid, 2007; DVCA, 2018).

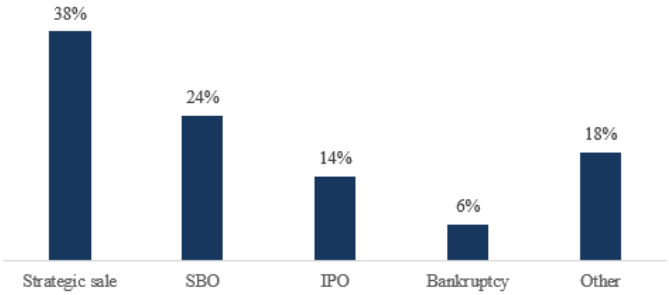
From the perspective of the portfolio companies, there is a series of rationales for being acquired by a PE fund. In a Scandinavian context, especially in the small/mid cap segment, many of the PE targets are family owned businesses that are acquired as a part of a family successions Other motives include risk diversification and the influx of expertise/capital, which the PE fund can contribute with, to fuel expansion ambitions or acquisition strategies (Achleitner et al., 2012).

2.3.2 The Exit Process

Following typically 3–7 years of ownership with a focus on operational improvements and general optimisation, the next step is to divest the company. This crucial aspect in the life cycle of a

PE fund is where the capital gains are realised. A PE fund has various potential exit options. Historically, the preferred exit route has been to divest portfolio companies to strategic buyers. Strategic buyers are industrial companies that acquire the portfolio companies with the aim of integrating these and realising the potential synergies. The strategic buyer is often the obvious buyer, as they may be willing to offer a premium price as they should be able to realise synergies post integration (Baker & Smith, 1998). Below is an overview of the most common exit methods used by PE funds historically in the period 1970-2007:

Figure 5: Historical Popularity of Exit Methods



Source: Bennedsen et al., 2008.

As seen from the illustration, SBOs has historically been the second most popular exit method accounting for 24% of all exits. This fraction has increased even further in recent years with some sources reporting as much as 35% of all buyouts from 2005 – 2010 being SBOs (Wang, 2012). Some argue that the trend is merely fuelled by PE funds helping each other solve their investing and exiting problems (The Economist, 2010). An alternative, and potentially more likely, explanation is that the diminishing activity on the IPO market complicates this exit route, thus making SBOs the obvious alternative if no strategic buyers exhibit interest. IPOs historically made up for 14% but the fraction has been declining over time as consequence of above-mentioned development (Kaplan & Strömberg, 2009). Lastly, it should be noted that only 6% of exits were due to a portfolio company bankruptcy.

2.4 A Historical Examination of Private Equity

The history of LBOs traces its roots back to the end of the 1970s, when Henry Kravis and George Roberts founded KKR, thus pioneering the PE industry. This sparked the beginning of what is known as the first buyout period, ranging from the beginning of the 1980s to the beginning of the 1990s primarily taking place in the US (KKR, 2018). The period was characterised by low taxes on capital gains and easy access to debt financing, which was fuelled by a thriving junk bond market

(Spliid, 2007; Fromson, 2015). Value creation in this period was primarily driven by high leverage ratios and asset stripping.

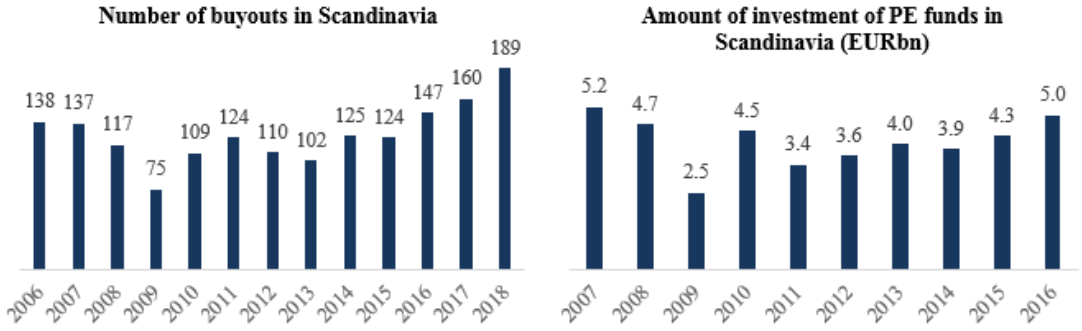
The second buyout wave lasted from 1990s to 2007, when the financial crisis provided an immediate halt to PE activity. There were a variety of contributing factors for buyout activity in this period, including low interest rates and lenient lending practices in the bank sector. This period saw some of the largest LBOs in history, including the USD ~32 billion buyout of the Texas-based power company, TXU, in 2007 by a group of PE firms led by KKR (Reuters, 2007). In Scandinavia, which is the focus of this thesis, large buyouts in the period include Falck in 2004 and TDC in 2006.

The third buyouts wave emerged in the wake of the financial crisis and is still ongoing. Our focus is on this period. Activity on the PE market in this period is record high with total buyout value of USD 582 billion in 2018, capping the strongest five-year period in the history of PE. The increasing activity is fuelled by unprecedented amounts of committed capital by institutional investors. This capital inflow is witnessed despite an environment, in which PE funds are under pressure due to high transaction multiples and increasingly fierce competition. In contrast to prior periods, the ongoing wave of buyouts is characterised by a spike in secondary buyouts (SBOs) and an increased focus on operational improvements. The latter is instrumental to provide sufficient returns to investors, given the often high price multiple paid (Bain & Company, 2019).

2.5 An Overview of the Scandinavian Markets

This section provides an overview of the PE markets in Denmark, Sweden and Norway, respectively. In general, the Scandinavian markets are less developed, and the investor universe is smaller than that of the U.S., even in relative terms. Fundraising is more complex, as Scandinavian PE funds rely on international investors from different jurisdictions. Moreover, there are fewer sources of credit in a credit market dominated by banks, as compared to the diversified credit market of the U.S. The PE industry is also more heavily regulated in Scandinavia, where governments attempt to limit the tax advantage inherent in the industry (Spliid, 2013). However, since the 1990s, the PE industry has evolved into one of the most important investor groups in Scandinavia. The graphs in Figure 6 on the next page clearly illustrate an increasing trend in buyouts of Scandinavian companies, as well as increase in the total invested capital by the funds.

Figure 6: Number of LBOs and Amount of PE Investment in Scandinavia

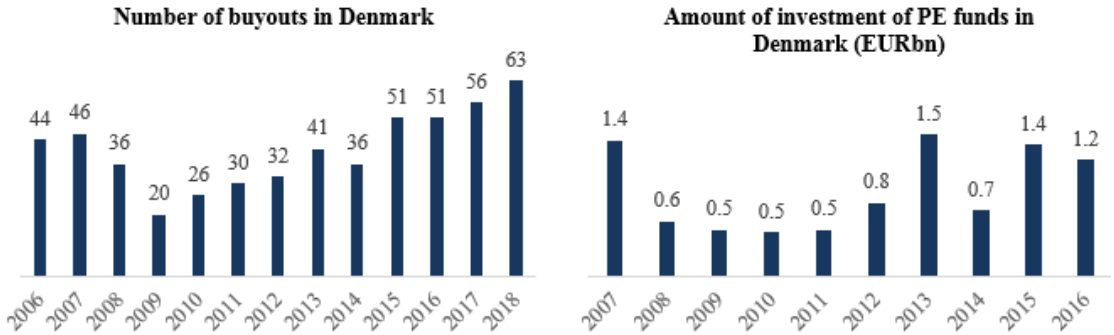


Source: Mergermarket (2019a), Statista (2017a).

2.5.1 Denmark

While the PE market was a well-known phenomenon in the U.S. and the UK during the 1980s, the Danish market for LBOs was practically non-existent. However, since Axcel established the first Danish PE fund in 1994, the PE market in Denmark has experienced significant advancement. In 2017, investors committed a record-high DKK 8.5 billion to Danish PE funds (DVCA, 2018). The graphs in Figure 7 below underline this development, showing 63 buyouts occurring in Denmark in 2018. The yearly total invested capital by PE funds has also picked up in recent years, after a drop in the aftermath of the 2008 financial crisis (Statista, 2017a; DVCA, 2018; Mergermarket, 2019a). Among the most prominent Danish PE funds are Polaris and Axcel. Axcel is particularly renowned for the investment in Pandora, which was IPO'd after only two years of ownership, as one of the most successful PE investments in European history (Axcel, 2014).

Figure 7: Number of LBOs and Amount of PE Investment in Denmark



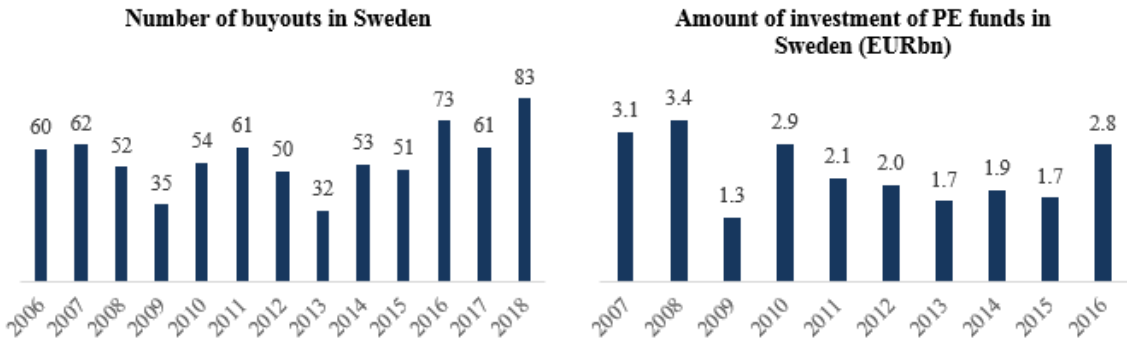
Source: Mergermarket (2019b), Statista (2017b).

2.5.2 Sweden

The PE ecosystem in Sweden is the most sophisticated and developed in Scandinavia. Since IK Investment Partners was founded in 1989, as the first Swedish PE fund, Sweden has played a major role in the progress of PE in the Scandinavian context, with many acquisitions and exits in the early 1990s (Spliid, 2007).

As Sweden constitutes the largest PE market in the region, measured by number of PE funds, number of buyouts and invested capital, the PE industry is highly influential in the Swedish economy. In 2018, Sweden experienced 83 LBOs, and the amount of invested capital by Swedish PE funds amounted to more than that of their Danish and Norwegian counterparts combined (Statista, 2017; Mergermarket, 2019). Since 2009, more than 1,000 Swedish companies have been acquired in LBOs with a combined value of more than SEK 150 billion. This equals the value of all IPOs on Nasdaq Stockholm in the same period and underlines the importance of the industry. Some of the most active Swedish funds include Nordic Capital, Altor and EQT. Especially EQT, which in 2018 raised a record fund of EUR 8 billion, has been very active on the Danish market. In Denmark, EQT is famous for buyouts such as Faerch Plast and NAC, as well as less gratifying deals, such as Top Toy and Flying Tiger.

Figure 8: Number of LBOs and Amount of PE Investment in Sweden



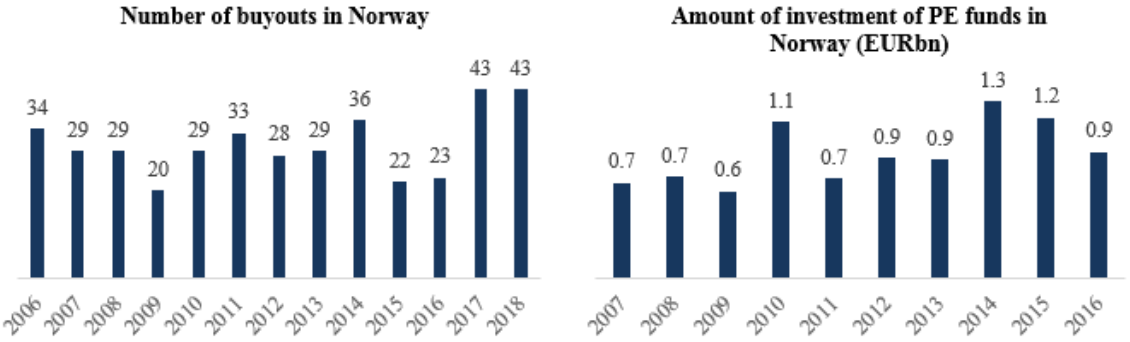
Source: Mergermarket (2019c), Statista (2017c).

2.5.3 Norway

The PE industry in Norway experienced a delayed onset, with the first LBO occurring in 1992. The following 10 years demonstrated only a slight increase in the activity level (NVCA, 2018), partly explained by a regime of somewhat strict credit-market regulations in Norway during the 1980s and 1990s, which made LBOs unfeasible (Jansen & Krogh, 2011). However, similar to Denmark and

Sweden, the Norwegian PE industry has seen strong growth in recent years. Norway saw 43 LBOs in 2018, more than double of that in 2009 during the financial crisis. As seen in figure 9 below, the total amount of invested capital by Norwegian PE funds has also increased to EUR 0.9 billion in 2016, from EUR 0.6 billion in 2009. The largest Norwegian funds are FSN Capital and Norvestor. Especially active is FSN Capital, known in Denmark for its acquisitions of Fitness World and HusCompagniet. FSN Capital is also one of the few PE funds that in recent years has succeeded with IPO'ing in Denmark, with the successful IPO of Netcompany in 2018.

Figure 9: Number of LBOs and Amount of PE Investment in Norway



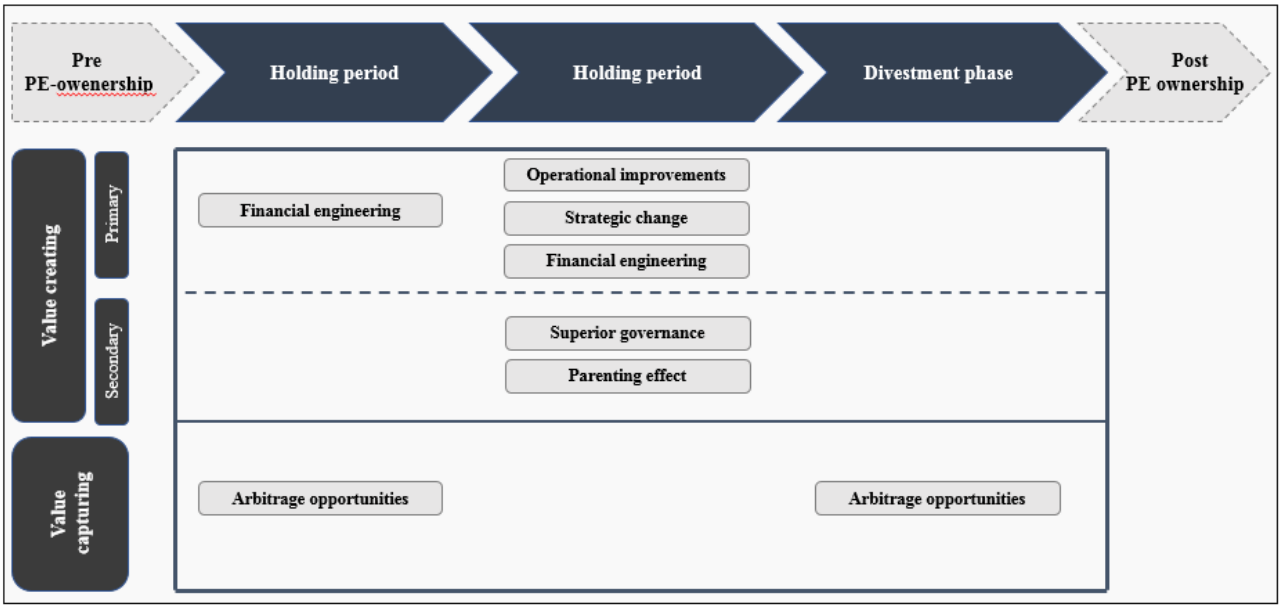
Source: Mergermarket (2019c), Statista (2017c).

3. Theoretical Background

The following section provides a comprehensive overview of the mechanisms used by PE funds to generate value in their portfolio companies. The section aims to equip the reader with a sufficient theoretical background to grasp the operating environment of PE-owned companies, as well as establishing a foundation from which the thesis can conceptualise a framework used in the empirical analysis.

As value creation prevails at various layers and stages in the ownership cycle a stringent review structure is required. We follow that of Berg and Gottschalg (2005) who introduces a three-dimensional meta framework where levers of value generation is classified in accordance to previous research. For the sake of completeness, we have included additional levers, for instance CEO Replacement, which has received wide academic attention in recent years (e.g. Siegel et al., 2010). Likewise, some of the less prominent or relevant value drivers are excluded. A simplified graphical representation of the framework is presented below.

Figure 10 – Private Equity Value Levers



Source: Author's own creation inspired by Berg & Gottschalg (2005)

3.1 Financial Arbitrage

The first layer from which PE funds can generate value in buyouts is through financial arbitrage. In the context of LBOs this refers to the notion of "buying low and selling high". That is, the funds exploit temporary differences in the valuation metric of a target firm to generate a positive return, regardless of the operational development in the ownership period. As financial arbitrage is

not related to the operational performance it is frequently referred to as *value capturing* rather than *value generating* (Berg & Gottschalg, 2005). The focus of this thesis, however, is on value generation why this layer falls slightly outside the core scope of the assignment. For the sake of completeness, and because PE funds frequently exploit financial arbitrage, the layer is briefly discussed below (Heel & Kehole, 2005). Berg and Gottschalg (2005) argue that financial arbitrage can be achieved through five different means: i) Exploitation of changes in market valuation, ii) superior private information, iii) superior market information, iv) superior deal-making capacities and v) optimising the corporate scope. Below we cover the four most relevant.

3.1.1 Changes in Market Valuation

In practice valuation in buyouts is typically derived from a weighted average of absolute valuation methods (e.g. leverage buyout models) and relative valuation methods (e.g. multiple analysis). Common for both methodologies is that they are influenced by valuation multiples for comparable public companies. Accordingly, PE funds are prone to experience changes in the value of target and portfolio companies due to exogenous industry dynamics (Welch, 2014). In scenarios where buyout investors have more accurate expectations about the future evolution of public markets than their counterparts, it can be used as a mean of capturing value by buying/selling at relatively low/high multiple. This value capturing mechanism is referred to as 'multiple riding' by practitioners (Berg & Gottschalg, 2005). As PE funds, in contrast to private company owners, are specialised investors, the potential of this effect is especially pronounced in primary buyouts[3] as well as for specialised funds that possess superior industry-specific information (Spliid, 2014).

3.1.2 Superior Private Information

Superior private information in the context of value creation in buyouts, which relates to information asymmetries between insiders and outsiders, was a cornerstone topic the early stage of the literature (e.g. Jensen, 1989; Lee, 1992). From the incorporation of the first PE funds until today it is common practice that the management of the portfolio company co-invests with the buyout fund to ensure alignment of incentives (Kaplan, 1989). This can be understood as a real option to the management, which will be valuable if the acquisition price in the buyout is lower than the true market value. In strategic buyouts, in contrast, it is less prevalent for the management to co-invest and even if they do so, it will be in the joint company, in which the link between their performance and reward

[3] Primary buyouts, as opposed to secondary buyouts, are buyouts in which the target firm is not previously owned by a financial sponsor

is vaguer (Fox & Marcus, 2011). Consequentially the management team will, from a strict financial perspective, have an incentive to be acquired by a PE fund rather than a strategic buyer. To realise this scenario, management may be inclined to share insider information with the PE fund, enabling it to acquire the firm at a discount. At the extreme, Lowenstein (1985) finds examples of management engaging in fraudulent activities by reporting manipulated earnings and depressed forecasts, with the intention of lowering the price in a buyout scenario. PE funds with access to 'true' information from management can then exploit it to extract value in the acquisition phase.

However, as mentioned initially, the theory of superior information as a mean of value creation was mostly a topic of discussion during the first buyout wave (Jensen, 1989). In this period so-called Management Buyouts (MBOs), in which the existing management of a company acquires the company alongside a PE fund, was highly popular (Berg & Gottschalg, 2005). By definition, the management acquired relatively larger stakes in such acquisitions thereby enhancing the magnitude of potential value extraction. However, in the current 3rd buyout wave MBOs are less pronounced which diminishes the value extraction potential of insider information (Berg & Gottschalg, 2005).

Whilst the value of superior information has deteriorated in the acquisition phase, Berg and Gottschalg (2005) argue that it has emerged in the divestment phase. PE funds, with the help of Investment Banks (IBs), engage in "window dressing", that is presenting information about the future in a manner where the post-buyout acquirer will have a more optimistic belief about the future prospects (Berg & Gottschalg, 2005).

3.1.3 Superior Deal Making Capacities

Having superior skill in the deal-making processes at entry or exit is another mean for PE funds to capture value. Negotiating about terms and price in buyouts is an inherent part of the activities in any PE fund, entailing that the funds over time earn considerable negotiation skills through the learning effect (Butler, 2001).

The sheer number of transactions is not the only mechanism from which PE funds enhance their deal making capabilities. Rather, by continuously and systematically reviewing the M&A market the funds achieve a profound understanding of the market, which can be used to identify industries or firms with distinct acquisition potential (Anders, 1992). Such targets may be found in industries about to undergo a consolidation or experiencing liberalisation of regulation, or it could be

firms that are particularly well positioned to benefit from changes in market dynamics or consumer preferences.

Upon having identified the relevant targets, another mechanism from which PE funds may benefit is through so-called 'proprietary deal flow' (Berger & Udell, 1998). The argument is that PE funds through their network can source exclusive deals that are not offered in the public market. Such unstructured processes[4] are highly advantageous as competition is less fierce and it allows the funds greater time to structure an attractive financing package as well as undergoing a comprehensive due diligence process (Wright and Robbie, 1996). Funds that can rely greater on proprietary deal flow is thus, *ceteris paribus*, able to extract a greater proportion of value from the transaction. Whilst the value of proprietary deal flows was highly acknowledged in the early buyout history (e.g. Berger & Udell, 1998), less attention has been devoted to it in recent time. In part this can be ascribed to increased competition amongst PE funds, and in part by Investment Banks persuading company owners to engage in structured processes, which may yield a higher valuation in the transaction.

Lastly, Spliid (2014) argues that having a pre-defined amount of committed capital enables the PE funds to leverage differences in market valuation during economic turmoil. In periods of economic downturn most strategic buyers will be hesitant to take on leverage or spend cash reserves on acquiring businesses. Consequentially, the competition in the M&A market will be scarce and valuation will in turn be lower. Under such market conditions it will be attractive for the PE fund to acquire new portfolio companies. Vice versa, in periods of economic upturn the funds can clean up its portfolio by divesting portfolio companies at an attractive valuation.

3.1.4 Asset Stripping

The final way that PE funds may benefit from financial is arbitrage is by identifying and exploiting the so-called "conglomerate discount effect". This effect suggests that a diversified firm is less valuable than the sum of its parts in isolation (Berg & Gottschalg, 2005). While diversification is generally a desirable trait, Saunders and Walter (2012) argue that in private companies the market does not compensate for this, as diversified firms are more complex and bureaucratic. PE funds can exploit this market inefficiency by acquiring the total firm at a depressed price and divest ("asset strip") individual divisions at a higher price. The practice was especially used in the first buyout wave

[4] An unstructured M&A process is one in which no set deadlines are communicated towards potential buyers. The buyer field is typically narrower with only one or a few buyers. Lastly, in most unstructured no Investment Bank is mandated.

in the United States (Singh, 1993), but this strategy has been on the decline is recent years as fewer firms operate as conglomerates (Davis et al., 2011).

As it is the case of the other financial arbitrage levers, asset stripping is an example of value capturing rather than value creation, as the potential of the strategy is exogenous to firm performance (Berg & Gottschalg, 2005). Measuring the impact of asset stripping is nearly impossible in this study, as we are considering only accounting data. This implies that financial figures must be reported at divisional level ex-ante buyout to get comparable figures to ex-post buyout financial statements. As discussed in section 6 we have excluded some of our observations as we were unable to account for this complexity.

3.2 Financial Engineering

Value creation in PE spans beyond mere value capturing through financial arbitrage. In what Berg and Gottschalg (2005) define as "primary levers" the funds generate operational value in the acquired company. One mean of doing so is through financial engineering, i.e. optimisation of the capital structure and minimisation of the cost of capital after tax.

3.2.1 Optimising Capital Structure

Following an LBO a PE fund will often initiate a paradigm shift in the capital structure. An inherent part of the business model in PE funds is to finance the acquisition primarily using debt (Kaplan, 2009). There are numerous advantages of using debt which explains the popularity. Firstly, it imposes a pressure on the managers to reduce financial slack in order to meet the heavy principal payments, thus resolving the "free cash flow" problem (Jensen, 1986). Secondly, because interest payments are tax deductible in most countries, including all the Scandinavian countries, it may enhance firm value. Using the framework of Miller and Modigliani (1958) we elaborate on this in the next section. Thirdly, and lastly, leverage enables the fund to maximize the return on the committed capital at a fund-level. As the scope of this assignment is limited to the portfolio companies, however, we do not discuss this aspect more in detail.

Instead we focus on why a levered capital structure is more attractive in PE-owned firms compared to other types of ownership. This is relevant, as one could argue that any firms could replicate the capital structure of PE-owned firms and reap the same benefits. However, arguably this appears not to the case as PE-owned companies are significantly more levered (Kaplan & Stromberg,

2009). Berg and Gottschalg (2005) suggest that debt is cheaper for PE-owned companies and thus more attractive for two primary reasons.

Firstly, PE funds will typically have a longstanding relationship with financial institution as they are instrumental in financing buyouts. Because PE funds are 'repeat players' in the LBO market, they are aware of the market dynamics and should be able to negotiate attractive terms (Magowan, 1989). The long-lasting relationship also reduces the marginal agency cost of debt, as the PE funds are dependent on borrowing in future periods, which disciplines the funds by reducing their incentive to engage in hazardous behaviour (DeAngelo et al., 1984). This disciplinary effect is also known as the reputational effect (Hendrikse, 2013).

Secondly, because PE funds have access to additional committed capital, which can be injected in case lending covenants are breached, the risk premium imposed on PE funds may be lower than for comparable firms (Berger & Udell, 1998). The relatively lower default risk also implies that portfolio companies can operate at higher level of leverage (Baker & Smith, 1998). In recent times we have seen numerous examples where a PE funds have injected additional capital, for instance Altor in Tresu (Andersen, 2018) and EQT in Top-Toy (Simonsen, 2018). In the latter example, however, it turned out to be insufficient as the company defaulted a year later. The case of Top-Toy illustrates that despite the above traits, levered PE-companies are not *per se* immune to default risk. On the contrary Badertescher (2015) shows that credit spreads are higher in PE owned companies, suggesting that investors demand a greater risk premium.

3.2.2 Utilisation of Tax Shields

As mentioned above the tax deductibility of interest payments makes borrowing in buyouts attractive. By providing a so-called tax shield on the cash flows, PE funds can enhance the value of the company by altering the capital structure (Berg & Gottschalg, 2005). The use of leverage as a value lever has, however, not always been accepted in the literature. The initial work of Miller and Modigliani (1958) in contrast suggested that, under the assumption of perfect capital markets and no taxes, the value of company is independent of the capital structure. In a latter article Miller and Modigliani (1963) relaxes these strict assumptions and argue that the value of a company can be defined as following:

$$V_L = V_u + PV(Tax\ shield) - PV(Distress)$$

The value of a levered company is equal to the value of an unlevered firm, plus the present value of tax shields less the cost of financial distress. From this equation it follows that an optimal level of leverage prevails for every firm, when the incremental value of adding debt is exactly offset by higher bankruptcy cost. This relationship is commonly referred to as the trade-off theory (Kraus & Litzenberg, 1973). PE Funds may utilize this theory by acquiring firms operating at sub-optimal level of leverage and adjust the capital structure so that the Weighted Average Cost of Capital (WACC) is minimized.

While financial engineering had a predominant role in the first buyout wave the isolated value of it is declining (Berg & Gottschalg, 2005). As the buyout market matures and becomes increasingly competitive, funds are instead looking to create value through operational and strategic initiative as discussed in the following sections. Even so, leverage may still have a complimentary role in value creation, as PE ownership alleviates the credit constraints faced by some private firms. Boucly et al. (2011) present this idea by showing that the balance sheet and number of employees expands greatly following a buyout, which can be ascribed to debt being used to realise previously inaccessible growth opportunities.

3.3 Increasing Operational Efficiencies

Operational efficiencies relate to the enhancement of the processes carried out within a firm to improve the financial performance. Berg and Gottschalg (2005) argue that PE funds apply three measures to enhance operating performance: i) Margin improvements, ii) reducing capital requirements and iii) removing managerial inefficiencies.

3.3.1 Margin Improvements

Following a buyout, it is common practice for a PE fund to conduct a thorough investigation of the extant structure and processes, with the goal of identifying sources for cost-cutting and margin improvement (Berg and Gottschalg, 2005). Because the GPs have extensive experience in the field and a systematic approach, they will relatively quickly identify ‘low hanging fruits’ where corporate spending immediately can be tightened (Kaplan, 1989). Concrete initiatives may include strategic sourcing, delayering the organizational structure, and limiting overhead costs (Baker, 1992; Butler, 2001)

Another, and more controversial, way in which PE funds may improve margin is by cutting the Research and Development (R&D) budget. While R&D expenditures have typical features of a

long-term investment, it is typically expensed immediately[5] even though the benefit of it may not be reaped in the short run (Lerner et al., 2011). As the holding period of PE funds, by definition, is relatively short it may be argued that they are willing to sacrifice long term potential for short term profitability. Empirical studies on the topic, however, to a wide extent find that R&D spending increases following a buyout (e.g. Amess et al., 2016; Lerner et al., 2011). This pattern can be ascribed to PE funds alleviating the credit constraint and establishing governance mechanism promoting an entrepreneurial culture.

Another source of margin improvement that PE funds are reputed to exhaust is to reduce head count (Rasmussen, 2008). Older studies on the topic also provide evidence in favour of this observation (e.g. Kaplan, 1989; Muscarella & Vetsuypens, 1990). A weakness in these studies, however, is that they focus on company-wide employment of the portfolio company. Thus, if a PE fund divests a division of a portfolio company, which was common in the first buyout wave, it will count as an employment loss even if FTE count remains unchanged in the divested business. Likewise, the acquisition of a division will count as an FTE gain, even if there is no change within the business itself (Davis et al., 2013). Controlling for "asset shuffling" more recent studies, on the other hand, find that greenfield job creation generally outpaces potential reduction in headcounts (e.g. EVCA, 2005; A.T. Kearney, 2007).

3.3.2 Reducing Capital Requirements

Another source of value creation is to optimise the usage of capital in a business. The main sources of doing so is either by improving the working capital management or by imposing a stricter capital expenditure (CAPEX) regime (Berg & Gottschalg, 2005). Both initiatives seek to "free up" capital that can be used to pay down acquisition debt or pursue growth opportunities.

Working capital is the difference between the current assets, such as inventory, and current liabilities, such as accounts payable, held by a firm. It is a measure of the liquidity management and operational efficiency of a firm, as it represents the cash that is tied up in the business and thus not available for investment in growth or dividends. Upon acquiring a firm PE funds typically attempt to tighten account receivable/payable policy and professionalize inventory management (Singh, 1990). Concrete measures may be to negotiate better payment terms with suppliers/customers, so that the

[5] Contingent on which accounting practices a company follows, is either has the option or the obligation to capitalise R&D expenditure if a direct relation between the costs and future income is present (Kieso et al., 2004).

cash cycle is improved, or change the order quantity placed with suppliers so that less capital is tied up in the inventory.

CAPEX is the cash used to acquire or upgrade the fixed asset of a company, such as Property, Plant and Equipment (PPE). Another mean of releasing capital to pay off debt or invest in the core operations, is by reviewing the CAPEX programme. PE fund will attempt to cut unsound investment programmes and divest unnecessary or underutilized assets (Magowan, 1989). By consolidating PPE, the portfolio company may experience improved productivity in addition to the cash effect. However, as CAPEX cuts may represent a trade-off between short term profitability and long-term growth critics argue that the PE fund eradicate value (Amess et al., 2016). On the contrary other studies find no evidence of such relationship (e.g. Bull, 1989; Zahra & Fescina, 1991).

3.3.3 Removing Managerial Inefficiencies

When screening the market for potential acquisition targets PE funds may identify companies, in which the management is operating the company in an inefficient manner. By acquiring the company and replacing the management the fund can realise the underlying potential (Berg & Gottschalg, 2005). The PE fund may appoint a new CEO from their network with experience in managing a company under PE ownership or simply with greater managerial talent. Aside from inferior performance another source of CEO turnover in buyout is to resolve agency problems. Gong and Wu (2011) find significant evidence that CEO replacement is correlated to CEO entrenchment and agency costs, measured by CEO tenure and the free cash flow problem (Jensen, 1986). However, CEO turnover needs not necessarily to be driven by underperformance or agency problems. It may also be a planned aspect of the succession in family-owned firms as a part of the LBO (Spliid, 2008). Lastly, it should be stressed that while some PE funds may screen for managerial inefficiencies, our review of the investment criteria amongst Scandinavian PE funds indicates that a skilled management ex-ante buyout is pivotal for many funds.

In section 8 we empirically test the extent of CEO replacement in Scandinavian buyouts, and whether CEO replacement has an effect on value generation under PE ownership. The apparent conflict between theory, suggesting PE funds screen for inefficient managers, and practice, indicating that PE funds screen for skilled managers, shall be interesting to empirically test.

3.4 Increasing Strategic Distinctiveness

Redefining the scope of a company in buyouts spans beyond the focus on operational efficiency as described above. In the acquisition stage, during the due diligence process, and in the early stage of the ownership phase many PE funds develop a so-called "100 day plan" (McKinsey & Company, 2007). This plan outlines the strategic headlines during the ownership with respect to aspects such as which markets to enter and which profit pools to pursue. Berg and Gottschalg (2005) argue that at a high level, PE funds seek to either reshape the corporate focus or initiate a "buy and build" strategy. Arguably there are more nuances to strategy development under PE, but as these two strategies cover the key concepts, our review is limited to the two.

3.4.1 Corporate Refocusing

Following a buyout an immediate focus of many PE funds, is to ensure that resources are devoted to the core business. A thorough review of the business is carried out, and strategic activities that are identified to be peripheral to the core business or not value-adding are shut down or divested to a third party (Singh, 1990; Anders, 1992). Furthermore, to improve efficiency and reduce organizational complexity some PE funds outsource back-office functions to independent third parties (Phan & Hill, 1995). By neutralising downside efficiencies, the PE fund establishes a foundation for the company to either pursue internal growth strategies or expand the scope of the business by acquiring firms with complementary resources or capabilities. The "buy and build" (B&B) strategy is an example of the latter approach (Berg & Gottschalg, 2005).

3.4.2 Buy and Build Strategy

In some buyouts the strategic ambition from the beginning is to follow a B&B plan. The strategy is to acquire a dominant player in fragmented market which act as nucleus in consolidating the given industry by acquiring competing firms (Berg & Gottschalg, 2005). The PE funds provide the portfolio company with cash, leverage and knowledge on how to execute an aggressive M&A strategy. The overarching aim of the strategy is to achieve a dominant market position and capture economies of scale (Berg & Gottschalg, 2005). By consolidating back-office functions and engaging in cross-selling the portfolio company will also reap cost and revenue synergies (Butler, 2001). Lastly, B&B investments provide an opportunity for improving operational efficiency as capacity and resources can be shifted between the acquired firms contingent to demand fluctuations (Borell & Heger, 2013).

The usage of B&B strategies is especially pronounced amongst partners with a background from IB (Acharya et al., 2013). One explanation may be that partners from this background are particularly skilled within M&A. In Scandinavia numerous of examples of B&B transactions is found, for example in the buyout of Däckia by Swedish Procuritas who made 11 minor follow-up acquisitions during the 3-year ownership period (Procuritas, 2019).

In relation to our study B&B buyouts may influence our results slightly, as they are expected to exhibit superior performance on the Growth measures, Sales and EBITDA. The magnitude of the latter, however, is contingent on the ability to successfully implement the acquired businesses. In our methodology section we discuss the implication of B&B for our results more in detail.

3.5 Governance Mechanisms

When Jensen (1989) argues that PE would become the dominant ownership form in the future, a key rationale was the potential in counteracting agency problems through governance mechanisms. While reducing agency costs in itself does not yield superior financial performance, it is pivotal in ensuring the successful implementation of the previously described value creating levers. Berg and Gottschalg (2005) argue that PE funds in a governance context create value through three different levers: i) Reducing financial slack, ii) improving incentive alignment and iii) improve monitoring and controlling.

3.5.1 Reducing Financial Slack

Fundamental to buyouts is the usage of leverage. Aside from offering an attractive source of financing, debt is also valuable in a governance perspective as it resolves the "free cash flow" problem (Jensen, 1986). Following a buyout the transaction debt used to finance the acquisition inflates the balance sheet. Meeting the significant principal payments and interest expenses disciplines the manager to not spend excess cash on non-value creating activities, as well as forcing them to run the company in an efficient manner (Lowenstein, 1985; Allen 1996; Cotter & Peck; 2001). Failing to meet interest payment will, in the worst case, lead to a bankruptcy which is costly not only to the PE fund but also for the co-invested management who will also suffer a reputational loss (Grossman & Hart, 1982). Consequently, high leverage is also an incentive for management to work harder and refrain from engaging in self-utility maximising behaviour such as "empire building".

Another beneficial trait of leverage is the outsourced monitoring that follows from lending institutions. To ensure that the company is able to fulfil its financial obligations the lenders have

strong incentive to monitor the actions of the management (Baker & Montgomery, 1994). In effect this is commonly done by incorporating loan covenants in the initial lending agreement, which sets out restrictions for the financial structure and behaviour in the portfolio company (Chava & Roberts, 2008). A commonly used covenant is to define an upper limit for the Debt/EBITDA ratio in the portfolio company. In case of breach the PE fund must adhere to a set of pre-defined implications for instance by injecting further capital (Chava & Roberts, 2008).

However, while leverage arguably offers attractive traits from an agency perspective, it should be stressed that it may have downsides for a company as well. Unforeseen shocks to the economy, such as increasing interest rates or plummeting demand, can be fatal for companies that become unable to meet its financial obligations (Berg & Gottschalg, 2005).

3.5.2 Improving Incentive Alignment

Another way PE funds utilise governance mechanisms to reduce agency costs and enhance value creation is through equity investments by management (Berg & Gottschalg, 2005). Following a buyout PE funds will strongly encourage the management of the portfolio company to acquire a significant equity stake. By making the personal wealth of the management dependent on the performance of the portfolio company, the management is incentivised to reduce financial slack and implement only value creating initiatives (Smith, 1990). Co-investments are not restricted exclusively to the management, as some PE funds implement employee-share programmes available also to middle managers (Thompson et al., 1992). By extending the scope, the fund ensures that incentives are aligned throughout the organization. Furthermore employee shares are found to be an effective mechanism of retaining employees as it increases the psychological ownership of the firm (Liu et al., 2009).

On the other hand, managerial ownership may also adversely impact the financial performance of the firm due to the managerial risk aversion. If the co-investment in the portfolio firm constitutes most of the personal wealth of management, the personal consequences of inferior performance in the firm would be substantial. To avoid these consequences risk averse managers may be reluctant to impose risky, but value enhancing, strategies (Fama & Jensen, 1985). This behaviour is closely related to the so-called underinvestment problem (Jensen, 1977).

3.5.3 Improving Monitoring and Controlling

Lastly, a buyout will often bring about a change in the governance structure so that monitoring and controlling becomes more pronounced mechanisms. Because there is a correlation between concentration of ownership and the degree of active ownership, Acharya et al. (2008) argue that the marginal cost of monitoring will be substantially lower in LBOs. PE funds use a variety of mechanics to exercises its active ownership, such as taking board positions and sophisticating the financial reporting in the portfolio company (Berg & Gottschalg, 2005). These mechanics will typically be implemented in the immediate aftermath of the buyout.

Monitoring in buyouts is, however, not limited to the early stage of the ownership period. Throughout the holding period the PE fund engages frequently with the company to monitor and evaluate decisions made by the management (Berg & Gottschalg, 2005). Because buyout specialists, and the board members they appoint, are highly experienced in the field of active ownership they are likely to have a comparative advantage over third party investors in monitoring managers in post-buyout organizations (DeAngelo et al., 1984; Jensen, 1989; Cotter & Peck, 2001). This specialisation makes the value of governance especially pronounced in buyouts.

3.6. Parenting Effect

Finally, PE funds generate value through the so-called parenting effect. The term refers to the positive externalities arising from being PE owned, such as access to advisory services, resources and a professional network. Berg and Gottschalg (2005) find that two levers of value creation are associated to the parenting effect, namely i) restoring entrepreneurial spirit and, ii) managerial advisory. The former relates primarily to increased managerial decision authority following divisional buyouts. As this deal type is not represented in our sample, we refer from discussing this lever more in detail.

3.6.1 Managerial Advisory

To fuel the operational value creation PE funds have a clear agenda for exercising their role as active advisors and enablers *vis-a-vis* the portfolio companies (Berg & Gottschalg, 2005). While the GPs in the PE funds typically refrain from interfering in the day-to-day business, they frequently engage in sparring on long-term strategic goals and operational initiatives as discussed in the previous sections. Utilising the experience gained from previous transactions, the funds can provide advisory on managerial and industrial areas (Anders, 1992). Furthermore, the funds draw on their frequent

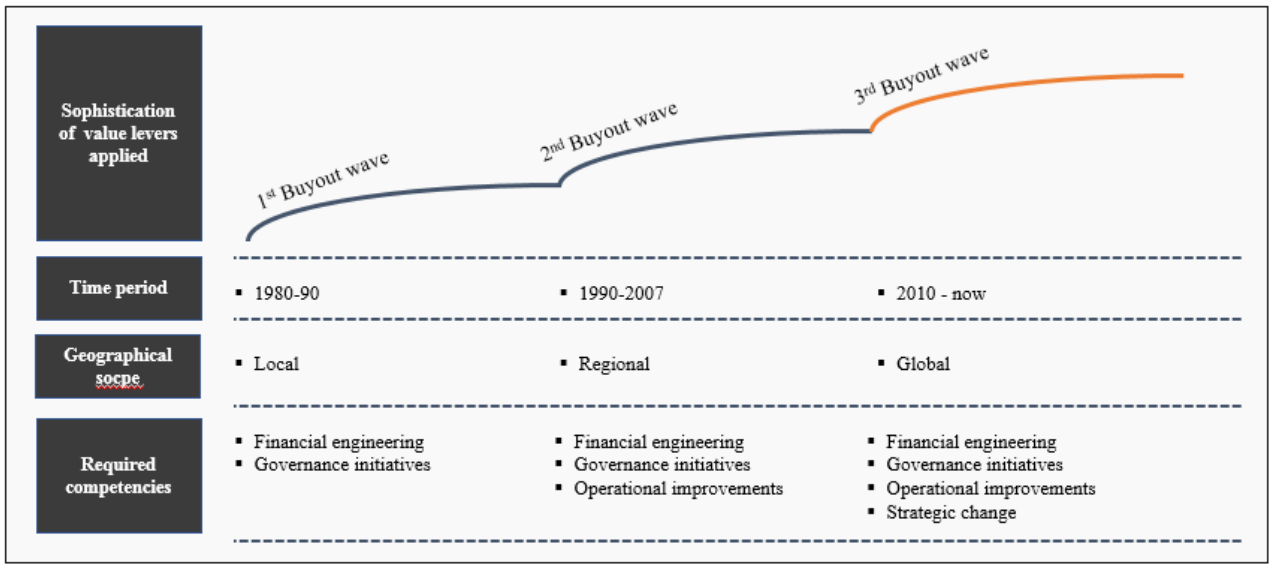
interaction with strategy consultancies, industry experts and investment bankers to provide the portfolio company with current market insights. The portfolio companies may also draw upon this network to identify relevant add-on acquisition or to recruit new managerial talent (Baker & Smith, 1998). As shown later in the analytical part of the study, the professional experience of the lead GP influences operational focus under PE ownership.

Another way that the parenting effect materialises is through 'cross-utilization' of knowledge held by portfolio companies (Berg & Gottschalg, 2005). One mechanism that is widely used is to host events and workshops for the management teams of portfolio companies. This enables interaction and exchange of knowledge and expertise, thereby nurturing a knowledge-sharing network within the PE fund (Kester & Luehrmann, 1995). A practical example of this can be seen in the Danish fund Polaris, who facilitates workshop for their portfolio companies on topics such as pricing and digitalization as a part of the so-called "Excellence Model" (Polaris, 2018). Lastly, some funds facilitate knowledge sharing by appointing executives from either current or previous portfolio companies as advisors or board members in other portfolio companies (Anders, 1992). This may ease the transition in the ownership change for the portfolio company as well as providing the fund with a trusted insider familiar with the fund's ways of working.

3.7 Value Creation Over Time

As it is evident from the review above the value creating levers that PE funds implement following a buyout have progressed over time. Factors such as increased internationalisation and sophistication of capital markets have escalated the flow of capital to PE funds and in turn forced the funds to differentiate the approach to value creation (Berg & Gottschalg, 2005). As the industry has matured, structuring an attractive leverage solution or engaging it asset stripping is, by itself, not sufficient to create value. Instead funds are increasingly focusing on co-creating operational improvements with the management (DVCA, 2012). A graphical illustration of how value creation has evolved over time is found on the next page:

Figure 11 – Private Equity Value Levers Over Time



Source: Author's own creation inspired by Klier, Harrigant et al. (2009)

As seen from the illustration, value creation by PE funds has evolved to increasingly revolve around strategic change and operational improvements. This development, in conjunction with the distinguishing factor of *when* value creation appears as illustrated in figure 10, motivates the scope of our assignment being on operational value creation. We use improvement in financial performance as a proxy for this.

4. Literature Review

Having established the theoretical framework, the following section provides a comprehensive overview of prior academic research on value creation in PE-owned companies and the relative impact of firm- and fund-specific characteristics. The section provides the reader with an understanding of relevant empirical research in the area, thus establishing a base from which the hypotheses can be developed. The section is divided into three main sub-sections. The first part will examine literature on value creation in PE-owned companies. The second and third part will present prior research related to the second layer of the analysis, that is, the impact of firm- and fund-specific characteristics.

4.1 Private Equity Ownership and Financial Performance

4.1.1 Value Creation Under Private Equity Ownership

That PE owned companies should outperform its peers was first theorised by Jensen (1989). According to Jensen, the new corporate structures would create value through superior governance mechanisms in the portfolio companies (the Jensen hypothesis). Significant effort has been devoted to empirically validate this hypothesis. Whilst methodological differences prevail across the investigatory studies, the impact of PE ownership is predominantly estimated by measuring the financial performance before and after the LBO. Overall, there seems to be a positive impact of PE ownership. This is substantiated by Amess et al. (2009), who finds a positive correlation between PE ownership and financial performance in a meta-study.

As PE emerged as a phenomenon in the US and UK, most research has focused on this geography. However, as the geographical scope of this thesis is Scandinavia, the literature review is supplemented with research on this region. It is relevant to distinguish between literature from the different geographies, because it is doubtful whether the conclusions drawn in different regions can be generalised, as many regulatory and cultural differences persist (Spliid, 2013). Table 1 on the following page summarises the findings and methodological approaches of the selected studies. These are briefly commented upon in the following section.

Table 1: Overview of Selected Research

Author	Geography	Period, Sample Size	Event Window	Results	Statistical Method	Impact of PE Ownership
Kaplan (1989)	US	1980-1986 n=76	-1 | +1, +2, +3	Positive impact on EBITDA and ROA relative to control group	Wilcoxon signed rank tests	Positive
Smith (1990)	US	1977-1986 n=58	-1 | +1, +2, +3	Positive impact on working capital and operational performance relative to control group	Wilcoxon signed rank tests	Positive
Muscarella and Vetsuypens (1990)	US	1976-1987 n=72	Reverse LBO	Positive impact financial performance relative to control group	Regression analysis	Positive
Opler (1992)	US	1985-1989 n=44	-1 | +1, +2, +3	Positive impact on EBIT and FTE growth relative to control group	Wilcoxon signed rank tests	Positive
Desbrieres and Schatt (2002)	France	1988-1994 n=161	-1 | +1, +2 -2 | +1, +2	Negative impact on ROE and ROI relative to control group	Regression analysis	Negative
Bergström et al. (2007)	Sweden	1998-2006 n=73	-1 | +3	Positive impact on EBITDA margin, ROIC and sales relative to control group	Wilcoxon signed rank tests	Positive
Vinten (2007)	Denmark	1991-2004 n=73	-1 | +3 -3 | +3	Negative impact on sales and ROA relative to control group	Regression analysis	Negative
Cressy et al. (2007)	UK	1995-2002 n=122	-1 | average	Positive impact on EBITDA and negative impact on Growth measures relative to control group	Regression analysis	Ambiguous
Boucly et al. (2011)	France	1994-2004 n=839	-1, -2 | +1, +2, +3	Positive impact on ROA, EBITDA and sales relative to control group	Difference-in-difference	Positive
Acharya et al. (2013)	Europe	1992-2007 n=395	n/a	Slight positive impact on EBITDA margin and sales relative to control group	Difference-in-difference	Slightly positive

Kaplan (1989) was the first to investigate the effect of PE ownership on value creation in portfolio companies. Kaplan utilises a sample of 76 large MBOs of public US companies in the time period 1980-1986 to analyse changes in financial performance measures. He uses a -1Y to +3Y event window. In line with Jensen's hypothesis, positive operational impact of PE ownership is found, which is fuelled by improved governance. Specifically, the paper finds that the acquired companies experienced increases in EBITDA, ROA and Net Cash Flows along with a reduction in CAPEX.

Applying the same methodology, Smith (1990) conducts a study utilising a dataset consisting of 58 MBOs in the US from 1977-1986. The aim of the paper is to investigate the impact of PE-ownership on operational performance and working capital management. Smith provides conclusive evidence in favour of improved operational performance. The evidence indicates that improvements are not due to layoffs or reductions in R&D spending, which amongst critics was a concern of the effect of PE ownership as described in section 3. Opler (1992) further substantiates the findings as no effect on R&D is found in PE owned companies. However, he finds a decrease in CAPEX, which is in line with the theoretical anticipation discussed in section 3. In addition, evidence supporting a positive impact of PE-ownership on operational performance measured as EBIT/Sales and EBIT/FTEs is found.

Muscarella and Vetsuypens (1990) mirror the work by Kaplan (1989) and Smith (1990), though they employ a different strategy in their investigation of the impact of PE ownership. They follow an approach known as 'reverse LBO', in their study of 72 American PE-owned companies that went public between 1983-1987. The authors argue that this study design is superior in capturing the full benefits of LBOs. Utilising conventional measures of accounting performance such as Sales, EBIT margin, and Asset Turnover, the findings reveal improved profitability relative to publicly traded peers. It is noteworthy, however, that the study found the improved performance to stem from cost reductions rather than increasing revenue generation or asset turnover.

While significant efforts have been put into empirical testing on companies residing in the US and UK, very limited research exist on companies outside this geography. Desbrieres and Schatt (2002), however, investigate the Jensen hypothesis on panel data of 161 French buyouts. In contrast to the US and UK market, where most LBOs consist of divisional buyouts and public-to-private transactions, the French market is dominated by buyouts motivated by family successions. This M&A market is comparable to the small and mid-cap segment in Scandinavia, why the study is particularly relevant for our thesis (Spliid, 2007). Contrary to Kaplan (1989) and Smith (1990), the paper presents evidence on a negative effect of LBOs on ROE and ROI, thus contradicting the Jensen hypothesis. The authors suggest that a limited use of leverage of the acquiring PE funds may be an explanatory factor for these conclusions.

Cressy et al. (2007) take a different methodological approach in their estimation on the effect of PE ownership using a sample of 122 UK-based companies. Contrary to previous research, Cressy et al. (2007) estimate the effect using an average of the performance in each of the three years

following a buyout. Previous empirical research, on the other hand, have measured the impact at set dates following the buyouts. The argument for basing the post buyout impact measure on multiple years is that it mitigates potential noise issues inherent in measuring performance in a given fiscal year. Their results provide contradicting evidence for the Jensen hypothesis with positive findings on EBIT, but negative findings on Growth measures.

During the 2000s LBOs gained increasing attention in the Scandinavian region. Bergström et al. (2007) investigate the financial impact of buyouts in a Scandinavian context, utilising panel data of 73 Swedish companies in the time period 1998-2006. Measuring the change using the event window -1/+3, the paper finds significant and positive effects on EBITDA margin, ROIC and Sales Growth. Contrary to these findings, Vinten (2007) shows a negative correlation between PE-ownership and operational value creation. On a dataset consisting of 73 Danish companies in the period 1991-2004, he finds a negative impact on Sales and ROA.

Boucly et al. (2011) adopt a different methodological strategy in their investigation of 839 LBOs in France from 1994 to 2004. Utilising the difference-in-difference approach, which is similar to the approach we take in this thesis, the paper finds a positive correlation between PE-ownership and improvements in Sales, EBITDA and ROA. Applying the same methodology, Acharya et al. (2013) provide supporting evidence of the Jensen hypothesis. Specifically, the paper presents a slight positive impact on Sales and EBITDA margin on a dataset of 395 buyouts conducted in Europe from 1992 to 2007.

4.2 Firm-Specific Characteristics and Post-Buyout Performance

The evidence from the previous section indicates a positive effect of PE ownership on the financial performance in portfolio companies. As a result, researchers have spent considerable efforts on investigating potential drivers of this effect. While a variety of studies have focused on economic cycles, stock market performance and bond market performance (Gottschalg et al., 2003; Phalippou & Zollo, 2005), we take a different approach by focusing on firm- and fund-specific characteristics. First, the operational impact of selected firm-specific characteristics is considered, namely i) transaction type, ii) CEO replacement, and iii) alleviation of credit constraint. As it is evident from table 2 on the next page, research on the effect of transaction type and CEO replacement has yielded ambiguous results, while the alleviation of credit constraints on target companies seem to have a positive effect on value creation. These studies are briefly examined in the following section.

Table 2: Overview of Selected Research

Author	Geography	Period, Sample size	Event Window	Results	Statistical Method	Impact on Value
Secondary Buyouts						
Wang (2012)	UK	1997-2008 n=4,908	-1 | +1, +2, +3	Compared to PBOs, SBOs offer a positive impact on sales and EBITDA, and a negative impact on ROA	Wilcoxon signed rank tests	Ambiguous
Achleitner and Figge (2014)	Europe	1990-2010 n=2,456	-1 | +1	There is no difference between SBOs and PBOs on equity returns nor operational value creation potential	OLS regression	No effect
Bonini (2015)	Europe	1998-2008 n=326	-1 | +1, +2	Compared to PBOs, SBOs offer significantly lower value on several performance measures such as sales, EBITDA and ROI	Regression analysis	Negative
CEO Replacement						
Harris and Parrino (1999)	US	1982-1987 n=197	n/a	CEO replacement is positively correlated with above-average operating performance	Regression analysis	Positive
Cornelli and Karakas (2015)	UK	1998-2003 n=88	n/a	CEO turnover is positively correlated with operating performance	Regression analysis	Positive
Alleviating Credit Constraints						
Boucly et al. (2011)	France	1994-2004 n=839	-2, -1 | +1, +2, +3	Alleviation of credit constraints due to PE-ownership results in positive impact on sales, assets and FTE growth	Regression analysis	Positive

4.2.1 Secondary Buyouts

In recent years a surge in the number of SBOs relative to other transaction types has prevailed and the topic is gaining increasing attention from scholars. While rarely used during the first buyout wave, secondaries now constitute as much as 35% of all buyouts (Wang, 2012). As shown in table 2, however, previous research has found ambiguous evidence on the impact of SBOs on operational value creation.

Wang (2012) utilises panel data to investigate if differences in operational value creation emerge when comparing PBOs to SBOs. The study follows the same methodological approach as Kaplan (1990) and Smith (1989), measuring ex-post performance in each of the subsequent three years compared to the last year pre-buyout. Applying a sample of 4,908 transactions taking place from 1997 to 2008, Wang presents ambiguous evidence on the effect on company performance. Specifically, the paper finds a positive impact on Sales and EBITDA, but a negative effect on ROA.

Applying a narrow event window of -1/+1, Achleitner and Figge (2014) consider 2,456 European LBOs from 1990 to 2010. The study finds no evidence of superior operational value creation potential in PBOs compared to SBOs measured by sales and EBITDA margin. Expanding the event windows to -1/+1, +2, Bonini (2015) examines panel data on 326 European LBO transaction in the period 1998 to 2008. Comparing SBOs to PBOs the paper finds that SBOs offer significantly lower, although still positive value on performance parameters such as Sales, EBITDA and ROI. Bonini (2015) suggests that this effect is caused by an exhaustion of the value creation potential during the first buyout.

4.2.2 CEO Replacement

In most of the existing literature management turnover has been investigated as the dependent variable and company performance as the independent variable. This thesis, however, takes a differing approach by investigating the impact of CEO turnover *on* operating performance. Existing literature suggests an ambiguous effect of this.

Harris and Parrino (1999) add insights to the literature in their study of 197 acquisition in the US between 1982 and 1987. The paper tests whether the replacement of managements team following a buyout impacts the realisation of post-acquisition gains. They find CEO replacement to be positively correlated with superior performance post-merger relative to a control group. Akin to this master's thesis, Harris and Parrino utilise CEO replacement as a proxy for measuring the effect of a new management team. They use Operating Cash Flow/Market Value of Assets as the measure of performance.

Cornelli and Karakas (2015) apply a dataset consisting of 88 LBOs in the UK from 1998 to 2003. In their sample of public-to-private transaction, they find that the CEO is replaced in 52% of the instances during the initial transition phase. Similar to Harris and Parrino (1999), they find CEO turnover to be positively correlated with improved operational performance, defined as EBIT and ROA, in the focal company.

4.2.3 Credit Constraint

As described in the theoretical overview the alleviation of credit constraint is an important driver in of value generation in many buyouts. Theory suggests that superior performance in portfolio companies is fuelled through access to capital reserves from their PE owners (Baker & Smith, 1998).

While the empirical evidence on the area is limited thus far, alleviation of credit constraint seems to have a positive effect on performance.

An elaborate study on the topic was conducted by Boucly et al. (2011) on a sample of 839 buyouts in France from 1994-2004. The authors investigate the ex-post performance of LBOs relative to a control group, and in addition, to what extent the hypothesised difference could be explained by an alleviation of credit constraints in the portfolio companies. The paper argues that alleviating credit constraints in portfolio companies allows them to realise expansion plans and investment opportunities, which were previously inaccessible. Evidence is found in favour of this argumentation, as a significant increase in Sales, Assets and FTE growth is found amongst portfolio companies that were credit constrained pre buyout. To estimate the degree of credit constraint, Boucly et al. (2011) utilise ex-post changes in CAPEX, FTEs and Target Leverage as proxies for credit constraint. The results are especially pronounced in industries characterised by a high dependence on external financing and in private-to-private buyouts, where companies are expected to be more credit constrained.

4.3 Fund-Specific Characteristics and Post-Buyout Performance

Upon having reviewed the impact of firm-specific characteristics on relative value creation, we next consider the effect of fund-specific characteristics. The following section consists of three main topics. The first part reviews literature on the effect of fund geography. The second part considers prior research on the effect of the professional background of GPs, while the last section focuses on the fund's industry experience. Table 3 on the following page presents an overview of the investigated studies.

Table 3: Overview of Selected Research

Author	Geography	Period, Sample Size	Results	Statistical Method	Impact on Value
Geography					
Scellato and Ughetto (2013)	Europe	1997-2004 n=241	Domestic buyouts perform better on performance parameters as compared to international acquisitions	Regression analysis	n/a
Phalippou and Gottschalg (2015)	Global	1971-2005 n=7,453	Distance correlates negatively with the efficiency of value enhancing initiatives	Regression analysis	n/a
Partner Background					
Achleitner et al. (2011)	North America, Europe	1986-2010 n=1,090	Experienced general partners are able to obtain more leverage as well as negotiate lower buyout prices	OLS regression	Positive
Acharya et al. (2013)	Europe	1992-2007 n=395	The background of the general partners in PE funds correlates with outperformance on deals within their field of expertise	Regression analysis	Positive
Fund Experience					
Lossen (2006)	Europe	1983-1991 n=227	Fund experience as measured by portfolio company industry correlates positively with fund performance as measured by IRR, MIRR, and PME	OLS regression	Positive
Cressy et al. (2007)	UK	1995-2002 n=122	Fund experience as measured by target company industry correlates positively with target company performance measured as EBITDA and Sales Growth	Regression analysis	Positive

4.3.1 Fund Geography

While the PE industry is becoming increasingly internationalised and a growing number of PE funds conduct cross-border transactions, the body of literature on the topic remains scarce. The existing literature, however, provides indicative evidence in favour of a differential focus on operational value creation contingent on the geographical scope of the acquiring fund.

Scellato and Ughetto (2012) consider the performance impact of cross-border buyouts. Applying a sample of 241 European LBOs between 1997 and 2004, the paper finds a differential effect on performance contingent on the geographical scope of the acquiring fund. Specifically, they find that Domestic acquisitions perform relatively better on Return measures, while International buyouts perform better on Growth measures. The authors hypothesise that the difference for the Domestic buyouts can be partially ascribed to increased efficiency of monitoring due to geographical proximity. Further, the efficiency of advisory is found to be inversely related to physical distance. In

contrast, International funds are better a driving top line growth, given their inherent greater international network and experience.

Using a sample of 7,453 global buyouts in the period 1971-2005 Phalippou and Gottschalg (2015) similarly investigate the influence of distance on relative performance in buyouts. Their findings show that distance complicates the implementation of value enhancing initiatives, which translates into a lower degree of value creation in cross-border transactions.

4.3.2 Partner Background

As a consequence of the fierce competition in raising funds amongst PE firms, increased focus has been devoted to the analysis on the impact of the professional experience of the GPs. While the literature on the topic remains scarce, the existing evidence suggests a differential impact of GP background on the value creating measures.

Measuring experience as "Fund Generation"[6] and "PE Sponsor Age"[7], Achleitner et al. (2011) investigates the impact of GP experience on value creation. They apply a sample of 1,090 LBOs taking place between 1986 and 2010 in North America and Europe. The paper finds that more experienced GPs are able to obtain more leverage and negotiate lower buyout prices in PE deals, independent of the industry. Though not specifically focused on firm-level performance measures or professional GP background, the study is relevant for this thesis as it is the first to investigate the importance of GP background on performance.

In a more recent study, Acharya et al. (2013) focus on the implication of GP background on operational value creation using a sample of 395 transaction completed in Europe between 1992 and 2007. The paper measures deal outperformance by the change in EBITDA margins relative to quoted peers. The study provides evidence that financial performance varies with the specific professional backgrounds of the partners. Partners with a background from IB are more focused on top line growth and perform better on deals based with a high focus on M&A. On the contrary, partners with a consulting background exhibit greater performance on EBITDA and a greater focus on implementing organic growth strategies in buyouts.

[6] Number of previous funds raised by the GP
[7] Joint tenure of the GP group at the current fund

4.3.3 Fund Specialisation

PE funds differ greatly in their investment scope. Some funds are generalists who invests in just about any sector, while other take a more specialised approach, investing strictly in e.g. software or healthcare. Literature on the topic suggests a positive impact of specialisation on performance in portfolio companies. In recent years, the effect of specialisation at a fund level has gained increased attention from numerous scholars (e.g. Ljungqvist & Richardson, 2003; Gottschalg & Wright, 2008).

Lossen (2006) conducted the first systematic analysis of industry specialisation, as defined by number of prior investments in the relevant industry, on value creation. In a sample consisting of 227 European PE funds active between 1983 and 1991, the study assesses the impact of experience on performance at a fund level. The paper finds that fund experience is positively correlated with fund performance defined as IRR, MIRR, and Public Market Equivalent[8] relative to the annual return of the MSCI index from 1979 to 2005.

Utilising a different definition of fund experience and measuring the impact at a company level, Cressy et al. (2007) provide supporting evidence on the effect of specialisation. Applying a data set consisting of 122 PE funds in the UK between 1995-2002, they define experience as the number of investments in a particular industry divided by the total number of investments by that specific PE fund. The findings suggest that fund experience is positively correlated with superior performance, measured as EBITDA Growth and Sales Growth, in portfolio companies.

4.4. Summary of the Empirical Background

Upon having reviewed the existing literature related to our two layers of analysis, it is evident that much literature exists on the first layer, while limited literature prevails related to the second layer. Below we briefly summarise the previous empirical findings related to our research questions.

The first layer of analysis concerns the performance of portfolio companies relative to non-PE backed companies. Significant effort has been used to empirically test this relationship. From table 1, it was observed that the existing literature suggests a positive relationship between PE ownership and firm performance. However, the evidence in a Scandinavian context is both more restricted and less conclusive.

[8] The Public Market Equivalent is a benchmarking methodology related to relevant stock indices.

The second layer of analysis concerns the impact of firm- and fund-specific characteristics on operational value creation in PE portfolio companies. As shown in table 2 and 3, the existing empirical evidence on this topic is scarce. Considering first the firm-specific characteristics, there is ambiguous evidence on the effect of SBOs, while there seems to be a positive effect of CEO Replacement and alleviation of credit constraint. Considering next the fund-specific characteristics, there seems to be a positive correlation between fund experience and firm performance, while the impact of geographical scope and background is differential across the investigatory parameters.

5. Hypotheses Development

Building on the insights gained in the previous section, the following section will develop the hypotheses sought to be empirically tested. Similar to the research questions put forth in section 1, this section is divided into two distinctive layers with latter consisting of two parts. The first part will develop the hypothesis concerning the impact of PE ownership, while the second and third parts develop the hypotheses related to firm- and fund-specific characteristics, and the extent to which these contribute to value creation.

5.1 Private Equity Ownership and Financial Performance

As previously established in the theoretical section of this thesis, there are a variety of value generating levers used by PE funds (Berg & Gottschalg, 2005). The literature review in the previous section showed that PE ownership, and the application of these levers, had a mostly positive and significant impact across a range of performance measures (e.g. Kaplan, 1989; Smith, 1990; Boucly et al., 2011).Yet, the empirical evidence in a Scandinavian context is limited so far. Thus, to shed further light on the existing literature, our first hypothesis is as follows:

> **H1:** *Private equity ownership has a positive impact on performance measures in portfolio companies compared to non-PE backed peers*

To measure the ex-post buyout performance of the target companies this thesis utilises Growth, Return, and Efficiency parameters. To gain a thorough understanding of when the value creation occurs, two distinct event windows are applied. The rationale behind the selected performance parameters and event windows will be further elaborated in the methodology part.

5.2 Firm-Specific Characteristics and Post-Buyout Performance

As described in the theoretical and empirical overview, value creation in PE-backed companies is linked to the implementation of value enhancing levers. The following three hypotheses test whether selected levers identified in section 3 *directly* impacts value creation.

First, we attempt to investigate all value levers in conjunction by differentiating between PBOs and SBOs. The rationale is that in SBOs value enhancing levers have already been implemented by the selling PE fund and thus the value creating potential should be exhausted. While previous research on value creation in SBOs has yielded mixed results (e.g. Wang, 2012; Achleitner & Figge,

2014), it has to our best knowledge not been tested on a dataset consisting exclusively of Scandinavian companies. Thus, we derive the following hypothesis:

> **H2(A):** *Ex-post financial performance of PE-owned companies is greater in PBOs as opposed to SBOs*

As described in the theoretical background, an important value creating tool of PE funds is to remove managerial inefficiencies, or simply appoint a new CEO with different competencies and/or prior experience of working under PE ownership (Berg & Gottschalg, 2005). We seek to investigate whether this replacement has a positive impact on the ex-post value creation. Our focus is strictly on planned replacements, which is defined as changes occurring within the first 12 months of ownership, as replacements in a later stage may be dependent of performance. This approach will be elaborated upon in section 6. While the general trend suggests a decrease in the number of CEOs replaced in buyouts, it is still prevalent in more than 60% of LBOs on the European market making it an interesting explanatory variable (EY, 2018)[9]. Although the previous research on the area is limited, the evidence thus far suggests a positive correlation between CEO replacement and subsequent financial performance (Harris & Parrino, 1999; Cornelli & Karakas, 2015). We thus expect a similar relationship to prevail in a Scandinavian context and hence hypothesise:

> **H2(B):** *Ex-post financial performance of portfolio companies is greater in LBOs, where the CEO is replaced within the first year of PE ownership*

The theoretical section described the importance of alleviating credit constraint as a lever of value creation. By injecting growth capital or providing better access to bank funding, by virtue of the fund's relationship with the bank, the portfolio company may be able to realise otherwise inaccessible growth opportunities (Berg & Gottschalg, 2005). Boucly et al. (2011) provide supporting evidence for this argument. The effect is found to be especially evident in private-to-private transactions where the seller is an individual, as opposed to other types of transaction where the seller is public firm or a PE fund. As the Scandinavian market is dominated by private-to-private transactions, this motivates the formulation of the following hypothesis:

> **H2(C):** *Ex-post financial performance of portfolio companies is greater for transactions, in which the acquired firm is characterised as being credit constrained ex-ante buyout*

[9] Measured as CEO Replacement occurring during the entire holding period.

5.3 Fund-Specific Characteristics and Post-Buyout Performance

The following five hypotheses concern the last aspect of the analysis, namely, the impact of fund-specific characteristics on post-buyout performance in PE-owned companies. Specifically, this thesis seeks to investigate the impact of i) geographical scope of the acquiring fund, ii) professional experience of the lead GP and the diversity of the GP Group, and iii) fund experience.

Section 3 described that governance mechanisms and the parenting effect were important factors in fuelling operational value creation in buyouts (Berg & Gottschalg, 2005). Sorensen and Stuart (2001) propose that the ability to effectively implement these initiatives is contingent on the geographical scope of the acquiring fund. Previous research suggest that International funds are better a driving top line growth, given their inherent greater international network and experience, which is useful is driving internationalisation in portfolio companies (Scellato & Ughetto, 2012). Furthermore, as a correlation between size and geographical investment scope prevails, the International funds are expected to have greater resources at their disposal to realise and execute expansion plans (Scellato & Ughetto, 2012). Domestic funds, on the other hand, may face lower costs of monitoring and advising given the proximity to portfolio companies. These expected differences in the skills and capabilities of PE fund due to their geographical scope leads us to the formulation of the following hypothesis:

> **H3(A):** *Ex-post financial performance of target companies will vary according to the geographical scope of the acquiring PE fund*

Throughout the ownership period, the portfolio companies will cooperate closely with the PE fund, particularly the lead partner, who is responsible for the ongoing communication and collaboration (Bennedsen et al., 2008). As previously mentioned, GPs are often highly experienced professionals who come from a variety of professional backgrounds. Previous studies have found that the background of the GPs impacts the operational value creation focus under specific value creation strategies (Bottazzi et al., 2007; Acharya et al., 2013). We extend the scope by analysing the impact in a broader context by considering all buyouts on a broad set of performance parameters. Based on the above we put forth the following hypothesis:

> **H3(B):** *Differential impact on ex-post financial performance measures is expected to prevail contingent on the professional experience of the lead GP in the focal buyout*

Whilst the lead partner is the primary intermediate between the PE fund and the acquired firm, the portfolio company can draw on the joint experience and knowledge of the entire partner group. To the best of our knowledge, there exists no literature on the effect of GP group diversity on financial performance of portfolio companies. However, in a more general context, that is, outside PE, managerial diversity is generally found to improve performance by being more multidimensional in the analytical work and thus capable of overcoming complex and changing environments (Carpenter & Fredrickson, 2001; Macus, 2002). We expect this relationship to hold in a PE context as well, why we put forth the following hypothesis:

> **H3(C):** *Ex-post financial performance of target companies is greater for transactions, in which the acquiring PE fund consists of a partner group with diverse backgrounds*

Finally, the experience of the acquiring fund may impact the magnitude of value creation in portfolio companies. Previous research has found industry specialisation at the fund level to be positively correlated with value creation in portfolio companies (e.g. Lossen, 2006; Cressy et al, 2007). As relatively few funds are specialised in Scandinavia conducting a study directly on specialisation is not feasible. Instead we use the number of previous investments in comparable industries as a proxy for specialisation. We consider two types of experience, namely, primary and secondary subject to the comparability of previous experience to the focal buyout. We elaborate further on the distinction between the two in the methodology section. The expectation is that funds accumulate industry specialisation over time, which leads to improved performance due to the learning curve. Thus, our hypotheses are the following:

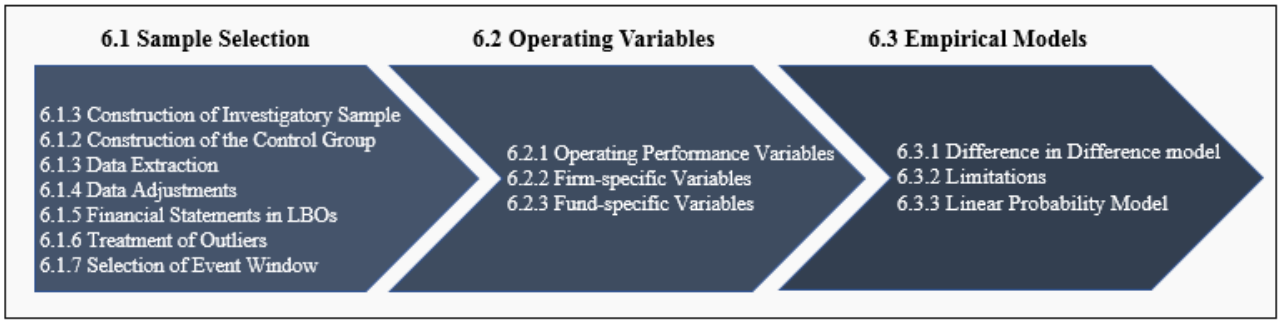
> **H3(D):** *A positive relation between previous experience, measured by the number of deals in the industry of the focal buyout, and the operational value creation is expected to prevail*

> **H3(E):** *A positive relation between previous experience, measured by the direct comparability between previous investments and the focal buyout, and the operational value creation is expected to prevail*

6. Methodology

As argued in the previous section this thesis strives to empirically test the magnitude of value creation in buyouts, and, whether this is influenced by firm- and fund-specific characteristics. The following section provides an overview of the methodological considerations made when designing the empirical part of the study. To accommodate the multidimensional process the approach is divided into three distinct sections as shown below:

Figure 12 – Structure of Methodology Section



The first section is devoted to the process of establishing the control and treatment groups, as well as extracting and manipulating the raw data to be empirically tested. Hereafter, we discuss the selection process of the dependent variables used in the study and the potential caveats linked to these. Lastly, we introduce the two empirical models used in the study, the Difference in Difference Model and the Linear Probability Model, and discuss the assumptions and limitations of the models.

Prior to the discussion of the specific details in the methodology we will briefly motivate our choice of using a strictly quantitative research approach. Quantitative research has the advantage that the results are concrete and, if designed appropriately, objective (Choy, 2014). Furthermore, in the case of our study it is beneficial that the data is publicly available and thus relatively easy to gather. On the other hand, quantitative research may lack understanding of the underlying behaviour driving the results. Even results that appear statistically significant may be distorted from omitted variable bias, that is, failing to include relevant variables. Had we instead chosen a qualitative research technique, such as open-ended interviews, we could have continuously reshaped the study to accommodate potential new behavioural insights. A significant caveat of qualitative studies, and decisive in this case, is that access to data would be highly scarce and subject to biased responses from interviewees (Yauch & Steudel, 2003). Thus, in line with the bulk of other empirical research on PE, this study is exclusively quantitative.

6.1 Sample Selection

To investigate the impact of PE ownership this study considers panel data on two samples of private Scandinavian companies in the period 2011-2016. One investigatory sample consisting of companies acquired by PE funds in the investigated period, and a control sample that is constructed of the most relevant peers. Theoretically the investigatory sample would consist of all transactions in the period, however, as the following sub-section shows data availability, extreme observations and the chosen event window somewhat limit the depth of the study.

As argued previously, the motivation for studying this exact sample is threefold. First, the legislation in the Scandinavian countries oblige companies to publish accounting data (Lekvall et al., 2014). This provides a unique opportunity to study operational improvements in private companies. Second, as illustrated previously, the number of buyout transactions in the region has witnessed a significant increase in the period. It shall be interesting to see whether the funds succeed in creating operational value despite the increased competition. Third, the existing empirical literature in the region remains relatively scarce, hence new insights are expected to be reaped.

6.1.1 Construction of Investigatory Sample

To identify the buyouts to be included in the sample, Mergermarket, a database containing information and statistic related to M&A transactions, was chosen. Initially, a comprehensive list containing information on all PE acquisitions in Scandinavia from 2011-2016 was extracted. This list was cross-checked with local PE-specific insights such as DVCA (2017) and SVCA (2017) to conduct a sanity check and ensure that all relevant transactions were included in the raw sample.

To transform the raw list of transactions into the investigatory sample, several criteria were included to ensure that each observation was representative and comparable. First, only transactions where the PE fund acquired a majority stake were included. To implement the value creating initiatives discussed in the theoretical background a majority stake is required in most cases (Baker and Wruck, 1989). Thus, when evaluating the operational impact of PE ownership it is most accurate to consider only majority stake transactions. Second, only transactions that were *completed* in the analysed time-period were included. Once the two parties in a buyout agree on the terms of the deal, it is common to sign a Sales and Purchase Agreement (SPA) and *announce* the transaction in public. However, the agreement is not effective until the transaction has been approved by regulatory and competitive authorities and the transaction sum has been transferred. Only when these processes are

cleared the ownership and control of the firm transfer. This process may take as long as several months in large transactions (Perry & Herd, 2004). Thus, to ensure that only full-year effects of value creation are measured, only *completed* transactions are included. Third, carve out transactions, where an industrial company divests a previously integrated business unit, in some cases had to be excluded if independent or pro-forma historical financials were not available. Lastly, industry-consolidating buyouts, where multiple companies are acquired and merged immediately[10], in some cases had to be excluded. Unless historical consolidated figures were reported, pro-forma consolidation is required to get comparable data ex-ante and ex-post acquisition, which would be related with a significant degree of uncertainty.

Upon having applied these criteria we had a long list of 684 transactions that were deemed fit to be included in the sample. However, while all Scandinavian firms are obliged to publish financial statements, the required granularity of the reported figures differs greatly. In Denmark, for example, only companies that belong to accounting class 'C' or 'D' are obliged to disclose revenue (EY, 2018). Consequently, a not insignificant amount of transactions had to be excluded from the final sample due to insufficient accounting data. The final sample thus consists of 188 buyouts. The investigated sample will, however, vary depending on which of the event windows that is studied as discussed in section 6.1.7.

6.1.2 Construction of the Control Group

Inherent to the Difference in Difference methodology, which is used to investigate whether PE owned companies exhibit superior operational performance, is to compare the investigatory sample to a control sample. In establishing a control sample most existing literature either follow a 'direct matching strategy', where a selective selection process is carried out (e.g. Kaplan 1989; Smith 1990), or a 'propensity matching strategy', in which an industry benchmark is used (e.g. Rosenbaum & Rubin, 1983). We follow the former approach by directly matching treatment and control firms based on pre-defined characteristics as outlined below. The primary advantage of this approach is that the comparability between the groups is expected to be greater as fewer, but more alike companies, in terms of size and profitability, constitute the control group. On the other hand, this approach is vulnerable to selection bias as well as omitted variable bias (Cook et. al, 2002). The selection effect arises when the observations included in the sample where not randomly chosen, thus

[10] An example of a consolidating transaction is Axcel's acquisition of SFK LeBlanc, Attec, ITEC and Carometec that where merged upon acquisition to form a leading global supplier of butchery equipment (Axcel, 2016).

making the analysed sample non-representative (Agresti, 2016). We seek to overcome this issue by including all observations that fulfil the selection criteria in the control group. Omitted variable bias refers to the exclusion of one or more relevant variables as selection criteria (Agresti, 2016). By applying the most common selection criteria in the existing literature we attempt to mitigate this bias (e.g. Vinten, 2008; Nicolas, 2010).

The control sample was, as the treatment sample, established in Mergermarket using the following selection criteria. First, all companies included in the control group had to be based in Scandinavia. Second, based on the NACE industry codes used in the European Union the control firms had to operate in the same industry[11]. When possible, we used four-digit codes, which is the most granular classification, but in niche industries the broader three-digit NACE code had to be used. Third, as the companies should be comparable in size a +/- 50% criterion on total assets and revenue, measured at the acquisition year of the treatment firm, was included as well. Collectively these criteria should ensure a sufficiently comparable sample for the empirical test to hold explanatory power. A total of 613 companies met all the above criteria and had sufficient financial data to be included in the control group. This corresponds to a ratio of 3.3 control firms to treatment firms, which is in line with comparable previous studies (e.g. Alemeny & Marti, 2010; Cressy et al., 2007)

6.1.3 Data Extraction

Upon having identified the companies that constitute the sample, the next step was to gather the required data. Testing the proposed hypotheses requires a mixture of strictly financial data as well as information on the PE funds, the GP groups and firm-specific data on the acquired companies.

To extract the financial data, Valu8, a Swedish database that extrapolates data from annual reports, was chosen. Screening of relevant companies to be included was conducted within Valu8 after which the historical financial data was exported. As Valu8 and Mergermarket do not share a system of unique company ID's the matching procedure had to be carried out manually. To ensure that the correct data was extracted from Value8, cross-checks were made from other databases such as Orbis and Greens in case of doubts. Particular attention was paid to changes in the company structure following the LBO. Following a buyout it is common to establish a new holding company, "NewCo", which formally acquires the vendor company (Scellatto & Ughetto, 2012). Depending on the transaction structure some of the operating activities may be reported through that company

[11] Some companies were classified as holding companies in Value8 with the NACE code 7010. These observation had to be classified manually using the company website to identify the relevant industry.

vehicle (Lowenstein, 1985). For the financial figures to be comparable pre and post buyout it is thus important to study consolidated figures. To accommodate this effect, the built-in function in Value8 of extraction consolidated accounts was used when required.

The fund-specific data used to test Hypothesis 3A-E was extracted in part using Preqin[12], Mergermarket as well as the websites of the PE funds. Information regarding the geographical scope and previous transaction could be exported from Preqin. When incomplete, and for the purpose of cross-checking, supplementary data was found from the websites of the PE funds. Data on the professional background of the GPs was likewise collected from the websites of the funds, supplemented with proprietary data from LinkedIn for funds without background description of the GPs. The assessment on the diversity amongst GP groups is based on data from this collection. It could be argued that it would be more accurate to use data at the year of acquisition, but as the GPs jointly contribute to value creation throughout the holding period, the current team constitution may be considered a reasonable proxy (McKinsey & Company, 2014).

Firm-specific data, more concretely data on CEO Replacement, was collected through the Central Business Registers for Danish transactions. For Norwegian and Swedish transactions it was extracted from the websites Proff.no and Proff.se respectively, which collects data from the Central Business Registers.

6.1.4 Data Adjustments

Prior to conducting the empirical test, the extracted data from Valu8 needed a few minor manipulations to ensure comparability across the sample. First, some of the observation followed a fiscal year that differed from the calendar year. As we are looking to study the operating effect after a given number of years under PE ownership, we needed to manually adjust these to get full year effects. This was done by constructing an arbitrary full year financial statement by multiplying an adjustment weight on the two fiscal years. For example, a company with a fiscal year ending 30/6 would have a 6/12 factor multiplied on the two financial years that overlaps a full calendar year. This procedure may impose a slight bias, especially for fast growing companies, but as the number of firms where the adjustment had to be made is relatively small, it is not considered a significant weakness.

Second, some firms had observations where the fiscal years spanned beyond 12 months. Typically this arose in relation to a M&A transaction or a change in accounting practice. We mitigated

[12] Preqin is a UK database focused on alternative investments.

this by converting the prolonged fiscal years into 12 months by multiplying an adjustment factor, of, for example 12/18 on the financials for a company with a fiscal year of 18 months. One caveat of this approach is that it fails to take the impact of seasonality into account, as the adjusted fiscal year may include data from multiple high/low seasons. However, as only very few observation had to be adjusted the potential bias is estimated to be limited.

6.1.5 Financial Statements in LBOs

To avoid biases in the design of the empirical study and the interpretation of the results, the following section addresses the implications on the financial statements that may come following a buyout. Unlike the previous section we do not seek to adjust for these distortions, as the reformatting of the financial statements would be subject to significant uncertainty given the limited disclosed information. Rather, we outline how to mitigate biases and interpret the results found.

The first aspect to be aware of relates to goodwill. Goodwill is an intangible asset that may arise in association to one company acquiring another. It represents the excess price paid over the book value of equity[13] (Kieso et al., 2014). In the context of this study, goodwill is important for two reasons. First, following an LBO, the goodwill, and in turn the balance sheet, will typically expand to represent the premium paid. This expansion of the balance sheet is problematic as it distorts the Return measures used. Both ROA and ROIC will *ceteris paribus* decline as the denominator, in the form of total assets and invested capital, increases. Thus when interpreting the results we should expect an immediate decline on the Return measures following the transaction, which ought to normalise throughout the ownership period. Second, goodwill may distort the results due to differences in accounting practices on amortisation. IFRS[14], for example, states that companies most conduct an annual impairment test of goodwill, and, in the case of value deterioration during the fiscal year the account must be written down. On the other hand, some practices such as the GAAP[15] in all Scandinavian countries, allows for amortisation over the useful lifetime, typically 20 years (KMPG 2014a, KMPG, 2014b, KPMG 2014c). On the income statement this negatively influences all items lines below depreciation and amortisation, including EBIT, NOPAT and Net Profit. To ensure comparability with the control group, which are expected not to have the same degree of goodwill amortisation, we use EBITDA for our Return measures as it is not affected by goodwill.

[13] In situations where the acquiring firm pays less than the book value of equity negative goodwill, or badwill, would arise. This is usually only seen in highly capitalised companies with low growth rates and modest profitability.
[14] IFRS is an abbreviation for International Financial Reporting Standards
[15] GAAP is an abbreviation for Generally Accepted Accounting Principles

The second aspect that one must be precautious about when studying financial statements in LBOs is the impact of transaction debt. As discussed in section 3 an LBO most often marks a paradigm shift in the capitalisation of a firm. The liability side of the firm is significantly boosted by the transaction debt (Halpern et al., 2009). This impacts the Return measures in a similar manner to the expansion of the balance sheet following a Goodwill write-up. We do not seek to adjust for this as it will be difficult to determine a normalised leverage level, but it should be kept into consideration when interpreting the results.

The magnitude of the two issues described above depends, in part, on how the company structure is following the buyout. As previously mentioned, it is common practice that the target company is formally acquired by a newly established holding company, hence the goodwill and the transaction debt will be booked within this entity. As our analysis is focused on the operating portfolio companies, not the holding companies, the potential impact of accounting biases is not considered a major limitation. For firms following a buy and build strategy, however, the impact may be greater as add-on acquisitions are likely to be made by the portfolio company.

It should be stressed that generally when comparing accounting figures, also outside an LBO context, one should ensure that the companies follow the same accounting practices. For instance when practitioners construct a peer group valuation model, it is important to recognise differences on parameters such as capitalisation of intangibles and depreciation methods. Failing to do so could greatly influence the valuation metric. Ideally our study should also ensure that all observatory firms follow the same accounting practices. Given the vast number of companies included in the study, this is not feasible within the scope of the assignment, which constitutes a minor limitation of the methodology.

6.1.6 Treatment of Outliers

In the process of collecting the data it became evident that some observation exhibited extreme development in the investigatory variables. Especially the ROIC and FCF/IC measures proved to have significant yearly deviations, as discussed further below. To avoid skewed results and ensure the validity of our findings it was necessary to treat the outliers. Literature on the topic of outlier treatment suggests three primary means of accommodating outliers, namely i) transformation ii) truncation and iii) "robust" procedures (Osborne & Overbay, 2004). Data transformation limits the magnitude of extreme data, but keeps the relative ranking of data, by e.g. taking the log of a variable. As our data primarily consists of ratios and includes negative data, this approach is not feasible.

Truncation is a process in which extreme scores are set to the highest (or lowest) 'reasonable' score decided by the researcher. As there are no natural boundaries on financial firm performance, this approach is not suitable either. Instead, we use robustness procedures to avoid our data from being distorted from outliers. Specifically, we use the trimmed mean approach, in which extreme observations are temporarily eliminated (Hu & Sung, 2004). For each empirical test the values beyond the 5^{th} and 95^{th} percentile is excluded from the test. For the ROIC and FCF/IC empirical tests, which suffer from more volatile data, additional extreme observations were removed manually. We follow a paired outlier removal approach by excluding both the 'pre' and 'post' observation, if either one is extreme. An alternative robustness approach is to compute a Windorized mean, for which the extreme values are temporarily censored, and replaced with adjacent values from the distribution. To ensure that the treatment of our outliers does not bias our results we also conduct a Winsorization test with the 5^{th} and 95^{th} percentile as the adjacent values in section 9.

It should be stressed that the number of outliers removed in this study is relatively high. While we argue the necessity of this to generate meaningful results the approach does involve drawbacks. First, the representativeness of the study can be questioned. Second, as we are operating with relatively small samples the removal of observations impacts the statistical validity.

6.1.7 Selection of Event Windows

The Difference in Difference model explores the impact on the investigatory group undergoing a treatment *vis-a-vis* a control group. To get an accurate measure of the impact it is crucial to define a representative event window. A representative event window would be a window that captures the effect of value creation over time, but also allows for a sufficiently large sample. Unfortunately these two dimensions are conflicting, as a broader event window, measured by the number of years, would require further data points, in the form of fiscal data, which would limit the potential size of the sample. To accommodate this trade-off previous studies have typically used event windows such as -1/+1, -1/+3 and -2+/2 years before/after acquisition of the PE fund (e.g. Kaplan, 1990; Smith, 1990).

As described in section 2 the typical ownership period of PE funds is 3-7 years which would translate to an event window allowing for at least three years of ownership. Furthermore, as value creation in PE funds tends to follow the J-curve, with modest performance in the initial years followed by improved performance in the latter years, an event window that considers multiple year of PE ownership is preferred (Grabenwater, 2005). Based on these arguments, and the data availability, this

study uses a primary event window of -1/+3. One caveat of this event window is the implied restriction on the sample size, as only transactions from 2014 and before would have sufficient ex-post treatment data. Furthermore, the proposed event window considers only one observation per firm after the buyout. It may be questioned whether this specific observation is representative for the operational value creation throughout the ownership period. One-off accounting adjustments, such as Write-Downs for example, typically accumulate over time but only appear in the books when it materialises (Kieso et al., 2014). To increase the validity of results and mitigate potential biases, we thus include a second event window that considers the average for each of the years under PE ownership, though maximum 3 years, as the ex-post measure. The ex-ante measure remains -1 year.

A dynamic ex-post time event window has, to our best knowledge, not previously been used in empirical studies despite the attractive traits of normalised performance data and increased sample size. One explanation may be that the parallel trend assumption in the Difference in Difference model, as discussed in section 6.3, is less likely to hold the greater the time period (Abadie, 2005). A violation of the parallel trend assumption may bias the estimator of the causal effect, hence the interpretation the results for this event window should be done with caution. Despite the potential drawback of the dynamic time window we believe valuable insights may be drawn from it, and thus the following two event windows are investigated:

Table 4 - Overview of Buyouts in Event Windows

	-3Y to +3Y	-3Y to +Average(1-3Y)
Number of transactions	106	188

Another mentionable caveat of the chosen event window relates to the ex-ante measurement of -1 year. As discussed in section 2 some managers may seek to manipulate the financials adversely prior to the acquisition for their own benefit (Gottschalg & Berg, 2005). To mitigate this potential bias, several studies use a more distant ex-ante measurement, such as -2 or -3 years (e.g. Cressy et al., 2007; Scellatto & Ughetto, 2012). Pure play MBOs, however, prevail less frequent during the current third buyout wave, hence the potential bias of choosing -1 year is assumed to be negligible (Berg & Gottschalg, 2005).

6.2 Operating Variables

To empirically test the proposed hypotheses we use several variables based on the above described data. Research question one, relating to value creation in buyouts *via-a-vis* a control group, utilises various financial metrics extracted from Valu8. Research question two, which relates to value

creating initiatives, draws on company and transaction-specific variables. Lastly, research question three which investigates the impact of fund-specific characteristics on value creation, builds upon several fund-specific variables. The table below presents an overview of the variables used. In the following sections we briefly motivate and elaborate on the investigated variables.

Table 5 - Overview of Variables used

Variable	Definition	Hypothesis	Source
Sales growth (%)	$(Sales_{t0} / Sales_{t-1})-1$	H1	Valu8
EBITDA growth (%)	$(EBITDA_{t0} / EBITDA_{t-1})-1$	H1	Valu8
Return on Assets (%)	$(EBITDA_{t0} / Total\ Assets_{t0})$	H1	Valu8
Return on Invested Capital (%)	$EBIT_{t0}$ / Total Assets $_{t0}$	H1	Valu8
FCF/Invested Capital	Free Cash $Flow_{t0}$ / Invested Capital $_{t0}$	H1	Valu8
Buyout type	Primary vs Secondary	H2(A)	Mergermarket, Priveq
CEO Replacement	CEO Replaced within 12 months of aquisition	H2(B)	Company registers, Websites
Credit Constraint	Leverage% + CAPEX% vs. control group	H2(C)	Valu8
Fund Geography	Geographical dispersion of offices	H3(A)	Priveq
Lead partner background	Primary experience prior to joining a PE fund	H3(B)	Priveq, LinkedIn
Partner diversity	Number of LP backgrounds in relation to size	H3(C)	Priveq, LinkedIn
Secondary fund experience	Number of relevant investments prior to buyout	H3(D)	Priveq, Fund websites
Primary fund experience	Number of previous directly comparables buyouts	H3(E)	Priveq, Fund websites

6.2.1 Performance Variables

Our analysis of operational value creation in buyouts focuses on three dimensions, namely, i) Growth, ii) Return and iii) Efficiency. By taking a multidimensional approach to value creation we aim to get a better understanding of how, if present, value creation materialises in buyouts.

As Growth measures we use Sales and EBITDA. For both variables the growth is measured as the year on year change (YOY) in percentage. By using ratios we mitigate potential biases in the results arising from large companies skewing the data. Sales was considered a relevant variables as it is widely used in the existing literature (e.g. Bergström et al., 2007; Boucly et. al, 2011) and because it is a rigid measure with little room for accounting flexibility (Petersen et al., 2017). An impediment of using Sales, however, is that observable growth may be influenced by acquisitive growth. Firms are not obliged to differentiate between organic and inorganic growth in the financial statements. Therefore we might observe companies, especially in buy and build cases, where the growth is predominantly driven by acquisitions. Inorganic growth in itself is not problematic but the value of it is contingent on the ability to successfully integrate the add-on acquisitions (Hammer et al., 2017). To accommodate the dimension of integration we also include EBITDA as a growth measure. In conjunction, we believe these two variables are indicative for the ability to grow a business. It must

be noted that regardless of which variables was chosen, true value creation cannot be measured from accounting data in isolation (Marr et al., 2004). In the retail industry, for example, underlying parameters such as same-store sales or the pace of store openings are equally valuable, but less accessible, indicators for operational value creation (McKinsey & Company, 2005).

As Return measures, we use ROA and ROIC. The variables measure the degree to which the firm can generate return on its assets or invested capital. ROA is widely used in the existing literature as it is relatively robust to yearly fluctuations in the income (e.g. Boucly et al., 2011). While the metric is defined in numerous different ways, we define it as EBITDA / Total Assets, as seen in the above table. This definition is chosen to accommodate the previously discussed implications of goodwill. EBITDA in itself, however, may also be biased as it fails to account for differences in R&D capitalisation and by excluding depreciation, which by some are considered a 'real' expenditure (Eastman, 1996). To mitigate this effect, ROIC is used as another Return measure. The primary difference between the two measurements is that ROIC focuses on the operating assets, whereas ROA concerns the entire asset base (Petersen et al., 2017). Despite this feature of taking capital efficiency into account ROIC is generally less frequently used in the existing literature. One explanation may be the inherent noise in the capital structure following a buyout as discussed earlier. As this issue should be less prevalent for the Average window, we argue that it is worthwhile to include ROIC in this study. It should be noted that ROIC is commonly calculated using NOPAT in the numerator but due to differences in tax rates across the sampled countries we use EBIT to overcome potential biases. A decomposition of the exact formula used is carried out in appendix 2.

As Efficiency measure, we use just one measure, namely FCF/Invested capital. This metric is relevant as it shows the ability of the firm to generate cash required to pay down the acquisition debt. Furthermore, free cash flows are also found to be an important factor in achieving top line growth (Brush et al., 2000). The relative importance of free cash flow to generate top line growth is contingent on the industry. In capital intensive industries, such as oil production, significant liquidity is required to acquire the relevant operating assets. On the other hand 'asset light' industries may have lower capital requirements to fuel top line growth (Bolwjin et al., 2018). The FCF/IC measure is also decomposed in appendix 2.

6.2.2 Firm Specific Variables

Our analysis on the impact of firm-specific characteristics focuses on three dimensions, namely, i) transaction type (primary or secondary) ii) credit constraint and iii) CEO replacement. The

variables were chosen as they are proxies for whether concrete strategic initiatives, as described in section 2, have been implemented. The variables were chosen on the basis of the expected insight to be gained weighted against the accessibility and quality of data.

The transaction type variable is a binary variable that is contingent on whether the buyout is a PBO or SBO. The information is accessible through extracted data from Valu8 which contains various information on the seller, from which it can be determined whether it is a PBO or SBO. As described in section 4 the impact of ex-post ownership has been widely studied in the existing literature (e.g. Wang, 2012; Bonini, 2015). It shall be interesting to see whether the potential of value creating initiatives used by PE funds is, in part, exhausted after one or more periods of PE ownership.

The credit constraint variable is a binary proxy variable established to investigate whether a, potential, alleviation of the credit constraint following a buyout impacts the operational value creation. As the financial flexibility is not directly observable the existing literature relies on proxies to estimate the prevalence of credit constraint. Changes in CAPEX and leverage ratio following a buyout is commonly used (Boucly et al., 2011; Beck et al., 2006). A caveat of this approach is that it ignores that leverage and CAPEX both are industry dependent. Accounting for this, we instead study leverage and CAPEX ratios for the treatment firms relative to the control group ex-ante buyout using the following estimation equation:

$$CC_{it} = \left(Leverage_{treat} - \frac{(\sum_{n=1}^{n} Leverage_{treat})}{n} \right) + \left(CAPRATIO_{Treat} - \frac{\sum_{n=1}^{n} CAPRATIO_{treat}}{n} \right)$$

Where a firm is said to be credit constrained if CC_{it} is below 0. Leverage ratio is measured as Long-Term Debt/Total Liabilities and the CAPEX ratio is measured as CAPEX/PPE. A weakness of our approach is that we are looking at relative credit constraint, but since the primary objective is to study relative performance changes following a buyout this is considered a negligible caveat.

CEO Replacement is likewise a binary variable that is contingent on whether the CEO is replaced within 12 months of the buyout. Removing managerial inefficiencies is identified as one of the mechanisms used by PE funds to realise the underlying value creating potential as discussed in section 2. To empirically test whether this theoretical concept is applicable in practice we investigate whether CEO replacement impacts our performance measures. One significant caveat in investigating this parameter is that CEO replacement is not an independent variable. Instead it may be a function of (poor) performance, capability fit or disagreement on strategic direction (Farrell & Whidbee,

2003). To mitigate this potential bias we consider only replacements made within 12 months of the acquisitions as these are assumed to be part of the ex-ante value creation plan.

6.2.3 Fund-Specific Variables

The fund-specific variables are included in the study to test our hypotheses as to whether operational value creation is influenced by characteristics specific to the acquiring PE fund. Three dimensions are considered, namely, i) fund geography, ii) GP background and iii) fund experience.

Fund geography is a categorical variable that takes on a value depending on the geographical scope of the acquiring PE fund. All PE funds in the sample are classified into either Domestic, Scandinavian or International depending on the number of office locations. Funds operating strictly in one country are classified as Domestic, funds with multiple offices in Scandinavia are classified as Scandinavian whereas funds with locations in Scandinavia and a primary office abroad are classified as International[16]. An alternative classification methodology would be to look at the transaction scope, i.e. whether the fund make investments domestically or internationally. However, we argue that to reap the benefit of localisation a strong physical presence is required (Sorenson & Stuart, 2001).

The impact of GP background is studied through two lenses. Firstly at the individual level using the professional background of the lead partner on a transaction, and secondly at a fund-level by the professional diversity of the GP group. For the first purpose a categorical variable is established that take on values depending on the primary occupation of the lead partner prior to joining a PE fund[17]. The GPs are grouped into six segments, namely, "Consultants", "Bankers", "Accountants", "Industrial", "Private Equity" and "Other" (Acharya et al., 2013). To study the potential benefit from GP diversification at a fund level we establish a binary variable contingent on whether the GP group have differing backgrounds. A fund is said to have a diversified partner group if i) three or more background types are present and ii) no more than 50% of the GPs come from same background. By having two selection criteria we are able to accommodate the significant numerical difference in the number of GPs in the different funds.

Finally, we investigate the impact of fund experience on value creation. To do so, we establish a categorial variable on the basis of previous investments. Previous studies have used the NACE

[16] Capidea is an example of a Domestic fund using the defined classification methodology. Axcel is an example of a Scandinavian fund. Hellman and Friedman would be an example of an International fund.
[17] 'Primary' background is defined as the role/industry in which the most years were spent prior to joining a PE fund. In case of equal experience in multiple fields, most weight was put on the most recent role.

industry codes to group and trace investment experience (Lossen, 2006; Cressy et al., 2007). We take a more sophisticated approach by splitting experience into two tiers – tier 1 experience, which are 'directly' related investments, and, tier 2 experience for investments in the same NACE industry. The tier 1 matching was done manually using the Priveq database[18]. As all companies and the situation they are in are unique, it should be stressed that no investments can be compared one-to-one, but conducting a manual matching should yield more sophisticated insights. As the relevance and value of experience declines over time as we focus only on transactions from the past 10 years. A caveat of this approach is that older and larger funds, with multiple offices, has a greater number of deal count and thus *ceteris paribus* are more likely to have more experience in a given industry. We thus might see a correlation between the fund geography and experience results.

6.2.4 Control Variables

In line with comparable previous studies we also introduce a number of control variables. Specifically these are, firm size (total assets), firm age and industry dummies (based on the NACE classifications). By including firm size we control for potential biases arising from economies of scale. As previously described, the risk of this is negligible though, as total assets were one of the selection criteria when establishing the control sample, thereby ensuring homogenous samples. Age is included to control for survivorship bias, that is, old firms being prone to exhibit better performance as they have survived longer (Carpenter & Lynch, 1999). Lastly, we include an industry control variable to mitigate potential industry variations. The companies are grouped in accordance to the 8 primary NACE classifications as illustrated in section 7. When regressing the statistical models an alternative specification in which fixed effects are estimated, i.e. industry dummies are excluded, is also made. This fixed effects approach is included to account for potential firm specific differences that are independent across time but possibly correlated with other explanatory variables.

6.3 Empirical Models

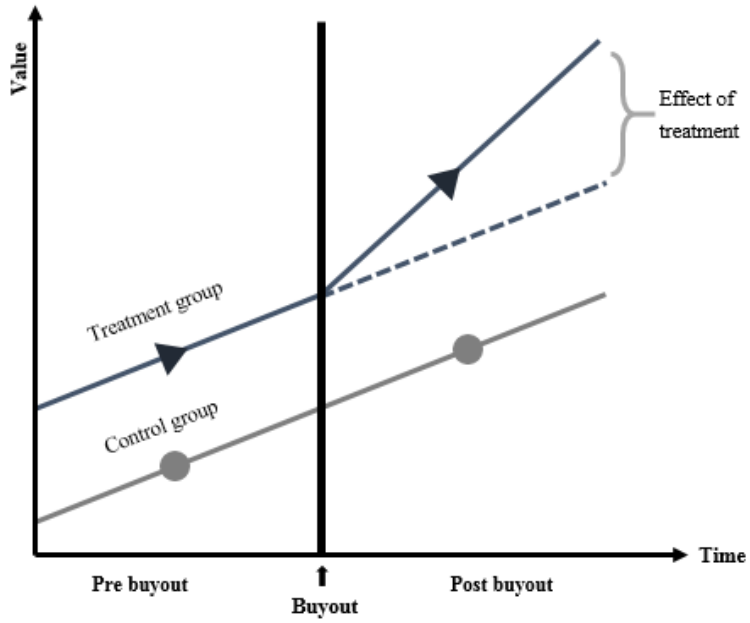
The following section is devoted to presenting the empirical models used to test the hypotheses put forward. Firstly, we specify the Difference in Difference model (DID) used in the first layer of the analysis, including assumptions and potential biases. Hereafter, the Linear Probability Model used in the second layer is introduced.

[18] For an investment to be classified as Tier 1 investment it needs not only to be in the same NACE industry code, but also directly comparable in terms of operating activities. This distinction was done manually.

6.3.1 Difference in Difference Estimation Model

DID is a statistical technique that is used to estimate the differential effect of an intervention or treatment, by comparing the outcome over time in a 'treatment group' against a 'control group' (Angrist & Pischke, 2008). The method was originally developed for social science studies but in more recent times it has seen wide usage in LBO studies (e.g. Boucly et al., 2011). By some scholars it is even considered superior for this purpose as it can estimate causal effects without experimental data (Lechner, 2011). A graphical illustration of the approach is provided below:

Figure 13 – Difference in Difference Illustration



Source: Author's own creation inspired by Angrist & Pischke (2008)

Using the operating measures defined in section 6.2.1 as the dependant variables, we perform several versions of the following baseline regression model:

$$y_{it} = \alpha + \beta_1 Dtreat_i + \beta_2 Dtime_t + \beta_3 (Dtreat_i * Dtime_t) + B_i(X') + \varepsilon_{it}$$

Where *Dtreat* is a dummy variable that takes the value one if firm *i* has been acquired in a LBO and zero if firm *i* is a control company. *Dtime* is a dummy variable that is set to zero if the observation at time *t* is prior to the acquisition and one if the observation is after the buyout. β_3 is the DID estimator, the primary variable of interest, which is the OLS estimate of the interaction term between the time and the treatment effect. *X'* is a vector of the previously described control variables used in the regressions. Standard errors are clustered at the firm level in all regressions (Bertrand et al., 2004).

6.3.2 Assumption and Limitations of the Difference in Difference Model

The DID technique builds on the general assumptions of an OLS Model, of which the most important are commonly known as MLR 1-5 or Gauss-Markow assumptions, and three additional assumptions specific to the DID approach (Angrist & Pischke, 2008). A brief overview is presented in table 6 below:

Table 6 – Overview of Statistical Assumptions

Assumption	General vs Specific	Definition	Robustness in study
1) Linear parameters	General	The specificed model must fit a linear pattern	✓
2) Random sample	General	The investegitated sample(s) must be drawn randomly	✓
3) No multicolinarity	General	Dependt variables are not perfectly correlated	✓
4) No omitted variables	General	Relevant variables must be included in the model	(✓)
5) No hetroscadicity	General	Residuals independent of range of observations	✓
6) Paralell trend	Specific	Difference between Treatment and Control is steady	(✓)
7) Random treatment allocation	Specific	Treatments firms are randomly allocated	(✓)
8) Stable groups	Specific	Treatment and Control group equal in both windows	✓

As the empirical study was designed to accommodate the MLR 1-5 assumption they are assumed to hold. For instance the studied parameters exhibit linear behaviour (ML1). Furthermore, the sample was randomly chosen by including all possible transactions (ML2). The imposing threat of omitted variable is eliminated by assuming that all relevant independent variables affecting the dependent variable are included in the model (ML4). The DID assumptions are more challenging to accommodate, hence we discuss the 'Parallel trend' and 'Random treatment allocation' more in detail.

The parallel trend assumption states that in the absence of a treatment, the performance wedge between the 'control' and 'treatment' group should remain constant over time (Angrist & Pischke, 2008). In our case, the portfolio firms and control firms should exhibit similar endogenous behaviour regardless if they were exposed to the exogenous natural experiment of being acquired. Breach of this assumption would lead to biased estimates of the causal effect[19]. There is no statistical test capable of validating the assumption, hence most researchers address the issue by thoroughly constructing a comparable post treatment group (Bertrand et al., 2004). Furthermore, a simple visual inspection of the plotted data may provide sufficient grounds to reject or accept the assumption. We follow a similar approach as multiple variables were included in the establishment of the control group. Visual tests were also made on selected dependent variables. Using the fiscal years as the time dimension, thereby flattening the treatment effect, we observe parallel performance with increased

[19] We might, for example, overstate the causal effect of PE ownership if the treatment group would exhibit superior performance regardless of whether or not they were acquired (Boucley et al., 2011).

magnitude in the differences over time as the proportion of treated firms in the treatment group increases.

The random treatment allocation states that the intervention (in this case, buyouts), should be randomly allocated conditional only on fixed effects. It is questionable whether this assumption holds in buyouts. More likely is it, that buyouts are endogenous and determined, for instance, on the expectations about future growth and profitability. If this argument holds, then our sample is subject to selection bias in which the causal effect may merely be a result of the PE funds "picking the winner". Consequently our empirical model may be subject to an endogeneity bias, and therefore the results founds should be interpreted as descriptive and indicative rather than causal (Boucly, 2011). We have sought to mitigate this limitation by including a performance measure in our selection criteria for the control group. However, as a thorough due diligence is conducted by the PE fund when selecting buyouts, it is not realistic that similar information content can be acquired from public financial data, let alone a single variable. A potential approach could have been to include only companies that had witnessed a recent change in ownership in the control group, but this would greatly restrict the potential number of includable firms.

6.3.3 Linear Probability Model

The hypothesis relating to research question 2 and 3 focuses exclusively on the 'treatment' sample hence a different, and, simpler empirical model can be used. We perform various linear OLS regressions using the following baseline model:

$$_{\Delta}y_{it} = \alpha + \beta_1 PEF + B_i(X') + \varepsilon_{it}$$

Where $_{\Delta}y_{it}$ is the change in the performance measures used in the previous model. *PEF* is the investigatory variable which changes in accordance to the hypothesis being tested. The variable is either binary or categorical, depending on the specific hypothesis. The regression model deployed changes accordingly to fit the analysed data. *X'* is again a vector of control variables used in the regressions. For each hypothesis the model is regressed two times, one for each event window.

7. Data Description and Sample Statistics

Having established the methodological approach of the thesis, the following section describes the data used for the empirical test and presents descriptive statistics for the sample. The section is divided into three parts. The first section describes the investigatory sample used in the thesis. The second part displays our data on firm- and fund-specific variables included in the study. Lastly, we present descriptive statistics for the treatment and control sample pre and post buyout.

7.1 Sample Data

We use a dataset consisting of 188 LBOs in Scandinavia from 2011 to 2016. A graphical illustration of the yearly distribution is shown below. The observed distribution in our sample mirrors that of the Scandinavian market (as seen in figure 6). Hence, our sample appears to be representative. A general consideration in relation to the investigated period is that it is characterised by a high degree of economic stability. This entails a strengthened external validity of our study which promotes a greater degree of generalisability of the findings (Kalaian & Kasim, 2012).

Figure 14: Number of Buyouts in our Sample Per Year

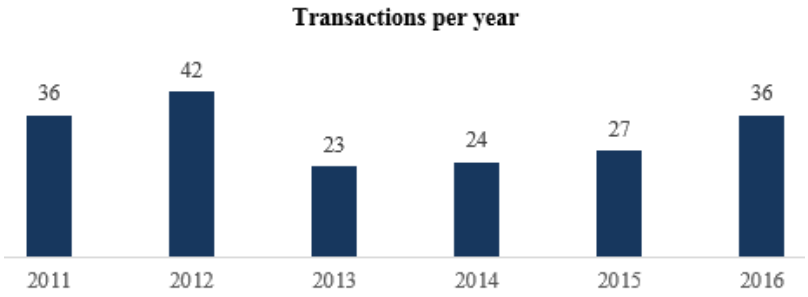


Table 7 below presents the distribution of treatment and control firms in two chosen event windows. The first thing to note is that the sample using the +3Y window is smaller than the Average sample. At the time of data collection, financial data for the fiscal year 2018 had not been made publicly available, while the fiscal year of 2019 has not ended yet. Thus, we had to exclude LBOs conducted in 2015 and 2016 in the +3Y sample. Secondly, the ratios of treatment firms to control firms are similar across the two event windows, which strengthens comparability between the two samples.

Table 7: Number of Treatment and Control Firms in the Sample Per Event Window

	Control Firms	Treatment Firms	Ratio
-1 | +3	340	106	3.21
-1 | Average	613	188	3.26

As previously established in section 2, differences exist in the PE activity level and financial disclosure requirements in the Scandinavian region. Thus, in order to ensure internal validity, it is important to examine the distribution of treatment firms across the countries. As seen in table 8 below, the sample consists predominantly of Swedish firms, while Danish firms are underrepresented. As noted in the methodology section, this distribution is affected by a less strict reporting disclosure regime in Denmark. However, as the homogeneity of the region is considered to be rather high (Spliid, 2013), we argue that this skewed country distribution only constitutes a minor limitation of this paper. Finally, we conclude that the distribution is mostly similar across the event windows, mitigating potential differences amongst the two samples.

Table 8: Country Distribution of Treatment Firms in the Sample Per Event Window

Treatment firms	Denmark	Sweden	Norway	Total
-1 | +3	11	67	28	106
% of total	10.38	63.21	26.42	100
-1 | Average	24	118	46	188
% of total	12.77	62.77	24.47	100

Table 9 below depicts the distribution of treatment and control firms based on the European Union's NACE codes, which groups and defines industries. The proportional distribution is largely equal between the two samples, thus mitigating potential industry bias across the samples. Two industries dominate the sample, namely Manufacturing, and Trade and Transport. This is in line with the traditional distribution of industries in Scandinavia, where many large industrial and shipping companies are found.

Table 9: Industry Classification of Sample Firms Per Event Window

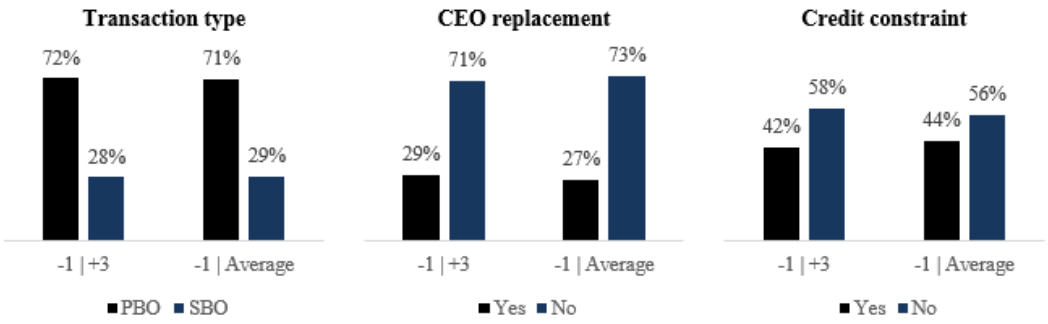
	1	2	3	4	5	6	7	8
	Manufacturing	Construction	Trade and transport	Information and communcation	Financial, insurance and real estate	Other business activities	Public administration, education and health	Arts, entertainment and other services
-1 | +3	131	33	117	73	13	60	12	7
% of total	29.37	7.40	26.23	16.37	2.91	13.45	2.69	1.57
-1 | Avg.	225	67	206	130	17	117	29	10
% of total	28.09	8.36	25.72	16.23	2.12	14.61	3.62	1.25

7.2 Dependent Variables used in Second Layer of Analysis

7.2.1 Firm-Specific Variables

The following section presents the descriptive statistics of the variables used in the empirical test of RQ2. That is, Transaction Type (PBO/SBO), CEO Replacement (Yes/No) and Credit Constraint (Yes/No).

Figure 15: Transaction Type, CEO Replacement, and Credit Constraint



To investigate the impact of Transaction Type, treatments firms are grouped into either PBOs or SBOs. As seen in the graph, there is an overweight of PBOs making up for more than 2/3rd of the buyouts in both windows. The share of SBOs is slightly lower than what Bonini (2015) observes in his sample on UK buyouts. The underrepresentation of SBOs in our sample may be ascribed to the less developed PE market in Scandinavia as previously described.

Examining the effect of CEO Replacement, treatment firms were classified dependent on whether the CEO had been replaced within 12 months of the acquisition. From the graph we observe that the CEO is replaced in roughly 1/3rd of the LBOs. This is less than what is observed globally, where CEO Replacement stood at 70% in 2017 after declining for a number of years (EY, 2018). This number, however, is measured as CEO Replacement throughout the holding period. The distribution is similar across the event windows, mitigating potential differences amongst the samples.

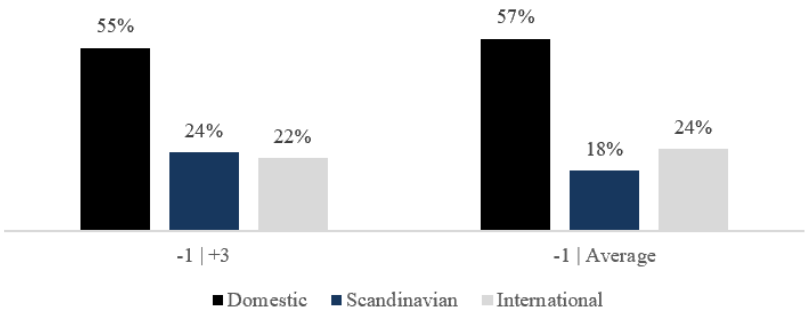
Finally, to consider the effect of a firm being credit constrained, treatment firms were grouped based on our definition and calculation of credit constraint. The graph displaying the split shows an even distribution across the event windows with a slight overweight of non-credit constrained companies. As limited research exist on Credit Constraint in PE it is not possible to compare our distribution to other studies. The equal split between the 'Yes' and 'No' may however impact our ability to generate insightful results.

7.2.2 Fund-Specific Variables

This section introduces the fund-specific variables used to test the hypotheses related to RQ3. These variables concern the geographical scope of the acquiring fund, the professional experience of the GPs, as well as the relevant industry experience of the fund.

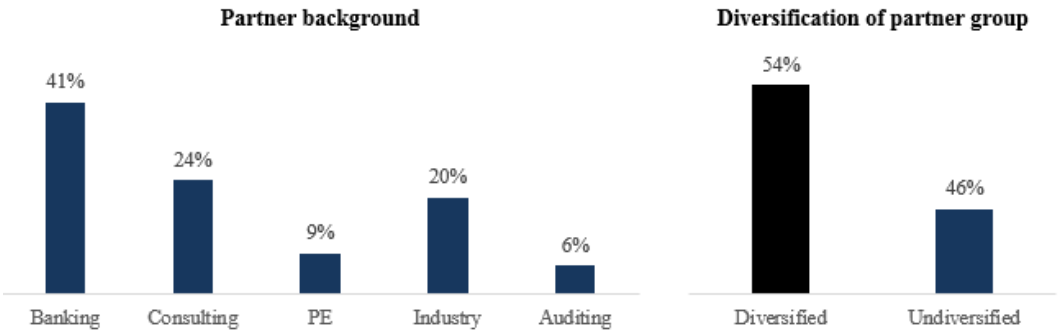
To investigate the impact of fund geography, we classified the PE funds as either Domestic, Scandinavian or International. Figure 16 below visualises the split across the two event windows. Funds operating strictly in one country are classified as Domestic, funds with multiple offices in Scandinavia are classified as Scandinavian whereas funds with locations in Scandinavia and a primary office abroad are classified as International. Domestic funds comprise more than 50% of the observation, with Scandinavian and International funds constituting about 25% each. Minor differences in the proportional split is observed in the two event windows, though it should not have any mentionable impact on the results. An interesting observation is that the decline of International buyout in the Average suggests a diminishing presence of International funds in the region. However, as it is based on relatively few transactions this is not conclusive evidence.

Figure 16: Geographical Scope of PE Funds



To investigate the impact of the professional experience we classified the lead GPs by their primary experience prior to joining a PE fund. To determine the diversification of a fund the GP group was considered jointly to assess the degree of heterogeneity in professional backgrounds. The results are presented in figure 17 on the following page. As seen, there is an overweight of partners with a background from Banking, while 24% and 20% have backgrounds from Consulting and the Industry, respectively. Next, we consider GP diversity at a fund level. Our definition yielded an even split between diversified and undiversified as seen below. The equal proportion of the two may inhibit our ability to generate insightful results on the impact of diversification.

Figure 17: Distribution of GP Background and GP Group Diversity in the Sample

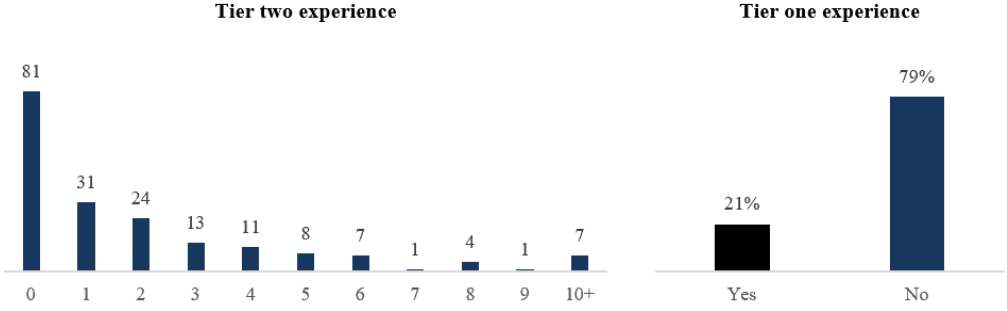


Our last hypothesis concerns the impact of fund experience on operational value creation. There are multiple ways in which experience is defined. We consider two types of experience, namely, primary and secondary subject to the comparability of previous experience to the focal buyout. Secondary, or Tier 2, experience is defined as the number of deals in the same industry as the focal buyout. Primary, or Tier 1, experience is the number of directly comparable deals to the focal buyout. The distribution is depicted in figure 18 below.

Considering first Tier 2 experience we observe a left skewed distribution of data with a small peak at the extreme upper value. This suggests that most funds are somewhat inexperienced, while a few highly specialised funds also constitute a part of our sample. For the purpose of empirically testing the effect, we group the deal into four distinct categories. Buyouts in which the acquiring fund have zero prior investments in the same industry is classified as having "No experience". When the fund has 1-4 relevant buyouts it is classified as having "Low experience", 5-10 buyouts corresponds to "Medium experience" and +10 relevant buyouts is equal to "High experience".

Considering next Tier 1 experience, we find that only 1/5th of the transactions the acquiring fund has made a directly comparable transaction to the focal buyout. This distribution is assumed to be suitable for investigating the impact of primary experience.

Figure 18: Tier Two and Tier One Experience



7.3 Descriptive Statistics

This section provides the pre and post buyout descriptive statistics for the treatment and control firms in both event windows. To support the robustness of the empirical test it is important that control and treatment firms exhibit similar behaviour in the pre buyout descriptive statistics. The tables in the following section depict whether any statistically significant differences exist between the treatment and control firms across two event windows.

7.3.1 Pre-Buyout Descriptive Statistics

Overall, it is evident from table 10 on the following page that few variations persist between the two groups across the performance measures ex-ante buyout. This suggests that the applied matching procedure has been effective. Most noticeable is the significant positive mean difference in EBITDA Growth and the significant negative mean difference in ROIC in the +3Y sample. This indicates that treatment firms exhibit higher EBITDA Growth and lower ROIC compared to the control group pre buyout. Moreover, we observe that there is a difference, at an insignificant level however, in the asset bases of the treatment and control firm. Nonetheless, these discrepancies are negligible and assumed to have little impact on the results found. Hence, we conclude that the samples are sufficiently similar for proper empirical testing.

Table 10: Pre-Buyout Descriptive Statistics

The table reports the means of the treatment and control firms in the event windows -1/+3 and -1/Average for our growth, profitability and efficiency measures pre-buyout. The column to the far right depicts the difference in the means across the two event windows and whether this difference is significantly different from zero. The standard deviation and number of observations are reported in brackets below the mean. ***, **, * denote whether the difference in the means between the treatment and the control groups in the two event windows are significantly different from 0 at the 1%, 5%, and 10% level, respectively.

		-1 | +3		-1 | Average		Variation	
		Treatment	Control	Treatment	Control	-1 | +3	-1 | Average
A.	**Growth**						
	Sales growth	0.20	0.17	0.20	0.20	0.03	0.00
	(SD)	(0.25)	(0.24)	(0.34)	(0.51)	(0.24)	(0.01)
	(n)	*(99)*	*(298)*	*(173)*	*(538)*		
	EBITDA growth	0.36	0.17	0.28	0.16	0.19*	0.12
	(SD)	(1.00)	(0.87)	(1.01)	(1.04)	(0.10)	(0.03)
	(n)	*(100)*	*(293)*	*(177)*	*(531)*		
B.	**Return**						
	ROA	0.08	-0.02	0.08	0.06	0.10	0.02*
	(SD)	(0.17)	(4.43)	(0.11)	(0.10)	(0.00)	(0.01)
	(n)	*(103)*	*(298)*	*(179)*	*(542)*		
	ROIC	-0.32	-0.18	0.17	0.12	-0.14**	0.05
	(SD)	(1.14)	(-0.71)	(0.78)	(0.61)	(0.12)	(0.05)
	(n)	*(94)*	*(266)*	*(161)*	*(520)*		
C.	**Efficiency**						
	FCF/Invested Capital	0.10	0.14	0.05	0.06	-0.04	-0.01
	(SD)	(1.04)	(0.91)	(0.82)	(0.90)	(0.11)	(0.06)
	(n)	*(94)*	*(266)*	*(161)*	*(520)*		
D.	**Control**						
	Age	22.90	25.48	20.55	23.02	2.58	2.47
	(SD)	(17.79)	(19.99)	(17.06)	(19.39)	(19.71)	(18.88)
	Asset	61.23	67.44	65.37	50.76	-6.21	14.61
	(SD)	(242.56)	(143.56)	(206.19)	(125.59)	(185.65)	(148.53)

7.3.2 Post-Buyout Descriptive Statistics

Table 11 on the next page presents the same data as the table above only it is measured post buyout. From the table we observe that differences prevail across the Growth, Return and Efficiency measures. The increased significance of the results suggests that PE ownership does impact the underlying behaviour of our performance measures. The Growth measures display a positive difference in the +3Y window, while showing a slightly negative difference in the Average window. With respect to the Return measures no impact is found on ROA, whereas the impact of ROIC is contingent on the event window. For the Average sample a positive, and significant, effect is found while a negative, but insignificant, effect is found in the +3 sample. The FCF/IC measure exhibits a

negative difference in the +3Y window and a positive difference in Average window. With respect to Assets, we observe a positive and significant difference in the Average window, which suggest an increase in the asset base after the buyout for portfolio companies relative to the control group. For the +3 sample, however, no significant difference is found thus suggesting that growth investments are made in the immediate aftermath of the acquisition. Finally, the Age statistic tells us that treatment firms are generally slightly younger than control firms, though the difference is not severe enough for the survivorship bias to have an impact.

Table 11: Post-Buyout Descriptive Statistics

The table reports the means of the treatment and control firms in the event windows -1/+3 and -1/Average for our growth, profitability and efficiency measures post-buyout. The column to the far right depicts the difference in the means across the two event windows and whether this difference is significantly different from zero. The standard deviation and number of observations are reported in brackets below the mean. ***, **, * denote whether the difference in the means between the treatment and the control groups in the two event windows are significantly different from 0 at the 1%, 5%, and 10% level, respectively.

		-1 | +3		**-1 | Average**		**Variation**	
		Treatment	Control	Treatment	Control	-1 | +3	-1 | Average
A.	**Growth**						
	Sales growth	0.08	-0.02	0.08	0.10	0.10	-0.02
	(SD)	(0.16)	(0.16)	(0.26)	(0.28)	(0.02)	(0.01)
	(n)	*(99)*	*(298)*	*(173)*	*(538)*		
	EBITDA growth	0.20	-0.27	-0.08	0.00	0.47***	-0.08
	(SD)	(1.09)	(-0.79)	(0.82)	(1.02)	(0.07)	(0.06)
	(n)	*(100)*	*(293)*	*(177)*	*(531)*		
B.	**Return**						
	ROA	0.03	-0.03	0.04	0.05	0.00	-0.01
	(SD)	(0.17)	(0.43)	(0.13)	(0.94)	(0.01)	(0.01)
	(n)	*(103)*	*(298)*	*(179)*	*(542)*		
	ROIC	-0.15	0.07	0.22	0.13	-0.08	0.09*
	(SD)	(0.90)	(0.63)	(0.69)	(0.65)	(0.09)	(0.06)
	(n)	*(94)*	*(266)*	*(161)*	*(520)*		
C.	**Efficiency**						
	FCF/Invested Capital	0.30	0.27	0.29	0.10	0.03	0.19*
	(SD)	(1.43)	(1.06)	(1.05)	(0.84)	(0.15)	(0.09)
	(n)	*(94)*	*(266)*	*(161)*	*(520)*		
D.	**Control**						
	Age	26.90	29.48	22.70	25.20	2.58	2.50
	(SD)	(17.79)	(19.99)	(17.06)	(19.39)	(19.74)	(18.86)
	Asset	81.41	84.55	69.79	52.13	-3.14	17.66*
	(SD)	(245.70)	(298.70)	(187.53)	(139.08)	(202.67)	(151.85)

8. Results and Analysis

The following section is devoted to the presentation and the analysis of the results related to the hypotheses stated in section 5. The results are produced using the statistical software STATA on the basis of the methodology and data described in section 6 and 7. The interpretation of the results is done in relation to the theoretical and empirical background. The section is structured in accordance with the research questions, that is, firstly the relative performance of PE owned companies *vis-a-vis* the control group is analysed, after which the impact of firm- and fund-specifics characteristics is investigated.

8.1 Relative Operational Value Creation in Buyouts

Hypothesis 1 states that portfolio companies of PE funds will exhibit superior performance relative to the control group across all performance measures. The rationale is that, as discussed in section 3, PE funds can implement distinctive initiatives that fuel operational value creation. Furthermore, it is expected that the magnitude of the effect is more pronounced in the event window -1Y to +3Y, under the assumption that the J-curve holds for PE value creation (Grabenwater, 2005).

8.1.1 Relative Performance on Growth Measures

As seen in table 12 on the following page, the results are for the most part supporting the hypothesis. Sales Growth is positive, and significant, with approximately 6 percentage points for the +3Y sample. For the -1 to 3Y average sample the impact is ambiguous with slightly negative but insignificant coefficients. This fits our expectations as initiatives implemented by the acquiring fund will not have an immediate effect. The results are robust to different econometric specifications using either industry control or fixed effects estimation.

Table 12: Impact of PE Aquisition on Growth Measures

The table reports the DID regressions on the Growth measures for Scandinavian buyouts in the period 2011-2016 against a control group. The dependent variables are Sales Growth and EBITDA Growth, both of which are measued as the YOY change. Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). The number of treatment firms is equal to Table 10. Each equation is modelled using industry dummies (1, 3) and fixed effects estimation (2, 4). 'Time' and 'Buyout' are dummy variables. Time equals 1 in the post-buyout period and Buyout equals 1 if the company is aquired by a PE fund. The explanatory variable 'PE Aquisition' is an interaction term that equals 1 when Time and Buyout both equal 1. The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	**(1B)**	**(2A)**	**(2B)**	**(3A)**	**(3B)**	**(4A)**	**(4B)**
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	Sales Growth		Sales Growth		EBITDA Growth		EBITDA Growth	
Constant	0.19***	0.15***	0.18***	0.13***	0.17**	0.24***	0.20**	0.16**
	(0.02)	(0.01)	(0.02)	(0.01)	(0.08)	(0.07)	(0.07)	(0.06)
Time	-0.19***	-0.09***	-0.19***	-0.06***	-0.45***	-0.16**	-0.44***	-0.11
	(0.16)	(0.01)	(0.17)	(0.01)	(0.07)	(0.06)	(0.07)	(0.08)
Buyout	0.27	0.035*	0.03	0.04	0.18	0.12	0.19	0.13
	(0.03)	(0.02)	(0.02)	(0.02)	(0.11)	(0.09)	(0.10)	(0.09)
PE Aquisition	0.06**	0.00	0.06*	-0.01	0.29*	-0.02*	0.29**	-0.02
	(0.03)	(0.02)	(0.03)	(0.02)	(0.17)	(0.12)	(0.15)	(0.12)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	0.01**	0.00	0.01**	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Industry controls	Yes	Yes	No	No	Yes	Yes	No	No
Fixed effects	No	No	Yes	Yes	No	No	Yes	Yes
Observations	794	1422	794	1422	786	1416	786	1416
Adj R^2	0.18	0.06	0.17	0.06	0.09	0.03	0.07	0.01

From a theoretical point of view there are multiple ways this pattern can be understood. One possible explanation is that PE funds alleviate the credit constraint faced ex-ante buyout thereby enabling portfolio companies to invest in previously inaccessible growth opportunities, such as new locations, products or markets (Boucly, 2011). Closely linked to this, it may be that the growth is fuelled by the portfolio companies following new and more aggressive growth strategies, such as the Buy and Build strategy (Berg & Gottschalg, 2005).

The Sales results are also in line with previous empirical research that also find positive results of approximate same magnitude (e.g. Boucly et al., 2011; Bergström et al., 2007). When interpreting results on sales, however, it should be stressed that top line growth in itself is not *per se* positive. Selling products/services at a depressed price or operating at sub-optimal scale may adversely impact Return measures, such as ROIC, which translates to eradication of shareholder value (Petersen, 2017).

Empirical support on this concern is provided by Ramezani et al., (2003) who find a negative relationship between Sales Growth and ROA/ROIC in subsequent periods. This effect may be especially pronounced in Buy and Build strategies as a vast body of literature highlights difficulties of post-merger integration as detrimental to value creation (Hitt et al., 2002).

Considering next the impact on EBITDA, we observe positive and significant results of 29 percentage points for the +3Y sample, which fits previous literature (e.g. Kaplan, 1989; Boucly, 2011). This is a rather high coefficient, but as indicated by the standard errors it derived from a dispersed dataset with sizeable outliers, and should thus be interpreted with caution. The results for the Average sample, on the other hand, are negative and significant with 2 percentage points. While the pattern is in line with the discussion above suggesting that investments in top-line growth may not be accompanied by a proportional EBITDA Growth initially, the staggering magnitude of the difference between the two windows is surprising. An explanation could be that non-recurring expenditure items prevail during the first years of ownership. It is common practice that PE funds conduct a "housekeeping" exercise following the buyout, in which the books and operations of the focal firm are tidied up to ensure coherent reporting and streamlined operations going forward (Sampson, 2010). Likewise, in large cap deals it is frequently seen that the consultancy firm that assisted in the Due Diligence phase subsequently helps implement the 100-day plan or mapping the long-term strategic agenda following the buyout. While the costs during the acquisition phase are held by the PE fund itself, the post buyout expenses are booked in the focal firm, which could have an adverse effect on EBITDA.

Another somewhat surprising result is that EBITDA Growth for the +3Y sample greatly outpaces Sales Growth despite of the above-mentioned arguments. To understand why this might be the case it would be useful to decompose the measure. At the highest level, EBITDA Growth is either fuelled by an increase in sales or a decrease in costs. Sales is a function of price and quantity, whereas costs are a function of quantity times the marginal cost plus the fixed costs. Observed improvements in EBITDA Growth must be ascribed to a positive development in one or more of these inputs. As an example, in the 3Y sample above we found an excess EBITDA Growth of 29 percentage points. Sales Growth exhibited an excess growth of 6 percentage points, implying that the bulk of EBITDA Growth stems from a more efficient cost structure. One approach to fuel profitable growth, which is advocated for by numerous practitioners, is to couple investments in top line growth with cost-out programmes

focusing on fixed costs (BCG, 2012; Oliver Wymann, 2014)[20]. An alternative road to profitable growth is to improve the Gross margin by targeting the variable cost component. Concrete initiatives could be renegotiation of supplier contracts, streamlining the manufacturing process or changing the production inputs (Scott et al., 1998).

As a closing note, it is interesting to see that 'Time' is negative and significant across all tests. This implies that firms across the sample generally perform worse in the "after" period for some reason. The 'Buyout' effect on the other hand is positive, suggesting that the treatment firms across time periods generally grows faster. This fits the observed summary statistics in section 7.

8.1.2 Impact of PE Ownership on Return Measures

As seen in table 13 on the following page the results for the Return measures are mostly negative both for ROIC and ROA, which is contradicting to hypothesis 1. ROA is negative with approximately 6 percentage points for the +3Y sample at a 5% significance level, and negative with 2 percentage points for the Average sample, at an insignificant level, however. Similar results are found using fixed effects estimation.

[20] As always when using industry sources, it is important to question the credibility as the author has commercial incentive to publish the findings. In this case though the message is coherent with the theoretical background.

Table 13: Impact of PE Aquisition on Return Measures

The table reports the DID regressions on the Return measures for Scandinavian buyouts in the period 2011-2016 against a control group. The dependent variables are Return on Assets (ROA) and Return on Invested Capital (ROIC). Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). The number of treatment firms is equal to Table 10. Each equation is modelled using industry dummies (1, 3) and fixed effects estimation (2, 4).
'Time' and 'Buyout' are dummy variables. Time equals 1 in the post-buyout period and Buyout equals 1 if the company is aquired by a PE fund. The explanatory variable 'PE Aquisition' is an interaction term that equals 1 when Time and Buyout both equal 1. The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	**(1B)**	**(2A)**	**(2B)**	**(3A)**	**(3B)**	**(4A)**	**(4B)**
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	ROA		ROA		ROIC		ROIC	
Constant	0.07***	0.08**	0.10***	0.07**	0.02	0.10**	0.10	0.06
	(0.01)	(0.01)	(0.56)	(0.01)	(0.07)	(0.04)	(0.06)	(0.04)
Time	-0.03***	-0.02**	-0.12*	-0.02**	-0.08	0.01	-0.12	0.03
	(0.00)	(0.01)	(0.62)	(0.01)	(0.06)	(0.04)	(0.06)	(0.05)
Buyout	0.03**	0.02*	0.15	0.02*	0.20	0.06	0.15	0.06
	(0.01)	(0.00)	(0.09)	(0.01)	(0.13)	(0.07)	(0.09)	(0.06)
PE Aquisition	-0.06**	-0.02*	-0.06**	-0.02*	-0.19	0.03	-0.19	0.03
	(0.02)	(0.01)	(0.13)	(0.01)	(0.17)	(0.09)	(0.13)	(0.09)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	0.00	0.01*	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Industry controls	Yes	Yes	No	No	Yes	Yes	No	No
Fixed effects	No	No	Yes	Yes	No	No	Yes	Yes
Observations	802	1442	802	1442	720	1362	720	1362
Adj R^2	0.05	0.03	0.02	0.02	0.02	0.02	0.02	0.01

The negative results are conflicting with the bulk of existing research (e.g. Kaplan, 1989; Bergström, 2007), but using a comparable sample of exclusively Danish buyouts Vinten (2008) likewise find negative impact on ROA following a buyout. Relating the results to the Growth measures it is surprising that the +3Y coefficients are negative given the observed growth in EBITDA for the same event window. One potential explanation may be that the expansion of the balance sheet following a buyout, driven by investments in growth opportunities, dominates the EBITDA Growth. Considering the Average sample next, the impact of ROA is less negative. This conflicts with the previous result of the EBITDA Growth being negative in the Average window, which should translate to a relatively poor performance on ROA in the same period. This indicates that the growth investments are gradually made over the ownership period.

ROIC is negative with 19 percentage points, but insignificant, at the +3Y window and slightly positive, but insignificant, for the Average window standing at 3 percentage points. The +3Y results

are also conflicting with our hypothesis, both in terms of direction and relative magnitude compared to the Average sample. On the basis of existing literature, we would expect a positive development in ROIC (Bergström, 2007). Furthermore, EBITDA was found to grow relatively faster in the +3Y window, which should positively influence ROIC in the same period. Likewise, the potential negative impact of transaction debt should be less penalising over time. Similar to the argument used for the negative development in ROA, it could be that the expansion of the asset base dominates growth in EBITDA and EBIT. It should be stressed, however, that the ROIC data is highly volatile and that the coefficients are not significant, suggesting that the results may be inferred by data noise.

Compared to ROA, ROIC is more negative in both event windows. This is more line with our expectations, assuming that the suggested pattern of increased investment activity following a buyout holds. EBIT, which is used as the profitability input in ROIC, includes depreciation of the expanded asset base as well as goodwill amortisation. EBITDA, on the other hand, which is used for the ROA calculation excludes these expenditures. ROIC should therefore, as it does, exhibit more extreme behaviour.

Lastly, the Time variable is again negative and significant for ROA. Buyout is positive, and significant, which indicates that isolated for time the buyouts have superior performance on ROA. In relation to the parallel trend assumption of the DID approach this is a minor weakness, but given the relatively low coefficient it is not considered critical.

8.1.3 Impact of PE Ownership on the Efficiency Measure

As illustrated in table 14 on the next page, PE ownership appears to have a positive, but insignificant, effect on operational efficiency using the FCF/IC measure. The effect is more pronounced in the Average sample, which shows a 16 and 21 percentage points increase against a 6-percentage point increase for the +3Y sample. This is in line with the proposed hypothesis and previous literature (e.g. Vinten, 2007), although the positive impact of PE ownership seems to be declining over time. The +3Y observations may, however, be subject to data noise, as large fluctuations are expected in FCF as the measure includes CAPEX which has an inherent degree of year on year volatility. This concern is also backed by the relatively large standard errors for this event window.

Table 14: Impact of PE Aquisition on Efficiency Measures

The table reports the DID regressions on the Effciency measure for Scandinavian buyouts in the period 2011-2016 against a control group. The dependent variables is Free Cash Flow (FCF) over Invested Capital (IC). Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). The number of treatment firms is equal to Table 10. Each equation is modelled using industry dummies (equaition 1) and fixed effects estimation (2).
'Time' and 'Buyout' are dummy variables. Time equals 1 in the post-buyout period and Buyout equals 1 if the company is aquired by a PE fund. The explanatory variable 'PE Aquisition' is an interaction term that equals 1 when Time and Buyout both equal 1. The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	**(1B)**	**(2A)**	**(2B)**
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	FCF/IC		FCF/IC	
Constant	0.16*	0.07	0.03	0.03
	(0.09)	(0.06)	(0.08)	(0.06)
Time	0.12	0.04	0.11	0.05
	(0.08)	(0.05)	(0.09)	(0.07)
Buyout	0.00	0.01	-0.03	-0.01
	(0.12)	(0.08)	(0.13)	(0.08)
PE Aquisition	0.06	0.21	0.06	0.16
	(0.20)	(0.12)	(0.18)	(0.12)
Total assets	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Industry controls	Yes	Yes	No	No
Fixed effects	No	No	Yes	Yes
Observations	720	1362	720	1362
Adj R^2	0.03	0.21	0.02	0.10

That FCF/IC is positive while ROIC is negative may indicate that while the accounting profitability is declining under PE ownership, the ability to generate cash is improved following a buyout. An explanation for this may the focus of many PE funds on cash conversion, the proportion of net income that is transformed into cash, which is instrumental to meet debt obligation (Berg & Gottschalg, 2005). Cash conversion is closely linked to the concept of working capital management and typically include initiatives such as inventory management and payments terms with customers/suppliers.

Another interesting finding from the above table is that despite the PE owned companies exhibiting superior growth rates, they also succeed in generating excess cash relative to the invested capital. Growth and FCF are found to be inversely correlated in the existing literature as growth, inorganic as well as organic, requires a certain degree of cash consumption (Brush et al., 2000). The

above results, while not statistically significant, provides indicative evidence for PE funds managing to mitigate this relationship.

8.1.4 Summary of Impact of PE Ownership on Performance Measures

Hypothesis 1 stated that PE ownership should have a positive impact on the financial parameters relative to the control group following a buyout. The above analysis shows that for the +3Y window this is the case on Sales Growth and EBITDA Growth, with 5% and 10% statistical significance, as well as on the FCF/Invested Capital measure at an insignificant level though. With respect to ROA and ROIC, on the other hand, negative performance relative to the control group is identified. For ROA the difference is significant at a 5% significance level, whereas the difference in ROIC is insignificant. Similar evidence is found for the Average sample, though with the difference being that EBITDA Growth is negative, Sales Growth is unchanged and ROIC is slightly negative.

On the basis of the above findings we do not find sufficient evidence to fully accept Hypothesis 1. There are indications on the value of PE ownership, but we argue that the results found are too ambiguous and that they are subject to significant data noise. The gradual improvement in Sales and EBITDA over time, however, indicates that if a longer event window were chosen the results found may have been different. Thus we partially accept hypothesis 1.

8.2 Impact of Firm Specific Characteristics on Performance Measures

The following section is devoted to investigating the impact of firm-specific characteristics on the financial performance following a buyout, as hypothesized in hypotheses 2(A)-(C). As the scope is focused exclusively on the implementation of value creating initiatives in buyouts, we are only studying the treatment group in this section. Consequently, the tests will be based on a smaller sample.

8.2.1 Relative Value Creation in PBOs and SBOs

Hypothesis 2(A) states that the operational performance improvement following a buyout should be more pronounced in PBOs relative to SBOs. The argument is that once PE investors exit a company, they will have extracted most of the value that a PE investor could generate. Empirical backing for this rational was provided by numerous scholars (e.g. Bonini, 2015; Wang, 2012). As shown in Table 15 on the following page, however, our results do not provide one-sided evidence neither for nor against the impact of PBOs against SBOs.

Table 15: Impact of Primary vs Secondary Deals on Performance Measures

The table reports the OLS regressions on the PBO measure for Scandinavian buyouts in the period 2011-2016. The dependent variables are Sales Growth, EBITDA Growth, ROA, ROIC and FCF/IC. Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). The number of treatment firms is equal to Table 10. Equations are modelled using industry dummies.

Tier 1 is a dummy variable that equal 1 when the aquiring fund has Tier 1 experience and 0 otherwise. The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	(1B)	(2A)	(2B)	(3A)	(3B)	(4A)	(4B)	(5A)	(5B)
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	Sales Growth		EBITDA Growth		ROA		ROIC		FCF/IC	
Constant	0.30***	0.16***	0.66**	0.10**	0.13***	0.13**	0.29**	0.23*	0.20	0.17**
	(0.11)	0.02	(0.18)	(0.02)	(0.02)	(0.03)	(0.06)	(0.11)	(0.24)	(0.06)
Primary	**0.03**	**-0.01**	**0.15**	**-0.02*** **	**-0.04**	**0.02*** **	**-0.48****	**0.36**	**-0.14**	**0.10**
	(0.04)	0.03	(0.31)	(0.01)	(0.04)	(0.00)	(0.24)	(0.09)	(0.55)	(0.09)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	0.00	-0.01	0.00	0.00	0.00	0.01	0.02	0.01	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)
Industry controls	YES	YES	YES	YES	YES	YES	YES	YES	Yes	YES
Observations	198	350	200	354	206	358	188	322	188	322
Adj R^2	0.15	0.39	0.58	0.62	0.10	0.14	0.04	0.07	0.02	0.04

No significant results are found for Sales Growth and FCF/IC for which the direction of the result in both cases is contingent on the event window. EBITDA Growth is slightly negative with 2 percentage points, and significant at a 1% significance level, for the Average sample. ROA shows a modest positive development for the Average sample with a statistical significance of 1%. Lastly, ROIC is highly negative for the +3Y sample at a 10% significance level.

With respect to the Growth measures our expectation was that SBOs would exhibit negative performance compared to PBOs, as value creating initiatives such as access to growth capital already had been implemented during the previous ownership. Consequently, the most obvious and profitable growth opportunities should have been exhausted already. Our results, however, does not seem to fit this argumentation as the only significant result is a 2-percentage points underperformance on EBITDA in the Average sample. A potential explanation for this ambiguous performance is that in PBOs, in contrast to SBOs, the management is experiencing a buyout situation for the first time. As managing an M&A process is highly demanding on the management the lack of experience may translate to sub-pair performance in the initial period following a buyout (Gossens et al., 2012). On a similar note, it is likely that the management, especially in the small/mid cap segment who typically

are less experienced, may require some time to get used to the ways of working under PE ownership. The observed relatively poor performance on Growth measures in the Average sample lends credence to these arguments.

With respect to the Return measures, PBOs were expected to outperform as the value enhancing initiatives used by PE funds would already have been implemented in SBOs. We find mixed evidence suggesting an ambiguous impact of PBOs. Evers and Hege (2012), who find comparable results argue that the lack of conclusive evidence may stem from in-sample differences. Specifically, they argue that market conditions, such as the "hotness" of the IPO market and the "Pressure-to-exit", impacts the value creating potential in SBOs. In a hot IPO market SBOs are more likely to represent the lemons as better firms are IPO'd[21]. On the other hand, SBOs from a fund with a "Pressure to exit", e.g. a fund close to expiration date or a fund looking to convince investors during a fundraising process, may offer a bigger operational upside as the divestment decision is biased by the pressure to exit. Internal factors of the focal company will obviously also impact the value creating potential. An argument in favour of superior performance in SBOs could be that the previous owner has ensured a streamlined and capable organization that is ready to execute on the new strategic agenda. BCG (2016) finds that Buy & Build strategies perform better in SBOs for this reason. Furthermore, there will be lower information asymmetry between new owners and management, as the management has proved capable of paying down the LBO debt once before (Evers & Hege, 2012). On the other hand, it may be that the previous PE owner has postponed strategic investment to make the portfolio company as lean as possible at exit to maximize the sales price. This could hurt profitability in the following year as "catch-up" investments has to be made (Freelink & Volosovych, 2012). While this effect may prevail in PBOs as well, we argue that it is less pronounced as PE funds are more experienced in the deal phase (Berg & Gottschalg, 2005). Lastly, SBOs may suffer from a double negative impact of transaction goodwill as the initial amount may not have been fully amortized.

With respect to the Efficiency measure we experience an increase for the +3Y window and a decrease for the Average window, both at an insignificant level. In both cases the coefficients report

[21] The impact of this effect is hypothesised to primarily be of relevance in Sweden that has vastly more developed primary financial market. In Denmark, for instance, only 6 companies were IPO'd since 2010 (DVCA, 2018). The IPO window of opportunity for PE funds is also highly sensitive to reputational spill over risk from other fund's IPOs.

high standard errors, suggesting significant data noise within the sample, thus making it hard to draw any conclusive evidence for or against the potential of PBOs.

8.2.2 The Impact of CEO Replacement

Hypothesis 2(B) states that the relative performance in buyouts where the CEO is replaced within 12 months of the acquisition should outperform other buyouts. The argument being that PE funds through their network can appoint skilled managers who are experienced in leading companies under PE ownership (Berg & Gottschalg, 2005). Table 16 below shows that partial support for the hypothesis is found.

Table 16: Impact of CEO Replacement on Performance Measures

The table reports the OLS regressions on the CEO Replacment measure for Scandinavian buyouts in the period 2011-2016. The dependent variables are Sales Growth, EBITDA Growth, ROA, ROIC and FCF/IC. Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). The number of treatment firms is equal to Table 10.. Equations are modelled using industry dummies.
Tier 1 is a dummy variable that equal 1 when the aquiring fund has Tier 1 experience and 0 otherwise. The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	**(1B)**	**(2A)**	**(2B)**	**(3A)**	**(3B)**	**(4A)**	**(4B)**	**(5A)**	**(5B)**
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	Sales Growth		EBITDA Growth		ROA		ROIC		FCF/IC	
Constant	0.24**	0.18	0.63***	0.55***	0.12**	0.11***	0.16	0.03	0.00	-0.03
	(0.09)	0.26	(0.19)	(0.14)	(0.03)	(0.01)	(0.15)	(0.14)	(0.26)	(0.07)
CEO Replacement	**0.05**	**0.09****	**-0.03**	**0.47*****	**0.00**	**0.00**	**-0.15**	**0.04**	**0.34**	**-0.38**
	(0.64)	0.01	(0.14)	(0.13)	(0.05)	(0.02)	(0.11)	(0.16)	(0.31)	(0.39)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Industry controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	198	350	200	354	206	358	188	322	188	322
Adj R^2	0.16	0.22	0.22	0.30	0.09	0.10	0.08	0.02	0.02	0.03

Positive and statistically significant results, at respectively 5% and 1% level, are found for Sales Growth and EBITDA Growth in the Average sample. For ROA no impact is found, whereas for ROIC and FCF/IC the direction of results is dependent on the event window. These results are all insignificant though.

The Growth measures yield the most consistent results, with all but one being positive and two of the three being significant. This is in line with our expectations and existing literature (e.g.

Harris & Parrino, 1999). That the effect is so pronounced may relate to the deal types in our sample. Numerous Scandinavian buyouts, particularly in the small/mid cap segment, is a part of succession in family firms (Spliid, 2007). Following a buyout, the founding family may gradually step down from operations, and new professional management is onboarded (Scholes et al., 2012). As the new management are less invested, both financially and emotionally, they are more willing to pursue risky and aggressive growth strategies which fits the found results (Elsaid & Ursel, 2011). Likewise new CEOs may be more prone to unremittingly cut financial slack for the same reasons. The results are significantly stronger in the Average sample both for EBITDA and Sales. This compliments the existing literature that find a declining value of CEO replacement over time as firm performance converges towards the mean (Leker & Salomo, 2000).

For ROA and ROIC no clear pattern nor significant results are observed. This is against our expectations as well as the results found by Cornelli and Karakas (2011), who investigated CEO replacement in UK buyouts. The lack of evidence can potentially be ascribed to the argument of a lag in the effect of growth investments on Return measures, used in section 8.1, also being applicable in the context of CEO replacement. The FCF/IC measure provides no valuable insights as the results appear to be driven by data noise given the great standard errors.

To sum up, significant evidence is found in favour of Hypothesis 2(B) with respect to the Growth parameters, but no conclusive evidence is found with respect to Return and Efficiency. After-rationalising, the ambiguous evidence is in itself not surprising as a strong management team is a key investment preference for many PE funds (DVCA, 2017). It would thus be counterintuitive if the PE fund immediately replaced a strong management. If the management team in the acquired firm in fact is qualified, their performance should be also be on pair with buyouts where new managements teams are hired. Thus, to reap greater insights about the consequences following a CEO replacement future studies might need to consider factors such as the characteristics of the CEO as well as the firm performance pre buyout. The upside potential of a CEO replacement is, *ceteris paribus*, greater in scenarios where the replaced CEO has underperformed (Chen & Hambrick, 2011). This falls outside the scope of this study, however.

8.2.3 The Impact of Credit Constraint

Hypothesis 2(C) states that the relative value creation in buyouts is greater in portfolio companies that were credit constrained prior to being acquired. The rationale for this hypothesis is that PE funds can facilitate growth by alleviating the credit constraint, thereby allowing the target to

exploit previously inaccessible growth opportunities (Boucly et al., 2011). We thus expect credit constrained companies to grow relatively faster post buyout. As illustrated in table 17 below, however, the exact opposite pattern seems to prevail.

Table 17: Impact of Credit Constraint on Performance Measures

The table reports the OLS regressions on the Credit Constraint measure for Scandinavian buyouts in the period 2011-2016. The dependent variables are Sales Growth, EBITDA Growth, ROA, ROIC and FCF/IC. Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). The number of treatment firms is equal to Table 10. Equations are modelled using industry dummies.
Tier 1 is a dummy variable that equal 1 when the aquiring fund has Tier 1 experience and 0 otherwise. The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	**(1B)**	**(2A)**	**(2B)**	**(3A)**	**(3B)**	**(4A)**	**(4B)**	**(5A)**	**(5B)**
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	Sales Growth		EBITDA Growth		ROA		ROIC		FCF/IC	
Constant	0.20**	0.17***	0.66**	0.47***	0.12***	0.12***	0.25*	0.13	0.16	-0.02
	(0.07)	0.02	(0.18)	(0.15)	(0.02)	(0.01)	(0.15)	(0.10)	(0.36)	(0.16)
Credit Constraint	**-0.11****	**-0.04**	**0.15**	**-0.01**	**0.02**	**0.01**	**0.25**	**0.35****	**0.26**	**-0.16**
	(0.04)	0.05	(0.32)	(0.16)	(0.03)	(0.02)	(0.30)	(0.14)	(0.53)	(0.26)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	-0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.01
	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Industry controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	198	350	200	354	206	358	188	322	188	322
Adj R^2	0.10	0.24	0.16	0.18	0.03	0.06	0.05	0.02	0.02	0.03

The primary variable of interest in relation to the hypothesis is Sales Growth. Credit constrained companies, however, experience a 11 percentage points and 4 percentage points slower Sales Growth for the +3Y and the Average samples respectively. The former coefficient is statistically significant at a 5% level, whereas the latter is insignificant. These results are inconsistent with previous literature as well as the proposed hypothesis (Boucly et al., 2011). As our sample consists mostly of private-to-private deals, in which the effect should be especially strong, the found results are peculiar. Furthermore, we would expect a spill over effect on the EBITDA Growth, yet this seems not to be the case as no significant results are found.

We argue that the disconnect between results and theory could be ascribed to measurement errors arising from methodological issues. Our methodology, which is inspired by previous research (Boucly et al., 2011), assumes that operating below peers in terms CAPEX and leverage is an unambiguous consequence of being credit constrained. In practice, however, this needs not to be the

case. Rather it may represent a deliberate strategic choice. In fact, within capital structure theory much effort has been devoted to understanding the so-called "zero-leverage puzzle", that is, firms with access to external financing that nevertheless uses zero capitalization (Strebulaev & Yang, 2012). Certainly firms like Microsoft and Apple, who for many years operated with zero leverage, are by no means credit constrained although they might be flagged so using our methodology. Likewise, it can be argued that high CAPEX, in itself, is not desirable either. Rather, firms are assumed to focus on maximizing the effect of growth CAPEX, that is, pursue only the most profitable growth opportunities in the most efficient manner possible. Likewise, firms strive to minimize capital outlay related to maintenance CAPEX (Brealy et al., 2016). These arguments illustrate a significant weakness in the methodology and the results should thus be interpreted in an accordingly precautious manner. An alternative approach could be to measure leverage ratio, or the gearing, post acquisition although this would probably bias the results as PE funds generally use more leverage (Berg & Gottschalg, 2005).

Aside from Sales Growth ambiguous behaviour is observed for the other parameters. The only significant result is ROIC being positive for the Average sample. However, as neither of the parameters are directly linked to the credit constraint hypothesis, the results are not discussed further.

8.2.4 Summary of Impact from Firm Characteristics on Performance Measures

Hypothesis 2(A) stated that superior performance should be observed in PBOs, as the value creating levers of PE funds are assumed not be fully exhausted. Our empirical evidence, however, does not provide sufficient backing to accept this hypothesis. Rather we found statistically significant results suggesting that PBOs perform worse on EBITDA Growth and ROIC, compared to SBOs. With respect to ROA, however, significant positive results were found for PBOs in the Average sample. Collectively these results indicate that value creation is equally, if not more, likely in SBOs. We thus partially reject hypothesis 2(A).

Hypothesis 2(B) stated that CEO replacement should yield relatively greater operational performance, as the instalment of a new professional and incentivised management is a PE value lever (Berg & Gottschalg, 2005). Our results show a significant positive impact on the Growth measures, both Sales and EBITDA, whereas the Return and Efficiency measures remained unchanged. We argue that these results may, in part, be driven by the new CEOs being less emotionally and financially invested, and thus more willing to pursue risky growth strategies. Over time, however, a mean reverting behaviour was observed. Collectively, the evidence leads us to partially accepting H2(B).

Hypothesis 2(C) stated that greater value creation should be observed in firms with low financial flexibility pre buyout, as being acquired could alleviate the credit constraint and allow access to previously inaccessible growth investments. Our results show the exact opposite relationship, namely a significant negative impact on Sales Growth for firms classified as being credit constrained. We argue that the results may be blurred by a methodological weakness in relationship to the "zero leverage puzzle" and assumption made on CAPEX patterns. Regardless of these potential methodological flaws, we find strong support to reject H2(C).

8.3 Impact of Fund-Specific Characteristics on Performance Measures

The following section is devoted to investigating the impact of fund-specific characteristics on the financial performance following a buyout, as hypothesized in hypotheses 3(A)-(E). The investigatory sample is identical to the one studied in the previous section. As none of the control variables yielded any significant impact, we report simplified tables in the following section. The full statistical results are found in appendix 2-5.

8.3.1 Impact of Fund Geography on Performance Measures

Hypothesis 3(A) states that the magnitude of value creation varies across the performance parameters depending on the geographical scope of the acquiring fund. The rationale being that while Domestic funds benefits from the geographical proximity when providing advisory and monitoring, International funds may possess greater network and knowledge about new target markets that is useful in driving top line growth (Sorenson & Stuart, 2001; Scelatto & Ughetto, 2012). Scandinavian funds are expected to generate intermediate results as they positioned in between the two extremes. As illustrated in table 18 on the following page, the results are partially in line with our expectations.

Table 18: Impact of Fund Geography of Acquiring Fund on Performance Measures

The table reports the OLS regressions on the Fund Geography measure for Scandinavian buyouts in the period 2011-2016. The dependent variables are Sales Growth, EBITDA Growth, ROA, ROIC and FCF/IC. Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). The number of treatment firms is equal to Table 10. Equations are modelled using industry dummies.

'Domestic' is a dummy variable that equal 1 when the aquiring fund is Domestic and 0 otherwise. 'Scandinavian' and 'International' are likewise dummy variables with similar specifications . The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	**(1B)**	**(2A)**	**(2B)**	**(3A)**	**(3B)**	**(4A)**	**(4B)**	**(5A)**	**(5B)**
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	Sales Growth		EBITDA Growth		ROA		ROIC		FCF/IC	
Constant	0.19*	0.16	0.61**	0.63***	0.13***	0.11***	0.04	-0.03	0.01	0.07
	(0.09)	0.22	(0.30)	(0.22)	(0.03)	(0.00)	(0.18)	(0.12)	(0.30)	(0.15)
Domestic	**0.04**	**-0.02**	**0.19**	**0.09**	**0.03**	**0.00**	**0.00**	**-0.04**	**-0.04***	**0.02**
	(0.04)	0.03	(0.39)	(0.13)	(0.02)	(0.00)	(0.25)	(0.16)	(0.51)	(0.36)
Observations	54	101	52	101	55	106	50	97	52	90
Adj R^2	0.10	0.08	0.18	0.35	0.09	0.06	0.04	0.06	0.03	0.05
Constant	0.21**	0.16	0.45***	0.41**	0.10***	0.10***	0.29**	0.17*	0.14	0.06
	(0.05)	(0.25)	(0.13)	(0.10)	(0.01)	(0.01)	(0.15)	(0.13)	(0.30)	(0.08)
Scandinavian	**0.04**	**-0.08*****	**-0.45****	**-0.26**	**-0.03**	**0.00**	**0.01**	**0.01**	**0.17**	**-0.07**
	(0.06)	0.18	(0.26)	(0.19)	(0.04)	(0.01)	(0.55)	(0.16)	(0.47)	(0.24)
Observations	24	31	26	32	25	31	23	27	22	39
Adj R^2	0.13	0.09	0.28	0.20	0.12	0.06	0.08	0.07	0.11	0.12
Constant	0.25***	0.18	0.59**	0.52**	0.13***	0.12***	0.20	0.07	0.14	0.02
	(0.06)	(0.26)	(0.14)	(0.12)	(0.01)	(0.01)	(0.18)	(0.12)	(0.30)	(0.09)
International	**0.10***	**0.09*****	**0.18**	**-0.07**	**-0.01**	**0.01**	**-0.01**	**-0.04**	**0.39**	**0.04**
	(0.06)	(0.03)	(0.24)	(0.10)	(0.05)	(0.01)	(0.39)	(0.13)	(0.55)	(0.32)
Observations	21	41	22	44	23	42	21	37	20	32
Adj R^2	0.11	0.09	0.20	0.28	0.11	0.08	0.13	0.10	0.11	0.1

With respect to the Growth measures, we find that International funds do exhibit superior performance across both Sales and EBITDA. The relationship is strongest for Sales in which International funds achieve an excess growth rates of 10 and 9 percentage points, for the +3Y and Average window respectively. The former is statistically significant at a 10% level and the latter at a 1% level. This is complementary to what is found in previous studies (Scelatto & Ughetto, 2012). The Domestic funds are, in line with expectations, performing slightly worse on the Sales Growth but comparable on EBITDA Growth. Yet, neither of the results are statistically significant. The modest difference between the two indicates that it is an oversimplification to assume that Domestic funds are less top line focused. After all, not all growth strategies are about internationalisation (Berg & Gottschalg, 2005). The Scandinavian funds seem to underpeform, thereby indicating that there is no

golden mean betweeen proximity and international outlook. However, as the evidence is based on relatively few deals the above results need to interpreted with caution and are by no means conclusive.

With respect to the Return measures no consistent pattern can be interpreted from our results. Most of the coefficients across both geography and performance measures are around zero and insignificant. This conflicts with our expectations of Domestics funds exhibiting superior performance on Return measures, due to more efficient mitigation of agency problems given the geographical proximity (Sorensen & Stuart, 2001). We would argue that two factors may cause this discrepancy between theory and our results. Firstly, the literature suggesting an inverse relationship between distance and efficiency of monitoring is relatively dated. The rapid technological development in recent years has easened the process of distant monitoring and thus the mitigation of agency problems. Secondly, many of the International deals in our sample are done by "mega funds"[22] such as KKR and Bain Capital who are assumed to have sufficient resources and capabilities to carry out effective distant monitoring (Harris et al., 2014). Also, it is questionable whether proximity in itself leads to better monitoring. More likely is it instead, that it leads to a different and less formel monitoring style that goes beyond scheduled board meetings and monthly reports.

Lastly, for the FCF/IC an ambigiuous pattern was found as well. The Domestic sample showed statistically significant negative performance at a 10% level for the +3Y sample, yet the performance was positive for the Average sample. The International funds exhibited superior performance although the high standard errors indicate that the results may be coincidental. The Scandinavian funds overperformed for the +3Y sample, but underperformed for the Average sample. In sum, the mixed evidence with high volatility and low number of transactions does not allow for any valuable conclusions.

8.3.2 Impact of GP Background

Our empirical study on the impact of GP background is twofold. First, the professional background of the lead GP is studied, after which the effect of of a diversified partner group is investigated in the next coming section. Hypothesis 3(B) states that the relative value creation would wary across the performance parameters in accordance to the professional experience of the GP. The rationale is that as GPs come from different backgrounds, they have acquired distinctive skillsets and networks, which might influence their operational focus in portfolio companies (Loos, 2007). Based

[22] Mega fund is a term used in the industry to describe particularly large PE funds. The cut-off for classifying varies according to source but is typically around 5bn USD (Pitchbook, 2018).

on the results from Acharya et al., (2013) we would expect GPs with a Banking and Auditing backgorund to outperform with respect to Growth measures, whereas Consulting should show superior performance on the Return and Effiency measures[23]. As seen in Table 19 below, the results are partially aligned with the hypothesis.

Table 19: Impact of Lead Partner Background on Performance Measures

The table reports the OLS regressions on the GP Background measure for Scandinavian buyouts in the period 2011-2016. The dependent variables are Sales Growth, EBITDA Growth, ROA, ROIC and FCF/IC. Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). The number of treatment firms is equal to Table 10. Equations are modelled using industry dummies.

'Banking' is a dummy variable that equal 1 when the lead GP has Banking background and 0 otherwise. 'Consulting' and 'Auditing' are likewise dummy variables with similar specifications . The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	**(1B)**	**(2A)**	**(2B)**	**(3A)**	**(3B)**	**(4A)**	**(4B)**	**(5A)**	**(5B)**
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	Sales Growth		EBITDA Growth		ROA		ROIC		FCF/IC	
Constant	0.25**	0.18***	0.49***	0.54***	0.13**	0.12***	0.18**	0.06	0.07	0.00
	(0.08)	(0.03)	(0.23)	(0.14)	(0.03)	(0.01)	(0.08)	(0.12)	(0.27)	(0.10)
Banking	**0.11**	**0.02**	**0.02**	**0.34**	**-0.03**	**-0.01**	**-0.18**	**-0.10**	**0.08**	**-0.06**
	(0.08)	(0.05)	(0.55)	(0.25)	(0.60)	(0.03)	(0.18)	(0.92)	(0.42)	(0.15)
Observations	34	70	38	79	40	70	34	66	36	66
Adj R¨2	0.11	0.22	0.19	0.24	0.12	0.06	0.11	0.08	0.03	0.05
Constant	0.23**	0.18**	0.67**	0.59**	0.11***	0.10***	0.01	0.00	0.13	0.04
	(0.07)	(0.03)	(0.16)	(0.14)	(0.02)	(0.01)	(0.10)	(0.14)	(0.31)	(0.07)
Consulting	**-0.01**	**0.00**	**0.20**	**0.13**	**0.04**	**-0.02**	**-0.05**	**-0.04**	**0.20**	**0.05**
	(0.06)	(0.08)	(0.58)	(0.18)	(0.04)	(0.03)	(0.17)	(0.13)	(0.21)	(0.23)
Observations	44	73	44	74	46	78	42	68	41	68
Adj R¨2	0.12	0.18	0.28	0.15	0.10	0.06	0.11	0.03	0.05	0.08
Constant	0.22***	0.16***	0.48**	0.43**	0.13***	0.10**	0.26	0.18*	0.15	0.08
	(0.06)	(0.03)	(0.23)	(0.18)	(0.02)	(0.01)	(0.24)	(0.10)	(0.31)	(0.12)
Auditing	**-0.18*** **	**-0.02**	**-0.42**	**-0.78** **	**-0.01**	**0.02**	**0.42**	**0.25***	**-0.05**	**0.03**
	(0.05)	(0.08)	(0.45)	(0.34)	(0.07)	(0.03)	(0.58)	(0.13)	(0.54)	(0.38)
Observations	21	32	18	34	17	31	18	27	17	27
Adj R^2	0.13	0.18	0.23	0.34	0.10	0.06	0.12	0.06	0.06	0.07

With respect to the Growth measures Banking shows positive coefficients for both Sales and EBITDA, at an insignificant level, however. The direction of the results is in line with the previous findings of Acharya et al., (2013) who argues that a close network within the financial industry

[23] While"Private Equity", "Industry" and "Other" were also included as categories when mapping the GP backgrounds, neither of these partners served as lead partner on deals.

provides access to attractive add-on acquisiton. Furthermore, Bankers will have aquired competencies in the M&A process which is useful in structuring the transaction and integrating the add-on acquisition. Auditing, on the other hand, does not yield results in line with expectations as significant negative coefficients are found both for Sales and EBITDA. Loos (2007) who find similar underpeformance, though measured by IRR, suggests that a broader skillset than financial analysis and auditing is required to succeed in value creation. While there may be some grounding in this slightly stereoptypical argument, it should be stressed that the Auditing sample is very small and vulnerable to data noise. Lastly, GPs with a Consulting background performs mediocrely at an insignificant level on the Growth parameters as theorised.

Considering next the Return measures, we find negative, but statistically insignificant, performance amongst GPs with a Banking background. This is in line with the findings of previous studies who ascribe this to be a result of overconfidence on deals or a lag in realisation of synergy effects[24] (Acharya et al., 2013; Loos, 2007). GPs with a Consulting background generate mixed results, with the ROIC results being slighly negative at an insignificant level. While this is contradicting with previous studies, it could be a product of a relatively dispersed data, as illustrated by high standard errors, which might bias the results (Acharya et al., 2013). Lastly, GPs with an Auditing background significantly outperforms, especially on the ROIC parameter. This is somewhat dubious considering the significant underperformance on the Growth measures. It may be a result of asset trimming on the balance sheet, but more likely it is driven by data noise in the small sample and thus not representative. In general our methodology fails to account for GPs with professonal experince in multiple roles. These will be stricly classifed into one role although their skillset is multidimensional thus potentially blurring our results.

With respect to the Efficiency measure we mostly find ambiguous insignificant results. The Consulting group, however, stands out in a slighlty positive manner with positive coefficients for both event windows, though at an insignificant level. Theoretically this may be understood as Consultants having a strong operational focus which translates to improved efficiency (Acharya et al., 2013).

[24] That results are insignificant could be ascribed to some of the acquisitions led by GPs with a Banking background not including any M&A post buyout. Had we studied only these buyouts, the effect is expected to be more pronounced.

8.3.3 Impact of GP Diversity

The second investigative aspect in relation to the professional background of GPs concerns the professional diversity amongst the GPs in the partner group. Hypothesis 3(C) states that the relative value creation should be greater in buyouts acquired by funds with a diversified GP team. The rationale is that portfolio companies draw on the joint experience, network and competencies of the GP group, and thus a heterogenous GP group should be value enhancing (Loos, 2007). As seen in Table 20 below our results are ambiguous in relation to the hypothesis.

Table 20: Impact of Partner Diversity on Performance Measures

The table reports the OLS regressions on the GP Diversity measure for Scandinavian buyouts in the period 2011-2016. The dependent variables are Sales Growth, EBITDA Growth, ROA, ROIC and FCF/IC. Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). The number of treatment firms is equal to Table 10. Equations are modelled using industry dummies.

Tier 1 is a dummy variable that equal 1 when the aquiring fund has diversified partner group and 0 otherwise. The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	**(1B)**	**(2A)**	**(2B)**	**(3A)**	**(3B)**	**(4A)**	**(4B)**	**(5A)**	**(5B)**
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	Sales Growth		EBITDA Growth		ROA		ROIC		FCF/IC	
Constant	0.20**	0.17***	0.19*	0.46**	0.12**	0.12**	0.33**	0.08	0.04	0.00
	(0.06)	0.03	(0.07)	(0.13)	(0.02)	(0.02)	(0.11)	(0.07)	(0.29)	(0.14)
Diversified GP	**-0.11*** **	**0.00**	**0.07**	**-0.19***	**0.03**	**0.01**	**0.48***	**0.13**	**0.55** **	**-0.04**
	(0.33)	0.02	(0.08)	(0.10)	(0.03)	(0.02)	(0.32)	(0.12)	(0.26)	(0.23)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	-0.01	0.00	-0.01	0.00	0.00	-0.01	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Industry controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	99	175	100	177	103	179	94	161	94	161
Adj R^2	0.12	0.09	0.04	0.05	0.09	0.05	0.03	0.09	0.07	0.04

With respect to the Growth measures Sales is negative with 11 percentage points at a 1% statistical significance level for the +3Y window. Likewise EBITDA Growth is negative with 19 percentage points with 10% statistical significance. While no impact is observable on ROA, a positive, and statistically significant, impact is found for ROIC in the +3Y sample. Lastly, the FCF/IC measure is significantly positive for the +3Y sample, but negative in the Average window.

Collectively, the above results suggest that the impact of GP diversity is negative on the Growth measures, but positive on Return and Efficiency. The seemingly scattered impact of Diversity is not theoretically grounded and thus hard to interpret. In more general contexts, that is, outside PE,

managerial diversity is generally found to improve performance by being multidimensional in the analytical work and thus capable of overcoming complex and changing environments (Carpenter & Fredrickson, 2001; Marcus, 2002). The lack of consistency in the results could be linked to our methodology. As seen in section 7 there was a relatively equal split between being diversified and not, with 56% and 44% respectively. Less ambiguous result may have been found had we chosen a stricter classification criteria to qualify as being diversified. However, as no studies previously have investigated the impact of GP diversity it could merely be that is has no specific impact on value creation in PE.

8.3.4 Impact of Secondary Experience on Value Creation

Our empirical study on the impact of previous experience is twofold. First, the secondary experience, measured by the number of buyouts within the same industry, is analysed, after which the primary experience, measured by the homogeneity between the focal deal and previous buyouts is investigated. Hypothesis 3(D) states that the relative value creation is positively influenced by secondary experience, also defined as Tier 2 experience. The argument is that the learning curve effect should be applicable in a buyout context. As seen in Table 21 on the following page the impact of Tier 2 experience seems to be mostly positive as hypothesised.

Table 21: Impact of Tier 2 Experience on Performance Measures

The table reports the OLS regressions on the Tier 2 Experience measure for Scandinavian buyouts in the period 2011-2016. The dependent variables are Sales Growth, EBITDA Growth, ROA, ROIC and FCF/IC. Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). The number of treatment firms is equal to Table 10.. Equations are modelled using industry dummies.

'None' is a dummy variable that equal 1 when the aquiring fund has no Tier 2 experience and 0 otherwise. 'Low', 'Medium' and 'High' are likewise dummy variables with similar specifications . The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	**(1B)**	**(2A)**	**(2B)**	**(3A)**	**(3B)**	**(4A)**	**(4B)**	**(5A)**	**(5B)**
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	Sales Growth		EBITDA Growth		ROA		ROIC		FCF/IC	
Constant	0.24***	0.17***	0.37*	0.37*	0.11**	0.11***	0.01	0.05	-0.05	-0.09
	(0.06)	0.03	(0.20)	(0.20)	(0.02)	(0.01)	(0.23)	(0.14)	(0.23)	(0.08)
None	**0.34**	**-0.07***	**-0.08***	**-0.08**	**-0.01**	**-0.04****	**-0.20**	**0.20***	**-0.94**	**-0.32**
	(0.04)	0.03	(0.05)	(0.05)	(0.04)	(0.02)	(0.21)	(0.10)	(0.68)	(0.22)
Observations	43	78	41	76	44	81	40	68	41	70
Adj R^2	0.11	0.29	0.31	0.34	0.12	0.08	0.03	0.08	0.06	0.08
Constant	0.23**	0.17	0.62**	0.62**	0.13**	0.12***	0.19	0.03	0.25	0.19
	(0.08)	0.23	(0.20)	(0.20)	(0.03)	(0.01)	(0.14)	(0.14)	(0.37)	(0.14)
Low	**0.03**	**0.05****	**-0.29*****	**0.20**	**0.05***	**0.04****	**-0.05**	**-0.26****	**0.21**	**0.22**
	(0.07)	0.03	(0.05)	(0.07)	(0.03)	(0.02)	(0.25)	(0.21)	(0.38)	(0.16)
Observations	44	80	45	80	46	81	43	76	41	76
Adj R^2	0.10	0.24	0.16	0.37	0.10	0.05	0.11	0.03	0.04	0.05
Constant	0.21***	0.18***	0.54**	0.54**	0.11***	0.11***	0.30	0.15	0.08	0.13
	(0.07)	0.03	(0.19)	(0.19)	(0.02)	(0.01)	(0.09)	(0.10)	(0.32)	(0.10)
Medium	**-0.22**	**0.02**	**0.06**	**-0.20**	**-0.11**	**0.01**	**0.67****	**0.31**	**1.76*****	**-0.08**
	(0.18)	0.09	(0.22)	(0.17)	(0.10)	(0.00)	(0.29)	(0.21)	(0.35)	(0.39)
Observations	8	11	8	13	9	12	8	13	8	11
Adj R^2	0.12	0.08	0.18	0.33	0.11	0.06	0.04	0.04	0.10	0.09
Constant	0.22***	0.18***	0.55**	0.54**	0.12***	0.11***	0.18	0.08	0.06	0.04
	(0.07)	(0.03)	(0.18)	(0.18)	(0.02)	(0.01)	(0.13)	(0.12)	(0.27)	(0.08)
High	**0.15***	**0.12**	**1.04*****	**1.29****	**-0.05*****	**-0.01**	**0.45****	**-0.30**	**3.29*****	**1.14**
	(0.06)	(0.11)	(0.15)	(0.58)	(0.06)	(0.02)	(0.17)	(0.09)	(0.27)	(0.88)
Observations	4	6	5	5	4	5	3	4	4	4
Adj R^2	0.10	0.08	0.16	0.09	0.18	0.07	0.03	0.06	0.08	0.10

Considering first the Growth parameters we observe, as hypothesised, a somewhat positive development as experience increases. Sales and EBITDA are both significantly negative for buyouts where the acquiring fund has no relevant experience prior to acquiring the focal firm. At a Low degree of experience, however, we observe significant positive results for Sales while EBITDA remains negative at an even higher significance level. If the acquiring fund has High experience in a given

industry, we find significant positive results, especially for EBITDA, although it should be stressed that this is based on a very small sample[25].

With regards to the Return parameters, the pattern in the results is less consistent. Considering first ROA, we initially observe a shift from negative coefficients in the None experience sample to two positive coefficients with 10% and 5% statistical significance in the Low sample. However, the marginal learning curve for ROA seems to be negative as the impact is mostly negative for the Medium and High sample. For ROIC, on the other hand, the exact opposite relationship seems to hold. That is, going from None to Low experience has a negative impact, whereas the effect is positive when experience is Medium and High. The lack of consistency implies that causal effect is biased and that the results thus should be interpreted with caution.

Finally, the FCF/IC parameter seems to offer the most compelling evidence in favour of the hypothesis, as an exponential improvement in the coefficients can be observed. Once again, however, it may be that the results are blurred by relatively low number of buyouts in each sample.

Collectively, our results are mostly aligned with previous studies that find experience, or specialisation as it is a proxy for, to positively influence value creation (Cressy et al., 2011; Loos, 2007). Theoretically it can be explained by the fund gradually accumulating tacit knowledge and developing competencies within a given industry that can be applied in focal buyouts (Yelle, 1979). Relating it to the initial value levers described, experienced funds can for instance provide better advisory and are likely to have a more valuable network (Berg & Gottschalg, 2005). That the value of experience is heterogeneous across operational parameters is somewhat surprising. An explanation may be that the ease of implementing initiatives is different across the operational parameters. The commonly used 100-day plans will often include a number of "quick wins" by targeting the low hanging fruits, such as renegotiating payment terms or putting contracts out to bid (EY, 2019). These initiatives are easily replicated and could be drivers of why for instance FCF/IC has consistently high performance. Improving Return measures, on other hand, typically requires a more firm-specific strategy thus flattening the slope of the learning curve.

Lastly, it is somewhat dubious that the marginal gain of experience is negative for some of our results, such as ROIC going from positive to negative when moving from No to Low experience. Theoretically this may be explained by the fact that frequent repetitions, in this case buyouts in a

[25] The "High" sample consists predominantly of highly specialised funds such as G Square Capital and Energy Ventures that invest exclusively in Healthcare and Oil & Gas respectively.

given industry, promotes the development of organizational routines that reduces the level of attention paid (Nelson & Winter, 1982). The lack of attention increases the risk of superstitious learning and inaccurate application of experiences gained in previous transactions (Loos, 2007). In practice, highly experienced funds may become overconfident and instinctively repeat the implementation of value creating initiatives, inconsiderate of the unique context of the focal buyout. While this line of argumentation is well grounded theoretically, the multidirectional pattern could also merely be the result of data noise given the relatively small samples.

In sum, our results for H3(D) are mostly in favour for acceptance. The marginal gain of experience is strongest going from None to Low experience, except for EBITDA, but positive impact is also observable beyond this stage. For FCF/IC the relationship even seems to be exponentially positive.

8.3.4 Impact of Primary Experience on Value Creation

The second dimension of our empirical study on experience relates to the homogeneity between the focal deal and previous buyouts. Hypothesis 3(E) states that the magnitude of value creation is positively influenced by the comparability of previous acquisitions. The argument is that in more homogenous buyouts the acquiring fund is more likely to recognize and mitigate particularities that might arise in the focal buyout (Loss, 2007). As seen in Table 22 on the following page, strong evidence is found in favour this hypothesis.

Table 22: Impact of Tier 1 Experience on Performance Measures

The table reports the OLS regressions on the Tier 1 Experience measure for Scandinavian buyouts in the period 2011-2016. The dependent variables are Sales Growth, EBITDA Growth, ROA, ROIC and FCF/IC. Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). The number of treatment firms is equal to Table 10. Equations are modelled using industry dummies.

Tier 1 is a dummy variable that equal 1 when the aquiring fund has Tier 1 experience and 0 otherwise. The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	**(1B)**	**(2A)**	**(2B)**	**(3A)**	**(3B)**	**(4A)**	**(4B)**	**(5A)**	**(5B)**
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	Sales Growth		EBITDA Growth		ROA		ROIC		FCF/IC	
Constant	0.23***	0.17***	0.58**	0.56***	0.11	0.11	0.23**	0.13*	0.16	0.13*
	(0.07)	0.02	(0.21)	(0.15)	(0.32)	(0.10)	(0.10)	(0.09)	(0.31)	(0.09)
Tier 1 Experience	**0.00**	**-0.03**	**0.66*** **	**0.15**	**-0.04**	**0.01**	**0.22**	**0.35****	**1.07***	**0.35****
	(0.05)	0.32	(0.17)	(0.18)	(0.57)	(0.11)	(0.17)	(0.14)	(0.71)	(0.14)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	-0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Industry controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	99	175	100	177	103	179	94	161	94	161
Adj R^2	0.09	0.08	0.03	0.06	0.10	0.05	0.03	0.02	0.06	0.03

Considering first the Growth parameters, primary experience seems to have no impact on Sales Growth. This is in strong contrast to our previous results on secondary experience, which showed a significant positive relationship. EBITDA, on the other hand, is now significant a 1% percent level for the +3Y sample. The Average sample is positive, but insignificant, which indicates that the results are potentially biased by extreme observation in year 3 or a gradual development prevails. These results also greatly diverge from the Tier 2 experience that showed a mostly negative impact. The sharp difference between primary and secondary experience is quite remarkable. One explanation could be that the learning curve for Sales Growth is more influenced by the absolute sum of experiences and less by the homogeneity of these. As some of the initiatives to fuel top line growth, such as refocusing channel programmes or reinforcing sales representatives, are relatively simple and non-contextual, it seems logical that they can be successfully applied across buyouts (Bain & Company, 2018). The initiatives that drive EBITDA, on the other hand, may be more novel and specific to a given context. If this argumentation holds then it makes sense that a mere replication of initiatives in a given industry would yield poor EBITDA results, as found for Tier 2 experience, but targeted implementation in more comparable firms generates excess performance as seen above.

Considering next the Return parameters, the coefficients are mostly positive especially ROIC for the Average sample that is statically significant at a 5% level. This is in line with our expectations and previous studies on the specialisation hypothesis (Cressy et al. 2007, Lossen, 2006). That the impact of ROIC dominates that of ROA could indicate that Invested Capital Management is especially effective in buyouts with high comparability. This argument may also hold for the FCF/IC measure which is statically significant at a 5% and 10% level for the Average and +3Y sample respectively.

In sum, primary experience seems to have a positive impact on operational value creation as hypothesised. The magnitude of the effect varies across the parameters, which could be related to the novelty the initiatives implemented by the PE fund. An important point to make is that primary experiences needs not only to be industry specific as investigated in our study. Instead funds may accumulate specialised knowledge on strategic areas, such as expansion into a given market, digitalisation or industry consolidation. It could be equally interesting to study the effect of these, although it will be harder to define such experience.

8.3.5 Summary of Impact from Fund Specific Characteristics on Performance Measures

Hypothesis 3(A) stated that the relative value creation post buyout should vary in accordance to the geographical scope of the acquiring fund. Specifically, it was hypothesised that superior performance on Growth and Return measures should be generated by International and Domestic funds, respectively. Our empirical evidence is partly aligned with these expectations. While International funds did return significant positive results on Sales Growth, EBITDA Growth yielded no differential results. With respect to the Return measures no significant difference was identified. Collectively, this allows only for a partial acceptance of H3(A).

Hypothesis 3(B) stated that the relative magnitude of value creation should vary across the parameters contingent on the professional background of the lead GP in the focal buyout. Our results show a significant underperformance on the Growth measures for GPs with an Auditing background. On the other hand, Auditors exhibited superior performance on the Return measures especially on ROIC which returned significant results. Contradictory to our expectations no significant impact was found on any parameters for GPs with Consulting and Banking backgrounds, although the direction fitted previous literature (Acharya et al., 2013). This leads us to partially accepting H3(B).

Hypothesis 3(C) stated that superior performance post buyout should be found amongst buyouts with a diversified GP group. No one-sided evidence was found for nor against. The Growth parameters exhibited significant negative coefficients, whereas ROIC and FCF/IC was positive and significant. We argued that the classification methodology could have generated a sub-optimal distribution, and in turn generate ambiguous results. However, as the impact has not previously been studied it is unclear whether any effect should be observed. Regardless of the methodological impact our evidence prompts a rejection of H3(C).

Hypothesis 3(D) stated that experience of the acquiring fund, measured by deal count in the industry of the focal buyout, should amplify the value creation. However, the impact of Tier 2 experience, as we phrase it, yields ambiguous results. Generally, the marginal value of experience was found to be positive, especially from the None experience to Low, across most parameters. The High experience showed extraordinarily good and significant results, but this was argued to be related to the relatively small samples. The Growth measures indicated a somewhat linear benefit of experience, whereas the effect on Efficiency was exponential. The impact on the Return parameters seemed more inconsistent, hence we can only partially accept H3(D).

Hypothesis 3(E) stated, on a similar note, that the magnitude of value creation in the focal buyout is contingent on the direct comparability of previous acquisitions. The results were predominantly in line with expectations, as positive significant results were found for EBITDA, ROA and FCF/IC. We observed a differential pattern across parameters on the value of Tier 1 and Tier 2 experience, with the former being beneficial primarily in relation to the Return and Efficiency measures. Thus, we find evidence to fully accept H3(E).

8.4 Summary of Results

Upon having reviewed all the empirical results it is evident that while evidence in favour of PE ownership is found, few definitive conclusions can be made as illustrated in table 23 on the next page. In the following section we will briefly review our results jointly and discuss potential intercorrelations.

Table 23 - Summary of Emperical Results for the Hypotheses

Number	Hypothesis	Evidence
H1	PE ownership has a postive impact on operational value creation	(✓)
H2(A)	Relative value creation is greater in PBOs compared to SBOs	(×)
H2(B)	Replacing the CEO following a buyout has a positive imapact on relative value creation	(✓)
H2(C)	The impact of PE ownership is relatively greater in credit constrainted firms post buyout	×
H3(A)	Geographical scope of the aquiring fund impacts the relative split of value creation	(✓)
H3(B)	The professional experience of the lead GP will impact the split of relative value creation	(✓)
H3(C)	Diversification in the professoinal experience of the GP group postively impacts value creation	×
H3(D)	The degree of secondary experience will positively impact operational value creation	(✓)
H3(E)	The degree of primary experience will positively impact operational value creation	✓

For hypothesis 1 we found positive significant results for the Growth measures, though only in the +3Y window, while the Return measures were negative with ROA being significant. The impact of Efficiency was ambiguous. Jointly these results correspond to a partial acceptance.

The firm-specific hypotheses showed mixed results. H2(A) provided no clear evidence in favour of PBOs. In fact, there was a slight overweight in the results in favour of SBOs, thus the hypothesis was partly rejected. We found partial evidence in favour for the CEO replacement hypothesis, though the effect seemed to be short term and limited to the Growth measures, hence H2(B) was partially accepted. The credit constraint hypothesis showed inverse performance of the hypothesised relationship and H2(C) was thus strictly rejected.

The fund-specific hypotheses likewise returned inconclusive results. The results for H3(A) showed only modest impact of the geographical scope of the acquiring fund on the operational focus, and was thus only partially accepted. We found partial evidence in favour of H3(B), though the impact was concentrated amongst GPs with auditing background. No decisive evidence was found in favour of GP diversity, hence H3(C) was rejected. The impact of experience was mostly found to be positive. Significant variation was observed across parameters, in relation to the magnitude as well as the sensitivity to primary and secondary experience. Jointly the evidence allowed for partial acceptance of H3(D) and full acceptance of H3(E).

What can be interpreted on the basis of above is that the common denominator is a somewhat scattered impact of PE ownership. There is an overweight of positive results suggesting that PE ownership is value enhancing. The ambiguity in the first layer results, however, may have an unfortunate trickle-down effect on our subsequent tests on identifying drivers of the observed value creation. Evidently it is harder to investigate the underlying sources of a scattered pattern.

Acknowledging this we devote the following sections to discussing potential measurement errors in the study and how it might bias our results. Likewise we afterwards outline the inherent limitations of the methodology applied.

9. Validity of Results

In the following we discuss how our construction of the empirical study may have encouraged measurement errors that bias our results. Specifically we consider i) outlier treatment, ii) sample uniformity and iii) excluded observations. Lastly, we discuss how the premises of value creation in PE might be challenged by an alternative "picking the winner" argumentation.

9.1 Winsorization Robustness Test

One caveat that could have influenced the validity of our results is the outlier treatment used. We followed a paired trimmed mean approach excluding observations more extreme than the 5^{th} and 95^{th} percentile. The number of observations excluded is relatively large but given the volatility of our data we argued that it was a prerequisite to generate normalised results. However, an obvious concern is that by omitting the tails of the distribution our results are vulnerable to measurement errors. To empirically test the substance of this concern we rerun our test related to hypothesis 1 using a winsorized estimator instead. Rather than excluding outliers, they are replaced by adjacent values, in this case by being set equal to the most extreme observations allowed within the distribution. This approach mitigates the risk of post hoc alteration by including the tails, though normalising them to restrict the impact on the kurtosis of the distribution (Angrist & Pischke, 2008). As seen in Table 24 on the following page, the alternative specification of the distribution has a moderate influence on our results.

Table 24: Impact of Winzorised mean on Performance Measures

The table reports the OLS regressions on the Growth, Return and Efficiency measures for Scandinavian buyouts in the period 2011-2016 using a windorized estimator. A full sample, corespodning to 106 and 188 treatments firms are included in the +3Y and the Average models respectively. Equations are modelled using industry dummies. All other econometric specifications are identical to those of Table 12-14.

The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	(1B)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)	(5a)	(5b)
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	Sales groth		EBITDA Growth		ROA		ROIC		FCF/IC	
Constant	0.17	0.16	0.20	0.20	0.08	0.08	0.07	0.09	0.00	0.00
	(0.02)	(0.14)	(0.08)	(0.06)	(0.00)	(0.00)	(0.06)	(0.06)	(0.09)	(0.08)
Time	-0.15***	-0.09***	-0.28***	-0.19***	-0.03***	-0.01**	-0.03	0.00	0.21**	0.21***
	(0.02)	(0.12)	(0.07)	(0.05)	(0.00)	(0.00)	(0.06)	(0.05)	(0.08)	(0.08)
Buyout	0.02	0.00	0.19**	0.17**	0.02	0.02***	0.22**	0.18**	0.13	0.11
	(0.02)	(0.02)	(0.09)	(0.07)	(0.01)	(0.00)	(0.11)	(0.10)	(0.13)	(0.12)
PE Aquisition	**0.01**	**0.03**	**0.19**	**-0.18***	**-0.04****	**-0.03****	**-0.18**	**0.02**	**-0.20**	**-0.08**
	(0.29)	(0.18)	(0.15)	(0.17)	(0.03)	(0.12)	(0.24)	(0.23)	(0.19)	(0.17)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Industry controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	892	1602	892	1602	892	1602	892	1602	892	1602
Adj R^2	0.02	0.07	0.05	0.03	0.08	0.03	0.03	0.02	0.02	0.01

Neither of the results, except for the FCF/IC measure, observe a directional change as a consequence of the alternative outlier treatment. However, in term of statistical significance we observe a more scattered pattern. Compared to the results found in Table 12–14, a windorized estimator only yields significant results for ROA and EBITDA as seen above. The dispersal of previously significant results can be ascribed to increased standard errors as a consequence of the more scattered data. This increases the statistical uncertainty and consequently lowers the significance of the coefficients. Consequentially, the interpretation of our results should be done with a certain degree of precaution, as a different outlier specification would have yielded different results. In the following section we discuss how the lack of uniformity in our sample may be a driver of this weakness in robustness.

9.2 Uniformity of Sample

In our methodological section it was described how we strived for the largest possible sample and thus included all appropriate transactions. The argument was that a greater sample increased the

representativeness of the study. A counterargument could be that it is an (over)simplification to assume that all Scandinavian PE transactions are alike, and thus conducting a undeferential study will produce inconsistent results biased by data noise.

An example might be useful in illustrating the point. The largest observation in our sample, measured by revenue, is Hilding Anders that has more than 1bn EUR in revenue. The firm was acquired by KKR, one of the oldest and largest PE funds worldwide. The smallest observation, on the other hand, is ILT Inläsningstjenste with around 1mn EUR in revenue. ILT was acquired by Karnell, a Swedish small cap fund. While the absolute size difference in it itself is not problematic as we use scaled variables, it is questionable whether the impact of PE ownership is comparable in the two scenarios. Arguably the value levers implemented in the portfolio company differ vastly depending on whether the acquiring fund is KKR or Karnell, who represent two opposite ends of a scale, when looking at fund and deal size. Consequentially it may be hard to get one-sided results on the value of PE ownership as well as the impact of various initiatives implemented.

A mitigating counterargument is that we found only minor impact of fund geography, which is good proxy for the size of the fund, on the performance parameters (Harris et al., 2014). However, differentiating more strictly between fund size may have provided results with less impact of data noise. In particular the inclusion of small cap deals increases the vulnerability towards measurement errors, as large YOY deviations are frequently witnessed, given the small accounting figures in absolute terms. Furthermore, Phalippou and Zollo (2005) find that small inexperienced funds are the main drivers of inferior performance amongst PE funds.

9.3 Early Exists and Bankruptcies

Another measurement error may arise as a consequence of our selection criteria for treatment firms. As described in the methodology section only buyouts with sufficient financial data available post-buyout were included. By implication firms that defaulted within the first three years of ownership were not included. Likewise only buyouts that had not been exited by the PE fund within the analysed period were included. Assuming that a positive relationship between early exit and superior value creation prevails, then we effectively exclude both top performing and bottom performing buyouts (Povaly, 2007). This could potentially bias our results.

Excluding companies that face bankruptcy might induce a survivorship bias that positively skews our results. On the other hand, by excluding the accelerated exits we might negatively skew

our results as the top performing investments are not considered. As we have two opposing effects the net impact depends on the relative magnitude of the two. Axelson et al., (2015) find that less than 5% of buyouts default during PE ownership. On the other hand, historical data shows that up to 30% of buyouts are exited within the first four years of ownership (Preqin, 2015). For our sample, however, the effect was less pronounced as approximately 10% of the potential sample in the +3Y window was excluded due to early exit.

The above data points allow for no definite conclusion on the direction of the bias. We cannot say whether the bankruptcy rates are applicable in Scandinavia. Neither can we without further testing validate the assumed positive impact on value creation from excluding early divestments. However, it does indicate that we have might have an adverse bias on the value of PE ownership.

9.4 Picking the Winner Explanation

While our results mostly suggest a positive impact on value creation in PE-owned companies, the dispersed evidence prompts the question whether the observed development *de facto* is a function of PE ownership. An alternative explanation could be that the buyout decision itself is endogenous and determined, for instance, on expectations about future growth and profitability. If this holds then the causal effect, superior performance, may merely be ascribed to superior screening capabilities of the PE fund.

While the literature in a PE context is scarce, screening capabilities is a widely debated topic in the field of Venture Capital (Metrick & Yasuda, 2011). VC funds invest at a stage in the firm life cycle where information asymmetry and uncertainty are severe, as many firms have yet to proof their commercial validity. Thus it is essential to accurately screen the potential of the business model. Whilst VC funds incontestably play an active role in the value creation process, some researchers find that the true differentiator between the top funds and other funds is their screening capabilities (Kaplan, 2009; Nahata, 2008). Top performing funds consistently succeed in investing in the winning business models of tomorrow whilst mostly bypassing the lemons. The question is whether this also holds for PE funds.

Considering two concrete cases from Denmark may help us substantiate the discussion. In 2008, just before the financial crisis, the two Danish consumer companies Pandora[26] and Babysam[27]

[26] A Danish jewellery firm with international presence
[27] A Danish brick and mortar retailer of equipment for babies

were acquired by Axcel and Polaris, respectively. IPO'd only two years later Pandora turned out to be one of the best PE investments ever made in Europe, while Babysam after a significant turmoil during the financial crisis only recently recovered to status quo on its financial figures (Hall, 2014; Høyer, 2018). Considering only these two cases one might argue that Polaris is inferior at value creation or that Axcel is extraordinarily skilled. In practice, however, the story might be multidimensional. Pandora was built on a, at the time, unique business model with a low initial out of the pocket cost to acquire a bracelet but a strong focus on repeat buy in the form of 'charms'. While Axcel incontestably had an instrumental role in the strategic execution and thus the operational value creation, it may be argued that the Pandora case had an inherent degree of "winner" in it. Babysam, on the other hand, suffered from a decline in the fertility rate, lower consumer spending and a reduced traffic in physical stores as a consequence of increased popularity of ecommerce. Consequentially the company was close to bankruptcy during the financial crisis. However, in collaboration with Polaris the management succeeded in a turnaround by increasing the online presence and streamlining the network of physical stores (Høyer, 2018). Analysing this investment case, it may be argued that Babysam, on the other hand, had an inherent degree of "loser" in it.

While no definite conclusion can be drawn on the basis of these two examples in isolation, they illustrate that the "picking the winner" argument has some grounding in a PE context as well. It is arguably less pronounced than in VC given the lower uncertainty and degree of novelty, but after all, PE funds spend sizable amount on Due Diligence processes to validate the commercial potential and ensure that they invest in the winners. That operational value creation in part may be influenced by screening capabilities is in itself not problematic, as the magnitude of return, not the source of it, is the primary variable of interest for investors. In the context of our study, however, it implies that extra caution should be made when evaluating the ability of PE funds to fuel operational value creation as it may be influenced by a degree of "luck".

10. Limitations

Having reviewed the potential measurement errors arising from our statistical approach, the following section is devoted to discussing the limitations of this thesis, which could pose a threat to the internal and external validity of the results. Firstly, the validity of the data will be critically challenged, after which the methodological limitations will be discussed.

10.1 Data Validity

An important limitation of this paper is the selection bias that arose during the data gathering process. Potentially this could bias our establishment of causal relationship and in turn effect the ability to generalise the found results. The first section discusses potential validity issues stemming from the exclusion of particular transaction types, whereas the second section consider the uneven geographical split of our sample.

During the data gathering process it quickly became evident that divisional buyouts had to be excluded from the sample as the available financial data did not suffice for the analysis. Except for divisions of conglomerates, financial statements for divisions are seldom publicly available as they for the most part are consolidated under the parent company. The exclusion of divisional buyouts, which might exhibit different behaviour relative to other buyouts, limits the validity of the results and the comparability to other studies of PE performance. Likewise, the low prevalence of public-to-private (PTP) buyouts in the region implied that no such transactions were included in the sample. The lack of PTP transactions weakens the ability to generalise our results to other geographies, especially to the US and the UK where PTP transactions historically have been highly prevalent (Desbrieres and Schatt, 2002). Finally, we had to exclude ‘consolidation deals’ due to the uncertainty in establishing pro forma accounts on the basis of limited insight.

Another potential bias is the unequal distribution of countries in our sample where an overweight of Swedish observation prevailed as seen in table 8. While this in part may be ascribed to difference in activity levels, it is largely accredited to differences in the disclosure duties within the Scandinavian region. In Denmark, for instance, companies are not obliged to publish all line items on their financial statements. In many cases firms choose not to report revenue figures, hence they had had to be excluded from the study. While the exact impact of this matter is difficult to estimate, we do not consider this skewness a major limitation due to the homogeneity within the region.

10.2 Methodological Limitations

The following section discusses issues related to methodological limitations. The first section considers alternative variables and matching criteria, whereas the latter section examines our choice of event windows.

10.2.1 Alternative Variables and Matching Criteria

An important factor to consider critically is whether the selected estimators of Growth, Return and Efficiency are exhaustive and appropriate in their measurement of performance. As discussed in section 6, several alternative measures could have been included in the analysis, which may have had an impact on the direction and magnitude of the results found. However, due to data availability and the limited scope of the assignment we have chosen to focus on a few selected key measures of performance. As the chosen parameters find robust grounding in the existing literature, this is only considered a minor limitation (e.g. Kaplan, 1989; Bergström et al., 2007; Boucly et al., 2011). Furthermore, we could have chosen additional control variables in addition to the ones used, namely company age, company industry and company size. For instance, it may have been interesting to control for add-on acquisitions during the holding period as previously mentioned. However, as neither of the control variables yielded any significant results it is doubtful whether the inclusion of additional variables had yielded any impact. Another interesting perspective relates to the matching procedure of control firms. An additional matching criterion could be to only consider control firms that also had experienced a recent change in ownership. Under the assumption that ownership change is endogenous, these control firms may have been more comparable ex-ante buyout. This would, however, greatly limit the size of the control group as relatively few firms would fit all criteria.

10.2.2 Alternative Event Windows

Another limitation to have in mind when considering the conclusions of this thesis, is the impact from the selection of specific event windows in the measurement of value creation. We chose a +3Y and Average event window, and thus our approach estimated the impact of PE ownership until three years into the ownership period. As the typical holding period of PE firms is 3-7 years, however, our approach fails to capture the total value creation. After three years, some of the planned initiatives by the PE funds may either not have been implemented yet or the effect of them has not fully materialised. Thus, we might underestimate the value of PE ownership. To mitigate this, a more adequate way of measuring the full benefits of PE ownership, could be to examine the effect only

once the PE fund exits the portfolio company (Muscarella & Vetsuypens, 1990. However, two main problems arise with this methodology. First, a broader event window, as measured by the number of years, would require further data points, thus restricting the potential size of our sample even further. Secondly, as PE funds typically stay longer in distressed portfolio companies, it is likely that this sampling methodology will be biased towards well-performing firms (Vinten, 2008). These firms would require fewer data points and thus be more accessible.

11. Conclusion

The purpose of this thesis was to explore the impact of PE ownership on operational value creation in a Scandinavian context. Operational value creation was defined based on financial measures grouped into three categories: Growth, Return and Efficiency. The analysis was structured into two distinctive layers. In the first layer it was examined whether PE ownership generates superior operational performance relative to a control group of non-PE backed firms. The second layer investigated whether selected firm- or fund-specific characteristics influenced the relative value creation amongst buyouts

The first part of the empirical study showed an ambiguous impact on operational value creation in buyouts. On the Growth measures, evidence was found in favour of superior value creation in PE-backed companies. For the +3Y event window, Sales Growth and EBITDA Growth were both positive and significant. It was argued that, amongst other initiatives, PE funds can alleviate the credit constraint faced ex-ante buyout thus providing access to previously inaccessible growth opportunities. Both measures revealed an apparent lag in the effect of PE ownership, as it did not prevail in the Average sample. We argue that the lag could be ascribed to growth investments and their effect occurring gradually. Further, non-recurring expenditures and general housekeeping may adversely impact Growth measures in the immediate aftermath of the buyout. With respect to the Return measures, the observed evidence was against the hypothesised impact of PE ownership. ROA was negative, and significant, for both event windows whereas ROIC was negative in the +3Y sample and positive in the Average sample, although both register at insignificant levels. That the Return measures were negative despite a growing top line indicated that the expansion of the balance sheet, following investments in growth and increased leverage, dominated the profitability increase. Lastly, the Efficiency measure yielded a positive but insignificant effect on FCF/IC. This complemented our expectations on PE funds focusing on cash conversion, e.g. through working capital initiatives, to be able to pay off the acquisition debt. The above evidence collectively supports partial acceptance of the hypothesis on superior operational value creation in buyouts.

The second part of the analysis investigated the impact of firm- and fund-specific characteristics on the relative value creation within buyouts. Considering first the firm-specific initiatives, a modest impact on value creation was found. No categorical evidence was found for nor against PBOs relative to SBOs. It was argued that a mixture of internal factors, such as the experience of management in working under PE ownership, as well as external factors, such as the pressure to

exit of the PE fund, jointly generated an ambiguous pattern. The PBO hypothesis was thus partially rejected. The impact of CEO replacement was found to have a short-term effect on the Growth measures. In the Average sample, Sales and EBITDA both witnessed a significant increase in buyouts with a new CEO, which could be ascribed to the new CEO being less financially and emotionally invested. Consequentially, greater willingness to pursue risky growth strategies and unremittingly cut financial slack should prevail. Over time, however, performance converged towards the mean, which allowed for a partial acceptance of the CEO replacement hypothesis. Lastly, a firm being credit constrained ex-ante buyout was found to have a negative impact on the ex-post value creation. As this sharply conflicted with the hypothesised relationship it was strictly rejected. It was argued that the disconnect could stem from methodological issues.

With respect to the fund-specific characteristics, a modest impact on relative value creation was identified. As hypothesised, the geographical scope of the acquiring fund did influence the post-acquisition operational focus. Specifically, International funds exhibited superior performance on the Growth measures, attributable to a larger network and experience in internationalisation. No noteworthy differences were observed on the Return and Efficiency measures, hence, the hypothesis was partially accepted. Next, the impact of GPs professional backgrounds was found to influence the relative value creation. The effect was, however, concentrated amongst GPs with an Auditing background, and manifested as underperformance on Growth measures but outperformance on Return measures. As no significant impact was found for Banking and Consulting backgrounds the GP hypothesis was only partially accepted. The heterogenous performance impact was argued to be linked to the skillset and network acquired in various GPs' previous roles. The effect of a diversified GP team was also investigated, though the hypothesis was strictly rejected as no significant results were found. It was argued that the inconclusive results were a consequence of the classification methodology generating an unsuitable sample distribution. Lastly, the effect of secondary (Tier 2) and primary (Tier 1) experience was investigated. Predominantly a positive relationship between experience and value creation in the focal buyout was found. The impact was especially pronounced going from None to Low experience. Across the performance parameters a differential effect of primary and secondary experience was observed. Secondary experience yielded the most persuasive evidence on the Sales Growth and FCF/IC measures, corresponding to partial acceptance of the hypothesis. Primary experience exhibited a relatively stronger impact on EBITDA Growth and Return measures. As a positive impact also was found on Sales Growth and FCF/IC, the hypothesis was fully

accepted. It was argued that the difference could be explained by the novelty of implemented value creating levers.

Following the analytical part of our thesis, we discuss the validity and robustness of our results. The discussion revolved around three focus areas. Firstly, the robustness of the chosen outlier procedure was tested by rerunning the empirical test in the first layer of the analysis using a winsorized estimator. Whilst the statistical significance of the results diminished, the direction remained mostly unchanged. The lowered statistical certainty, however, underpins that the results are interpretive rather than strictly causal. Next, we discussed how the vast in-sample differences as well as the exclusion of early exits and defaults could evoke measurement errors. Finally, we question whether the basic premises of operational value creation in buyouts builds partially on a "picking the winner" explanation.

Despite these apparent methodological limitations of our study and the prospective biases, we would argue that this study adds valuable insights to Scandinavian PE literature. First, we found indicative evidence of superior performance in PE-backed companies. The magnitude of the effect, however, was vaguer than in other geographies though this may be ascribed to the design of the study. Second, we established a foundation for further research on the impact of firm- and fund-specific characteristics on relative performance in buyouts. Especially interesting would be to study the impact of experience in more detail, using different specifications of experience than 'deal count' in a given industry. Finally, PE practitioners can reap insights into how specific GP backgrounds alter the operational value creation.

12. Managerial and Academic Implications and Areas of Future Research

Having reviewed the main findings of this thesis, the following section seeks to put these findings into perspective by assessing the managerial and academic implications of the conclusions, as well as providing suggestions for future research.

12.1 Managerial and Academic Implications

The findings of this thesis have implications for numerous stakeholders. In this section we highlight the implications of the conclusions for academic scholars, LPs and GPs.

From the perspective of academic scholars our results shed further light on the operational value creation in Scandinavia. Our results show a modest positive impact of PE ownership, which positions our results in the midst of those found by Vinten (2008) using a strictly Danish sample and those of Bergström et al. (2007) derived from a Swedish sample. In a broader geographical context, our results also fit the seemingly declining value of PE ownership as previously illustrated in Table 1. While the cardinal empirical research found a highly significant value of PE ownership (e.g. Kaplan, 1989; Smith, 1990) more recent studies have, as ours, found more modest results (e.g. Cressy et al., 2007; Acharya et al., 2013). Whether the convergence of performance is due to improved performance amongst the control groups or diminishing value of PE ownership is hard to tell. It does, however, indicate that funds are under pressure on multiple fronts to deliver acceptable returns.

From the perspective of LPs it was found that, measured at an operational level, PE funds were able to generate superior performance in the portfolio companies. While the primary variable of interest for LPs is the IRR, the ability to generate superior operational performance is usually a prerequisite to generate satisfactory returns. This is especially relevant in the current operating environment, where momentous capital inflows have increased competition and valuations in the PE industry.

From the perspective of GPs our results indicated that fund-specific characteristics influenced the ability to generate superior operational performance. Of particular relevance it was found that industry experience, both primary and secondary, positively influenced relative value creation. While the positive impact is in itself is intuitive, the differential effect across the operating parameters suggests that caution should be paid when applying previously accumulated knowledge in focal buyouts.

12.2 Areas of Future Research

As a closing remark, suggestions for further research based on the results found in this thesis are presented. Specifically, we propose three areas of interest for other scholars, namely, i) characteristics of replaced CEOs, ii) different specifications of fund experience and iii) effect of owner type ex-ante buyout.

In our study a short-term positive effect of CEO replacement in buyouts was identified. While we did not include any characteristics of the replaced CEO, it would be interesting to see which 'type' of CEOs that fuelled the effect, and, if some types are more successful in generating a sticky effect. Existing literature suggests that the performance of newly appointed CEOs is contingent on factors such as industry experience, competencies and performance in previous roles (Chen & Hambrick, 2011). In PE funds, however, Berg and Gottschalg (2005) suggest that PE firms frequently appoint the same managers, at different point in time, in multiple portfolio companies. The rationale is that the CEO will have a track record and experience in cooperating with a PE fund. It would, however, be interesting to see how these "repeat" CEOs perform relative to other types of CEOs, such as "industry experts" or "internal successors". A such study would provide practitioners with insights on how to handle managerial change following a buyout.

Another area of interest in future studies could be to investigate the impact of experience from a different perspective than deal count in the industry of the focal buyout. Often the application of previously accumulated knowledge needs not only to be applied in a specific industry. Instead funds may accumulate specialised knowledge revolving around specific competencies or markets. Some funds may be particularly skilled in fuelling the digital transformation or expanding into specific markets and distribution channels (Bain, 2016). While mapping the accumulation of such competencies at a fund level may prove difficult, it would be a highly interesting study. Practitioners would be provided with insights on how to best apply accumulated knowledge in future buyouts.

Lastly, it could be interesting to see whether taking a more differentiated approach to the previous owner could help PE funds in identifying buyouts with significant value creation potential. Our focus was on the relative value creation in PBOs compared to SBOs. While we found no conclusive evidence, other dimensions may provide greater insights. As many of the buyouts included in the sample are part of family successions it could for instance be interesting to see whether the value creation depends on whether the selling part is the founder, 2nd or 3rd generation. The "third generation curse" suggest that in family businesses the first generation creates the business, the

second maintains it and the third lavishes it (McKinsey & Company, 2010). If this argument holds in a Scandinavian context it could be hypothesised that superior value creation was found in 3rd generation buyouts as the relative value creation potential would be greater. Likewise it could be interesting to investigate the value creating potential in state-owned buyouts, which ex-ante acquisition may be operated through a less commercial lens (Loos, 2007). This should translate into a relatively greater value creation potential. However, such transactions are relatively seldomly seen, thus a such study would be based on a small sample.

13. References

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14. Appendices

14.1 Appendix 1 – Key Abbreviations

B&B - Buy and Build

CAPEX - Capital Expenditure

CEO - Chief Executive Officer

DID - Difference in Difference

EBIT - Earnings Before Interest and Taxes

EBITDA - Earnings Before Interest Taxes Depreciation and Amortization

FCF - Free Cash Flow

FTE - Full Time Employees

GAAP - Generally Accepted Accounting Principles

GP - General Partner

IB - Investment Bank

IC - Invested Capital

IFRS - International Financial Reporting Standards

IPO - Initial Public Offering

IRR - Internal Rate of Return

LBO - Leveraged Buyout

LP - Limited Partner

MIRR – Modified Internal Rate of Return

M&A - Mergers and Acquisitions

MBO - Management Buyout

NACE - Nomenclature Générale des Activités Économiques dans les Communautés Européennes (EU Industry Classification)

NOPAT - Net Operating Profit After Tax

OLS - Ordinary Least Squares

PBO - Primary Buyout

PE - Private Equity

PPE - Plant, Property and Equipment

R&D - Research and Development

ROA - Return on Assets

ROE - Return on Equity

RQ - Research Question

SBO - Secondary Buyout

SPA - Sales and Purchase Agreement

VC - Venture Capital

WACC - Weighted Average Cost of Capital

14.2 Appendix 2 – Decomposition of Key Formulas

Invested Capital Decomposition - Example of -1Y to +3Y calculation					
Year	-1	0	1	2	3
Date	31/12/2012	31/12/2013	31/12/2014	31/12/2015	31/12/2016
+ Inventory	40				30
+ A/R	50				50
- Accounts Pyable	10				25
Net working Capital	80				55
+ Intangible Assets	30				30
+ PPE	150				260
Invested Capital	260				345

ROIC Calculation - Example of -1Y to +3Y calculation					
Year	-1	0	1	2	3
Date	31/12/2012	31/12/2013	31/12/2014	31/12/2015	31/12/2016
EBIT	20				30
Invested Capital	260				345
ROIC	**7.7%**				**8.7%**

Free Cash Flow Decomposition - Example of -1Y to +3Y(Average) calculation					
Year	-1	0	1	2	3
Date	31/12/2013	31/12/2014	31/12/2015	31/12/2016	31/12/2017
Earnings after Tax	75		85	100	120
+ Depreciation	30		20	30	40
- Increase in NWC	25		40	15	20
- CAPEX	20		30	40	50
FCF	**60**		35	75	**90**

Invested Capital - Example of -1Y to +3Y calculation					
Year	-1	0	1	2	3
Date	31/12/2012	31/12/2013	31/12/2014	31/12/2015	31/12/2016
FCF	60		35	75	90
Invested Capital	150		140	150	225
FCF/IC	0.40		0.25	0.50	0.40
FCF/IC Average	**0.40**				**0.38**

14.3 Appendix 3 – Impact of Fund Geography Full Model

Impact of Fund Geography of aquiring fund on Performance Measures - Full model

The table reports the OLS regressions on the Fund Geography measure for Scandinavian buyouts in the period 2011-2016. The dependent variables are Sales Growth, EBITDA Growth, ROA, ROIC and FCF/IC. Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). The number of treatment firms is equal to Table 10. Equations are modelled using industry dummies.

'Domestic' is a dummy variable that equal 1 when the aquiring fund is Domestic and 0 otherwise. 'Scandinavian' and 'International' are likewise dummy variables with similar specifications . The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	**(1B)**	**(2A)**	**(2B)**	**(3A)**	**(3B)**	**(4A)**	**(4B)**	**(5A)**	**(5B)**
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	Sales Growth		EBITDA Growth		ROA		ROIC		FCF/IC	
Constant	0.19*	0.16	0.61**	0.63***	0.13***	0.11***	0.04	-0.03	0.01	0.07
	(0.09)	0.22	(0.30)	(0.22)	(0.03)	(0.00)	(0.18)	(0.12)	(0.30)	(0.15)
Domestic	**0.04**	**-0.02**	**0.19**	**0.09**	**0.03**	**0.00**	**0.00**	**-0.04**	**-0.04***	**0.02**
	(0.04)	0.03	(0.39)	(0.13)	(0.02)	(0.00)	(0.25)	(0.16)	(0.51)	(0.36)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	0.01	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	(0.00)	0.04	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.21**	0.16	0.45***	0.41**	0.10***	0.10***	0.29**	0.167*	0.14	0.06
	(0.05)	0.25	(0.13)	(0.10)	(0.01)	(0.01)	(0.15)	(0.13)	(0.30)	(0.08)
Scandinavian	**0.04**	**-0.08*****	**-0.45****	**-0.26**	**-0.03**	**0.00**	**0.01**	**0.01**	**0.17**	**-0.07**
	(0.06)	0.18	(0.26)	(0.19)	(0.04)	(0.01)	(0.55)	(0.16)	(0.47)	(0.24)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)
	(0.00)	0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.03)	(0.02)
Constant	0.25	0.18	(0.59)	0.52	0.13	0.12	0.20	0.07	0.14	0.02
	(0.06)	(0.26)	(0.14)	(0.12)	(0.01)	(0.01)	(0.18)	(0.12)	(0.30)	(0.09)
International	**0.10***	**0.09*****	**0.18**	**-0.07**	**-0.01**	**0.01**	**-0.01**	**-0.04**	**0.39**	**0.04**
	(0.06)	(0.03)	(0.24)	(0.10)	(0.05)	(0.01)	(0.39)	(0.13)	(0.55)	(0.32)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	0.00	-0.01	(0.00)	-0.01	(0.00)	0.00	0.00	0.00	0.01
	0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Industry controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	99	175	100	177	103	179	94	161	94	161
Adj R^2	0.12	0.10	0.22	0.26	0.12	0.15	0.13	0.10	0.11	0.13

14.4 Appendix 4 – Impact of GP Background Full Model

Impact of Lead Partner Background on Performance Measures

The table reports the OLS regressions on the GP Background measure for Scandinavian buyouts in the period 2011-2016. The dependent variables are Sales Growth, EBITDA Growth, ROA, ROIC and FCF/IC. Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). The number of treatment firms is equal to Table 10. Equations are modelled using industry dummies.

'Banking' is a dummy variable that equal 1 when the lead GP has Banking background and 0 otherwise. 'Consulting' and 'Auditing' are likewise dummy variables with similar specifications . The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	**(1B)**	**(2A)**	**(2B)**	**(3A)**	**(3B)**	**(4A)**	**(4B)**	**(5A)**	**(5B)**
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	Sales Growth		EBITDA Growth		ROA		ROIC		FCF/IC	
Constant	0.25**	0.18***	0.49***	0.54***	0.13**	0.12***	0.18**	0.06	0.07	0.00
	(0.08)	(0.03)	(0.23)	(0.14)	(0.03)	(0.01)	(0.08)	(0.12)	(0.27)	(0.10)
Banking	**0.11**	**0.02**	**0.02**	**0.34**	**-0.03**	**-0.01**	**-0.18**	**-0.10**	**0.08**	**-0.06**
	(0.08)	(0.05)	(0.55)	(0.25)	(0.60)	(0.03)	(0.18)	(0.92)	(0.42)	(0.15)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.23**	0.18**	0.67**	0.59**	0.11***	0.10***	0.01	0.00	0.13	0.04
	(0.07)	(0.03)	(0.16)	(0.14)	(0.02)	(0.01)	(0.10)	(0.14)	(0.31)	(0.07)
Consulting	**-0.01**	**0.00**	**0.20**	**0.13**	**0.04**	**-0.02**	**-0.05**	**-0.04**	**0.20**	**0.05**
	(0.06)	(0.08)	(0.58)	(0.18)	(0.04)	(0.03)	(0.17)	(0.13)	(0.21)	(0.23)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Constant	0.22***	0.16***	0.48**	0.43**	0.13***	0.10**	0.26	0.18*	0.15	0.08
	(0.06)	(0.03)	(0.23)	(0.18)	(0.02)	(0.01)	(0.24)	(0.10)	(0.31)	(0.12)
Auditing	**-0.18*** **	**-0.02**	**-0.42**	**-0.78** **	**-0.01**	**0.02**	**0.42**	**0.25***	**-0.05**	**0.03**
	(0.05)	(0.08)	(0.45)	(0.34)	(0.07)	(0.03)	(0.58)	(0.13)	(0.54)	(0.38)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	0.00	0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	99	175	100	177	103	179	94	161	94	161
Adj R^2	0.43	0.39	0.43	0.34	0.1	0.45	0.18	0.08	0.06	0.01

14.5 Appendix 5 – Impact of Tier 2 Experience Full Model

Impact of Tier 2 Experience on Performance Measures

The table reports the OLS regressions on the Fund Geography measure for Scandinavian buyouts in the period 2011-2016. The dependent variables are Sales Growth, EBITDA Growth, ROA, ROIC and FCF/IC. Two event windows are studied, namely "-1Y to +3Y" (models denoted A) and "-1 to Average +1-3Y (models denoted B). TThe number of treatment firms is equal to Table 10.. Equations are modelled using industry dummies.
'None' is a dummy variable that equal 1 when the aquiring fund has no Tier 2 experience and 0 otherwise. 'Low', 'Medium' and 'Highl' are likewise dummy variables with similar specifications . The ***,** and * denotes whether the difference in the means between the control and treatment group is significant at a 1, 5 or 10-percent level. Standard errors are reported in parenthesis below the parameters.

	(1A)	**(1B)**	**(2A)**	**(2B)**	**(3A)**	**(3B)**	**(4A)**	**(4B)**	**(5A)**	**(5B)**
Event window	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)	-1 | +3	-1 | (Avg)
Dependent variable	Sales Growth		EBITDA Growth		ROA		ROIC		FCF/IC	
Constant	0.24***	0.17***	0.37*	0.37*	0.11**	0.11***	0.01	0.05	-0.05	-0.09
	(0.06)	0.03	(0.20)	(0.20)	(0.02)	(0.01)	(0.23)	(0.14)	(0.23)	(0.08)
None	**0.34**	**-0.07***	**-0.08***	**-0.08**	**-0.01**	**-0.04****	**-0.20**	**0.20***	**-0.94**	**-0.32**
	(0.04)	0.03	(0.05)	(0.05)	(0.04)	(0.02)	(0.21)	(0.10)	(0.68)	(0.22)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.00
	(0.00)	0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Constant	0.23**	0.17	0.62**	0.62**	0.13**	0.12***	0.19	0.03	0.25	0.19
	(0.08)	0.23	(0.20)	(0.20)	(0.03)	(0.01)	(0.14)	(0.14)	(0.37)	(0.14)
Low	**0.03**	**0.05****	**-0.29*****	**0.20**	**0.05***	**0.04****	**-0.05**	**-0.26****	**0.21**	**0.22**
	(0.07)	0.03	(0.05)	(0.07)	(0.03)	(0.02)	(0.25)	(0.21)	(0.38)	(0.16)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	0.00	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)
	(0.00)	0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Constant	0.21***	0.18***	0.54**	0.54**	0.11***	0.11***	0.30	0.15	0.08	0.13
	(0.07)	0.03	(0.19)	(0.19)	(0.02)	(0.01)	(0.09)	(0.10)	(0.32)	(0.10)
Medium	**-0.22**	**0.02**	**0.06**	**-0.20**	**-0.11**	**0.01**	**0.67****	**0.31**	**1.76*****	**-0.08**
	(0.18)	0.09	(0.22)	(0.17)	(0.10)	(0.00)	(0.29)	(0.21)	(0.35)	(0.39)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
	(0.00)	0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Firm age	0.00	-0.01	0.01	0.00	0.00	0.00	0.01	(0.00)	0.00	0.01
	(0.00)	0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Constant	0.22***	0.18***	0.55**	0.54**	0.12***	0.11***	0.18	0.08	0.06	0.04
	(0.07)	(0.03)	(0.18)	(0.18)	(0.02)	(0.01)	(0.13)	(0.12)	(0.27)	(0.08)
High	**0.15***	**0.12**	**1.04*****	**1.29****	**-0.05*****	**-0.01**	**0.45****	**-0.30**	**3.29*****	**1.14**
	(0.06)	(0.11)	(0.15)	(0.58)	(0.06)	(0.02)	(0.17)	(0.09)	(0.27)	(0.88)
Total assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Firm age	0.00	0.00	(0.01)	(0.00)	0.00	(0.00)	0.01	0.00	0.00	0.00
	0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Industry controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	99	175	100	177	103	179	94	161	94	161
Adj R^2	0.12	0.34	0.10	0.22	0.09	0.05	0.34	0.18	0.22	0.34

14.6 Appendix 6 - Example of Coding the Statistical Models in STATA

H1 simple* × H2H3*

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//Example of DID approach for FCF/IC with a Winsorized estimator

//Setting up the model:

rename Firmageinyears firmage

rename EBITDAGrowth EBITDAG

rename SalesGrowth SG

rename ReturnoninvestedcapitalROIC ROIC

rename Returnonassets roa

xtset Transactionyear

gen Dint = (Dtreat*Dtime)

winsor2 FCFIC, cuts(5 95)


//Using Industry Control:

reg FCFIC_w Dtreat Dtime Dint firmage Totalassets i.Industry, robust

//Using Fixed Effects estimation:

xtreg FCFIC Dtreat Dtime Dint firmage Totalassets, fe
```