The Effect of Industry Specialisation and Secondary Buyouts on Value Creation in Nordic Private Equity

Part I: Industry Specialisation in Nordic Private Equity – *An analysis of performance differences between specialised and non-specialised PE firms in the Nordics*

Part II: Secondary Buyouts in the Nordics – *An analysis of value creation differences between SBOs and PBOs in the Nordics*

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Abstract

This thesis consists of two parts. Part 1 focuses on the potential benefits of industry specialisation within Nordic private equity (PE). Using a unique dataset of 259 transactions conducted by 77 different PE firms during the period 2008-2014 in the Nordics, I show that industry specialisation has an advantage in certain situations. An advantage to industry specialisation exists when it comes to margin improvements. Targets of industry specialised PE firms show higher post-buyout profitability improvements compared to non-specialised PE firms' targets. Furthermore, in certain demanding situations, when the target firm has low pre-buyout profitability, the advantage to industry specialisation is even stronger. Neither advantage, nor disadvantage, is found with regards to turnover growth. Part 2 is dedicated to investigating potential value creation differences between secondary buyouts (SBOs) and primary buyouts (PBOs) in the Nordics. Namely, differences in target firm operational performance improvements post-buyout, the amount of leverage used, and multiples paid. Operational performance improvements and changes in leverage are tested with the same sample as in Part 1. I find that target firms in SBOs generate significantly lower turnover growth post-buyout compared to PBOs. No significant differences for improvements in profitability and changes in leverage are found. Further, I show that SBOs are significantly more likely during favourable debt markets, i.e. when debt is cheap. A second sample is used for testing pricing differences. The sample consists of 329 deals, 250 PBOs and 79 SBOs, during the period 1998-2018 in the Nordics. No significant differences in multiples between the two types of deals.

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Part I

Industry Specialisation in Nordic Private Equity

An analysis of performance differences between specialised and non-specialised PE firms in the Nordics

Abstract

This study focuses on the potential benefits of industry specialisation within Nordic private equity (PE). I have investigated whether industry specialised PE firms achieve a higher increase in operating performance post-buyout in their target firms compared to non-specialised PE firms. Furthermore, the effect of PE firm industry specialisation on post-buyout performance in more demanding situations, in terms of target firm pre-buyout profitability and vendor source type, has been investigated. Using a unique dataset of 259 transactions conducted by 77 different PE firms during the period 2008-2014 in the Nordics, I show that industry specialisation has an advantage in certain situations. An advantage to industry specialisation exists when it comes to margin improvements. Targets of industry specialised PE firms show higher post-buyout profitability improvements compared to non-specialised PE firms' targets. Furthermore, in certain demanding situations, when the target firm has low pre-buyout profitability, the advantage to industry specialisation is even stronger. Neither advantage, nor disadvantage, is found with regards to turnover growth.

I.1. Introduction

The private equity (PE) industry has been growing steadily since its first wave during the 1980s. During the past decade, the PE industry is said to have reached a certain degree of maturity. Harris et al. (2015) find an outperformance for buyout funds over public markets before 2006 net of fees, but after 2006 PE and public market returns are approximately equal. Post the global financial crisis, the number of PE firms has increased, fundraising has been booming and competition with cash-rich strategic acquirers have become fiercer (Appelbaum and Batt, 2016). Unspent funds, also called "dry powder", reached a record level of $2 trillion globally in late 2018 (Bain & Company, 2019). Main challenges facing the industry are high prices for target firms, a lack of suitable investment opportunities and tough competition in the industry.

The traditional value creation mechanisms, financial and governance engineering, are not enough in today's highly competitive environment, operational engineering is becoming more and more important (Kaplan and Strömberg, 2009). Furthermore, the heterogeneity among PE firms, their specialised resources, and capabilities, has been recognised as an important factor explaining performance differences across PE firms (Meuleman et al., 2009). These specific resources and capabilities allow certain PE firms to consistently outperform their competitors and the public market (Brigl et al., 2008).

Considering these trends, this study aims at providing further evidence for and knowledge about PE firms' specific capabilities and resources, i.e. heterogeneity among PE firms, and the effect on performance. Hence, the purpose of this paper is to investigate whether an advantage to industry specialisation exists within Nordic PE. PE firms have been divided between relatively industry-specialised and non-specialised based on the Index of Competitive Advantage (ICA). Whether industry specialised PE firms achieve a higher increase in operating performance post-buyout in their target firms compared to non-specialised PE firms has been investigated. Furthermore, the effect of PE industry specialisation on post-buyout performance in more demanding situations, in terms of target firm pre-buyout profitability and type of vendor source, has also been investigated.

Using a unique dataset of 259 transactions conducted by 77 different PE firms during the period 2008-2014 in the Nordics, I show that industry specialisation has an advantage in certain situations. An advantage to industry specialisation exists with regards to

improvements in profitability. Industry specialised PE firms' targets show higher post-buyout profitability improvements compared to non-specialised PE firms' targets. Furthermore, in certain demanding situations, when the target firm has low pre-buyout profitability, the advantage to industry specialisation is even stronger with regards to profitability improvements. No specialisation advantage, nor disadvantage, is found for turnover growth.

This study contributes to previous literature by providing further evidence on the specialisation advantage for PE firms for an interesting geographic region and time period. Hence, this study provides further knowledge about the heterogeneity among PE firms, how different resources and capabilities can be important drivers of differences in PE performance. A highly relevant topic given the importance of operational engineering in today's PE value creation process. Furthermore, to the best of my knowledge, this paper is the first to test whether the advantage of PE specialisation differs across different vendor sources. The PE industry is highly developed in the Nordics (Invest Europe, 2018) and this topic has not been the focus of previous literature. The time period occurs after the recent financial crisis when the PE industry has reached a certain degree of maturity.

I.1.1. Private Equity (PE) in Short

A private equity (PE) firm is a "specialized investment company" (Kaplan and Strömberg, 2009). The term leveraged buyout (LBO) firm is often used synonymously with PE firm (or simply buyout firm). The PE firm, also referred to as the general partner (GP), raises funds together with limited partners (LPs). LPs include institutional investors, such as pension funds and insurance companies and wealthy individuals. The LPs are the main capital providers, while the GP manages the fund in line with the fund agreement. A limited investment horizon is normally used. The funds have a finite life. The PE firm has approximately five years to deploy the committed capital and thereafter five to eight years of improving the investments before returning the capital to the LPs. Investments are normally majority stakes in mature companies. The PE firm is remunerated in two main ways; Firstly, a management fee is paid annually by the LPs to the GP. This is usually a small percentage of the committed capital. Secondly, carried interest is earned once the

fund closes. The carried interest is a share of the profits (usually ~20% according to Axelson et al., 2009a). The transactions are typically financed with a large amount of debt. Leverage levels of 60 to 90 percent are common. Most of the equity is provided by the PE fund and a smaller part by the management team of the acquired target.

I.1.2. Definition: PE Firm

Caselli and Negri (2018) explain that there exist different definitions of what types of firms/deals the term PE includes, especially with regards to the lifecycle of a target firm; For example, according to the traditional European definition venture capital (VC) and PE firms belong to different clusters. VC firms invest in start-up/early-stage firms, while PE firms invest in more mature firms. VC firms usually have a different performance profile compared to traditional PE firms. Previous research has generally found that, on average, buyout funds show higher returns and a lower percentage of losses compared to VC firms (Aigner et al., 2008). A typical VC firm invests early in the company lifecycle, making an assessment of success pre-transaction difficult, which implies far from every investment pays off (Lossen, 2006). Large performance differences between different VC funds, much higher than for buyout funds, have been shown (Harris et al., 2015). Furthermore, VC firms often take minority positions. Also, investment companies, both private and public ones, show important differences from traditional PE firms. Investment companies usually have a longer-term investment horizon, hence maximising value in the short- to medium-term may not be of the highest priority. Hence, VC firms and investment companies are excluded from the definition of PE firms in this paper. The definition of PE firms used is therefore in line with the traditional European definition of PE firms and in line with previous research such as Kaplan and Strömberg (2009).

I.2. Previous Literature

The private equity (PE) industry witnessed its first wave during the 1980s (Kaplan and Strömberg, 2009). Around this time Jensen (1989) predicted the PE organisational structure to be superior to the structure of the public corporation. The author explained that the organisational form of a traditional public company, especially with regards to the dispersed ownership, created agency conflicts between owners and management resulting in inefficient use of resources. PE firms use concentrated ownership and active governance in their portfolio firms, they implement management incentives based on financial performance and change the capital structure into a more efficient one. These mechanisms allow for the elimination of the agency conflicts typical to public corporations and hence lead to an increase in company value.

Strömberg (2008) shows with a sample of 21,397 buyout transactions during the period 1970-2007 that the PE industry has witnessed enormous growth over the years, in terms of both the number and value of transactions. According to the author, PE has become a "global phenomenon". Furthermore, the number of secondary buyouts (SBOs) has increased steadily over the years. During the 1980s SBOs represented 13% of all LBOs, at the end of the 2000s the share had risen to 35% (Wang, 2012). Strömberg (2008) concludes that the evolvement of the industry is not too far from the prediction of Jensen (1989).

Cumming et al. (2007) provide an extensive review of previous research and conclude that, in general, PE firms have shown "significant financial returns", with regards to both shareholder returns and target firm operating performance. Also, Kaplan and Strömberg (2009) state strong empirical evidence for positive value creation by PE firms. The authors expect this abnormal performance to continue partly due to the increased focus on operational improvements in the value creation process.

During the past decade, the industry has evolved further. Harris et al. (2015) investigate PE returns with a sample of 300 European and 1,800 North American funds from 1984 to 2010. The authors find an outperformance for buyout funds over public markets before 2006 net of fees, but after 2006 PE and public market returns are approximately equal. Gross of fees buyout funds have performed better than the public market over the entire sample period. Furthermore, there exists a negative relationship between PE

performance and capital inflows to the PE industry. A certain degree of maturity in the industry has been reached according to Sensoy et al. (2014), characterised by increased competition and a lack of so-called "low-hanging fruit". After the financial crisis, the number of PE firms has increased, fundraising has been booming and competition with cash-rich strategic acquirers have become fiercer (Appelbaum and Batt, 2016). Also, new financial regulation has made it more difficult to finance transactions with a very high leverage ratio. The share of SBOs has continued to increase, especially in Europe. Unspent funds, also called "dry powder", reached a record level of $2 trillion globally in late 2018 (Bain & Company, 2019). The number of transactions conducted by PE firms has remained fairly stable after the financial crisis, between 3,000-4,000 deals annually, but deal value has increased year by year due to higher valuations. In a recent survey among leading PE firms, Bain and Company (2019) found that the main challenges facing the industry are high prices for target firms, a lack of suitable investment opportunities and tough competition in the industry.

The rest of this section is organised as follows: Firstly, in sub-section 2.1., the traditional value creation drivers in the PE industry are presented. Also, a few papers explicitly pointing out the heterogeneity among PE firms as an important driver of differences in PE performance are discussed. Secondly, in sub-section 2.2. previous research concerning PE specialisation is presented. The section ends, sub-section 2.3., with a review of the effect different vendor sources, have on PE performance.

I.2.1. Value Creation and Performance Drivers

PE firms improve the performance of their portfolio firms and create value through three distinct mechanisms; Financial, governance and operational engineering (Kaplan and Strömberg, 2009). The first two were common during the 80's wave as explained by Jensen (1989). Together these two make up the so-called "agency perspective" (Meuleman et al., 2009). They consist of mechanisms such as the implementation of a more efficient capital structure, concentrated ownership, active participation in portfolio firms' boards and management incentives linked to the financial performance of the portfolio firm. Due to a more competitive PE industry, the importance of operational engineering has grown significantly in more recent times. Operational engineering refers

to industry and operating expertise. Cumming et al. (2007) argue that in today's market financial restructuring is not enough, PE firms need to have "the expertise to deliver changes in strategy and product development".

Financial and governance engineering are more standardised techniques of value creation compared to operational engineering, which demands specific industry and strategic expertise. Hence, financial and governance mechanisms are easier to replicate and may therefore not provide for a true basis of strong competitive advantage.

The heterogeneity among PE firms, i.e. the specific resources and capabilities individual PE firms possess, has been recognised as an important factor explaining performance differences between PE firms (Meuleman et al., 2009). These specific resources and capabilities allow certain PE firms to consistently outperform their competitors and the public market (Brigl et al., 2008). Heterogeneity is likely to be mostly found within operational engineering.

I.2.1.1. Governance and Financial Engineering

The PE firm structure is said to provide a solution to the so-called "free cash flow" issue (Jensen, 1989). The free cash flow problem implies the unwillingness of managers to pay out excess cash to shareholders. Excess cash provides for more flexibility in the day-to-day operations but may lead to value-destroying projects being undertaken and empire building behavior among managers. PE firms finance their transactions to a large extent with debt, debt that is kept on the books of the portfolio firm. The high leverage forces the management team to run the business as efficiently as possible in order to meet the required debt service payments (Cotter and Peck, 2001). Debt provides for an important disciplinary effect; the risk of default puts higher pressure on management to perform and makes it difficult to waste money on value-destroying projects.

The fact that a large amount of debt is used allows for further important value creation drivers; concentrated ownership and active participation in the boards of portfolio firms. Hence, "ownership incentives" are created (Jensen, 1989). PE firms can at their own discretion take decisions with regards to the future development of the portfolio firm.

Under PE ownership, boards become smaller in size and have meetings more frequently (Gong and Wu, 2011).

Guo et al. (2011) investigate how PE firms create value during the second PE wave with a sample of 192 US public-to-private transactions during 1990-2006. The authors report a significant increase in leverage post-buyout: The median debt to capital increases from ~24% pre-buyout to ~70% post-buyout. The authors find a high return on invested capital for investors, however, only modest gains in operating performance for PE firms' targets compared to benchmark firms. There exists a positive relationship between an increase in leverage and operating performance improvements post-buyout, large leverage increases translate into higher operating gains. Hence, the results are in line with the disciplinary effect of debt. High leverage puts pressure on the firm to allocate resources as effectively as possible.

With regards to specific debt used Cotter and Peck (2001) point out that short-term and senior debt are likely to provide for higher governance effects compared to long-term and subordinated debt. Oftentimes senior debt has a set of hard covenants and short-term debt is likely to have larger debt repayments directly. With a sample of 64 public-to-private LBOs during 1984-1989, the authors find a positive relationship between default and senior and/or short-term debt, i.e. tighter debt terms, implying a larger disciplinary effect. However, LBOs conducted by buyout firms use a smaller amount of senior and short-term debt compared to LBOs conducted by other acquirer types. Also, an increased amount of senior debt does not translate into an increase in post-LBO operating performance for buyout firms, which it does for other acquirers. The authors explain that buyout firms use smaller boards and, hence, a larger board representation in their portfolio firms compared to other acquirers, implying more active governance. Active governance is more important than the disciplinary effect of debt for PE value creation according to the authors.

Gong and Wu (2011) explain that management displacements are an important part of the governance mechanisms used by PE firms. The authors investigate PE firms' governance techniques by looking into CEO retention decisions post-buyout. With a sample of 126 conducted LBOs (public-to-private transactions) in the US during 1990-2006, the authors find a CEO turnover of 51% a couple of years post-announcement. Also, LBOs of target firms with large agency problems, defined as firms that pre-buyout have a

low debt-to-equity ratio and a lot of cash on hand (in line with the Jensen's, 1989, free cash flow hypothesis), are more prone to change CEO. Leverage has a negative relationship with CEO turnover and free cash flow has a positive. Furthermore, higher CEO entrenchment (CEO tenure used as a proxy) is found to lead to higher CEO turnover, explained as an unwillingness to change current processes and strategies by entrenched CEOs and therefore a higher probability of them being let go. Hence, corporate governance processes are improved post-buyout by PE firms the authors conclude.

PE firms introduce management incentives based on financial performance and the management team becomes minority owners in the portfolio firm. This implies management remuneration is highly dependent on the financial performance of the portfolio firm (Jensen, 1989). The PE firms' objectives become aligned with the objectives of the management. Both parties have a strong motivation to use resources as effectively as possible and improve portfolio firm financial performance as much as possible.

In their literature review, Wright et al. (2009) explain that the management's equity stake is an important driver of performance in LBOs. Kaplan and Strömberg (2009) find that 16% of the equity upside (stock and bonds) belongs to the management team post-buyout (CEO receives 5.4%) based on 43 leveraged buyouts during 1996-2004 in the US. Nikoskelainen and Wright (2007) investigate the governance effect in the value creation process among LBOs. The authors look at internal rates of return for 321 leveraged buyouts during 1995-2004 in the UK. Across their entire sample, governance mechanisms are not the largest value creation driver, more important drivers are the size of the buyout and conducted add-on acquisitions. However, for a sub-sample consisting of larger transactions the equity stake held by management is an important performance driver. Guo et al. (2011), on the other hand, show that larger management equity stakes do not lead to better operating performance post-buyout.

Debt also provides for less equity capital needed, hence a higher return on equity, as well as, tax deductibility in several countries. Bonini (2012) finds better returns on equity post-buyout for PE portfolio firms. The author explains that this result is consistent with the positive effect increased leverage has on equity returns. Guo et al. (2011) find that increases in valuation multiples and tax shields from interest expenses are as important explanatory factors as operating performance improvements when it comes to returns on invested capital. Acharya et al. (2013) show that the gross IRR of 56.1% in their sample of

large PE firms can be contributed to abnormal performance (~35%), higher financial leverage (~50%) and the specific industry which the investment takes place in (~15%).

I.2.1.2. Operational Engineering and Heterogeneity among PE Firms

Operational engineering implies industry and operating expertise (Kaplan and Strömberg, 2009). In an interview Kaplan (2009) points out that in recent times PE firms have started focusing more and more on improving their capabilities in creating operational improvements. Governance and financial engineering are not enough today, private equity firms try to stand out through highly developed operational engineering capabilities. In a survey of 79 private equity investors, Gompers et al. (2016) find that operational engineering mechanisms are seen as more important value drivers than governance and financial engineering mechanisms. 100% of the respondents answered that growing the underlying business is an important value driver and 97% said operational improvements, only 76% and 65% mentioned leverage and industry arbitrage as important value drivers.

Brigl et al. (2008) describe how the main value creation driver has evolved from the leverage era in the '80s to the multiple expansion era in the '90s, to the earnings growth era in the 2000s and finally to the current operational improvements era during the 2010s. Furthermore, with a sample of 32 European PE portfolio firms, the authors find that 22% out of total investor IRR of 48% comes from sales growth, 5% from EBIT-margin improvements, 10% from EBIT multiple improvements and only 11% from leverage. The results stress the importance of operational engineering in today´s value creation process for PE firms.

Acharya et al. (2013) find that operational improvements contribute to approximately one-third of abnormal financial performance (IRR). Furthermore, the authors show that the specific skillset (background and experience) of the partners at the PE firms has an impact on performance. Organic transactions (no M&A during PE ownership) led by partners with previous experience within consulting or the industry show higher abnormal performance than organic transactions led by partners with a background in the financial sector. The reverse is true for inorganic transactions.

PE firms differ in their resources and capabilities, they are quite heterogeneous, which may be an important driver of differences in value creation among PE firms. Meuleman et al. (2009) use a "strategic entrepreneurship perspective, grounded in the research-based view of the firm" instead of the widely used agency perspective. The agency perspective is in line with Jensen (1989), which implies that PE firms create value through active governance, management incentives, and high leverage. The strategic entrepreneurship perspective, on the other hand, recognises that having specific resources and capabilities are truly important for improving performance, see Ireland et al (2003). The heterogeneity will affect all value creation mechanisms (governance, financial and operational), but will be most important for operational engineering since the other two have a more generic nature.

Brigl et al. (2008) find that certain PE firms manage to achieve high and consistent performance over time, a strong outperformance compared to their competitors. The authors state that the reason behind why the best performing PE firms manage to consistently outperform their peers is "distinctive organizational capabilities that allow them to identify the best deals, bid competitively, and then transform the performance of their portfolio companies". The authors proceed with describing three important capabilities; Firstly, what the authors call networked access, implying that PE firms become insiders in their respective sectors/industries. An increasing amount of personnel at PE firms has a background in areas such as consulting and the industry in general, as compared to the traditional banking background. Also, increased use of advisors with an extensive background of working within the relevant industry has been observed in recent times. Secondly, domain expertise, implying vast industry expertise. Building the organization around specific industries allows for specialised knowledge. Lastly, operational improvements, given fundamental value creation's importance in today's PE market, the ability to quickly and reliably increase growth and margins in portfolio firms has become highly important.

Castellaneta and Gottschalg (2016) investigate the PE firm effect on buyout performance. With the use of a comprehensive sample consisting of 6,950 buyouts by 255 PE firms during 1973-2008 in 77 countries, they find that the PE firm effect explains 4.6% of the variance in gross IRR among PE firms. The authors explain that the PE firm effect, the specific resources, and capabilities of the PE firm, will be more important when the

situation is more demanding in terms of value creation. Implying that in a situation when only simple value creation strategies are needed the heterogeneity in resources and capabilities among PE firms will not matter to any larger extent for buyout performance. In more demanding situations, on the other hand, specific resources and capabilities become truly important for creating value. Kaplan and Schoar (2005) find large differences between the performance of different PE firms, some PE firms manage to persistently run successful funds, while others do not, this is true for both venture capital and buyout funds. The authors hypothesise that this persistence in returns may be due to heterogeneity among PE firms.

I.2.2. Specialisation Advantage

The two most closely related papers to this study are Cressy et al. (2007) and Le Nadant et al. (2018), both papers investigate the PE specialisation effect on the target firm operating performance post-buyout as well as points out PE firm heterogeneity as an important factor for differences in PE firm performance. Both papers find an advantage for relatively specialised PE firms. However, as explained at the end of this sub-section the evidence whether specialisation provides for a true advantage is mixed.

Cressy et al. (2007) investigate differences in post-buyout operating performance between targets of PE firms and targets of non-PE firms, as well as between specialised and non-specialised PE firms. The authors identify two main factors that have the potential to give a specialised PE firm a competitive advantage over other PE firms. Firstly, by acquiring knowledge about the specific industry/stage the PE firm can reduce information asymmetries regarding the probability of success for target firms. Secondly, knowledge about specific firms and business models in the industry/stage allows the PE firm to reduce uncertainty regarding the implementation of successful value-adding strategies. This implies the benefits of specialisation comes both from the pre-buyout selection process of which targets to acquire, as well as, the post-buyout capabilities of improving the acquired targets. The degree of specialisation is based on Index of Competitive Advantage (ICA) from Archibugi and Pianta (1994), i.e. specialisation relative to the PE firm's competitors. The authors' sample consists of 122 UK buyouts during 1995-2000. They find that PE firms' targets perform better than non-PE firms (over the

first 3 post-buyout years). Industry specialised PE firms' targets perform better than non-industry specialised, higher profitability and mixed results on growth. Stage specialisation does not impact profitability but may influence growth. Also, the profitability of the target firm in the year of the deal has a large impact on post-buyout profitability.

Le Nadant et al. (2018) confirm the results of Cressy et al. (2007); Industry specialised PE firms' targets show higher improvements in operating performance compared to non-specialised PE firms, both in terms of sales growth and profitability improvements. A sample of 217 transactions in France during the period 2001-2007 is used. The authors argue that the benefit of relative industry specialisation comes from having specific resources and capabilities, which can be utilised in order to achieve a competitive advantage. Heterogeneity among PE firms implies different potential for value creation. Furthermore, the authors hypothesise that the specialisation advantage will be larger in more demanding situations. Target firms are divided into three groups, low-, medium-, and high-performers based on profitability pre-buyout and the authors argue that low- and high-performers are more demanding cases of value creation. No significant results with regards to profitability (although the signs in the regression show that the specialisation benefit is larger for low-, and high-performers). The advantage of specialisation is significantly higher for low-, and high-performers compared to medium-performers with regards to growth. The authors conclude that industry specialisation within PE is more beneficial in more demanding cases.

Furthermore, a few papers investigate the effect of specialisation on PE funds' returns, cash flows to the investors. Somewhat different results are found: Lossen (2006) investigates the effect of diversification[1] on PE funds' returns (gross cash flows to investors). The author hypothesises that PE firm specialisation should lead to higher rates of return at the fund level due to an ability to overcome information asymmetries pre-buyout and therefore have a competitive advantage in the selection process of target firms, as well as being able to overcome agency conflicts post-buyout and hence implement better value creation strategies. With a sample of 100 PE funds in the US and Europe (38 venture capital and 62 buyout funds), the author finds mixed results regarding

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[1] Calculation of industry, stage and geographic diversification using the Herfindahl-Hirschmann-Indices (HHI).

the effect of diversification on the rate of return for PE funds; Diversification across more industries imply an increased rate of return, lower rate of return for financing stage diversification and geographic diversification does not affect PE fund performance. Humphery-Jenner (2013) finds a positive relationship between the PE funds' return (net IRR) and a higher degree of diversification, in terms of both the number of industries and the number of geographies. Sample of 1,505 funds in the US during 1980-2007. Also, the author argues that internal knowledge sharing and learning are important factors behind the positive relationship. Bowden et al. (2016) also find a positive relationship between industry and geographic diversification (HHI) and US PE funds' rate of returns during 1999-2013.

Zweig et al (2014) show that sector specialised PE firms outperform diversified PE firms, both with regards to MOIC and IRR. For example, a gross IRR of 23.2% for the sector specialised PE firms compared to a gross IRR of 17.5% for the diversified are found. A PE firm is seen as specialised if more than 70% of the capital during the period 2001-2010 was invested into one specific sector. The sample consists of 717 specialised investments and 3,013 diversified investments. Furthermore, the authors explain that this difference is likely due to advantages with regards to "sourcing/portfolio company selection, post-acquisition value adds, and exiting investments". Aigner et al. (2008) use a dataset consisting of cash flows for 104 PE funds during the time period 1971 to 2007. The authors find evidence of persistence in the rate of return (IRR and PME) among PE funds – A PE firm having a top-quartile fund after already having one is around 40%. Also, the PE firm experience has a positive impact on fund returns. Interestingly, the authors also find that PE firm experience has a positive relationship with losses (defined as portfolio firms with an IRR below zero). The authors argue that in order for more experienced PE firms to receive a higher return they need to take on more risk. With regards to the effect of fund specialisation/diversification on returns, mixed results are found: No significant effect on returns are found with regards to diversification across sectors or regions. However, a higher stage diversification (HHI) leads to increased returns, the same positive relationship holds for number of portfolio firms in a fund and fund performance.

I.2.3. Vendor Source Impact on Performance

The vendor source has been shown to impact the post-buyout performance for PE firms' targets. Previous research typically divides the vendor sources into divisional buyouts, private buyouts and secondary buyouts (SBOs). In theory, it is often assumed that acquisitions of divisions should show the largest improvements post-buyout and SBOs the smallest. Private buyouts somewhere in between. This holds true to some extent. However, minor empirical differences exist as is explained below.

Alperovych et al. (2013) investigate differences in efficiency between PE buyouts from different vendor sources namely: Private, divisional and secondary buyouts. As well as the effect of PE experience on efficiency in the target firm. The authors argue that divisional buyouts should show the largest improvements in efficiency, thereafter private buyouts and lastly SBOs. Divisions run the risk of experiencing parental control problems as well as too little attention from the parent firm, which implies excellent potential for efficiency improvements. Private firms oftentimes experience a need for more professionalism, such as improved general processes. There should, therefore, exist some potential for improvements in efficiency. Given that SBOs have already been owned by a professional investor that most likely implemented several control mechanisms and value-adding strategies there should not be too much room for efficiency improvements. With a sample consisting of 88 UK PE buyouts during 1999–2008 the authors find that divisional buyouts show higher efficiency improvements post-transactions than private and secondary buyouts. Private and divisional buyouts both show higher than the average while SBOs show lower. PE firm experience seems to have a positive effect on efficiency as well.

Desbrieres and Schatt (2002) hypothesise that LBOs of subsidiaries or divisions should show larger operating performance gains post-buyout compared to buyouts of family-run businesses. Subsidiaries of larger corporations usually show several malfunctions, for example, inefficient internal capital markets and conflicts of interests between different actors and layers within the organisation. Also, if the previous management of the subsidiary stays on post-buyout a clear information advantage regarding the underlying business exists compared to family-run businesses in which managers wish to retire. Hite and Vetsuypens (1989) explain that the fact that the division will no longer be part of a

potentially inefficient hierarchical structure is an important potential value driver. Becoming a stand-alone company makes the decision-making process for the management and the new owners (PE firm) easier and more effective. Desbrieres and Schatt (2002) use a dataset of 161 LBOs during 1988-1994 in France. Buyouts of subsidiaries show somewhat larger improvements in operating performance compared to family-owned targets, at least when it comes to increases in return on invested capital.

Meuleman et al. (2009) start off by investigating if divisional buyouts show higher post-acquisition operating performance compared to other buyouts. The authors argue that divisional buyouts often involve targets that are experiencing large agency costs post-transaction, therefore, have not been able to achieve their full potential. "Parental control problems and constraints on initiatives" the authors state. Family and secondary buyouts, on the other hand, usually have very low agency costs. Hence, less room for performance improvements through governance and incentives in family/private buyouts and SBOs compared to divisional buyouts. Thereafter, the effect of PE firm experience (cumulative number of buyouts) on post-buyout performance is investigated. PE firms can gain specialist skills and capabilities through experience that can give them a competitive advantage, hence they will become more sophisticated in the selection process pre-buyout and become better at realizing value-adding strategies post-buyout. Lastly, the effect of the degree of PE firm experience on divisional buyouts compared to other buyouts is investigated. The degree of complexity varies between different vendor sources. Specialist skills based on experience will likely be more important in divisional buyouts compared to other buyouts: Evaluating the division pre-buyout is often difficult, especially if it is not a stand-alone firm and realizing value-adding strategies usually demand a high level of knowledge about the specific situation. With a sample consisting of 238 PE-backed transactions in the UK during 1993-2003, the authors show that divisional buyouts do not experience higher profitability post-buyout compared to other buyouts. However, more experienced PE firms manage to receive higher growth in their targets post-buyout, this relationship does not hold for profitability. Furthermore, PE experience is truly important for the post-acquisition performance of divisional buyouts, especially with regards to growth.

Degeorge et al (2013) investigate the performance and characteristics of SBOs compared to primary buyouts (PBOs) with a sample of 548 SBOs and 7,449 PBOs. The authors find

that SBOs perform worse than PBOs – 15% lower IRR and 0.4 lower cash multiple. PBOs show a much larger percentage of home runs (defined as cash multiples above 3) compared to SBOs, similar percentages with regards to bad deals (cash multiples below 1). Furthermore, only SBOs conducted in the later stages of the investment period underperform PBOs. Also, a positive relationship between the underperformance and "dry powder" is found for late-stage SBOs. These findings are in line with the "go for broke" hypothesis introduced by Axelson et al (2009a), in the later stage of the investment period a PE firm is better off deploying the remaining capital in deals that may not provide superior performance compared to not making any investment at all. SBOs are easier to find and usually require less due diligence than PBOs, which make them suitable candidates for quick deployment of capital. The authors do not find any significant downside risk differences between SBOs and PBOs. Also, higher returns are found for SBOs conducted by specialised funds.

Bonini (2012) explains that SBOs should have a low potential for operational improvement gains, given that the first acquirer already should have implemented several of the value creation mechanisms typical in PE deals. A sample of 163 SBOs during the period 1999-2007 in western Europe is used, with industry-adjusted operating performance measures, i.e. abnormal performance. The author finds that PBOs generate significant change in target firm profitability post-buyout. Margin improvements in SBOs are much lower than the ones for PBOs. Also, PBOs produce much higher increases in sales ratio compared to SBOs. Similar results are found for other operating performance measures, investment-, equity-, liquidity-ratios. All in all, only small operating performance improvements post-buyout in targets of SBOs are found and significantly lower than for PBOs. Furthermore, SBOs are shown to be more levered than PBOs.

Achleitner and Figge (2014) find that operating performance improvements (sales growth and margin expansion) are similar in SBOs and PBOs. Dataset consisting of 2,456 European and North American transactions during 1990-2010. Wang (2012) uses a sample consisting of UK deals (140 SBOs and 465 PBOs) during 1997-2008. Mixed evidence with regards to efficiency gains (different operating performance measures used) post-buyout for SBOs is found. No clear conclusion can be drawn weather SBOs or PBOs show better efficiency gains post-buyouts according to the authors.

I.3. Hypotheses

PE industry specialisation has the potential to allow for a more sophisticated pre-buyout selection process, which targets to acquire, as well as, superior post-buyout capabilities of improving the acquired targets (Lossen, 2006 and Cressy et al., 2007). A vast amount of knowledge and expertise concerning specific industries allow PE firms to reduce information asymmetries pre-buyout, which should allow for a competitive advantage in assessing the potential success of target firms. Hence, an advantage in the selection process of which targets to acquire compared to non-specialised PE firms. Post-buyout the specialised PE firm should be able to more easily overcome agency conflicts, as well, as implement more successful value-adding strategies, given vast amounts of expertise regarding industry dynamics.

In the pre-buyout phase, the industry specialised player should be able to find targets with a greater potential for value creation, as well as, negotiate a better price (Le Nadant et al., 2018). According to Zweig et al (2014) industry specialists have closer ties to other industry participants and follow carefully important industry trends, which allow them to better source and evaluate investment opportunities. Furthermore, given a reputation of having vast industry expertise the specialised PE firm may have an advantage in negotiations with the vendor/management of target firms.

In the post-buyout phase, the industry specialised PE firm should have an advantage in implementing financial and governance mechanisms (Kaplan and Strömberg, 2009), i.e. concentrated ownership and active governance in portfolio companies, implementation of management incentives based on financial performance and a change in capital structure into a more efficient one. Having prior experience and knowledge about these aspects should allow for a quick implementation of the most optimal solutions. However, the largest advantage will likely come from operational engineering in the post-buyout phase, i.e. the ability to implement value-adding strategies with regards to areas such as marketing practices, cost structure, customer attraction, and retention. The specialised player possesses deep industry expertise, which allows for making optimal decisions regarding the strategic direction and operational goals for target firms (Zweig et al., 2014). Experience in managing costs translates into increased profitability and

understanding of customer needs leads to higher turnover growth (Le Nadant et al., 2018).

Industry specialisation also gives rise to a potential disadvantage. The fact that diversification across industries allows for spreading of risks may make PE firm industry specialisation a sub-optimal solution (Cressy et al., 2007 and Le Nadant et al., 2018). Zweig et al (2014) explain that a potential downside of being industry specialised is the risk of having to invest in unattractive investment opportunities during weak industry cycles. Of course, as usual in portfolio theory, the investor him-/herself can diversify away any idiosyncratic risks by investing in several different industry specialised PE firms.

Hence, in line with Cressy et al. (2007) and Le Nadant et al. (2018), my first set of hypotheses are that industry specialised PE firms manage to achieve a higher increase in operating performance post-buyout in their target firms compared to other PE firms. Operating performance improvements are measured both as sales growth and improvements in profitability:

Hypothesis 1a: Industry specialised PE firms achieve higher sales growth in their targets post-transaction compared to other PE firms

Hypothesis 1b: Industry specialised PE firms achieve higher profitability improvements in their targets post-transaction compared to other PE firms

In line with Le Nadant et al. (2018), I hypothesise that the same factors that should make industry specialised PE firms achieve higher performance in their targets compared to non-specialised PE firms, a better selection process pre-buyout and superior capabilities in implementing value-adding strategies post-buyout, will be more pronounced in more demanding situations. Their specialist resources and capabilities will come to greater use in more complex situations (Castellaneta and Gottschalg, 2016). Le Nadant et al. (2018) use target firms' profitability pre-buyout as an indicator of the complexity of the transaction. The authors explain that initially low-performing targets, in general, have large improvement potential. However, the value creation strategies needed are often both risky and complex, involving cases such as "corporate restructuring, strategic

renewal, and turnaround practices". An industry specialist should have a clear informational advantage with regards to necessary changes for a successful turnaround. Furthermore, improving an already high-performing target firm usually require both risky and innovative strategies. The high-performing target's business model already works well, and further improvements are likely to imply a risky change in strategy. Such as entering new markets or increasing the product offering.

Hence, my second set of hypotheses are that the specialisation benefit will be higher in buyouts of targets performing badly pre-buyout compared to buyouts of medium-performing targets and higher in buyouts of targets performing well pre-buyout compared to buyouts of medium-performing targets:

Hypothesis 2a: The positive relationship between sales growth and PE industry specialisation is stronger for initially low-performing targets compared to initially medium-performing targets

Hypothesis 2b: The positive relationship between profitability improvements and PE industry specialisation is stronger for initially low-performing targets compared to initially medium-performing targets

Hypothesis 2c: The positive relationship between sales growth and PE industry specialisation is stronger for initially high-performing targets compared to initially medium-performing targets

Hypothesis 2d: The positive relationship between profitability improvements and PE industry specialisation is stronger for initially high-performing targets compared to initially medium-performing targets

My third set of hypotheses are concerned with the effect of PE industry specialisation on post-buyout performance depending on the vendor source. Post-buyout performance for PE firms' targets has been shown to differ depending on the vendor source. Previous research normally divides the vendor sources into divisional buyouts, private buyouts and secondary buyouts (SBOs). It is often assumed that acquisitions of divisions should

show the largest improvements post-buyout and SBOs the smallest. Private buyouts somewhere in between.

Divisions often exhibit parental control problems and a lack of parent attention (Alperovych et al., 2013). Malfunctions in divisions may include an inefficient internal capital market and conflicts of interests between different actors and layers within the organisation, among others (Desbrieres and Schatt, 2002). Therefore, a division often performs below its full potential. Hence, divisional buyouts should show larger improvement potential compared to SBOs and private buyouts. Going from part of a larger organisation to a stand-alone firm implies several processes need to be redesigned. Divisional buyouts are more complex and more demanding cases of value creation compared to SBOs and private buyouts. Private buyouts are oftentimes in need of more professionalism (Alperovych et al., 2013). This may, for example, take the form of updating and improving sales and accounting processes. Hence, there should exist some improvement potential and specialised resources and capabilities may come in handy. Targets in SBOs have been owned by a professional investor that most likely implemented several control mechanisms and value-adding strategies, hence further value creation should be limited (Bonini, 2012).

In line with the reasoning of the second set of hypotheses, the specialisation advantage will be larger in more demanding situations of value creation. Hence, my third set of hypotheses are that the specialisation benefit will be higher in private buyouts compared to secondary buyouts and higher in divisional buyouts compared to private buyouts:

Hypothesis 3a: The positive relationship between sales growth and PE industry specialisation is stronger for private buyouts than for SBOs

Hypothesis 3b: The positive relationship between profitability improvements and PE industry specialisation is stronger for private buyouts than for SBOs

Hypothesis 3c: The positive relationship between sales growth and PE industry specialisation is stronger for divisional buyouts than for private buyouts

Hypothesis 3d: The positive relationship between profitability improvements and PE industry specialisation is stronger for divisional buyouts than for private buyouts

I.4. Data and Methodology

I.4.1. Data

The data gathering process consisted of three main steps; Firstly, relevant PE transactions were identified using the databases Zephyr and SDC Platinum. Secondly, accounting data on target firms were gathered from Amadeus. Using Zephyr as the first-hand database for identifying relevant transactions is due to Zephyr and Amadeus belonging to the same company (Bureau van Dijk) – This makes the process of finding target firms' accounting information easier (an internal company code can be used). Also, Wang (2012) explains that Zephyr has better coverage than SDC when it comes to European deals. Lastly, in the third step, PE firm information was retrieved from Thomson Banker. The final dataset consists of 259 transactions conducted by 77 different PE firms during the period 2008-2014 in the Nordics. A more detailed description of the respective step is provided below.

As a first step, relevant PE deals were identified from the databases Zephyr and SDC. The following criteria were used:

- Time horizon set at 2008-2014 – Lower-limit chosen due to data availability and higher-limit due to three years of post-transaction operating performance will be used.
- The target company is based in the Nordics; Sweden, Finland, Norway, and Denmark – Both international and domestic PE firms as acquirers have been included.
- The acquirer is a PE firm (as defined in section 1.1.).
- The vendor source can be categorised as Division, Private or SBO – Hence, public-to-private transactions have been excluded.
- A majority stake has been acquired, over 50% of the share capital.

The dataset received from Zephyr consisted of 645 transactions[2]. A number of non-relevant transactions were excluded; Transactions, where the acquirer cannot be defined as a private equity firm, i.e. other financial sponsors such as banks, investment companies,

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[2] The following criteria were used: *Time period:* 2008-2014, *Target country:* Finland, Sweden, Norway, Denmark, *Deal types:* Institutional buy-out, MBI/MBO, Management buy-in, Management buy-out, *Completed:* Yes

and venture capital firms, were excluded. 88 transactions excluded under this criterium. Further, private-to-public transactions have been excluded. 25 more transactions excluded. Transactions representing a minority interest and/or simply an increase in ownership has been excluded. 51 transactions excluded. Lastly, a few other non-relevant transactions have been excluded, such as undisclosed PE firm or a portfolio of properties. 31 transactions excluded. This exercise led to a total number of transactions included from Zephyr amounting to 450.

Thereafter, the Zephyr dataset was compared to a dataset from SDC Platinum. Relevant transactions not included in Zephyr have been added to the final dataset. A total number of transactions in SDC Platinum was 347[3]. In the SDC Platinum 92 new relevant transactions were found (same procedure as for Zephyr data were conducted), implying a final dataset of relevant transactions consisting of 542 deals.

Furthermore, with regards to a couple of control variables[4], a few transactions had missing values. Information for these missing values has been gathered from sources such as press releases and articles.

The second step consisted of gathering accounting data for target firms. The fact that PE firms often create a new holding company meant identifying the correct (new) entity for every single transaction. Accounting information was found for 259 transactions (conducted by 77 different PE firms).

The number of buyouts per year in the sample is shown in Figure 1. Interesting to note is the large drop in the number of transactions during 2009, which clearly shows the effect the global financial crisis had on the PE industry in the Nordics. Similar trends in the number of conducted transactions have been reported by for example Invest Europe (2018) when it comes to Europe as a whole.

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[3] *Time period:* 2008-2014, *Target country:* Finland, Sweden, Norway, Denmark, *Acquiror is a Leveraged Buyout Firm:* Yes, *% owned after transaction:* >50%, *Completed:* Yes

[4] Data on syndication and vendor source has been gathered manually for a few transactions, see section 5.2. and 5.3. for a detailed description of these variables.

Figure 1: Number of Buyouts per Year

The graph shows the number of transactions per year in the sample - A total of
259 buyouts conducted by 77 different PE firms
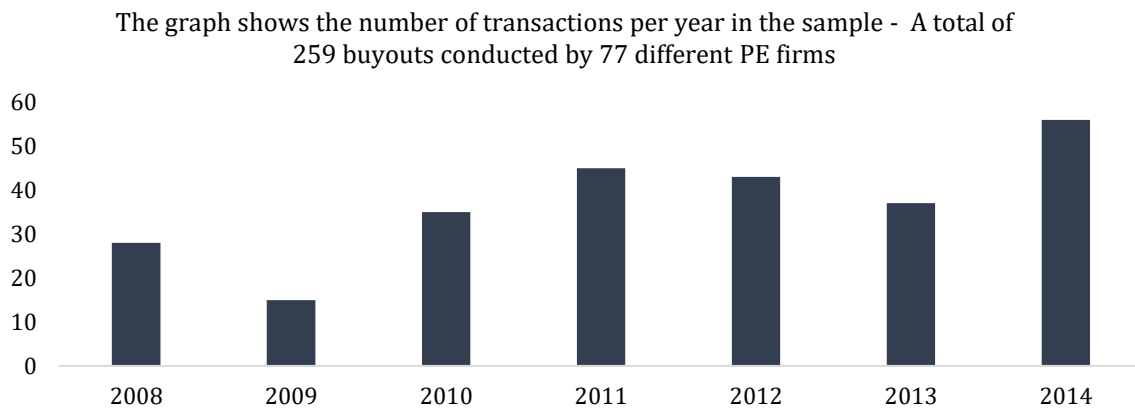
In the third step information regarding each private equity firm (and all their portfolio firms) was gathered from Thomson Banker.

I.4.2. Dependent Variables

The objective of this paper is to investigate the PE industry specialisation effect on performance as well as the extra effect of specialisation in more demanding buyouts (with regards to profitability pre-buyout and vendor source). The measure of performance for the PE firm is operating performance improvements in the target company. One important point to raise is earnings manipulation, accounting profits can be manipulated and do not always show true performance (Cumming et al., 2007). However, according to Acharya et al. (2013) operating performance improvements are key explanatory factors for PE firm abnormal performance. The authors show that higher abnormal performance, defined as the difference between unlevered IRR for PE firms and unlevered IRR for quoted peers, is closely related to improvements in turnover growth, EBITDA-margins, and multiples. Also, operating profitability improvements are higher for PE firms' portfolio companies compared to the industry as a whole.

Hence, the dependent variables used are Turnover Growth and Change in Profitability. These dependent variables are in line with Cressy et al. (2007) and Le Nadant et al. (2018), as well as with several other studies measuring operating performance gains in PE firms' targets (see for example Nikoskelainen & Wright, 2007 and Guo et al., 2011).

The time period used for measuring operating performance is year +1' to +3' post-transaction, i.e. year 0' represents the year of the transaction. This time period is in line with previous research, see Cressy et al. (2007). Also, Bonini (2012) explains that previous research has generally shown that the majority of improvements in operating performance can be seen two-years post-buyout. The Turnover Growth is calculated as a compounded annual growth rate (CAGR) for sales from year +1' to year +3'. Profitability is calculated as EBITDA/Sales. The Change in Profitability is then calculated as the margin at year +3' subtracted from the margin at year +1' divided by 3. A similar approach for calculating the change in profitability is used by for example Acharya et al. (2013).

I.4.3. Main Independent Variables

The main independent variables are PE Industry Specialisation, Profitability Pre-Buyout (Low-Performing, Medium-Performing, and High-Performing) and Vendor Source (Division, Private and SBO), all of which are needed to test the different hypotheses.

The degree of specialisation, i.e. the variable PE Industry Specialisation, is calculated in the same way as Cressy et al. (2007). The authors adapted the Index of Competitive Advantage (ICA) from Archibugi and Pianta (1994). The ICA is defined in the following way:

$$ICA_{ij} = \left(\frac{C_{ij}}{C_{.j}}\right) / \left(\frac{C_{i.}}{C_{..}}\right)$$

C_{ij}: number of PE firm i's portfolio companies within industry j

$C_{.j}$: total number of portfolio companies within industry j (all PE firms)

$C_{i.}$: PE firm i's total number of portfolio companies

$C_{..}$: total number of portfolio companies in all industries (all PE firms)

The numerator equals PE firm i's share of portfolio companies within industry j. The denominator equals PE firm i's share of portfolio companies within all industries. This

implies ICA_{ij} gives relative specialisation, if the value is greater than 1 the PE firm is relatively industry specialised (compared to the other PE firms in the industry).

The ICA is calculated for each year for each PE firm as follows; Given an average holding period for Swedish PE firms of five years (Copenhagen Economics, 2017), the same holding period has been assumed for all portfolio firms for the relevant PE firms. Hence, the portfolio firms included for each PE firm in year 0' are all targets acquired during the period -4'-0'. For example, the portfolio firms included in the year 2008 are the ones acquired during the years 2004-2008, the included firms in the year 2009 are the ones acquired during the years 2005-2009, and so forth. It can be noted that previous papers, i.e. Cressy et al. (2007) and Le Nadant et al. (2018), have simply taken the portfolio firms for the entire timespan of their research window. However, this procedure may create a bias due to the potential risk that the PE firm makes several transactions within a specific industry in the latest years and therefore cannot be said to be specialised in the earlier years.

In case of a syndicated transaction (more than one PE firm as the acquirer) the main acquirer in terms of percentage of equity acquired has been identified and used as the relevant PE firm when constructing the variable PE Industry Specialisation. Previous literature states that the main PE firm has a large influence on the implementation of different value creating mechanisms post-buyout (Cressy et al., 2007).

The variable PE Industry Specialisation is a dummy variable, it receives the value of 1 if the PE firm is considered industry specialised (an ICA higher than 1) with regards to the acquired portfolio company and the value of 0 if this is not the case (an ICA lower than 1).

The variable Profitability Pre-Buyout (EBITDA/Sales at year 0') has been industry adjusted in line with Le Nadant et al. (2018), i.e. the sample industry median has been subtracted from the specific target firm's EBITDA/Sales when creating the dummy variables Low-Performing, Medium-Performing and High-Performing. The observations have been divided into three groups consisting of an equal number of buyouts based on their industry adjusted profitability pre-buyout. The dummy variables Low-Performing and High-Performing will function as interaction variables when testing the 2nd set of hypotheses. Also, note that the general variable Profitability Pre-Buyout will be used as a control variable in several regressions.

The included vendor sources are Division, Private and SBO, meaning private-to-private transactions. A divisional buyout is defined as a deal where a private equity firm(s) acquires a division, subsidiary, or another operating unit from a larger company, see Hite and Vetsuypens (1989) and Meuleman et al. (2009). A secondary buyout (SBO) is defined as a transaction where a private equity firm(s) buys a company from another private equity firm(s). Not only secondary buyouts are included, but also tertiary buyouts, etc. This definition is in line with that of Degeorge et al. (2016).[5] A private buyout occurs when a private equity firm(s) acquires a portfolio company from other private owners, not belonging to the above to groups, oftentimes this category implies family owners. Public-to-private (PTP) transactions have been excluded. The reason for excluding PTP transactions is due to the fact that they have received a lot of attention in previous papers and are therefore well-understood as well as them only representing a small share of the total amount of PE deals, see Strömberg (2008), Meuleman et al. (2009), Alperovych et al. (2013) and Cumming et al. (2007). Also, Acharya et al. (2013) explain that the characteristics of private-to-private transactions, in terms of size and profit margins, are different compared to public-to-private transactions. For example, with the use of a dataset consisting of 21,397 buyout transactions during the period 1970-2007 Strömberg (2008) shows that most leveraged buyouts can be categorised as private or division, with an increasing share of SBOs. Public-to-private transactions only represent 6.7% of total transactions. Also, public-to-private transactions represent a smaller share in more recent times. Three dummy variables are created; Division, Private and SBO. The variables Division and SBO will function as interaction variables when testing the 3rd set of hypotheses. Also, note that the dummy variables Division and SBO will be used as control variables in several regressions.

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[5] The definition of a private equity firm for the seller is broader than the one used for the buyer (see section 1.1.), if the selling company is a venture capital firm or an investment company the transaction will show up as an SBO.

I.4.4. Other Independent Variables

Several control variables that have been shown to affect operating performance in PE firms' targets post-buyout are included based on previous research;

Syndication – A dummy variable that takes the value of 1 if the acquisition was conducted by more than one PE firm and the value of 0 in case of a single acquirer. Guo et al. (2011) find a positive relationship between syndication, or club deals as these deals are also called, and return on invested capital. The authors conclude that this relationship is due to more attractive targets in terms of value creation are more likely to be syndicated. Furthermore, Meuleman et al. (2009) explain that deals get syndicated in order for PE firms to take advantage of each other's strengths.

Profitability Pre-Buyout – EBITDA/Sales in year 0' – Guo et al. (2011) explain that firms that underperform pre-buyout may have the largest operating performance improvement potential, the authors include profitability (EBITDA/Sales) in the year prior to the buyout.

Turnover Pre-Buyout – Sales in year 0', normalised using a log function. Nikoskelainen and Wright (2007) show that the size of the target company is an important driver of value creation. Larger targets show higher performance improvements and investor returns. The authors use enterprise value at entry for the target firm. Meuleman et al. (2009) use sales in the buyout year in order to consider the scale effect on performance.

Deal Leverage – Debt to total assets in the buyout year (in year 0'). The use of a higher amount of debt is an important value creation driver in PE deals (see for example Jensen, 1989). Guo et al. (2011) find a positive relationship between increases in leverage and operating performance improvements post-buyout.

PE Age – Defined as the number of years since the PE firm was founded. Calculated from the year of the transaction. Kaplan and Schoar (2005) show that first-time funds perform worse than higher sequence funds, implying PE firm age has a positive effect on performance.

PE Experience – As the cumulative number of investments since the inception of the PE firm (total number of investments for the PE firm from inception until 2014). This measure of experience is used by for example Meuleman et al. (2009) and Nikoskelainen and Wright (2007). Meuleman et al. (2009) find that more experienced PE firms achieve

higher growth in their targets post-buyout, although the same does not hold for profitability. Also, PE experience is truly important for the post-acquisition performance of divisional buyouts, especially with regards to growth. Nikoskelainen and Wright (2007) explain that experience is gained through "deal doing" and therefore a cumulative measure is to be preferred. Furthermore, Kaplan and Schoar (2005) show that larger funds tend to perform better than smaller funds, although only up to a certain point when size increases too much performance starts declining.

MSCI – The MSCI Nordic Countries Index in the month of the deal. Armour and Cumming (2006) explain that there exists a relationship between the level of the index and fundraising and exits for PE firms. This might affect growth and profitability for target firms (Cressy et al., 2007). Lossen (2006) finds a negative relationship between the MSCI World Index and PE fund return. When the economy is performing well target firm valuations and prices increases, which leads to lower rates of returns.

PE Investments – The total amount of investments by European PE firms in the year of the deal (Invest Europe, 2018). Gompers and Lerner (2000) show that there exists a positive relationship between capital inflow into the venture capital industry and the valuations for relevant target firms, "too much money chasing too few deals" the authors explain. More capital available implies more buyouts of lower-quality targets (Lossen, 2006), which may influence operating performance post-buyout according to Cressy et al. (2007).

Local PE – A dummy variable taking the value of 1 if PE firm's home country is the same as the target firm's home country, and zero otherwise. Having more local knowledge and presence can provide for an advantage with regards to both finding suitable target firms and implementing value-adding strategies in the acquired targets (see for example Lossen, 2006 for similar reasoning).

Industry dummies will also be included in order to take into account performance differences across industries (see Le Nadant et al., 2018 and Degeorge et al., 2013).

I.4.5. Statistical Methods

In order to test the 1st set of hypotheses and receive a preliminary result, a univariate analysis is conducted. The difference in mean sales growth (*Hypothesis 1a*) and mean profitability improvements (*Hypothesis 1b*) between specialised and non-specialised PE firms is tested. In line with previous literature (see Cressy et al., 2007 and Le Nadant et al., 2018), the test used is a one-tailed independent sample t-test with the assumption of unequal variances.

To test the 1st, 2nd and 3rd set of hypotheses ordinary least squares (OLS) regressions are conducted. As mentioned in sections 4.1. – 4.3., the dependent variables are Turnover Growth and Change in Profitability. The main independent variables are PE Industry Specialisation, Profitability Pre-Buyout, and Vendor Source. Furthermore, several control variables are included in the regressions. The use of OLS regression is in line with previous literature (see Cressy et al., 2007 and Meuleman et al., 2009). In general, OLS regressions require the following assumptions: linear relationship between the dependent variable and parameters of independent variables, errors have a mean of zero, errors are independent, the variance of the errors is homoscedastic, and errors are normally distributed (Williams et al., 2013). Also, outliers and multicollinearity can affect the results. Errors in the sample are not perfectly normal (however, deviation from normality not large) and show signs of heteroscedasticity. Therefore, in line with Meuleman at al., (2009), robust standard errors are used in all regressions in order to take into account heteroscedasticity of the errors. No signs of multicollinearity according to VIF-test. Also, no extreme outliers in the data.

I.4.6. Descriptive Statistics

Table 1 provides descriptive statistics for the dependent and the independent (control) variables for specialised PE firms, non-specialised PE firms and for the global sample. As can be seen the global sample average turnover growth is 13.9% and average profitability improvements are -0.1%. The average turnover growth is somewhat higher for specialised PE firms (14.2%) compared to non-specialised PE firms (13.3%). The same holds true for profitability improvements, 0.1% for specialised PE firms compared to -

0.7% for non-specialised. No major differences in standard deviation between the two samples with regards to turnover growth and profitability improvements.

With regards to control variables Table 1 shows that specialised PE firms are more seldom involved in syndicated deals. Furthermore, small differences in pre-buyout target firm financial standing among the two groups of PE firms can be seen. PE firms' targets are on average somewhat smaller in terms of sales, show higher profitability and a higher leverage ratio pre-buyout. Interestingly, specialised PE firms are younger on average (16.2 years compared to 18.1 years for non-specialised) and have less experience in terms of cumulative investments (62.0 compared to 77.2). Note that the significance of the differences in all these variables between specialised and non-specialised PE firms will be tested in section 5.1.

Table 1: Descriptive Statistics

The table shows the mean, standard deviation, min, max and number of observations for the dependent and independent variables. Turnover Growth is the compounded annual growth rate (CAGR) for sales from year +1' to year +3' post-buyout. The Change in Profitability is the EBITDA/Sales-margin at year +3' subtracted from the EBITDA/Sales-margin at year +1' divided by 3. Syndication is a dummy variable taking the value of 1 if the acquisition was conducted by more than one PE firm and the value of 0 in case of a single acquirer. PE Experience as cumulative number of investments since the PE firm was established, i.e. total number of investments for the PE firm from inception until 2014. PE Age defined as the number of years since the specific PE firm was founded. Local PE is a dummy variable taking the value of 1 if PE firm's home country is the same as the target firm's home country, and 0 otherwise. MSCI is the level of the MSCI Nordic Countries Index in the month of the deal. PE Investments is the total amount of investments by European private equity firms in the year of the deal. ln(Turnover Pre-Buyout) represents sales in year 0', normalised using a log function. Profitability Pre-Buyout as EBITDA/Sales in year 0'. Deal Leverage is debt to total assets in year 0'.

	Non-Specialised PE Firms					Specialised PE Firms					All PE Firms				
	Mean	Std. Dev.	Min.	Max.	N	Mean	Std. Dev.	Min.	Max.	N	Mean	Std. Dev.	Min.	Max.	N
Dependent variables															
Turnover Growth	0.133	0.231	-0.241	1.252	80	0.142	0.237	-0.223	1.511	167	0.139	0.235	-0.241	1.511	247
Change in Profitability	-0.007	0.028	-0.155	0.051	76	0.001	0.032	-0.079	0.237	164	-0.001	0.031	-0.155	0.237	240
Independent variables															
Syndication	0.083	0.278	0.000	1.000	84	0.057	0.233	0.000	1.000	175	0.066	0.248	0.000	1.000	259
PE Experience	77.214	77.578	2.000	350.000	84	61.983	75.835	2.000	675.000	175	66.923	76.588	2.000	675.000	259
PE Age	18.071	14.072	1.000	80.000	84	16.200	12.576	1.000	79.000	175	16.807	13.082	1.000	80.000	259
Local PE	0.476	0.502	0.000	1.000	84	0.566	0.497	0.000	1.000	175	0.537	0.500	0.000	1.000	259
MSCI	96.376	15.568	54.800	121.620	84	96.686	15.942	53.900	121.620	175	96.585	15.792	53.900	121.620	259
PE Investments	46.179	6.857	28.000	59.000	84	46.183	6.556	28.000	59.000	175	46.181	6.642	28.000	59.000	259
ln(Turnover Pre-Buyout)	10.396	1.375	5.394	13.518	74	10.171	1.152	7.010	14.269	157	10.243	1.229	5.394	14.269	231
Profitability Pre-Buyout	0.113	0.341	-2.564	0.681	72	0.118	0.183	-1.431	0.743	154	0.117	0.244	-2.564	0.743	226
Deal Leverage	0.609	0.209	0.074	1.062	76	0.619	0.223	0.112	0.988	164	0.616	0.218	0.074	1.062	240

In Table 2 the number of transactions belonging to each of the three groups of industry-adjusted profitability pre-buyout divided between specialised and non-specialised PE firms is shown. Interestingly, the percentage of low-performers are higher for specialised PE firms (~36% compared to ~28% for non-specialised) and the percentage of high-performers are lower for specialised PE firms (~29% compared to ~42% for non-specialised). Relatively specialised PE firms acquire more low-performing targets and less high-performing targets compared to non-specialised PE-firms. Le Nadant et al. (2018) have a similar distribution in their sample, ~40% of the industry specialised PE firms' targets are low-performing and ~26% are high-performing (the numbers are ~26% and ~43% for non-specialised PE firms).

Table 2: Distribution of Profitability Pre-buyout

The table shows the distribution of the target firm industry adjusted profitability pre-buyout between specialised and non-specialised PE firms. PE Industry Specialisation is a dummy variable taking the value of 1 if the PE firm has an ICA above 1, i.e. is considered industry specialised, and 0 otherwise. Low-Performing, Medium-Performing, and High-Performing are dummy variables taking the value of 1 if the industry adjusted EBITDA/Sales at year 0' is in the first, second or third tercile respectively, and zero otherwise.

PE Industry Specialisation	Low-Performing	Medium-Performing	High-Performing	Total
Non-Specialised PE Firms	20	22	30	72
	27.78%	*30.56%*	*41.67%*	*100.00%*
Specialised PE Firms	55	54	45	154
	35.71%	*35.06%*	*29.22%*	*100.00%*
All PE Firms	75	76	75	226
	33.19%	*33.63%*	*33.19%*	*100.00%*

Table 3 shows that ~31% of the buyouts in the sample are SBOs, ~17% are divisional buyouts and ~52% are acquired from other private sellers. Furthermore, SBOs and divisional buyouts show a lower percentage of total buyouts for specialised PE firms compared to non-specialised PE firms. A larger share of SBOs among non-specialised PE firms is in line with the idea that SBOs should represent transactions with an easier and lower value-creation potential and hence less need for distinct capabilities and resources more likely to be seen among specialised PE firms. That divisional buyouts represent are a larger share of total buyouts for non-specialised compared to specialised PE firms is a bit surprising given their potential complex value creation.

Table 3: Distribution of Vendor Sources

The table shows the distribution of buyouts from different vendor sources between specialised and non-specialised PE firms. PE Industry Specialisation is a dummy variable taking the value of 1 if the PE firm has an ICA above 1, i.e. is considered industry specialised, and 0 otherwise. SBO, Division and Private are dummy variables taking the value of 1 if the vendor source in the buyout corresponds to each respective one, and zero otherwise.

PE Industry Specialisation	SBO	Division	Private	Total
Non-Specialised PE Firms	31	18	35	84
	36.90%	*21.43%*	*41.67%*	*100.00%*
Specialised PE Firms	49	26	100	175
	28.00%	*14.86%*	*57.14%*	*100.00%*
All PE Firms	80	44	135	259
	30.89%	*16.99%*	*52.12%*	*100.00%*

I.5. Results

I.5.1. Univariate Analysis

In order to provide a first indication of the 1st set of hypotheses, that industry specialised PE firms achieve higher sales growth and higher profitability improvements in their targets post-transaction compared to non-specialised PE firms, a one-tailed independent sample t-test with the assumption of unequal variances has been used. Table 4 shows the results of this test; As pointed out in the descriptive statistics sub-section (see section 4.5.) industry specialised PE firms show higher sales growth and higher changes in profitability on average. With regards to sales growth, this difference is truly small (14.2% compared to 13.3%) and not significant. The difference in change in profitability, on the other hand, is significant at the 10% level. In general, this implies no support for hypothesis 1a, but hypothesis 1b is supported to some extent. There seems to exist potential advantages to industry specialisation with regards to profitability improvements. These results are in line with Cressy et al. (2007), the authors also found a significant difference for in favor of industry specialised PE firms with regards to operating profitability and no significance for the difference in turnover growth. Le Nadant et al. (2018), on the other hand, found significant higher turnover growth and operating performance improvements for industry specialised compared to non-specialised PE firms.

Table 4: Univariate Analysis of the Dependent Variables

The table shows the mean and the standard deviation for average turnover growth and change in profitability for specialised and non-specialised PE firms. The difference between the means as well as the corresponding p-values and t-values are also shown. A one-sided independent sample t-test with unequal variances has been used. Turnover Growth is the compounded annual growth rate (CAGR) for sales from year +1' to year +3' post-buyout. The Change in Profitability is the EBITDA/Sales-margin at year +3' subtracted from the EBITDA/Sales-margin at year +1' divided by 3.

	Non-Specialised PE Firms		Specialised PE Firms		Difference		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
Turnover Growth	0.133	0.231	0.142	0.237	-0.009	0.389	(-0.283)
Change in Profitability	-0.007	0.028	0.001	0.032	-0.008*	0.030	(-1.899)
N	80		167		247		

*p<0.10, **p<0.05,
***p<0.01

A similar analysis has been conducted on the independent (control) variables (see Table 5 in the Appendix). No significant differences are found between the two types of PE firms for these variables.

I.5.2. Regression Analysis

In Table 6 regressions with Turnover Growth as the dependent variable are shown and Table 7 shows regressions with Change in Profitability as the dependent variable. Both regressions have the same structure: The first two regressions include no interaction terms and are used for testing the 1st set of hypotheses. In the next two regressions, interaction variables between industry specialisation and profitability pre-buyout are included. These regressions are aimed at testing the 2nd set of hypotheses. Note that the control variable Profitability Pre-Buyout is excluded from these two regressions due to the new included variables explaining the same aspect. In the last two regressions, interaction variables between industry specialisation and vendor source are included, hence used for the 3rd set of hypotheses.

As can be seen in Table 6 the dummy variable PE Industry Specialisation is not significant in any of the regressions. Hence, hypothesis 1a does not seem to hold true. This is in line with the results found in the univariate analysis of the difference in means in the previous

section (5.1.). Cressy et al. (2007) found similar results, no evidence for outperformance with regards to turnover growth for industry specialised compared to non-specialised PE firms. In contrast, Le Nadant et al. (2018) found a weak significant (10%) advantage for specialised PE firms with regards to sales growth.

Furthermore, as can be seen in regressions three through six, the interaction variables do not show any significance either. Hence, hypotheses 2a&c and 3a&c are not supported. Le Nadant et al. (2018) found strong evidence that the advantage of industry specialisation is higher for pre-buyout low-performing targets compared to medium-performing, as well as weak evidence of larger advantage to specialisation when the target is high-performing pre-buyout compared to medium performing.

Also, in Table 6, factors affecting turnover growth are if the transaction was an SBO, the Turnover Pre-Buyout, and the Profitability Pre-Buyout.

Table 6: Regressions with Turnover Growth as the Dependent Variable

Dependent variable: Turnover Growth	(1a) No interaction		(2a&c) Interaction: Specialisation & Pre-Buyout Profitability		(3a&c) Interaction: Specialisation & Vendor Source	
	Simple	Full	Simple	Full	Simple	Full
PE Industry Specialisation	0.0067	-0.0057	0.0258	-0.0033	-0.0137	-0.0048
	(0.838)	(0.855)	(0.519)	(0.938)	(0.802)	(0.926)
SBO		-0.0742*		-0.0779*	-0.0994*	-0.0628
		(0.051)		(0.050)	(0.077)	(0.300)
Division		-0.0457		-0.0543	-0.0969	-0.0677
		(0.284)		(0.212)	(0.188)	(0.267)
Syndication		-0.0068		-0.0069		-0.0029
		(0.881)		(0.884)		(0.950)
PE Experience		-0.0002		-0.0003		-0.0002
		(0.268)		(0.180)		(0.273)
PE Age		-0.0007		-0.0007		-0.0006
		(0.723)		(0.712)		(0.750)
Local PE		-0.0446		-0.0479		-0.0452
		(0.199)		(0.181)		(0.190)
MSCI		0.0017		0.0017		0.0017
		(0.120)		(0.133)		(0.127)
PE Investments		-0.0029		-0.0032		-0.0029
		(0.202)		(0.169)		(0.210)
ln(Turnover Pre-Buyout)		-0.0352**		-0.0258		-0.0349**
		(0.026)		(0.132)		(0.028)
Profitability Pre-Buyout		0.1075**				0.1019**
		(0.033)				(0.038)
Deal Leverage		0.0704		0.0708		0.0688
		(0.304)		(0.303)		(0.317)
Low-Performing			-0.0153	-0.0052		
			(0.722)	(0.920)		
High-Performing			0.0673	0.0576		
			(0.225)	(0.332)		
PE Industry Specialisation # Low-Performing			0.0472	0.0372		
			(0.468)	(0.592)		
PE Industry Specialisation # High-Performing			-0.0588	-0.0269		
			(0.399)	(0.723)		
PE Industry Specialisation # SBO					-0.0022	-0.0198
					(0.974)	(0.766)
PE Industry Specialisation # Division					0.0291	0.0354
					(0.745)	(0.667)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.1660***	0.5211***	0.1354**	0.4399**	0.2294***	0.5197***
	(0.000)	(0.004)	(0.014)	(0.024)	(0.000)	(0.009)
N	247	226	226	226	247	226
adj. R-sq	-0.017	0.029	-0.019	0.010	0.007	0.021
p-values in parentheses	*p<0.10, **p<0.05, ***p<0.01					

The table shows regressions for testing hypotheses 1a, 2a&c, and 3a&c, i.e. with Turnover Growth as the dependent variable. Turnover Growth is the compounded annual growth rate (CAGR) for sales from year +1' to year +3' post-buyout. Independent variables include: PE Industry Specialisation is a dummy variable taking the value of 1 if the PE firm has an ICA above 1, i.e. is considered industry specialised, and 0 otherwise. Low-Performing and High-Performing are dummy variables taking the value of 1 if the industry adjusted EBITDA/Sales at year 0' is in the first, second or third tercile respectively, and zero otherwise. SBO and Division are dummy variables taking the value of 1 if the vendor source in the buyout corresponds to each respective one, and zero otherwise. Syndication is a dummy variable taking the value of 1 if the acquisition was conducted by more than one PE firm and the value of 0 in case of a single acquirer. PE Experience as cumulative number of investments since the PE firm was established, i.e. total number of investments for the PE firm from inception until 2014. PE Age defined as the number of years since the specific PE firm was founded. Local PE is a dummy variable taking the value of 1 if PE firm's home country is the same as the target firm's home country, and 0 otherwise. MSCI is the level of the MSCI Nordic Countries Index in the month of the deal. PE Investments is the total amount of investments by European private equity firms in the year of the deal. ln(Turnover Pre-Buyout) represents sales in year 0', normalised using a log function. Profitability Pre-Buyout as EBITDA/Sales in year 0'. Deal Leverage is debt to total assets in year 0'. PE Industry Specialisation # Low-Performing, PE Industry Specialisation # Low-Performing, PE Industry Specialisation # SBO and PE Industry Specialisation # Division are interaction variables.

In the first two regressions in Table 7, the variable PE Industry Specialisation is shown to be positive and significant at the 10% level, implying that industry specialised PE firms have an advantage compared to not-specialised PE firms when it comes to improvements in profitability. Hence, these results show that hypothesis 1b holds true. Also, the result is in line with the results of the univariate analysis in the previous sub-section. Although, the evidence is rather weak, with only a 10% significance level and a low adjusted R-squared. The result is in line with Cressy et al. (2007) and Le Nadant et al. (2018). Both papers find a strong significant advantage for industry specialised PE firms with regards to profitability improvements.

Hypothesis 2b is also supported at the 5% level, as can be seen in regression three and four, i.e. specialisation provides a further advantage in the case of an initially low-performing target. Also, the adjusted R-squared is low in these regressions. Le Nadant et al. (2018) do not find evidence for this. Hypotheses 2d and 3b&d do not hold true.

Other factors affecting the change in profitability is PE firm age, which surprisingly takes a negative sign, implying younger PE firms perform better than older ones with regards to profitability improvements.

Table 7: Regressions with Change in Profitability as the Dependent Variable

Dependent variable: Change in Profitability	(1b) No interaction		(2b&d) Interaction: Specialisation & Pre-Buyout Profitability		(3b&d) Interaction: Specialisation & Vendor Source	
	Simple	Full	Simple	Full	Simple	Full
PE Industry Specialisation	0.0078*	0.0069*	-0.0019	-0.0046	0.0088	0.0097
	(0.058)	(0.092)	(0.704)	(0.445)	(0.172)	(0.163)
SBO		-0.0030		-0.0013	0.0017	-0.0009
		(0.600)		(0.827)	(0.785)	(0.912)
Division		0.0025		0.0018	0.0026	0.0086
		(0.635)		(0.768)	(0.831)	(0.366)
Syndication		-0.0004		0.0036		-0.0012
		(0.943)		(0.523)		(0.812)
PE Experience		-0.0000		-0.0000		-0.0000
		(0.208)		(0.290)		(0.166)
PE Age		-0.0002**		-0.0002		-0.0002**
		(0.037)		(0.125)		(0.046)
Local PE		-0.0056		-0.0083		-0.0056
		(0.369)		(0.196)		(0.365)
MSCI		0.0001		0.0000		0.0001
		(0.597)		(0.751)		(0.591)
PE Investments		-0.0005		-0.0005		-0.0005
		(0.151)		(0.145)		(0.161)
ln(Turnover Pre-Buyout)		0.0024		0.0031		0.0024
		(0.160)		(0.320)		(0.166)
Profitability Pre-Buyout		0.0215				0.0226
		(0.226)				(0.207)
Deal Leverage		0.0044		-0.0005		0.0051
		(0.676)		(0.961)		(0.623)
Low-Performing			-0.0178*	-0.0218*		
			(0.099)	(0.050)		
High-Performing			-0.0051	-0.0065		
			(0.389)	(0.373)		
PE Industry Specialisation # Low-Performing			0.0304**	0.0362**		
			(0.024)	(0.012)		
PE Industry Specialisation # High-Performing			-0.0021	0.0023		
			(0.780)	(0.787)		
PE Industry Specialisation # SBO					-0.0012	-0.0029
					(0.889)	(0.768)
PE Industry Specialisation # Division					-0.0019	-0.0093
					(0.884)	(0.352)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.0070	-0.0089	0.0018	0.0014	-0.0082	-0.0122
	(0.255)	(0.819)	(0.789)	(0.974)	(0.245)	(0.763)
N	240	223	223	223	240	223
adj. R-sq	0.006	0.024	0.047	0.055	-0.012	0.017
p-values in parentheses	*p<0.10, **p<0.05, ***p<0.01					

The table shows regressions for testing hypotheses 1b, 2b&d, and 3b&d, i.e. with Change in Profitability as the dependent variable. The Change in Profitability is the EBITDA/Sales-margin at year +3' subtracted from the EBITDA/Sales-margin at year +1' divided by 3. Independent variables include: PE Industry Specialisation is a dummy variable taking the value of 1 if the PE firm has an ICA above 1, i.e. is considered industry specialised, and 0 otherwise. Low-Performing and High-Performing are dummy variables taking the value of 1 if the industry adjusted EBITDA/Sales at year 0' is in the first, second or third tercile respectively, and zero otherwise. SBO and Division are dummy variables taking the value of 1 if the vendor source in the buyout corresponds to each respective one, and zero otherwise. Syndication is a dummy variable taking the value of 1 if the acquisition was conducted by more than one PE firm and the value of 0 in case of a single acquirer. PE Experience as cumulative number of investments since the PE firm was established, i.e. total number of investments for the PE firm from inception until 2014. PE Age defined as the number of years since the specific PE firm was founded. Local PE is a dummy variable taking the value of 1 if PE firm's home country is the same as the target firm's home country, and 0 otherwise. MSCI is the level of the MSCI Nordic Countries Index in the month of the deal. PE Investments is the total amount of investments by European private equity firms in the year of the deal. ln(Turnover Pre-Buyout) represents sales in year 0', normalised using a log function. Profitability Pre-Buyout as EBITDA/Sales in year 0'. Deal Leverage is debt to total assets in year 0'. PE Industry Specialisation # Low-Performing, PE Industry Specialisation # Low-Performing, PE Industry Specialisation # SBO and PE Industry Specialisation # Division are interaction variables.

I.5.3. Robustness Tests

As a robustness test, the variable PE Industry Specialisation has been modified. Instead of using an ICA>1 as the threshold for determining if a PE firm is relatively industry specialised, an ICA>1.25 has been used. This implies that for a specific PE firm to be considered industry specialised a higher percentage of the portfolio needs to be invested in that specific industry. Leading to a lower number of PE firms in the sample being seen as industry specialised compared to before. The results are shown in Table 8, Table 9 and Table 10 (see Appendix). Support is found for hypothesis 1b (Industry specialised PE firms manage to receive higher profitability improvements in their targets post-transaction compared to other PE firms) as before. However, hypothesis 2b (The positive relationship between profitability improvements and PE industry specialisation is stronger for initially low-performing targets compared to initially medium-performing targets) is no longer supported.

I.5.4. Summary of Results

Table 8 provides a summary of the hypotheses and the results found. The confirmed hypotheses are bolded.

Table 11: Hypotheses and Results

	Hypothesis	Supported
Hypothesis 1a	Industry specialised PE firms manage to receive higher sales growth in their targets post-transaction compared to other PE firms	No
Hypothesis 1b	Industry specialised PE firms manage to receive higher profitability improvements in their targets post-transaction compared to other PE firms	**Yes**
Hypothesis 2a	The positive relationship between sales growth and PE industry specialisation is stronger for initially low-performing targets compared to initially medium-performing targets	No
Hypothesis 2b	The positive relationship between profitability improvements and PE industry specialisation is stronger for initially low-performing targets compared to initially medium-performing targets	**Yes**
Hypothesis 2c	The positive relationship between sales growth and PE industry specialisation is stronger for initially high-performing targets compared to initially medium-performing targets	No
Hypothesis 2d	The positive relationship between profitability improvements and PE industry specialisation is stronger for initially high-performing targets compared to initially medium-performing targets	No
Hypothesis 3a	The positive relationship between sales growth and PE industry specialisation is stronger for private buyouts than for SBOs	No
Hypothesis 3b	The positive relationship between profitability improvements and PE industry specialisation is stronger for private buyouts than for SBOs	No
Hypothesis 3c	The positive relationship between sales growth and PE industry specialisation is stronger for divisional buyouts than for private buyouts	No
Hypothesis 3d	The positive relationship between profitability improvements and PE industry specialisation is stronger for divisional buyouts than for private buyouts	No

All in all, as shown in the previous two sections only Hypotheses 1b and 2b are confirmed. An advantage to industry specialisation within Nordic private equity seems to exist with regards to improvements in profitability (Hypothesis 1b). Industry specialised PE firms show higher post-buyout profitability improvements compared to non-industry-specialised PE firms. Furthermore, in certain demanding situations, when targets firm has low pre-buyout profitability, the advantage to industry specialisation is even stronger for profitability improvements (Hypothesis 2b). The positive relationship between profitability improvements and PE industry specialisation is stronger for initially low performing targets compared to initially medium-performing targets. However, the latter finding is only supported in the main regression and not in the robustness test.

I.5.5. Limitations

A few important limitations with regards to this study and the results are important to bring up. Firstly, although conducted thoroughly, a selection bias might exist. Not all buyouts during the relevant time period are included, the databases used may not have every single buyout on record and accounting information was unavailable for several transactions. This may have the effect of systematically leaving out some specific type of PE deals. Second, the final sample used is rather small (259 buyouts) and, therefore, the statistical power of the results is rather low. These two limitations are of course a general issue within private equity research, given that information is generally private (Lossen, 2006, and Harris et al. 2015). Third, although the independent variable selection is based on previous literature, the adjusted R-squared is low in all regressions (see sub-section 5.2.) implying that the independent variables do not explain the dependent variables that well. Fourth, the main independent variable, PE Industry Specialisation, may not be the most appropriate measure for industry specialisation. Previous studies have also used for example the Herfindahl-Hirschmann-Indices (HHI), see Lossen (2006).

I.6. Conclusions

The purpose of this paper has been to investigate whether an advantage to industry specialisation exists within Nordic private equity. PE firms have been divided between industry specialised and non-specialised based on the Index of Competitive Advantage (ICA). This implies relative specialisation, if the ICA is greater than 1 the PE firm is relatively industry specialised (compared to the other PE firms in the industry), and vice versa. Post-buyout operating performance differences, sales growth and margin improvements, between targets of the two groups of PE firms have thereafter been investigated. Furthermore, the effect of PE industry specialisation on post-buyout performance in more demanding situations, in terms of target firm pre-buyout profitability and type of vendor source, has also been investigated.

Using a unique dataset of 259 transactions conducted by 77 different PE firms during the period 2008-2014 in the Nordics, I show that industry specialisation has an advantage in certain situations. An advantage to industry specialisation exists when it comes to margin improvements. Targets of industry specialised PE firms show higher post-buyout profitability improvements compared to non-specialised PE firms' targets. Furthermore, in certain demanding situations, when the target firm has low pre-buyout profitability, the advantage to industry specialisation is even stronger. Neither advantage, nor disadvantage, is found with regards to turnover growth.

Specialised PE firms appear to have a competitive advantage when it comes to profitability improvements compared to non-industry specialised PE firms. The specialisation advantage may come from a more sophisticated pre-buyout selection process, which targets to acquire, or superior post-buyout capabilities of improving the acquired targets. The advantage is most likely a combination of the two phases.

With regards to the pre-buyout phase; A lower share of SBOs among specialised PE firms was observed in the sample, which is in line with the idea that SBOs should represent transactions with an easier and lower value-creation potential and hence less need for distinct capabilities and resources more likely to be seen among specialised PE firms. Also, specialised PE firms acquire more low-performing targets and less high-performing targets compared to non-specialised PE-firms. Hence, the industry specialist chooses more demanding targets with higher potential for operating performance improvements.

In the post-buyout phase, industry specialised PE firms achieve higher margin improvements. Hence, successful implementation of value-adding strategies. Having a vast amount of expertise and knowledge about a specific industry appears to allow for better management of costs, the specialist knows how to streamline the business without affecting turnover growth.

In practice, there are not many truly industry specialised PE firms in the Nordics. Most PE firms are generalists and target several different industries. This is interesting, given the small advantage of being industry specialised shown in this paper. A similar advantage has been shown by Cressy et al., 2007 and Le Nadant et al., 2018. The reason PE firms choose industry diversification may simply be risk spreading. Industry specialists run the risk of having to invest in unattractive investment opportunities during weak industry cycles. PE firms may not want to take on this risk. However, in today's highly competitive PE market finding a competitive advantage is important. Industry specialisation may provide for the creation of that much-needed competitive advantage.

I.6.1. Suggestions for Future Research

This paper has shown a competitive advantage for industry specialised PE firms when it comes to profitability improvements post-buyout in their target firms, and no such advantage with regards to turnover growth. Furthermore, this advantage has been shown to be explained by a better selection process pre-buyout, as well as, superior capabilities in implementing value-adding strategies post-buyout. However, which of the two phases contributes more to the competitive advantage has not been investigated in detail. Therefore, future research could focus on detailing the importance of the two phases.

Another interesting topic for future research would be to investigate whether the advantage of PE specialisation differs across different vendor sources for other regions than the Nordics. This paper shows that there does not exist any further advantage of industry specialisation within Nordic PE depending on the vendor source. To the best of my knowledge this paper was the first to conduct such an analysis. Hence, more research is needed in this field.

Furthermore, Bonini (2012) explains that the amount of empirical evidence with regards to target firms' operating performance after SBOs is rather low. As seen in the previous section, SBOs show significantly lower turnover growth compared to PBOs, no such difference between SBOs and PBOs when it comes to profitability improvements. However, a more detailed analysis is needed to reach more conclusive results whether SBOs truly underperform PBOs in the Nordics. Therefore, further evidence on the operating performance of SBOs compared to PBOs in the Nordic PE market would be an interesting topic for further investigation.

Part II

Secondary Buyouts in the Nordics

An analysis of value creation differences between SBOs and PBOs in the
Nordics

Abstract

This study is dedicated to investigating potential value creation differences between secondary buyouts (SBOs) and primary buyouts (PBOs) in the Nordics. Namely, differences in target firm operational performance improvements post-buyout, the amount of leverage used, and multiples paid. Two different samples have been used; In testing differences in operational performance improvements and changes in leverage a sample of 259 transactions, 179 PBOs and 80 SBOs, conducted by 77 different PE firms during the period 2008-2014 has been used. This sample is called the "main sample". The so-called "additional sample" is used for testing pricing differences. Deal values in PE transactions are often not disclosed. Therefore, a longer time horizon has been used in the additional sample in order to receive a large enough sample to be able to conduct a reasonable statistical analysis. The additional sample consists of 329 deals, 250 PBOs and 79 SBOs, during the period 1998-2018 in the Nordics. I find that target firms in SBOs generate significantly lower turnover growth post-buyout compared to PBOs. No significant differences for improvements in profitability and changes in leverage are found. Further, I show that SBOs are significantly more likely during favourable debt markets, i.e. when debt is cheap. No significant differences in multiples between the two types of deals.

"Buyout groups like secondaries because they are buying an asset from a peer and it feels like there is not much work to do, but often this leads to them paying too much. If you buy a company that has been improved by one or two previous private equity owners and if there is not much to do to improve it, then one way to get returns up is to add more leverage to it."
– Per Strömberg[6]

II.1. Introduction

Competition within the private equity (PE) industry has increased rapidly during the past decade; Increased number of active PE firms, cash-rich strategic acquirers bidding for the same targets and booming fundraising (Sensoy et al., 2014, and Appelbaum and Batt, 2016). PE firms are facing difficulties finding suitable investment opportunities and the available ones are expensive. Furthermore, there has been a surge in the number of secondary buyouts (SBOs), i.e. transactions in which both the buyer and the seller are PE firms. During the 1980s SBOs represented 13% of all LBOs, at the beginning of the 2010s the share had risen to 35% (Wang, 2012). This tremendous increase in SBOs is partly explained by the PE industry becoming more competitive and mature.

A PE deal has three main value drivers; operational performance improvements, leverage and pricing (Achleitner and Figge, 2014). The "conventional wisdom" regarding SBOs is that they should exhibit limited value creation potential. The PE firm conducting the first buyout, the so-called primary buyout or PBO, will implement several of the potential value-creating mechanisms. Hence, only limited operational improvement potential for target firm after the SBO. Also, the professionalism of the seller in the SBO will likely lead to a high price. SBOs are often said to be overpriced. However, the second acquirer may be able to increase leverage, especially during favourable debt markets. The empirical evidence on conventional wisdom is mixed, previous research has not been able to fully conclude that SBOs always show lower value creation than PBOs.

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[6] Per Strömberg interviewed in "Private equity plays risky game of musical chairs", Financial Times, 25/09/2018. Per Strömberg is SSE Centennial Professor of Finance and Private Equity, Director of the Swedish House of Finance (SHOF) and Adjunct Associate Professor of Finance at the University of Chicago Booth School of Business.

Given the growing importance of SBOs in the PE industry and the somewhat inconclusive empirical evidence on the true value creation potential in these types of deals, this study is dedicated to investigating potential value creation differences between SBOs and PBOs. Namely, differences in target firm operational performance improvements post-buyout, the amount of leverage used, and multiples paid. The perspective taken in this study is that of the buyer – Is conventional wisdom true? Or will a buyer be able to extract value similar to that in PBOs?

Two different samples have been used; In testing differences in operational performance improvements and changes in leverage a sample of 259 transactions, 179 PBOs and 80 SBOs, conducted by 77 different PE firms during the period 2008-2014 has been used. This sample is called the "main sample". The so-called "additional sample" is used for testing pricing differences. The sample consists of 329 deals, 250 PBOs and 79 SBOs, during the period 1998-2018 in the Nordics. The reasons for using two different samples are data availability and a need to receive a large enough sample to be able to conduct a reasonable statistical analysis. The fact that most PE deals are private transactions implies that deal values are not made public, and hence, unavailable without private access. Therefore, the additional sample used for pricing differences has a longer time horizon.

I show that target firms in SBOs generate significantly lower turnover growth post-transactions compared to PBOs. No significant differences are found for improvements in EBITDA-margin and ROA. Also, no significant differences in leverage one-year post-transaction, although on average leverage is higher in SBOs compared to PBOs. Further, I show that SBOs are significantly more likely during favourable debt markets, i.e. when debt is cheap. No significant differences between SBOs and PBOs are found for pricing, except for higher enterprise value in SBOs when not including control variables. SBOs show higher enterprise values and EV/sales multiples on average, but lower average EV/EBITDA multiples.

All in all, the results are to some extent in line with conventional wisdom. Significantly lower turnover growth in SBOs compared to PBOs and SBOs being more likely when debt is cheaper. The average values of other operational performance measures, leverage and pricing are mostly in line with conventional wisdom, but the differences are not significant.

The reminder of this paper is structured as follows; In section 2, a review of previous research regarding the value creation potential in SBOs is provided. Section 3 contains the hypotheses. The sample and the methodology are presented in section 4. In section 5 the results are presented. Finally, section 6 concludes.

II.2. Previous Literature

Simply put, a private equity (PE) firm's business model consists of acquiring firms, improving them for a few years and thereafter selling them. Hence, three potential return drivers in PE deals; operational performance improvements, an increase in leverage and advantageous pricing (Achleitner and Figge, 2014, and Martin and Stefanus, 2019). The mechanisms used by PE firms to create value are generally divided between financial, governance and operational engineering (Kaplan and Strömberg, 2009).[7] Firstly, operational performance improvements imply increasing target firms' turnover and margins, as well as, utilising the asset base more efficiently. Several different mechanisms used to achieve these improvements, including active participation in portfolio firms' boards, implementation of management incentives linked to financial performance and access to a vast amount of industry and operational expertise. Secondly, by increasing leverage less equity capital is needed, hence a higher return on equity (Bonini, 2012), as well as, tax-deductibility in several countries, i.e. higher interest tax shields (Guo et al., 2011). Lastly, pricing simply refers to creating value through "buy low sell high" (Achleitner and Figge, 2014), in other words, multiple expansion.

Secondary buyouts (SBOs) are PE transactions in which both the seller and the buyer are PE firms. Wright et al. (2019) explain that the importance of SBOs has grown tremendously during more recent years, but the empirical evidence of the value creation potential in these types of deals is mixed. Generally, the "conventional wisdom" is that SBOs should have very limited value creation potential (Achleitner and Figge, 2014). The traditional value-generating mechanisms in PE deals are likely to have been implemented by the first PE acquirer, and only limited operational improvement potential is therefore left to the second acquirer. Also, SBOs are often said to be expensive deals. The professionalism of the seller may allow for optimal timing of the exit and good negotiation tactics. However, the buyer may be able to increase leverage, since the target firm will be known to the bank. Hence, a reduction in information asymmetries. Buyers may also exploit favourable capital market conditions to further increase leverage ratios.

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[7] The first part of this paper (*"Industry Specialisation in Nordic Private Equity – An analysis of performance differences between specialised and non-specialised PE firms in the Nordics"*) section 2.1. contains a detailed description of and empirical evidence on these three value creation mechanisms.

In what follows empirical evidence on value creation in SBOs will be presented. In sub-section 2.1. findings regarding target firm operational performance improvements post-SBO are described. Thereafter, in sub-section 2.2., evidence on leverage and pricing is discussed. Lastly, in sub-section 2.3., other potential motives behind SBOs are presented.

II.2.1. Operational Performance in SBOs

As pointed out above, SBOs are generally said to have limited potential for improvements in target firms' operational performance, due to the professionalism of the previous owner. However, there may still exist a reasonable amount of improvement potential (Achleitner and Figge, 2014, and Wang, 2012). PE firms focus on different investment stages (Martin and Stefanus, 2019). A smaller PE firm may have exhausted its expertise and financial strength in further improving the target firm, and therefore, choose to sell to a larger PE firm with fewer restrictions. According to Arcot et al. (2015), different skill sets between seller and buyer may make further value creation possible. For example, a new PE firm may have better capabilities in specific operational strategies. Also, the seller may have to exit before all improvements have been done, for example, due to the fund reaching closure or a willingness to maintain a strong track record for fundraising purposes (Zhou et al., 2014).

Previous research has shown mixed results with regards to improvements in target firm operational performance post-buyout; Several studies find no significant differences in operational performance between SBOs and PBOs. Other studies report a significant underperformance of SBOs.

Achleitner and Figge (2014) report similar operational performance improvements, in terms of sales growth and margin expansion, for SBOs and PBOs. No significant differences between SBOs and PBOs with regards to improvements in operating performance are found. The authors use a large dataset consisting of 2,456 European and North American transactions during 1990-2010. Wang (2012) reports mixed evidence for efficiency gains post-buyout, several different operational performance measures used, with a sample consisting of UK deals (140 SBOs and 465 PBOs) during 1997-2008. No clear conclusion can be drawn whether SBOs or PBOs show better efficiency gains post-

buyout according to the author. Jenkinson and Sousa (2011) investigate changes in operational performance for 308 PE exits, either an SBO or an IPO, during 2000-2007. The authors find that firms exited through an IPO show significantly higher operational performance improvements (changes in total assets, total sales, and EBITDA) post-buyout compared to firms exited through SBOs. Firms exited through SBOs show higher increases in net cash flow, which is due to SBO firms reducing CAPEX significantly more than IPO firms.

Bonini (2012) uses a sample of 2,911 deals, but only accounting data on a sample of 163 SBOs during the period 1999-2007 in Western Europe. Industry-adjusted operational performance measures, i.e. abnormal performance, are used. The author finds that PBOs generate significant changes in target firm profitability post-buyout. Profitability improvements in SBOs are much lower than for PBOs. Also, SBOs produce significantly lower increases in turnover ratio compared to PBOs. Similar results are found for other operational performance measures, including investment-, equity- and liquidity-ratios. All in all, only small operational performance improvements post-buyout in targets of SBOs are found and significantly lower than for PBOs. Alperovych et al. (2013) investigate differences in efficiency between PE buyouts from different vendor sources; private, divisional and secondary buyouts. With a sample consisting of 88 UK PE deals during 1999–2008, the authors find that SBOs show lower efficiency improvements than private and divisional buyouts. Zhou et al. (2014) use a dataset of 491 SMBOs (secondary management buyouts), including deals backed by PE firms and not backed by PE firms, during 2000-2010 in the UK. The authors find that SMBOs perform worse than PBOs in terms of profitability, labor productivity and growth.

Martin and Stefanus (2019) investigate performance differences between two types of SBOs. The sample is divided between deals in which a larger PE firm buys from a smaller PE firm, and, deals in which a smaller PE firm buys from a larger PE firm. Sample of 389 deals, of which 137 are SBOs, during 2004-2012 in Europe. The authors find that SBOs in which the buyer is larger than the seller outperforms (in terms of operational performance improvements) SBOs that have the opposite relationship.

II.2.2. Leverage and Pricing in SBOs

Bonini (2012) explains that SBOs may be undertaken not because of potential operational performance improvements, but instead due to favourable market conditions. The rationale behind SBOs may be mispricing between equity and debt in the market. When debt is cheap, the second PE firm can increase leverage significantly and create value that way. Axelson et al. (2013) show that debt market conditions are the most important factor explaining leverage levels used in PE deals, i.e. the authors find a highly significant negative relationship between debt spread and leverage. Arcot et al. (2015) also point out that the second PE firm can be in a better position to get more favourable financing due to size or reputation.

Several studies have found that SBOs are more likely during favourable debt market conditions and that the leverage ratio in the target firm increases significantly post the SBO. Wang (2012) finds that SBOs tend to move with market conditions: SBOs are more likely during "cold" equity markets, i.e. low amounts of IPOs, and when debt is more affordable. Bonini (2012) also find that lower debt spreads increase the probability of an SBO. Furthermore, SBOs are shown to be more levered than PBOs. Similar results are found by Achleitner and Figge (2014); SBOs have higher leverage compared to PBOs, in terms of both debt to equity ratio and debt to EBITDA ratio. Axelson et al. (2013) also find that SBOs are more levered than PBOs.

Furthermore, the professionalism of the seller in the SBO will likely imply a high price for target firm, SBOs are often said to be overpriced. The seller is likely to "use market timing and negotiation skills to realise the highest value at exit" according to Achleitner and Figge (2014). The authors find higher EV/EBITDA multiples for SBOs, approximately 6-9% more expensive than PBOs. Axelson et al. (2013) and Wang (2012) also find that SBOs are more expensive than PBOs.

II.2.3. Other Motives behind SBOs

According to Arcot et al. (2015), SBOs may be conducted simply because PE firms are having difficulties finding other suitable investment targets or problems exiting their

current portfolio firms. The authors explain that a PE fund's potential investors are likely to be unwilling to commit capital to a new fund if the old one still has a lot of "dry powder", i.e. unspent capital. Therefore, the PE firm has an incentive to commit capital even though the value creation potential in the acquired target may not be optimal in order to have successful future fundraisings. Degeorge et al. (2013) explain that in the later stage of the investment period a PE firm is better off deploying the remaining capital in deals that may not provide superior performance compared to not making any investment at all. This is called the "go for broke" hypothesis, first introduced by Axelson et al. (2009a). SBOs are easier to find and usually require less due diligence than PBOs, which make them suitable candidates for quick use of capital.

Collusion is another potential motive (Bonini, 2012). PE firms may decide to collude in order to help each other out in keeping a strong track record for fundraising purposes. PE firms need to able to both exit investments with a reasonable return in time for fund closure, as well as, make use of the committed capital, i.e. buy companies.

Wang (2012) finds that SBOs are more likely when the PE firm has plans to raise a new fund or when the portfolio firm has been owned for a longer time by the PE firm. Bonini (2012) also finds that the longer target firm has been owned by the first acquirer the more likely an exit through an SBO is. Furthermore, Bonini (2012) report that the more reputable the buyer is the more likely an SBO. Jenkinson and Sousa (2011) find that the reasons firms exited through IPOs perform better than those of SBOs are longer holding periods of target firms before an SBO compared to an IPO, and the buying PE firms' lack of experience. Arcot et al. (2015) use a comprehensive sample of 9,575 LBO transactions in the US and Europe during 1980-2010. The authors show that SBOs are more likely when a PE firm is under pressure.

Degeorge et al. (2013) investigate the returns of SBOs compared to PBOs with a sample of 548 SBOs and 7,449 PBOs. The authors find that SBOs perform worse than PBOs – 15% lower IRR and 0.4 lower cash multiple. Furthermore, only SBOs conducted in the later stages of the investment period underperform PBOs. A positive relationship between the underperformance and "dry powder" is found for late-stage SBOs. These findings are in line with the "go for broke" hypothesis. The authors do not find any significant downside risk differences between SBOs and PBOs.

Only a few previous papers have investigated the collusion motive, i.e. PE firms helping each other out in exiting and investing in firms. Wang (2012) does not find any evidence for collusion being an important motive behind conducting SBOs, measured as how often the same PE firms sell targets to each other. Bonini (2012) finds some evidence that collusion may play a role. However, the results are in no way conclusive according to the author.

II.3. Hypotheses

I hypothesise that "conventional wisdom" about SBOs holds true (Achleitner and Figge, 2014). Hence, SBOs will show lower operational performance improvements compared to PBOs, higher leverage, especially during favourable debt markets, and higher transaction prices/multiples. Motives such as a need to spend capital in order to close a fund or to improve the investment track record in order to succeed in fundraising, as well as, collusion between PE firms, have been put forward as the rationale for buying from another PE firm. As explained in the previous section, empirical evidence is mixed, previous research has not been able to fully conclude that SBOs always show lower value creation than PBOs. Hence, there exists an alternative view; SBOs and PBOs have similar value creation potential. The first PE firm may not have exhausted all value creation potential, due to reasons such as the seller's fund reaching closure or different skill sets and stage focuses across PE firms. I find the theoretical motives behind conventional wisdom strong and, therefore, choose to hypothesise in favour of a general underperformance for SBOs compared to PBOs.

The 1st set of hypotheses concerns operational performance differences post-transaction between targets of SBOs and PBOs. Conventional wisdom state that SBOs have limited improvement potential. Target firm has been owned by another PE firm that most likely already implemented several of the traditional value-creating mechanisms; financial, governance and operational engineering (Kaplan and Strömberg, 2009). The first acquirer has likely put a more efficient capital structure in place, been actively participating in portfolio firms' boards and implemented management incentives linked to financial performance. Also, likely to have provided insights and expertise regarding strategy and product development. Hence, the 1st set of hypotheses are as follows;

Hypothesis 1a: SBOs have a lower sales growth post-buyout compared to PBOs

Hypothesis 1b: SBOs have lower EBITDA-margin improvements post-buyout compared to PBOs

Hypothesis 1c: SBOs have a lower return on total assets post-buyout compared to PBOs

The 2nd set of hypotheses concerns the difference in leverage ratios between SBOs and PBOs, and the effect of favourable debt market conditions on SBOs. According to conventional wisdom, leverage ratios will be higher in SBOs, and favourable debt markets will increase the likelihood of an SBO. Since the first acquirer likely has made several important value enhancing actions, target firm has a strong market position with strong financials. This implies that the underlying business can handle an increase in leverage. The second PE firm may also be in a better position to get more favourable financing due to size or reputation. Low interest rates make it possible to increase leverage more, the company's cash flow from operations will be able to bear higher interest payments. Therefore, the 2nd set of hypotheses are as follows;

Hypothesis 2a: SBOs have a higher debt/total assets ratio compared to PBOs

Hypothesis 2b: SBOs have a higher debt/EBITDA ratio compared to PBOs

Hypothesis 2c: SBOs are more likely during favourable debt market conditions, i.e. when debt is cheap

The 3rd set of hypotheses concerns transaction pricing/multiples differences between SBOs and PBOs. Given that the seller is highly professional, conventional wisdom states that SBOs are expensive. The seller is likely to have vast experience in exiting and is, therefore, able to receive the highest possible price. 3rd set of hypotheses as follows;

Hypothesis 3a: SBOs have a higher enterprise value (EV) compared to PBOs

Hypothesis 3b: SBOs have a higher EV/EBITDA ratio compared to PBOs

Hypothesis 3c: SBOs have a higher EV/sales ratio compared to PBOs

II.4. Data and Methodology

II.4.1. Data

For differences in operational performance improvements and in leverage between SBOs and PBOs, i.e. the 1st and the 2nd set of hypotheses, a sample consisting of 259 transactions (80 SBOs and 179 PBOs) conducted by 77 different PE firms during the period 2008-2014 in the Nordics has been used. This sample will be referred to as the "main sample".[8] The data gathering process consisted of three main steps; Firstly, relevant PE transactions were identified from the databases Zephyr and SDC Platinum. The following criteria were used; The transaction has been completed. The target company is based in the Nordics, i.e. Sweden, Finland, Norway, and Denmark, implying that both international and domestic PE firms are included. The acquirer is a PE firm, defined according to the European definition of PE firms (Caselli and Negri, 2018), implying that venture capital firms and investment companies have been excluded. The vendor source can be categorised as Division, Private or SBO, hence, public-to-private transactions have been excluded. A majority stake was acquired, over 50% of the share capital. Secondly, accounting data on target firms were gathered from Amadeus. Lastly, in the third step, PE firm information was retrieved from Thomson Banker.

A second sample, the so-called "additional sample", has been used to test differences in pricing between SBOs and PBOs, i.e. the 3rd set of hypotheses. This sample was gathered from SDC Platinum. The following criteria were used: Time horizon set at 1998-2018. The transaction has been completed. The target company is based in the Nordics; Sweden, Finland, Norway, and Denmark, implying that both international and domestic PE firms as acquirers have been included. The acquirer is a financial sponsor. A majority stake has been acquired, over 50% of the share capital. Enterprise value for the transaction is recorded.

The "additional sample" consists of 329 transactions, 79 SBOs, and 250 PBOs. The choice of a longer time horizon, a broader definition of PE firms and inclusion of all vendor

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[8] The first part of this paper (*"Industry Specialisation in Nordic Private Equity – An analysis of performance differences between specialised and non-specialised PE firms in the Nordics"*) section 4.1. provides a more detailed description of the data gathering process with regards to the "main sample".

sources in the "additional sample" compared to the "main sample" is based on a need to receive a large enough sample to be able to conduct a reasonable statistical analysis. The fact that most PE deals are private transactions implies that deal values and enterprise values are not made public, and hence, unavailable without private access.

II.4.2. Variables

This section will present the variables used for testing each of the three value creation drivers. In sub-section 4.2.1. the dependent and independent variables used with regards to operational performance improvements are presented and in sub-section 4.2.2. variables for leverage are described. As explained in the previous section the "main sample" is used for operational performance improvements and leverage.[9] In sub-section 4.2.3. variables regarding pricing are presented, here the "additional sample" has been used.

II.4.2.1. Operational Performance

The dependent variables used for measuring operational performance improvements are *Turnover Growth*, *Change in EBITDA-margin* and *Change in ROA*. The *Turnover Growth* is calculated as a compounded annual growth rate (CAGR) for sales from year +1' to year +3' post-buyout, year 0' represents the year of the transaction. EBITDA-margin is EBITDA/Sales. The *Change in EBITDA-margin* is then calculated as the margin at year +3' subtracted from the margin at year +1' divided by 3. Return on assets (ROA) is calculated as EBITDA/Total assets. The *Change in ROA* is calculated in the same way as for *Change in EBITDA-margin*. See e.g. Achleitner and Figge (2014), Wang (2012) and Bonini (2012) for a similar selection of dependent variables for measuring operational performance improvements.

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[9] The first part of this paper (*"Industry Specialisation in Nordic Private Equity – An analysis of performance differences between specialised and non-specialised PE firms in the Nordics"*) section 4.2.-4.4. provides a more detailed description of the variables included in the "main sample".

The main independent variable, *SBO*, for testing differences in operational performance improvements is a dummy variable that takes the value of 1 if the transaction is an SBO and 0 otherwise. An SBO is defined as a transaction where a PE firm(s) buys a company from another PE firm(s). Not only secondary buyouts are included, but also tertiary buyouts, etc. This definition is in line with previous research, see e.g. Achleitner and Figge (2014) and Degeorge et al. (2016). The definition of a PE firm for the seller is broader than the one used for the buyer, if the selling company is a venture capital firm or an investment company the transaction will show up as an SBO. Only private-to-private transactions have been included, i.e. primary buyout (PBOs) represent divisional and private buyouts.

Furthermore, several control variables that have been shown to affect operational performance post-buyout have been included. These include target firm characteristics, PE firm characteristics, and macroeconomic drivers. Target firm characteristics; *Profitability Pre-Buyout* as EBITDA/sales in year 0'. *Turnover Pre-Buyout* as sales in year 0'. *Deal Leverage* as debt to total assets in year 0'. PE firm characteristics; *PE Industry Specialisation* as relative industry specialisation based on the Index of Competitive Advantage (ICA). *PE Age* as number of years since founded. *PE Experience* as cumulative number of investments since inception. *Syndication*, a dummy variable that takes the value of 1 if the acquisition was conducted by more than one PE firm and the value of 0 in case of a single acquirer. *Local PE*, taking the value of 1 if PE firm's home country is the same as the target firm's home country, and zero otherwise. Macroeconomic drivers; *MSCI* as the MSCI Nordic Countries Index in the month of the deal. *PE Investments* as the total amount of investments by European PE firms in the year of the deal. Also, industry dummies will be included in order to take into account performance differences across industries (Achleitner and Figge, 2014).

II.4.2.2. Leverage

Debt/Total Assets and *Debt/EBITDA* are the dependent variables used for testing differences in leverage. *Debt/Total Assets* and *Debt/EBITDA* is at +1' post-buyout in order to reflect how much new debt target firms take on before amortisation starts. The dependent variable when testing the likelihood of SBOs during favourable debt markets

is the dummy *SBO*, as defined above. Achleitner and Figge (2014), Bonini (2012) and Axelson et al. (2013) use similar dependent variables when measuring leverage differences.

The main independent variable for testing differences in leverage ratios between SBOs and PBOs is the dummy *SBO*, as defined above. For favourable debt market conditions, *HY Rate*, the effective yield on ICE BofAML Euro High Yield Index at the end of the year of each transaction has been used. The index measures the performance of corporate debt issued by below investment grade companies in Europe and is intended to proxy the cost of debt for the PE firms. High yield bond rates commonly used by scholars to measure the impact of debt markets on leverage, see e.g. Axelson et al. (2013) and Achleitner and Figge (2014).

Furthermore, several control variables that are likely to affect lending capacity has been used. Higher quality targets are likely to able to lend more (Achleitner and Figge, 2014), i.e. *Profitability Pre-Buyout* and *Turnover Pre-Buyout* included. According to Axelson et al. (2013), PE firms with a better reputation are likely to be able to increase leverage more. Hence, *PE Age* and *PE Experience* included.

Also, industry dummies will be included in order to take into account leverage differences across industries (Achleitner and Figge, 2014).

II.4.2.3. Pricing

For pricing, log of *Enterprise Value (EV), EV/EBITDA and EV/Sales* at entry date have been used as dependent variables. Similar selection by Achleitner and Figge (2014), Wang (2012) and Axelson et al. (2013).

The main independent variable for testing differences in pricing between SBOs and PBOs is a dummy variable *SBO*, defined as a transaction where both the buyer and the seller are financial sponsors. Please note that this differs somewhat to the previous definition, i.e. this definition is broader, due to the use of the "additional sample" for pricing.

More profitable and larger targets are likely to show higher valuations, i.e. *EBITDA-margin at entry* and *Net sales at entry* included. Axelson et al. (2013) find a close relationship between leverage and pricing, i.e. higher debt spreads lead to lower deal multiples and

higher leverage ratios to higher deal multiples. Therefore, *HY Rate*, *Net Debt/EBITDA* and *Net Debt/Total Assets* at entry have been included. Furthermore, MSCI Nordic Countries Index, *MSCI*, at the of the year is included to take into account equity market conditions.

Industry dummies will be included in order to take into account pricing differences across industries (Achleitner and Figge, 2014). Also, time dummies included due to the "additional sample" having a rather long time horizon.

II.4.3. Statistical Methods

A univariate analysis is conducted in order to receive preliminary results. The difference in mean sales growth (*hypothesis 1a*), EBITDA-margin improvement (*hypothesis 1b*), ROA improvement (*hypothesis 1c*), debt to total assets (*hypothesis 2a*), debt to EBITDA (*hypothesis 2b*), log of enterprise value (*hypothesis 3a*), enterprise value to EBITDA (*hypothesis 3b*) and enterprise value to sales (*hypothesis 3c*) between PBOs and SBOs is tested. The test used is a one-tailed independent sample t-test with the assumption of unequal variances.

A multivariate analysis is thereafter conducted. In line with previous research ordinary least squares (OLS) regressions have been used (Achleitner and Figge, 2014, and Martin and Stefanus, 2019). Also, standard robust errors have been used in all regressions (Martin and Stefanus, 2019). Probit regressions have been used when testing *hypothesis 2c* (Wang, 2012, and Bonini, 2012).

II.4.4. Descriptive Statistics

Descriptive statistics are provided in Table 11 in the Appendix for the "main sample" and in Table 12 in the Appendix for the "additional sample". Average values for PBOs and SBOs, as well as, for the global sample are shown. Both dependent and independent variables included.

For the dependent variables, Table 11 shows that SBOs have lower average turnover growth and change in ROA compared to PBOs. Change in EBITDA-margin is similar

between the two deal types. SBOs show higher leverage ratios, both in terms of debt/total assets and debt/EBITDA. These average values are in line with conventional wisdom; SBOs show lower operational performance improvements and higher leverage ratios. Interesting to note with regards to independent variables; SBOs are more profitable on average pre-buyout and larger in terms of sales compared to PBOs, i.e. higher quality targets. Also, PE firms conducting SBOs are older and have much more experience.

Table 12 shows that the enterprise value is higher in SBOs compared to PBOs. The EV/EBITDA multiple is rather similar, somewhat higher for PBOs. The EV/sales multiple is much higher for SBOs. Hence, average values to some extent in line with conventional wisdom, i.e. that SBOs are more expensive deals than PBOs. No major differences between average EBITDA-margin and net sales at entry between the two types of transactions. Leverage at entry is higher for SBOs.

Table 13 and Table 14 in the Appendix shows differences between PBOs and SBOs with regards to independent variables using a two-sided independent sample t-test with unequal variances. Table 13 shows the differences in means for the "main sample" and Table 14 for the "additional sample".

II.5. Results

II.5.1. Univariate Analysis

In order to receive preliminary results, a univariate analysis is conducted on the dependent variables. In the following sub-sections the difference in mean sales growth (*hypothesis 1a*), EBITDA-margin improvement (*hypothesis 1b*), ROA improvement (*hypothesis 1c*), debt to total assets (*hypothesis 2a*), debt to EBITDA (*hypothesis 2b*), log of enterprise value (*hypothesis 3a*), enterprise value to EBITDA (*hypothesis 3b*) and enterprise value to sales (*hypothesis 3c*) between PBOs and SBOs is tested. As explained in the statistical methods section above, the test used is a one-tailed independent sample t-test with the assumption of unequal variances. Sub-section 5.1.1. presents the results for operational performance improvements, leverage differences are presented in sub-section 5.1.2., and lastly, in sub-section 5.1.3. results with regards to pricing are shown.

II.5.1.1. Operational Performance

As can be seen in Table 15 only the difference in sales growth between PBOs and SBOs is statistically significant. PBOs show much larger turnover growth in their target firms compared to SBOs. This difference is statistically significant at the 1% level. This implies support for *hypothesis 1a*, SBOs have a lower sales growth post-buyout compared to PBOs.

The growth in EBITDA-margin is approximately equal for PBOs and SBOs and not statistically significant. SBOs show lower improvements in ROA compared to PBOs, although the difference is not statistically significant. Hence, no support for *hypothesis 1b*, SBOs have lower EBITDA-margin improvements post-buyout compared to PBOs, and *hypothesis 1c*, SBOs have a lower return on total assets post-buyout compared to PBOs.

Previous literature has reported different results when it comes to differences in operational performance post-buyout between SBOs and PBOs. Achleitner and Figge (2014) report a somewhat higher average sales growth for SBOs compared to PBOs, the difference is not significant. Also, the authors find a significantly lower average change in EBITDA-margin for SBOs compared to PBOs. Wang (2012) finds different results

depending on the time horizon used when it comes to sales growth; One- and two-years post-buyout SBOs have a lower median sales growth. Three years after the buyout, the sales growth is higher for SBOs. The median change in EBITDA-margin is higher and the median change in ROA is lower for SBOs compared to PBOs for all time horizons used. Most of the differences are not statistically significant in the sample used by Wang (2012).

Table 15: Univariate Analysis of the Dependent Variables – Operational Performance – Main Sample

The table shows the mean and the standard deviation for average turnover growth, change in EBITDA-margin and change in return on assets for PBOs and SBOs. The difference between the means as well as the corresponding p-values and t-values are also shown. A one-sided independent sample t-test with unequal variances has been used. Turnover Growth is the compounded annual growth rate (CAGR) for sales from year +1' to year +3' post-buyout. The Change in EBITDA-margin is the EBITDA/Sales-margin at year +3' subtracted from the EBITDA/Sales-margin at year +1' divided by 3. The Change in ROA is EBITDA/Total Assets at year +3' subtracted from EBITDA/Total Assets at year +1' divided by 3.

	PBOs		SBOs		Difference		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
Turnover Growth	0.164	0.252	0.087	0.187	0.077***	0.004	(2.692)
Change in EBITDA-margin	-0.001	0.033	-0.001	0.027	-0.000	0.477	(-0.057)
Change in ROA	0.003	0.058	-0.001	0.040	0.004	0.255	(0.660)
N	179		80		259		

*p<0.10, **p<0.05,
***p<0.01

II.5.1.2. Leverage

Table 16 shows the results of the univariate analysis for the variables measuring leverage. SBOs are more levered compared to PBOs on average, both for debt/total assets and debt/EBITDA. However, the differences are not statistically significant. Hence, *hypothesis 2a*, SBOs have a higher debt/total assets ratio compared to PBOs, and *hypothesis 2b*, SBOs have a higher debt/EBITDA ratio compared to PBOs), are not supported.

Table 16: Univariate Analysis of the Dependent Variables – Leverage – Main Sample

The table shows the mean and the standard deviation for average debt/total assets and debt/EBITDA for PBOs and SBOs. The difference between the means as well as the corresponding p-values and t-values are also shown. A one-sided independent sample t-test with unequal variances has been used. Debt/Total Assets and Debt/EBITDA at +1' post-buyout.

	PBOs		SBOs		Difference		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
Debt/Total Assets	0.645	0.217	0.674	0.208	-0.029	0.154	(-1.022)
Debt/EBITDA	9.182	50.725	12.466	144.349	-3.283	0.422	(-0.198)
N	179		80		259		

*p<0.10, **p<0.05,
***p<0.01

In general, previous research has shown that leverage ratios are higher in SBOs. Hence, the average values shown in this thesis are in line with that of previous literature when it comes to differences in leverage ratios. For example, Achleitner and Figge (2014) finds a significantly higher average debt/EBITDA post-buyout for SBOs compared to PBOs.

II.5.1.3. Pricing

As shown in Table 17 SBOs have a higher average enterprise value than PBOs. The difference is significant at the 1% level. Hence, *hypothesis 3a*, SBOs have a higher enterprise value (EV) compared to PBOs, is supported.

Hypothesis 3b, SBOs have a higher EV/EBITDA ratio compared to PBOs, and *hypothesis 3c*, SBOs have a higher EV/sales ratio compared to PBOs, are not supported

Previous research has generally shown higher pricing for SBOs compared to PBOs. Hence, the average values shown in this thesis are somewhat in line with that of previous literature when it comes to pricing differences. Achleitner and Figge (2014) report higher enterprise values in SBOs, as well as, higher average EV/EBITDA multiples. Only the difference in EV/EBITDA is significant. Wang (2012) also finds that SBOs show higher average EV and EV multiples (the author used an average of the EV/sales and the EV/EBITDA multiples) than PBOs. Both are statistically significant.

Table 17: Univariate Analysis of the Dependent Variables –
Pricing – Additional Sample

The table shows the mean and the standard deviation for enterprise value, EV/EBITDA and EV/Sales at investment entry for PBOs and SBOs. The difference between the means as well as the corresponding p-values and t-values are also shown. A one-sided independent sample t-test with unequal variances has been used. ln(Enterprise Value) represents enterprise value at investment entry, normalized using a log function. EV/EBITDA and EV/Sales are enterprise value divided by EBITDA and enterprise value divided by sales at investment entry.

	PBOs		SBOs		Difference		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
ln(Enterprise Value)	4.020	2.068	4.850	1.811	-0.831***	0.000	(-3.427)
EV/EBITDA	16.602	25.777	16.447	22.191	0.155	0.488	(0.029)
EV/Sales	2.603	4.062	4.818	12.230	-2.216	0.110	(-1.243)
N	248		79		327		

*p<0.10, **p<0.05,
***p<0.01

II.5.2. Regression Analysis

A multivariate analysis is conducted to further test the differences in value creation between SBOs and PBOs. Sub-section 5.2.1. presents the results regarding operational performance improvements, sub-section 5.2.2. results on leverage differences, and sub-section 5.2.3. pricing.

II.5.2.1. Operational Performance

Table 18 shows the regressions with operational performance measures as the dependent variables. As can be seen in the first two columns, the variable SBO is negative and statistically significant, at the 10% level in the first column and at the 1% level in the second column. Targets in SBOs show significantly lower post-buyout sales growth compared to targets in PBOs. Hence, *hypothesis 1a* holds true. Also, the result is in line with the results of the univariate analysis in the previous sub-section. Should be noted that the significance

decreases from 1% to 10% when including control variables and the adjusted R-squared are low. Hence, the support found for *hypothesis 1a* is rather weak.

Other factors explaining turnover growth post-buyout are target firms' pre-buyout profitability and turnover. Higher pre-buyout profitability and lower pre-buyout sales lead to higher turnover growth.

Table 18: Regressions with Turnover Growth, Change in EBITDA-margin and Change in ROA as the dependent variables – Main Sample

	Hypothesis 1a		Hypothesis 1b		Hypothesis 1c	
	OLS		OLS		OLS	
	Turnover Growth		Change in EBITDA-margin		Change in ROA	
	Simple	Full	Simple	Full	Simple	Full
SBO	-0.0794***	-0.0605*	-0.0005	-0.0038	-0.0054	-0.0046
	(0.006)	(0.078)	(0.909)	(0.447)	(0.421)	(0.566)
Profitability Pre-Buyout		0.1126**		0.0213		-0.0233
		(0.026)		(0.223)		(0.284)
ln(Turnover Pre-Buyout)		-0.0373**		0.0025		0.0001
		(0.019)		(0.149)		(0.983)
Deal Leverage		0.0668		0.0046		-0.0165
		(0.333)		(0.660)		(0.418)
PE Industry Specialisation		-0.0032		0.0068		0.0043
		(0.918)		(0.104)		(0.573)
PE Age		-0.0007		-0.0002**		0.0002
		(0.722)		(0.038)		(0.562)
PE Experience		-0.0003		-0.0000		-0.0001
		(0.242)		(0.226)		(0.224)
Syndication		-0.0094		-0.0002		-0.0013
		(0.836)		(0.964)		(0.886)
Local PE		-0.0419		-0.0058		-0.0065
		(0.226)		(0.346)		(0.555)
MSCI		0.0017		0.0001		0.0000
		(0.118)		(0.599)		(0.980)
PE Investments		-0.0031		-0.0005		-0.0003
		(0.180)		(0.168)		(0.715)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.1986***	0.5364***	-0.0011	-0.0098	-0.0019	0.0245
	(0.000)	(0.004)	(0.854)	(0.805)	(0.772)	(0.754)
N	247	226	240	223	252	223
adj. R-sq	0.008	0.028	-0.008	0.028	0.004	-0.028
p-values in parentheses	*p<0.10, **p<0.05, ***p<0.01					

The table shows regressions for testing the 1st set of hypotheses, i.e. with Turnover Growth, Change in EBITDA-margin and Change in ROA as the dependent variables. SBO is a dummy variable that takes the value of 1 if the transaction is an SBO and 0 otherwise. Turnover Growth is the compounded annual growth rate (CAGR) for sales from year +1' to year +3' post-buyout. The Change in EBITDA-margin is the EBITDA/Sales-margin at year +3' subtracted from the EBITDA/Sales-margin at year +1' divided by 3. The Change in ROA is EBITDA/Total Assets at year +3' subtracted from EBITDA/Total Assets at year +1' divided by 3. Independent variables include: Profitability Pre-Buyout as EBITDA/Sales in year 0'. ln(Turnover Pre-Buyout) represents sales in year 0', normalized using a log function. Deal Leverage is debt to total assets in year 0'. PE Industry Specialisation is a dummy variable taking the value of 1 if the PE firm has an ICA above 1, i.e. is considered industry specialised, and 0 otherwise. PE Age defined as the number of years since the specific PE firm was founded. PE Experience as cumulative number of investments since the PE firm was established, i.e. total number of investments for the PE firm from inception until 2014. Syndication is a dummy variable taking the value of 1 if the acquisition was conducted by more than one PE firm and the value of 0 in case of a single acquirer. Local PE is a dummy variable taking the value of 1 if PE firm's home country is the same as the target firm's home country, and 0 otherwise. MSCI is the level of the MSCI Nordic Countries Index in the month of the deal. PE Investments is the total amount of investments by European private equity firms in the year of the deal.

Furthermore, the variable SBO is also negative in the regressions for change in EBITDA-margin and change in ROA. However, the results are not statistically significant. Hence, no support for *hypothesis 1b* and *hypothesis 1c*. This is also in line with the findings in the univariate analysis above.

Achleitner and Figge (2014) do not find a significant difference in neither sales growth nor margin improvements between SBOs and PBOs in their regression analysis. Can be noted that the low adjusted R-squared shown in this paper are in line with the R-squared in the paper by Achleitner and Figge (2014).

II.5.2.2. Leverage

In Table 19 the regression results regarding leverage are shown. As can be seen in the first four columns the variable SBO is not significant, i.e. no significant differences in debt to total assets and debt to EBITDA between SBOs and PBOs. Hence, *hypothesis 2a* and *hypothesis 2b* are not supported.

In the last two columns of Table 9, the probit regressions for testing the effect of debt market conditions on the likelihood of having an SBO are shown. The variable HY Rate has a negative sign and is significant at the 5% level in both columns. Implying that an increase in the cost of debt reduces the probability of an SBO. Hence, SBOs appear to be more likely during favourable market conditions, in terms of cheap debt. *Hypothesis 1c* is therefore supported.

Other factors explaining the likelihood of having SBO are turnover pre-buyout and PE firm experience, both with a positive sign. Larger targets have a higher probability of undergoing an SBO and SBOs are more likely the more experience the PE firm has.

Table 19: Regressions with Debt/Total Assets, Debt/EBITDA and SBO as the dependent variables – Main Sample

	Hypothesis 2a		Hypothesis 2b		Hypothesis 2c	
	OLS		OLS		Probit	
	Debt/Total Assets		Debt/EBITDA		SBO	
	Simple	Full	Simple	Full	Simple	Full
SBO	0.0344	0.0016	4.7978	-0.9021		
	(0.239)	(0.960)	(0.768)	(0.958)		
HY Rate		-0.0239		-10.5654	-3.1678**	-4.2913**
		(0.931)		(0.898)	(0.038)	(0.014)
Profitability Pre-Buyout		-0.0904		24.3748		0.1156
		(0.279)		(0.166)		(0.873)
ln(Turnover Pre-Buyout)		0.0415***		-3.3991		0.1716**
		(0.002)		(0.510)		(0.046)
PE Age		-0.0005		0.2957		0.0038
		(0.530)		(0.339)		(0.580)
PE Experience		0.0001		0.1087		0.0035**
		(0.762)		(0.208)		(0.023)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.6472***	0.2774**	-3.9264	20.0778	-0.1822	-1.9575**
	(0.000)	(0.038)	(0.780)	(0.634)	(0.445)	(0.028)
N	259	226	254	225	259	226
adj. R-sq	0.005	0.033	0.012	0.002		
p-values in parentheses	*p<0.10, **p<0.05, ***p<0.01					

The table shows regressions for testing the 2nd set of hypotheses, i.e. with Debt/Total Assets, Debt/EBITDA and SBO as the dependent variables. Debt/Total Assets and Debt/EBITDA at +1' post-buyout. SBO is a dummy variable that takes the value of 1 if the transaction is an SBO and 0 otherwise. HY Rate the effective yield on ICE BofAML Euro High Yield Index at the end of the year of the deal. Profitability Pre-Buyout as EBITDA/Sales in year 0'. ln(Turnover Pre-Buyout) represents sales in year 0', normalized using a log function. PE Age defined as the number of years since the specific PE firm was founded. PE Experience as cumulative number of investments since the PE firm was established, i.e. total number of investments for the PE firm from inception until 2014.

Achleitner and Figge (2014) find that SBOs have a significantly higher debt/EBITDA in their regression analysis. Wang (2012) finds that SBOs are more likely during favourable debt markets.

II.5.2.3. Pricing

In Table 20 regressions with pricing measures as the dependent variables are shown. The variable SBO is only significant in the first column, i.e. enterprise value is higher in SBOs compared to PBOs. However, when including control variables, no significance is found.

Table 20: Regressions with EV, EV/EBITDA and EV/Sales as the Dependent Variables – Additional Sample

	Hypothesis 3a		Hypothesis 3b		Hypothesis 3c	
	OLS		OLS		OLS	
	ln(Enterprise Value)		EV/EBITDA		EV/Sales	
	Simple	Full	Simple	Full	Simple	Full
SBO	0.7937***	0.0638	2.5279	-1.6608	1.8264	0.0086
	(0.004)	(0.756)	(0.683)	(0.825)	(0.213)	(0.989)
EBITDA-margin		4.3440***		-26.1666*		11.5089***
		(0.000)		(0.084)		(0.000)
ln(Sales)		0.9291***		-3.2807		-0.2630
		(0.000)		(0.116)		(0.174)
Net Debt/Total Assets		0.9115*		17.7008		1.4497
		(0.071)		(0.194)		(0.416)
Net Debt/EBITDA		0.0096		0.5616**		0.1843*
		(0.331)		(0.013)		(0.086)
HY Rate		5.6364		-301.4033		58.7732
		(0.693)		(0.339)		(0.207)
MSCI		0.0003		-0.0095		0.0029
		(0.629)		(0.511)		(0.179)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	5.1946***	-2.7369	8.2635***	101.8788	1.2019	-19.7396
	(0.000)	(0.562)	(0.000)	(0.340)	(0.324)	(0.204)
N	327	101	110	101	182	101
adj. R-sq	0.018	0.822	0.095	0.225	-0.016	0.570

p-values in parentheses   *p<0.10, **p<0.05, ***p<0.01

The table shows regressions for testing the 3rd set of hypotheses, i.e. with ln(Enterprise Value), EV/EBITDA, EV/Sales as the dependent variables. ln(Enterprise Value) represents enterprise value at investment entry, normalized using a log function. EV/EBITDA and EV/Sales are enterprise value divided by EBITDA and enterprise value divided by sales at investment entry. SBO is a dummy variable that takes the value of 1 if the transaction is an SBO and 0 otherwise. EBITDA-margin is EBITDA divided by sales at investment entry. ln(Sales) represents sales at investment entry, normalized using a log function. Net Debt/Total Assets and Net Debt/EBITDA also at investment entry. HY Rate the effective yield on ICE BofAML Euro High Yield Index at the end of the year of the deal. MSCI is the level of the MSCI Nordic Countries Index at the end of the year of the deal.

Also, no significant differences in EV/EBITDA and EV/Sales. Hence, *hypothesis 3a*, *hypothesis 3b,* and *hypothesis 3c* are not supported. An important factor explaining pricing is the EBITDA-margin at entry, which is significant in all regressions.

Wang (2012) finds in the regression analysis that both the EV and the EV multiple are significantly higher in SBOs compared to PBOs. Similar results found by Achleitner and Figge (2014).

II.5.3. Summary of Results

In this section value creation differences between SBOs and PBOs have been investigated. Firstly, when it comes to operational performance improvements, SBOs shows significantly lower turnover growth post-buyout. No significant differences are found for improvements in EBITDA-margin and ROA. Hence, *hypothesis 1a* is supported, but not *hypothesis 1b* and *hypothesis 1c*. Secondly, no significant differences in leverage, in terms of both debt to total assets and debt to EBITDA, are found. Hypothesis 2a and hypothesis 2b are not supported. The likelihood of SBOs decrease when the cost of debt is higher, i.e. *hypothesis 2c* is supported. Lastly, no significant differences between SBOs and PBOs are found for pricing, except for higher enterprise in SBOs without including control variables.

II.5.4. Limitations

The shortcomings of this study mainly refer to the general nature of private equity data. The transactions are private and, hence, not all potential deals are included. Therefore, a selection bias may exist. This may have the effect of systematically leaving out some specific type of PE deals, this is especially true for the "additional sample" given the far longer time horizon. Furthermore, this also leads to rather small samples (259 buyouts in the "main sample" and 329 deals in the "additional sample"), and, therefore, the statistical power of the results is rather low. The adjusted R-squared is low in most regressions, especially in the "main sample".

II.6. Conclusions

The private equity (PE) industry is becoming more and more competitive and mature. Secondary buyouts, deals in which one PE firm sells a company to another PE firm, have been increasing year over year. The "conventional wisdom" regarding SBOs is that they should exhibit limited value creation potential (Achleitner and Figge, 2014). However, the empirical evidence is mixed, previous research has not been able to fully conclude that SBOs always show lower value creation than PBOs. This study is dedicated to providing further evidence of the value creation differences between SBOs and PBOs. The perspective taken in this study is that of the buyer – Is conventional wisdom true? Or will a buyer be able to extract value similar to PBOs?

Differences in operational performance improvements, leverage, and pricing between SBOs and PBOs have been investigated. Operational performance improvements and changes in leverage have been tested with a sample of 259 transactions, 179 PBOs and 80 SBOs, conducted by 77 different PE firms during the period 2008-2014. Target firms in SBOs generate significantly lower turnover growth post-buyout compared to PBOs. No significant differences for improvements in profitability and changes in leverage are found. Further, SBOs are significantly more likely during favourable debt markets, i.e. when debt is cheap. A second sample has been used for testing pricing differences. The sample consists of 329 deals, 250 PBOs and 79 SBOs, during the period 1998-2018 in the Nordics. No significant differences in pricing/multiples between the two types of deals, except for higher enterprise value in SBOs when not including control variables.

All in all, the results are to some extent in line with conventional wisdom. Significantly lower turnover growth in SBOs compared to PBOs and SBOs being more likely when debt is cheaper. The average values of the other operational performance measures, leverage measures, and pricing measures are mostly in line with conventional wisdom, however, the differences are not significant.

It would be interesting for future research to investigate the difference in total returns to investors between SBOs and PBOs in the Nordics in order to further assess the true implications of the increased amount of SBOs. This kind of analysis requires access to cash flow data from the sponsors themselves or from their investors. Do SBOs underperform PBOs in terms of total returns as the significantly lower turnover growth shown in this

paper suggests? Or does the average higher increase in leverage compensate for the lower growth and make the returns approximately equal between SBOs and PBOs?

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Appendix

Table 5: Univariate Analysis of the Independent Variables

The table shows the mean and the standard deviation for the independent (control variables) for specialised and non-specialised PE firms. The difference between the means as well as the corresponding p-values and t-values are also shown. A two-sided independent sample t-test with unequal variances has been used. Syndication is a dummy variable taking the value of 1 if the acquisition was conducted by more than one PE firm and the value of 0 in case of a single acquirer. PE Experience as cumulative number of investments since the PE firm was established, i.e. total number of investments for the PE firm from inception until 2014. PE Age defined as the number of years since the specific PE firm was founded. Local PE is a dummy variable taking the value of 1 if PE firm's home country is the same as the target firm's home country, and 0 otherwise. MSCI is the level of the MSCI Nordic Countries Index in the month of the deal. PE Investments is the total amount of investments by European private equity firms in the year of the deal. ln(Turnover Pre-Buyout) represents sales in year 0', normalised using a log function. Profitability Pre-Buyout as EBITDA/Sales in year 0'. Deal Leverage is debt to total assets in year 0'.

	Non-Specialised PE Firms		Specialised PE Firms		Difference		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
Syndication	0.083	0.278	0.057	0.233	0.026	0.456	(0.747)
PE Experience	77.214	77.578	61.983	75.835	15.231	0.138	(1.490)
PE Age	18.071	14.072	16.200	12.576	1.871	0.302	(1.036)
Local PE	0.476	0.502	0.566	0.497	-0.090	0.180	(-1.347)
MSCI	96.376	15.568	96.686	15.942	-0.310	0.882	(-0.149)
PE Investments	46.179	6.857	46.183	6.556	-0.004	0.996	(-0.005)
ln(Turnover Pre-Buyout)	10.396	1.375	10.171	1.152	0.225	0.224	(1.221)
Profitability Pre-Buyout	0.113	0.341	0.118	0.183	-0.005	0.902	(-0.123)
Deal Leverage	0.609	0.209	0.619	0.223	-0.009	0.749	(-0.320)
N	84		175		259		

*p<0.10, **p<0.05,
***p<0.01

Table 8: Univariate Analysis of the Dependent Variables

The table shows the mean and the standard deviation for average turnover growth and change in profitability for specialised and non-specialised PE firms. The difference between the means as well as the corresponding p-values and t-values are also shown. A one-sided independent sample t-test with unequal variances has been used. PE Industry Specialisation is a dummy variable taking the value of 1 if the PE firm has an ICA above 1.25, i.e. is considered industry specialised, and 0 otherwise. Turnover Growth is the compounded annual growth rate (CAGR) for sales from year +1' to year +3' post-buyout. The Change in Profitability is the EBITDA/Sales-margin at year +3' subtracted from the EBITDA/Sales-margin at year +1' divided by 3.

	Non-Specialised PE Firms		Specialised PE Firms		Difference		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
Turnover Growth	0.121	0.210	0.154	0.254	-0.034	0.128	(-1.138)
Change in Profitability	-0.006	0.026	0.002	0.034	-0.008**	0.020	(-2.069)
N	113		134		247		

*p<0.10, **p<0.05, ***p<0.01

Table 9: Regressions with Turnover Growth as the Dependent Variable

Dependent variable: Turnover Growth	(1a) No interaction		(2a&c) Interaction: Specialisation & Pre-Buyout Profitability		(3a&c) Interaction: Specialisation & Vendor Source	
	Simple	Full	Simple	Full	Simple	Full
PE Industry Specialisation	0.0318	0.0089	0.0306	-0.0002	0.0461	0.0295
	(0.319)	(0.759)	(0.419)	(0.997)	(0.340)	(0.551)
SBO		-0.0731*		-0.0784**	-0.0623	-0.0432
		(0.053)		(0.047)	(0.133)	(0.409)
Division		-0.0441		-0.0546	-0.0504	-0.0367
		(0.300)		(0.214)	(0.404)	(0.510)
Syndication		-0.0052		-0.0055		-0.0046
		(0.908)		(0.906)		(0.918)
PE Experience		-0.0002		-0.0003		-0.0002
		(0.290)		(0.193)		(0.264)
PE Age		-0.0007		-0.0007		-0.0007
		(0.732)		(0.726)		(0.745)
Local PE		-0.0442		-0.0495		-0.0436
		(0.206)		(0.183)		(0.218)
MSCI		0.0017		0.0017		0.0016
		(0.121)		(0.128)		(0.144)
PE Investments		-0.0029		-0.0032		-0.0029
		(0.206)		(0.170)		(0.206)
ln(Turnover Pre-Buyout)		-0.0347**		-0.0251		-0.0334**
		(0.027)		(0.132)		(0.040)
Profitability Pre-Buyout		0.1076**				0.1064**
		(0.031)				(0.029)
Deal Leverage		0.0697		0.0682		0.0739
		(0.315)		(0.328)		(0.289)
Low-Performing			-0.0127	-0.0033		
			(0.707)	(0.935)		
High-Performing			0.0468	0.0442		
			(0.285)	(0.337)		
PE Industry Specialisation # Low-Performing			0.0485	0.0406		
			(0.470)	(0.577)		
PE Industry Specialisation # High-Performing			-0.0316	-0.0060		
			(0.637)	(0.933)		
PE Industry Specialisation # SBO					-0.0634	-0.0554
					(0.321)	(0.415)
PE Industry Specialisation # Division					-0.0416	-0.0088
					(0.636)	(0.929)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.1517***	0.5075***	0.1360**	0.4328**	0.1901***	0.4853**
	(0.001)	(0.005)	(0.013)	(0.027)	(0.000)	(0.014)
N	247	226	226	226	247	226
adj. R-sq	-0.013	0.029	-0.018	0.009	0.011	0.022
p-values in parentheses	*p<0.10, **p<0.05, ***p<0.01					

The table shows regressions for testing hypotheses 1a, 2a&c and 3a&c, i.e. with Turnover Growth as the dependent variable. Turnover Growth is the compounded annual growth rate (CAGR) for sales from year +1' to year +3' post-buyout. Independent variables include: PE Industry Specialisation is a dummy variable taking the value of 1 if the PE firm has an ICA above 1.25, i.e. is considered industry specialised, and 0 otherwise. Low-Performing and High-Performing are dummy variables taking the value of 1 if the industry adjusted EBITDA/Sales at year 0' is in the first, second or third tercile respectively, and zero otherwise. SBO and Division are dummy variables taking the value of 1 if the vendor source in the buyout corresponds to each respective one, and zero otherwise. Syndication is a dummy variable taking the value of 1 if the acquisition was conducted by more than one PE firm and the value of 0 in case of a single acquirer. PE Experience as cumulative number of investments since the PE firm was established, i.e. total number of investments for the PE firm from inception until 2014. PE Age defined as the number of years since the specific PE firm was founded. Local PE is a dummy variable taking the value of 1 if PE firm's home country is the same as the target firm's home country, and 0 otherwise. MSCI is the level of the MSCI Nordic Countries Index in the month of the deal. PE Investments is the total amount of investments by European private equity firms in the year of the deal. ln(Turnover Pre-Buyout) represents sales in year 0', normalised using a log function. Profitability Pre-Buyout as EBITDA/Sales in year 0'. Deal Leverage is debt to total assets in year 0'. PE Industry Specialisation # Low-Performing, PE Industry Specialisation # Low-Performing, PE Industry Specialisation # SBO and PE Industry Specialisation # Division are interaction variables.

Table 10: Regressions with Change in Profitability as the Dependent Variable

Dependent variable: Change in Profitability	(1b) No interaction		(2b&d) Interaction: Specialisation & Pre-Buyout Profitability		(3b&d) Interaction: Specialisation & Vendor Source	
	Simple	Full	Simple	Full	Simple	Full
PE Industry Specialisation	0.0074*	0.0082**	0.0035	0.0024	0.0111*	0.0142**
	(0.056)	(0.040)	(0.523)	(0.705)	(0.050)	(0.025)
SBO		-0.0031		-0.0017	0.0041	0.0024
		(0.585)		(0.775)	(0.401)	(0.689)
Division		0.0028		0.0015	0.0065	0.0113
		(0.590)		(0.823)	(0.498)	(0.159)
Syndication		0.0001		0.0028		-0.0007
		(0.989)		(0.594)		(0.884)
PE Experience		-0.0000		-0.0000		-0.0000
		(0.270)		(0.286)		(0.165)
PE Age		-0.0002*		-0.0001		-0.0002**
		(0.058)		(0.183)		(0.047)
Local PE		-0.0048		-0.0073		-0.0049
		(0.432)		(0.258)		(0.424)
MSCI		0.0001		0.0001		0.0001
		(0.595)		(0.679)		(0.623)
PE Investments		-0.0006		-0.0006		-0.0006
		(0.120)		(0.127)		(0.133)
ln(Turnover Pre-Buyout)		0.0026		0.0034		0.0031*
		(0.121)		(0.297)		(0.072)
Profitability Pre-Buyout		0.0221				0.0223
		(0.206)				(0.206)
Deal Leverage		0.0053		-0.0025		0.0059
		(0.605)		(0.811)		(0.564)
Low-Performing			-0.0067	-0.0096		
			(0.450)	(0.320)		
High-Performing			-0.0024	-0.0019		
			(0.660)	(0.773)		
PE Industry Specialisation # Low-Performing			0.0175	0.0226		
			(0.183)	(0.127)		
PE Industry Specialisation # High-Performing			-0.0075	-0.0053		
			(0.344)	(0.532)		
PE Industry Specialisation # SBO					-0.0055	-0.0095
					(0.528)	(0.330)
PE Industry Specialisation # Division					-0.0092	-0.0164*
					(0.394)	(0.071)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.0059	-0.0098	-0.0013	-0.0052	-0.0086	-0.0185
	(0.307)	(0.801)	(0.859)	(0.908)	(0.184)	(0.636)
N	240	223	223	223	240	223
adj. R-sq	0.006	0.030	0.030	0.036	-0.008	0.030
p-values in parentheses	*p<0.10, **p<0.05, ***p<0.01					

The table shows regressions for testing hypotheses 1b, 2b&d and 3b&d, i.e. with Change in Profitability as the dependent variable. The Change in Profitability is the EBITDA/Sales-margin at year +3' subtracted from the EBITDA/Sales-margin at year +1' divided by 3. Independent variables include: PE Industry Specialisation is a dummy variable taking the value of 1 if the PE firm has an ICA above 1.25, i.e. is considered industry specialised, and 0 otherwise. Low-Performing and High-Performing are dummy variables taking the value of 1 if the industry adjusted EBITDA/Sales at year 0' is in the first, second or third tercile respectively, and zero otherwise. SBO and Division are dummy variables taking the value of 1 if the vendor source in the buyout corresponds to each respective one, and zero otherwise. Syndication is a dummy variable taking the value of 1 if the acquisition was conducted by more than one PE firm and the value of 0 in case of a single acquirer. PE Experience as cumulative number of investments since the PE firm was established, i.e. total number of investments for the PE firm from inception until 2014. PE Age defined as the number of years since the specific PE firm was founded. Local PE is a dummy variable taking the value of 1 if PE firm's home country is the same as the target firm's home country, and 0 otherwise. MSCI is the level of the MSCI Nordic Countries Index in the month of the deal. PE Investments is the total amount of investments by European private equity firms in the year of the deal. ln(Turnover Pre-Buyout) represents sales in year 0', normalised using a log function. Profitability Pre-Buyout as EBITDA/Sales in year 0'. Deal Leverage is debt to total assets in year 0'. PE Industry Specialisation # Low-Performing, PE Industry Specialisation # Low-Performing, PE Industry Specialisation # SBO and PE Industry Specialisation # Division are interaction variables.

Table 11: Descriptive Statistics – Main Sample

The table shows the mean, standard deviation, min, max and number of observations for the dependent, independent and control variables in the main sample. Turnover Growth is the compounded annual growth rate (CAGR) for sales from year +1' to year +3' post-buyout. The Change in EBITDA-margin is the EBITDA/Sales-margin at year +3' subtracted from the EBITDA/Sales-margin at year +1' divided by 3. The Change in ROA is EBITDA/Total Assets at year +3' subtracted from EBITDA/Total Assets at year +1' divided by 3. Debt/Total Assets and Debt/EBITDA at +1' post-buyout. Profitability Pre-Buyout as EBITDA/Sales in year 0'. ln(Turnover Pre-Buyout) represents sales in year 0', normalized using a log function. Deal Leverage is debt to total assets in year 0'. PE Industry Specialisation is a dummy variable taking the value of 1 if the PE firm has an ICA above 1, i.e. is considered industry specialised, and 0 otherwise. PE Age defined as the number of years since the specific PE firm was founded. PE Experience as cumulative number of investments since the PE firm was established, i.e. total number of investments for the PE firm from inception until 2014. Syndication is a dummy variable taking the value of 1 if the acquisition was conducted by more than one PE firm and the value of 0 in case of a single acquirer. Local PE is a dummy variable taking the value of 1 if PE firm's home country is the same as the target firm's home country, and 0 otherwise. MSCI is the level of the MSCI Nordic Countries Index in the month of the deal. PE Investments is the total amount of investments by European private equity firms in the year of the deal. HY Rate the effective yield on ICE BofAML Euro High Yield Index at the end of the year of the deal.

	PBOs					SBOs					All PE Firms				
	Mean	Std. Dev.	Min.	Max.	N	Mean	Std. Dev.	Min.	Max.	N	Mean	Std. Dev.	Min.	Max.	N
Dependent variables															
Turnover Growth	0.164	0.252	-0.241	1.511	167	0.087	0.187	-0.210	1.286	80	0.139	0.235	-0.241	1.511	247
Change in EBITDA-margin	-0.001	0.033	-0.155	0.237	161	-0.001	0.027	-0.050	0.184	79	-0.001	0.031	-0.155	0.237	240
Change in ROA	0.003	0.058	-0.198	0.513	173	-0.001	0.040	-0.215	0.159	79	0.001	0.053	-0.215	0.513	252
Debt/Total Assets	0.645	0.217	0.119	1.382	179	0.674	0.208	0.134	1.087	80	0.654	0.214	0.119	1.382	259
Debt/EBITDA	9.182	50.725	-232.808	522.752	174	12.466	144.349	-603.300	1111.551	80	10.216	90.929	-603.300	1111.551	254
Independent variables															
Profitability Pre-Buyout	0.102	0.251	-2.564	0.728	151	0.146	0.229	-1.431	0.743	75	0.117	0.244	-2.564	0.743	226
ln(Turnover Pre-Buyout)	10.059	1.141	5.394	13.396	155	10.617	1.322	7.010	14.269	76	10.243	1.229	5.394	14.269	231
Deal Leverage	0.608	0.215	0.074	1.062	163	0.633	0.225	0.112	0.988	77	0.616	0.218	0.074	1.062	240
PE Industry Specialisation	0.704	0.458	0.000	1.000	179	0.613	0.490	0.000	1.000	80	0.676	0.469	0.000	1.000	259
PE Age	15.045	12.476	1.000	80.000	179	20.750	13.617	3.000	79.000	80	16.807	13.082	1.000	80.000	259
PE Experience	54.369	59.083	2.000	350.000	179	95.013	100.673	6.000	675.000	80	66.923	76.588	2.000	675.000	259
Syndication	0.050	0.219	0.000	1.000	179	0.100	0.302	0.000	1.000	80	0.066	0.248	0.000	1.000	259
Local PE	0.637	0.482	0.000	1.000	179	0.313	0.466	0.000	1.000	80	0.537	0.500	0.000	1.000	259
MSCI	95.715	16.350	53.900	121.620	179	98.532	14.372	54.800	121.620	80	96.585	15.792	53.900	121.620	259
PE Investments	46.307	7.357	28.000	59.000	179	45.900	4.689	28.000	59.000	80	46.181	6.642	28.000	59.000	259
HY Rate	0.094	0.065	0.042	0.245	179	0.076	0.048	0.042	0.245	80	0.088	0.061	0.042	0.245	259

Table 12: Descriptive Statistics – Additional Sample

The table shows the mean, standard deviation, min, max and number of observations for the dependent, independent and control variables in the additional sample. ln(Enterprise Value) represents enterprise value at investment entry, normalized using a log function. EV/EBITDA and EV/Sales are enterprise value divided by EBITDA and enterprise value divided by sales at investment entry. EBITDA-margin is EBITDA divided by sales at investment entry. ln(Sales) represents sales at investment entry, normalized using a log function. Net Debt/Total Assets and Net Debt/EBITDA also at investment entry. HY Rate the effective yield on ICE BofAML Euro High Yield Index at the end of the year of the deal. MSCI is the level of the MSCI Nordic Countries Index at the end of the year of the deal.

	PBOs					SBOs					All PE Firms				
	Mean	Std. Dev.	Min.	Max.	N	Mean	Std. Dev.	Min.	Max.	N	Mean	Std. Dev.	Min.	Max.	N
Dependent variables															
ln(Enterprise Value)	4.020	2.068	-3.079	9.641	248	4.850	1.811	-0.734	8.760	79	4.220	2.037	-3.079	9.641	327
EV/EBITDA	16.602	25.777	0.877	195.986	86	16.447	22.191	2.837	113.401	24	16.569	24.941	0.877	195.986	110
EV/Sales	2.603	4.062	0.013	28.645	133	4.818	12.230	0.165	75.992	49	3.199	7.258	0.013	75.992	182
Independent variables															
EBITDA-margin	0.168	0.154	0.017	1.004	85	0.164	0.115	0.048	0.434	24	0.167	0.146	0.017	1.004	109
ln(Sales)	4.548	1.804	-0.064	8.925	135	4.618	1.857	-0.281	9.536	49	4.567	1.813	-0.281	9.536	184
Net Debt/Total Assets	0.010	0.303	-0.949	0.786	105	0.120	0.211	-0.132	0.514	27	0.032	0.289	-0.949	0.786	132
Net Debt/EBITDA	1.973	10.314	-25.750	64.312	94	2.435	4.212	-1.125	17.088	25	2.070	9.354	-25.750	64.312	119
HY Rate	0.090	0.052	0.031	0.253	250	0.076	0.048	0.031	0.253	79	0.087	0.051	0.031	0.253	329
MSCI	4892.764	1285.385	2144.889	6890.661	250	5142.780	1170.125	2144.889	6890.661	79	4952.798	1261.472	2144.889	6890.661	329

Table 13: Univariate Analysis of the Independent Variables – Main Sample

The table shows the mean and the standard deviation for the independent (control variables) for PBOs and SBOs. The difference between the means as well as the corresponding p-values and t-values are also shown. A two-sided independent sample t-test with unequal variances has been used. Profitability Pre-Buyout as EBITDA/Sales in year 0'. ln(Turnover Pre-Buyout) represents sales in year 0', normalized using a log function. Deal Leverage is debt to total assets in year 0'. PE Industry Specialisation is a dummy variable taking the value of 1 if the PE firm has an ICA above 1, i.e. is considered industry specialised, and 0 otherwise. PE Age defined as the number of years since the specific PE firm was founded. PE Experience as cumulative number of investments since the PE firm was established, i.e. total number of investments for the PE firm from inception until 2014. Syndication is a dummy variable dummy variable taking the value of 1 if the acquisition was conducted by more than one PE firm and the value of 0 in case of a single acquirer. Local PE is a dummy variable taking the value of 1 if PE firm's home country is the same as the target firm's home country, and 0 otherwise. MSCI is the level of the MSCI Nordic Countries Index in the month of the deal. PE Investments is the total amount of investments by European private equity firms in the year of the deal. HY Rate the effective yield on ICE BofAML Euro High Yield Index in the end of the year of the deal.

	PBOs		SBOs		Difference		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
Profitability Pre-Buyout	0.102	0.251	0.146	0.229	-0.044	0.186	(-1.327)
ln(Turnover Pre-Buyout)	10.059	1.141	10.617	1.322	-0.558***	0.002	(-3.148)
Deal Leverage	0.608	0.215	0.633	0.225	-0.025	0.415	(-0.817)
PE Industry Specialisation	0.704	0.458	0.613	0.490	0.091	0.159	(1.415)
PE Age	15.045	12.476	20.750	13.617	-5.705***	0.002	(-3.196)
PE Experience	54.369	59.083	95.013	100.673	-40.644***	0.001	(-3.362)
Syndication	0.050	0.219	0.100	0.302	-0.050	0.188	(-1.325)
Local PE	0.637	0.482	0.313	0.466	0.324***	0.000	(5.117)
MSCI	95.715	16.350	98.532	14.372	-2.817	0.165	(-1.396)
PE Investments	46.307	7.357	45.900	4.689	0.407	0.592	(0.536)
HY Rate	0.094	0.065	0.076	0.048	0.018**	0.013	(2.494)
N	179		80		259		

*p<0.10, **p<0.05,
***p<0.01

Table 14: Univariate Analysis of the Independent Variables - Additional Sample

The table shows the mean and the standard deviation for the independent (control variables) for PBOs and SBOs. The difference between the means as well as the corresponding p-values and t-values are also shown. A two-sided independent sample t-test with unequal variances has been used. EBITDA-margin is EBITDA divided by sales at investment entry. ln(Sales) represents sales at investment entry, normalized using a log function. Net Debt/Total Assets and Net Debt/EBITDA also at investment entry. HY Rate the effective yield on ICE BofAML Euro High Yield Index in the end of the year of the deal. MSCI is the level of the MSCI Nordic Countries Index in the end of the year of the deal.

	PBOs		SBOs		Difference		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
EBITDA-margin	0.168	0.154	0.164	0.115	0.003	0.911	(0.112)
ln(Sales)	4.548	1.804	4.618	1.857	-0.069	0.822	(-0.226)
Net Debt/ Total Assets	0.010	0.303	0.120	0.211	-0.110**	0.032	(-2.193)
Net Debt/ EBITDA	1.973	10.314	2.435	4.212	-0.462	0.734	(-0.340)
HY Rate	0.090	0.052	0.076	0.048	0.014**	0.028	(2.222)
MSCI	4892.764	1285.385	5142.780	1170.125	-250.016	0.108	(-1.616)
N	250		79		329		

*p<0.10, **p<0.05,
***p<0.01