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Post exit operating performance of PE-backed firms: Evidence from Sweden

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Abstract

This study investigates whether the effects of PE-investors ownership persist over time. Explicitly, an evenly distributed sample of BO- and VC-backed firms, 112 in total, are selected from the Swedish PE transaction market during the years between 2004 and 2009. The firms' post exit operating performance are then examined in relation to a selected sample of matched firms to assess their post exit operating performance, using a set of accounting profitability and earnings measures. The findings from this study suggests that PE-backed firms demonstrate superior operating performance post exit, which to a large extent is driven by superior performance of VC-backed firms. BO-backed firms, however, did not demonstrate superior post exit operating performance. In addition, the operating performance with regards to first time BO as well as different exit routes are specifically investigated, but were not yielding any results that could lead to a conclusion of either better or worse post exit operating performance.

Keywords: Private equity, Buyout, Venture capital, post exit operating performance, Leveraged Buyout

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Preface

This Master's thesis was carried out during 2014. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Business and Administration at the School of Business, Economics and Law, Gothenburg University in Gothenburg, Sweden. The project was conducted at the Department of Industrial and Financial Management. Johan Medin have been responsible for writing this thesis, Hans Jeppsson for supervision.

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Gothenburg, June 2014
Johan Medin

Introduction

Private equity (henceforth PE) as an asset class has grown in popularity and has transformed the corporate landscape considerably worldwide, from the time it initially emerged as an important phenomenon in the 80s until today. During 2013, PE-funds attracted approximately $461 billion in capital inflows worldwide and global PE deal volume amounted to approximately $231 billion in 2013 (Bain & Company, 2014). Evidently, PE-investments account for a substantial part of the total M&A transaction volume worldwide.

The rapid growth of the PE industry has attracted ample attention from the academic field. Although PE still could be considered as a relatively young and immature asset class, scholars have provided with huge amount of research in the area. The previous literature will however be quite extensively discussed in the following sections in this paper and thus not further discussed here. Of special importance to this study however is the research targeting the post exit operating performance of PE-backed firms. Since this topic is largely unresolved and has important implications to bridge the moral hazard problems associated with PE-backed firms exiting their investments, this area is important to address. In addition, Sweden being a very transparent country in terms of gaining access to accounting data, which naturally are important in these types of studies, provided further motives for choosing this topic and this geographical area. Furthermore, Sweden has a very high PE penetration rate[1] relative to other countries, which also made this region interesting to examine.

Hence, the purpose of this study is to examine whether the effects of PE-investor ownership persist over time. More specifically, this will be tested by examining the post exit operating performance of PE-backed firms, targeting the Swedish market between 2004 and 2009. The post exit operating performance will be defined and measured by some specific accounting profitability and earnings measures of the PE-backed firms and then these results will be compared with the operating performance of a selected set of comparable firms, using a specific comparable firm methodology. In addition, various exit routes of the PE-backed firms will be analysed more specifically to investigate whether they exhibit different results. Furthermore, Buyout-

[1] Private equity investments relative to a country's GDP

backed (henceforth BO) firms specifically will also be tested whether first time BO-backed firms and secondary or third BO yield different post exit results. The tests will be conducted through univariate analysis and OLS regression models, in accordance with previous studies.

The study presents evidence that PE-backed firms exhibit higher profitability during the post exit period relative to the matched firms – to a large extent driven by superior operating performance of the VC-backed firms (henceforth VC). BO-backed firms did however not exhibit higher profitability over the post exit period. An additional variable was added in an attempt to shed further light to the exhibited absence of post exit operating performance improvement in BO-backed firms when examining first time BO- and secondary and third time BO-backed firms specifically. This did not however yield any conclusive results. With regards to different exit routes, the data set were deemed as too small to provide for any conclusive results, hence potentially constitutes a promising area for future research, comprising a larger data set.

The disposition of this paper will follow as this: i) a brief introduction to the asset class of PE will be discussed in the section "*Private Equity*"; ii) previous literature relevant for this thesis will be discussed under "*Theory and literature review*", this section will also contain further motives for why the targeted geographical scope of the thesis was selected; iii) the research hypothesis will consequently be presented in the section "*Hypothesis development*" and will be based on the discussion presented in the previous section; iv) The gathering of data and the overall methodology adopted when conducting this study will be presented in the section "*Data and Methodology*"; v) the results from the study will be presented and analysed in the section "*Results and analysis*", where the result output tables also will presented; vi) the main conclusions from the study will be presented and discussed along with the implications in the section "*Conclusions*"; vii) the references used in the thesis will be presented in the section "*References*".

Private equity

PE as an asset class is usually broadly defined as equity investments in private companies in which the owner has a medium to long-term investment horizon and intends to be active. PE can then roughly be divided between BO and VC investments. The definition is not uniform and can be defined ambiguously depending on the source, but in general terms, VC investments are characterised by investments in the relatively early stages of a company's development and in small companies that usually possesses few tangible assets and often operate in markets that change very rapidly (Gompers and Lerner, 2001). VC-investors usually acquire a stake in the company that amounts to roughly 20-40%, i.e. a non-controlling investment (Kaplan and Stromberg, 2009). In addition, due to problems associated with asymmetric information, the VC-investor will usually employ control mechanisms, such as staged capital infusions (Sahlman, 1990) and syndicated investments (Lerner, 1995). VC control mechanisms also includes possessing of board seats as a monitoring mechanism and employment of stock option schemes for management in order to align interests (Gompers and Lerner, 2001). These mechanisms are however also adopted by BO-investors.

BO-investments are conversely characterised by control investments targeting mature and stable companies (Jensen, 1989). The investment firm usually acquire the target company using an equity ticket combined with a substantial portion of debt to finance the transaction – a leveraged buyout (henceforth LBO). According to Kaplan and Stromberg (2009), apparent dissimilarities between VC- and BO-investments are the differences in: i) the target company stage; ii) the acquired stake of the company; iii) and the amount of leverage used to finance the transaction. Naturally, when the company becomes more stable and mature and the cash-flow generated from the business are high enough to sustain a capital structure with increasingly amount of debt, it could be rational for an investor to issue more debt in order to utilize the benefits of debt, i.e. the interest tax shield and the agency benefits of debt. However, if the company issues too much debt or issues debt too early in the company stage, the management may have an incentive to increase risk to undesirable levels (Jensen and Meckling, 1976).

Similarities for both VC- and BO-investments are however the viable exit routes for the investors – including a sale to either another PE-investor or a strategic buyer or an exit through an IPO. According to Gompers and Lerner (2001), the most profitable exit route for VC-investors is through an IPO, which could be explained by the fact that IPO as an exit route only is a viable option for well-performing companies (Meles et al., 2014). For BO-backed firms, an increasingly more common exit route is through a sale to another financial buyer – or a secondary BO. Naturally this evolvement follows from a rapid growth of the PE-industry globally. Between 2000 and 2004, secondary BO transactions accounted for more than 20% of total BO transaction value worldwide (Kaplan and Stromberg, 2009). Secondary BO transactions declined in the peak of the financial crisis but have further increased in volume in the aftermath of the crisis amounting to approximately 60% of the total BO transaction volume between 2010 and 2011 (Bonini, 2013).

Common features of both VC- and BO-investors are also the fact that they both usually raise money from investors or capital providers, denoted Limited Partners (henceforth LPs), through certain closed funds structured in a way where the PE advisory firm, denoted General Partner (henceforth GP), advises the fund on investments and divestments. When providing for this service, the GP is compensated through management fees and carried interest schemes, which are regulated through more or less complex terms and agreements negotiated by the LP-base and the GP (e.g. Gompers and Lerner, 2001; Hardymon, 2011).

As previously mentioned, PE has grown immensely in the last decades and has altered the M&A market and the corporate governance models profoundly worldwide. Interestingly enough, Jensen (1989) argued in his influential paper that publicly traded companies eventually would seize to exist. Jensen stipulated that the organizational structure of an LBO was far superior to the publicly traded corporation. Jensen pointed to several key explaining factors; i) the highly levered capital structure of the LBO which incentivized management to cut back on wasteful spending and increase productivity and efficiency, ii) the substantial equity investments by management forming an aligned interest with owners ensuring that management would not make short-term cash flow improvements at the expense of the long-term value of the firm, iii) the active participation by owners ensuring enhanced monitoring and ability to provide for value-added long-term strategic inputs for the firm. Large

amount of research supports these findings (e.g. Kaplan, 1989; Smith 1990). In a pioneering study by Kaplan (1989), the author concludes that the superior operating performance post-BO constitutes an important condition for yielding premium returns.

The vast interest from LPs to invest in PE-funds would not have grown this immensely if the GPs, on an aggregated level, had not been able to yield a satisfying return in relation to the risk. Theoretically, the fact that BO-backed firms tend to be more levered than non BO-backed firms, should not alone affect a rational LP's decision to invest in the fund since higher leverage on any given deal would lead to a higher expected return but simultaneously lead to a proportionally higher risk given the agency cost of debt, according to the famous Modigliani and Miller theorem (Axelsson et al., 2009). Hence, superior performance borne through an active ownership appears more likely to be the explaining factor for attracting the large capital inflows from LPs, which naturally seek a high return relative to the risk undertaken by the investor. As concluded by Harris et al. (2012), the returns demonstrated by PE-investors are far superior to the returns yielded by the public market. Harris et al. examine the returns exhibited by US BO- and VC-investors respectively and are able to conclude that the average BO-fund outperform the S&P 500 by on average 3% per year and on average 20-27% over the life of the fund. The VC-investors however on average only exhibits superior returns relative to the public market during the 90s, which indeed could be the explaining factor as to why VC-investors have experienced more difficulties in raising funds relative to the BO-investors (Kaplan and Lerner, 2010).

Theory and literature review

With regards to the vast interest the asset class private equity has attracted ever since its broad propagation during the mid-80s and forward, it is not surprising that it also has involved a high level of activity from the academic field. Surprising however could arguably be the general negative public attitude towards the asset class (Morris, 2010) given the large amount of research that have been issued exhibiting superior value creation in several areas in PE-owned companies. Numerous scholars have exhibited the superiority of private equity as an asset class and as an owner. PE-backed firms tend to grow faster than other ownership forms (e.g. Engel, 2002; Bertoni, 2011), show higher productivity and profitability and overall enhanced operating performance (e.g. Kaplan, 1989; Smith, 1990; Davis, 2008) and patent more (Kortum and Lerner, 2000). In general, PE-investors transforms the companies into more professional organisations according to the long term value-added hypothesis (e.g. Hellman and Puri, 2002), as well as are better at selecting high quality firms to invest in according to the screening role hypothesis (e.g. Chemmanur et. al., 2011). PE-backed firms also show higher market returns post-IPO (e.g. Brav and Gompers, 1997; Belghitar and Dixon 2012). Research has to a large extent focused on PE ownership contribution and value creation in VC-backed firms where it has been proven that PE-investors supports and guides the entrepreneurs with making correct long term strategic decisions for the firm (Barringer, 2005) as well as providing valuable business contacts and network for the entrepreneur (Hsu, 2006; Lindsey, 2008).

Of special interest to this study is the long term value added hypothesis which suggests that the PE-investor provides for value increasing activities within the company that goes beyond what is stipulated by prior financial theories. As explained in the study by Hellman and Puri from 2002:

"We find that a closely involved investor can have a broader impact on the development of the companies they finance, suggesting that there are value-added inputs that venture capitalists provide that go beyond that suggested by traditional financial intermediation theory" (Hellman and Puri, 2002)

The value increasing activities or inputs that were revealed in the study by Hellman and Puri were; i) adoption of human resource policies, ii) the imposition of stock option plans, iii) hiring of marketing professionals, iv) that VC-backed firms also are more prone to replace the founder with a more suitable CEO. Hellman and Puri denote these activities "professionalization measures" which can be exhibited in firms with closely involved investors such as PE-investors (Hellman and Puri, 2002). The study targets VC-backed firms but several studies have been published exhibiting the same phenomenon in BO-backed firms.

The value-added hypothesis is also demonstrated in papers by Kaplan and Stromberg (2003), and Colombo and Grilli (2010). It is therefore not surprising that studies by for example Kaplan (1989), revealed increasing operating performance, in terms of EBIT and net cash flow, post-buyout relative to pre-buyout. This supports the theory of value added operational inputs for BO-backed firms as well, as was furthered by Jensen (1989) – described in the previous section. In addition, Wright et al. (2009), are able to conclude that BO-investors often have unique sector expertize and substantial experience in building companies and therefor are able to contribute with substantial operational lasting value creation measures in their portfolio companies and thus simply are fit to make the companies better. Examples of concrete operational long term value added inputs with regards to BO-investors are presented in the study where the authors argue that BO-investors supports the companies with the following: i) investments and knowledge in new product development; ii) new investments in plants and equipment; iii) supports the company in market expansion.

Contradicting to the theory of the long-term value-added hypothesis is however the short term value added hypothesis, which stipulates that since PE-investors mainly are focused on maximizing their own wealth it could have long-term negative effects for the firm. For example Wang (2003), argues that there is a conflict of interest between the entrepreneur and the PE-backed firm that leads to negative long term effects for the firm. In addition, the PE-investor might have an incentive to cut back on capital expenditure in order to increase margins in the short term, which potentially could have damaging effects for the firm in the long run. Jain and Kini (1995), do however not exhibit such behaviour in their study when analysing post-exit performance of PE-backed firms. Wright et al. (2009), are able to conclude that PE-investors are more prone to stripping the firm of assets than other ownership forms. However, the authors

are unable to link this behaviour to long term negative effects for the companies. Another short term value added hypothesis frequently depicted academically is earnings management – usage of accounting techniques in order to smooth out or improve earnings prior to a sale or IPO. However, Chou et al. (2009), argues that there are little evidence supporting that earnings management measures adopted by PE-investors could be linked to poor post issue performance of PE-owned companies. Previous studies have however exhibited ambiguous results (e.g. Teoh et al. 1998).

The long term and short term value added hypothesis suggests that the value increasing (or destroying) activities potentially could have effect for the operating performance even in the post-exit period of former PE-backed firms. Prior research targeting the post-exit operating performance of PE-backed companies, that this paper aims to address, are covered in papers by Jain and Kini (1995), Wang (2003), Coakley (2007), Levis (2011), Tian (2012) and Meles et al. (2014). Jain and Kini's pivotal paper from 1995 made ground-breaking conclusions by confirming that VC-backed IPOs had better post-exit operating performance (proxied by ROA) than non VC-backed IPOs, which the market had acknowledged by valuing VC-backed firms higher in general than non VC-backed firms on a p/e-multiple – a VC-monitoring premium valuation. Previous research had indicated that VC-investors focus on investments with substantial requirements of monitoring services and Jain and Kini exhibited that US VC-investors provide for this service even post IPO, and thus support the operational value creation of the portfolio company. The findings are important since it demonstrates the post-issue long term value added hypothesis in VC-backed firms, which has implications for the decision-making process for both investors and entrepreneurs of companies – entrepreneurs will be more likely to benefit from premium valuation at the time of exit and IPO investors are more likely to benefit from superior operating gains.

Following Jain and Kini's study, several other papers have been issued on the subject, with varying results. Another US study by Tian (2012) confirms the superiority of VC-backed firms with regards to post-IPO operating performance as well as higher market valuations at the time of exit. In addition, Levis (2011), exhibited similar results when examining the UK market. Contrasting findings are however found in studies by Wang (2003) and Coakley (2007). Coakley studied the UK VC- and BO-market between 1985 and 2003 and Wang studied the Singaporean VC-market

between 1987 and 2001 and demonstrated worse post-IPO operating performance for VC-backed firms relative to non VC-backed firms. Coakley argues that the results revealed in his study largely can be explained by the boom-and-bust years of 1998-2001, distorting the results and can conclude that the results therefor not are robust. Nevertheless it can thus be concluded that previous findings have yielded ambiguous results and varied substantially between markets and time periods, perhaps reflecting the contradicting implications from the short term and long term value added hypothesis.

The study by Meles et al. (2014), targets the Italian PE-market with exits between 2001 and 2008 and with both BO- backed and VC-backed firms included in the analysis. The authors compare the PE-backed firms post-exit performance with a matched sample gathered in accordance with the methodology adopted by Tian, (2012). The authors exhibited that only VC-backed firms increase their post-exit operating performance and find no evidence for BO-backed firms. Interestingly enough, the study also shows that PE-backed firms exiting through an IPO exhibit lower positive change in operating performance than compared to other exit routes. The result could be seen as surprising since only high-quality firms should have the opportunity to exit through an IPO. In addition, the results contradict the monitoring role hypothesis of PE-investors, exhibited by Jain and Kini (1995). On the other hand, companies exiting through an IPO tend to be larger in size and more mature than non-public firms and since Meles et al. exhibited that BO-backed firms did not outperform their matched sample over the post-exit period this could indeed be the explanation.

An interesting and potential explanation to the results exhibited by Meles et al. regarding the lack of superior post exit performance concerning BO-backed firms, aside from the apparent implications from the short term value added hypothesis, might be that there could be differences between first time and secondary BO-backed firms in terms of operating performance. In a study by Bonini (2013), it was concluded that first time BO-backed firms exhibited superior operating performance during the holding period, in accordance with previous studies (e.g. Kaplan, 1989; Smith, 1990), however, second and third time BO-backed firms did not exhibit superior operating performance. The result seems somewhat logical since value-added input strategies implemented by BO-investors might be difficult to implement more than once, arising from difficulties to reap the benefits of the profitability increasing

measures when another BO-investor decides to acquire the firm. In order to increase profitability even further, the new BO-investor is required to target value-added input strategies for the firm that perhaps are not that apparent or may be harder to implement since the initial BO-investor already have reaped the benefits of the "easy" value-added input strategies. Hence, failing to consider these differences in "operating performance potential" between companies could be a plausible explanation for the results exhibited by Meles et al. (2014). This theory could also explain some of the results from the previous findings. Jain and Kini, (1995) for example had a bias towards high tech and only targeted VC-backed firms while Coakley targeted an evenly distributed sample between BO and VC. Even though these are only speculative ideas, the theory seems interesting for further investigation.

Previous research in the area of post-exit operating performance of PE-backed firms has to a large extent focused on IPO as an exit route. Meles et al. (2014) argues that it would be more appropriate to also examine other exit routes in the study – sale to financial or strategic buyer – and a failure to do so would lead to a bias affecting the results. This due to the following three reasons; i) IPO only constitutes a small portion compared to other exit routes for PE-investors ii) IPO is only a viable exit option for well-performing companies iii) The PE-investors remain with a substantial equity stake even after the IPO has been made. Previous research has also exhibited differences in firm characteristics depending on different exit routes decisions (Guo and Sørensen, 2007) leading to an adverse selection in the firm sample when only examining one exit route.

As this paper aims to build on previous aforementioned research and shed some light to the largely unexplained post-exit operating performance of PE-backed firms, the Meles et al. methodology will be adopted when examining the Swedish market – enabling a more thorough and broad analysis than simply only looking at IPO as an exit route. In addition, Sweden has been concluded to be an interesting market as it constitutes one of the most private equity penetrated markets in the world and where PE has a longer history than for example the Italian market with several PE-investors being active for as long as since the early 90s (e.g. IK Investment Partners, EQT and Nordic Capital) enabling a larger sample of for example secondary BOs. According to EVCA statistics (EVCA statistics, 2013), the private equity investments in Sweden amounted to ~0.8% of GDP (PE penetration rate) between the years 2007-2011 – only

surpassed by UK in the European union which has private equity investments relative to GDP of ~1.2% (2007-2011). London being the world's financial centre naturally explains this statistics where the majority of the large pan-European PE-funds are located. More interesting is the large gap between Sweden and the third country with regards to PE penetration rate in the EU, which is France, amounting to ~0.4%. According to the World Bank, only the US-market, in addition to the UK market, surpasses Sweden globally in PE-penetration rate amounting to ~1.0% (avg. 2011-2012) (World Bank, 2013). Hence, it can be concluded that Sweden constitutes a highly interesting country for PE-investors to invest in and thus an interesting market to investigate.

The business school IESE and advisory and audit firm Ernst & Young have a collaboration in which they produce an annual Private equity attractiveness index in which they highlight certain key elements as to why Sweden is an attractive country to invest in. According to the publication Sweden has a very high level of innovation, large pool of well-educated people, low level of bribing and corruption, relatively low level of administrative burden on companies, high level of investor protection and legal enforcement that protects investor rights as well as a sophisticated and large capital market relative to its size, which combined constitutes as attractive features of the Swedish VC- and BO-market (The Venture Capital and Private Equity Country Attractiveness Index, 2013).

Since similar studies have been made on other countries where PE-penetration is high (UK- and US-market) (e.g. Jain and Kini, 1995; Coakley, 2007), It can also be of interest to investigate the Swedish market more thoroughly. In addition, since Sweden is a very transparent country in terms of gaining access to accurate accounting data for unlisted companies, this region seemed highly interesting for this type of study.

Hypothesis development

Recognising the contradicting effects of the short term and long term value added hypothesis it is perhaps not surprising that previous research have borne ambiguous results on post-exit performance of PE-backed firms. Some papers exhibit that PE outperform relative to non PE-backed firms post-exit (Jain and Kini, 1995; Levis, 2011; Tian, 2012; Meles et al., 2014) and some papers demonstrate underperformance or inconclusive results from the data set (Wang, 2003; Coakley *et al.*, 2007). However, since the long term value added hypothesis seem to have the most support in the academic field, the first hypothesis is formulated in accordance with the long term value added hypothesis as follows:

H_1: *The profitability of PE-backed firms is expected to be higher over the post-exit period.*

Meles et al. (2014) argues that VC-investors in essence are "build winners" and that they provide for value-added activities (e.g. Hellman and Puri, 2002). For example, VC-investors provide for valuable business contacts (e.g. Hsu, 2006) and effective portfolio monitoring (e.g. Sahlman, 1990; Lerner, 1995), as well as several other value added operational activities and thus are likely to experience higher profitability in the post-exit period. One could however argue that another reason why VC-backed firms exhibit higher post-exit profitability could depend on investor bias. PE-investors in general invest in firms that perform better than the average firm, according to the screening role hypothesis (e.g. Chemmanur et. al., 2011). In addition, since usually only well-performing, "good", VC-backed firms are able to exit in the first place one could argue that there is another bias towards good firms to start out with in the data set of such a study. The aim, however, with this study is simply to examine if the long term or short term value added hypothesis could be extended to the Swedish market and made visible through higher or lower profitability in the post-exit period of PE-backed firms. Hence, the aforementioned theories are beyond the scope of this study but could potentially be of interest to further research. Hence, the second hypothesis is expressed in accordance with the long term value added hypothesis and in line with most previous findings as follows:

H_2: *The profitability of VC-backed firms is expected to be higher over the post-exit period.*

It seems unlikely, given the previous reasoning regarding BO-investors' ability to produce excess returns and attract substantial capital inflow that BO-investors do not provide for long term value-added activities. In a paper by Jelic and Wright (2011), the authors conclude that without consistent operating gains of the portfolio companies of BO-investors, it is unlikely that the excess returns exhibited by BO-investors could persist over such a long time period as have been mentioned previously. Most BO-investors have a clear strategy in for example matters of corporate governance in order to assure the close involvement necessary to produce superior operating performance, as stipulated by e.g. Hellman and Puri (2002). For example, the Nordic BO-fund EQT are famous for their governance structure called "The Troika", where the CEO and Chairman of the Board combined with an EQT Partner form a special team in order to share information effectively and continuously as well as plan and execute on the best strategic route for the company going forward (EQT website). In addition, earlier studies have exhibited long term value added inputs from BO-investors (Kaplan, 1989; Jensen, 1989; Wright et al., 2009). Hence, even though Meles et al. (2014) exhibited in their study that BO-backed firms did not show higher profitability over the post-exit period, the third hypothesis is based on the theoretical background that largely supports the long term value added hypothesis in BO-backed firms and thus is expressed as follows:

H_3: *The profitability of BO-backed firms is expected to be higher over the post-exit period.*

In order to try to analyse the previous issue regarding the profitability change over the post-exit period in BO-backed firms specifically a bit further than the Meles et al. (2014) study, an additional hypothesis is furthered regarding BO-backed firms. The purpose being to try to investigate why previous findings have not exhibited higher post exit profitability for BO-backed firms, as has been the case for VC-backed firms. It is based on the findings exhibited by Bonini (2013), revealing superior operating performance for first time BO-backed firms and not for secondary BO-backed firms. Since these findings supports the theory that value creation is higher in first time BO than for secondary or third time BO, the study will examine whether these results also

could be extended to the post exit performance of PE-backed firms. Hence, the fourth hypothesis will be expressed as follows:

H_4: *The profitability of BO-backed firms over the post-exit period is expected to be higher for a first-time BO than if it has been owned by BO-investors previously.*

When conducting the study in accordance with the Meles et al. methodology, different exit routes can be analysed. As already mentioned, previous studies have failed to consider different exit routes when analysing the post-exit performance. Since prior research have exhibited differences in firm characteristics for different exit routes with regards to PE-exits (e.g. Sørensen, 2007; Guo et al., 2012), it would be fairly plausible that the different exit routes would yield different results. In addition, according to the theory of the monitoring role of PE-investors, companies that exit through an IPO should exhibit superior performance since the PE-investor remains with a significant ownership position in the company and thus are able to contribute with value added operational inputs that benefit the firm – the monitoring role hypothesis (Jain and Kini, 1995). Hence, the fifth and last hypothesis will be expressed as follows:

H_5: *The profitability of PE-backed firms over the post-exit period is expected to be affected by the PE investor's exit strategy*

Data and methodology

In order to test the research hypotheses, a sample of Swedish PE-backed firms have been gathered that have been divested in the years between 2004 and 2009. The reason for choosing 2004 as start year are twofold: i) in order to avoid the bias that Coakly (2007), experienced by choosing PE-backed firms that were divested before or in the subsequent years of the IT-bubble, a period after this event have been chosen; ii) the screening possibilities and information gathering on databases utilized in this paper for operating metrics, (i.e. the Retriever database) are constraint to the last ten fiscal years for the companies in the study. The reason for choosing 2009 as the last year of study is simply due to the fact that three years of company accounting metrics data for the years subsequent to the divestment year is required in order to conduct the study. 2012 is the last year available of data for unlisted companies as of the date of gathering data for this study.

From the original sample of 201 PE-backed companies of Swedish origin that were divested in the years between 2004 and 2009, some companies were excluded. The main reasons for excluding companies were due to the following: i) the company had no registered annual reports for the required years and hence no accounting data available; ii) the company had been divested to a non-Swedish company with a foreign domicile and hence the company had not registered any reports to Bolagsverket (The Swedish Companies Registration Office) in the subsequent years of the divestment; iii) the company had been acquired by a strategic investor who had disjointed the company and therefore had seized to exist; iv) the company had been liquidated or gone bankrupt; v) some specific accounting metrics were unavailable to extract from the company data although reports had been filed at Bolagsverket.

The final list of companies that ultimately comprised the data set consequently amounted to 112 companies. However, important to allude is the fact that this reduction of the data set should not raise any major concerns as to the validity of the results of the study and the reason for this is twofold. One being that when dealing with a substantial amount of different accounting metrics for unlisted companies, a reduction in the data set is customary. Meles, et al. (2014), conducts a similar study on the Italian market and collects a sample from 2001-2008. Meles et al. starts out with a list of 206 PE-backed exits but due to difficulties in gathering data, the data set

conclusively consists of 118 companies. Meles et al. also concludes that the main reason for a reduction in the data set is due to bankruptcies or simply due to unfeasibility to obtain accounting data. The second reason as to why the reduction in the data set should not affect the validity of the results is that there does not seem to be any underlying rationale as to why a reduction of the data set, based on these premises, should lead to a bias of well-performing or underperforming companies in the data set. Naturally, companies that have gone bankrupt are by definition underperforming companies but these exclusions represent only a minor part of the total amount of the excluded companies (13 companies). The largest amount of reductions are assignable to unfeasibility to obtain accounting data for various reasons and there is no evident rationale as to why this would lead to a bias in the data set – both well-performing and underperforming companies should exhibit equal probability of not supporting the dataset with the accounting metrics necessary for this type of study.

The main sources of information in collecting the data set is through Capital IQ (henceforth CIQ) when sourcing for the PE-backed exited transactions and Retriever as the main source of gathering information of unlisted company accounting data. The gathering of transaction data was complemented by individual searches on PE-investors websites. The usage of two sources of information with regards to transactions data are important since the usage of websites may pick up transactions that are missing by CIQ and third party sources, such as CIQ, are important since it may include transactions that are not included by the PE-investor due to a potential selection bias arising from voluntary reporting. Retriever is used as the main source of information with regards to accounting data. In order to check for errors, a random sample of five firms have been manually checked by downloading the annual report and calculate the accounting metrics manually – it has been able to conclude that based on this sample, the information provided by Retriever is accurate and thus constitute a reliable source of information. For GDP calculations, SCB (Statistics Sweden) was used as a source of information.

In order to be able to draw conclusions about the PE-backed companies' post exit performance, a peer group have been selected as a benchmark. This is in accordance with other papers studying the operating performance of PE-backed companies (e.g. Kaplan, 1989; Bergström, 2007; Tian, 2012; Meles et al., 2014). Explicitly, for every

single observation of PE-backed exits containing accounting data – 112 observations in total – a matching firm that are not PE-backed have been selected. The method used when selecting these peers are identical to the methodology adopted by Tian (2012), and Meles et al. (2014). For each sample firm, a matched firm have been selected using the Retriever screening tool and have been selected in accordance with the following criteria: i) in the year prior to the divestment year the matched firm had the same Retriever industry classification code; ii) sales amounting to 75-125% of the PE-backed company; iii) after the two first criteria are satisfied, the peer is selected by the company exhibiting the closest EBITDA-margin to the PE-backed company. Hence, the total data set consists of 112 PE-backed companies and 112 peers – in total 224 companies.

Dependent variables

In order to analyse whether the effects of PE investments persist over time, the change in operating performance over the post exit period ($\Delta Perf$) is examined. Specifically, the change in operating performance between 0, 1, 2 and 3 years post the divestment year and the year prior to the divestment year are analysed for every company observation (Equation 1):

$$(1)\ \Delta Perf = Perf_{i,t} - Perf_j$$

where operating performance is signified *Perf* and *i* signifies specific companies (i = 1,2,…, 112), t represents the time frame between the year prior to the divestment year and the three years post the divestment year used in the analysis (t = 0,1,2,3). The fiscal year prior to the divestment year is signified by j. In order to examine the post exit performance for the PE-backed companies relative to the non PE-backed peers the operating performance metric of the PE-backed company is adjusted by the performance metric exhibited by the matched firm (Equation 2):

$$(2)\ \Delta AdjPerf = (Perf_{i,t} - Perf_j) - (Perf_{m,t} - Perf_{m,j})$$

Where i signifies the PE-backed firm (i = 1, 2…, 112), m signifies the matched firm (m = 1, 2 …, 112) and the other variables are defined analogously with Equation 1.

As an accounting metric used as a proxy of operating performance, return on assets is adopted (henceforth ROA[2]). This is in accordance with prior studies targeting similar purposes of study (e.g. Kaplan, 1989; Jain and Kini, 1995; Meles et al., 2014). ROA effectively measures the company's ability to return a profit relative to its asset base and thus constitute a solid metric when measuring a company's operating performance since it considers the efficiency of the organisation in terms of its capital usage. In addition, the simplicity of the metric enables a calculation with few adjustments of the accounting data, conversely to other commonly used operating metrics, making it a prevailing metric when dealing with large quantities of data and an unfeasibility to calculate metrics for all the observations manually. ROA is calculated by divide EBIT with total assets. The conventionally adopted method when calculating ROA is by using the average of the asset base for the investigated year and EBIT for the investigated year. However, in order to be consistent with prior studies (e.g. Kaplan, 1989) the asset base at closing balance for the investigated year have been chosen.

As robustness tests, two operating metrics have been chosen as proxies for operating performance; change in EBITDA and change in EBITDA-margin. In the study by Meles et al. (2014), only one robustness test metric is used – change in EBITDA. In order to build on the aforementioned study, an additional metric has thus been included in the analysis. The main reason why EBITDA-margin has been included is that growth in EBITDA alone could be a consequence of M&A activities and not through organic growth. Therefore, when comparing companies with different strategies in terms of growth, the results could be severely distorted, which is also furthered by e.g. Kaplan (1989). This is of special importance when dealing with non-pro-forma earnings data, which is the case with this thesis[3]. Hence, EBITDA-margin constitutes a solid complementary metric to changes in EBITDA for the robustness test as any acquired growth also will affect the denominator. Changes in EBITDA will henceforth be signified by $\Delta Perf_2$ and $\Delta AdjPerf_2$, and changes in EBITDA-

[2] Recognising several other operating accounting metrics commonly used as proxies for operating efficiency – e.g. return on invested capital (ROIC) and return on capital employed (ROCE) – the adoption of ROA is justified based on the widespread usage of ROA in the academic literature.
[3] Pro-forma means when companies have adjusted their earnings for extraordinary items or M&A transactions to make earnings more comparable between time periods. Unfortunately it is not possible to acquire pro-forma earnings data for unlisted companies through annual reports from Retriever.

margin will henceforth be signified by $\Delta Perf_3$ and $\Delta AdjPerf_3$. Changes in ROA will henceforth be signified by $\Delta Perf_1$ and $\Delta AdjPerf_1$.

Independent variables

In order to be able to test for the research hypotheses, dummy variables are used for the independent variables, in accordance with several other studies (e.g. Levis, 2011; Meles, et al., 2014). To test for the first hypothesis (H_1), the PE-backed (PE) companies are signified by 1 and the non PE-backed is set at 0. Recognising the first hypothesis, this variable is expected to be positive.

According to the hypotheses, other variables are expected to have an effect on PE post exit performance. The second and third hypothesis stipulates that whether the PE-investor is targeting VC or BO will influence the post exit performance. Hence, two dummy variables are used to test for this – VC-backed (VC) firms are signified 1 and non VC-backed firms are denoted 0, BO-backed (BO) firms are signified 1 and non BO-backed firms are denoted 0. According to H_2 and H_3, both the VC variable and the BO variable are expected to be positive.

In contrast to previous studies, the differences in performance between first time BO-backed firms and BO-backed firms that have been owned by BO-investors previously are examined by adding one independent variable with regards to BO-investments (H_4). A first time BO (FTBO) will be signified 1 and secondary or third BO will be signified 0. The FTBO variable is expected to be positive according to H_4, based on the findings from Bonini (2013).

Lastly, it is expected to be variations in the post exit performances depending on the exit route the company has targeted (H_5), in accordance with other studies (e.g. Meles et al., 2014). Hence, three dummy variables are used to test for all of the exit routes – IPO (IPO) is signified by 1 and 0 otherwise, sale to strategic buyer (SSB) is signified by 1 and 0 otherwise, sale to financial buyer (SFB) is signified by 1 and 0 otherwise.

In addition, since there are numerous other factors likely to affect companies' operating performance, several control variables are included that are commonly used in the literature (e.g. Berger and Ofek, 1995; Dushnitsky and Lenox, 2006; Meles et al., 2014). The control variables are the following: i) company size calculated as the natural logarithm of the firms total assets (TA); ii) the company's capital ratio defined

as book value of equity divided by total assets (CR); iii) the company's productivity defined as labour productivity, measured as the natural logarithm of sales divided by number of employees (LP), and capital productivity, measured as the natural logarithm of sales divided by fixed assets (CP); iv) lastly, macroeconomic and industry factors are controlled for by adding national GDP growth between two sequential years (GDP) and a sector dummy variable that controls for variations between different sectors.

Empirical model

In accordance with influential papers in this purpose of study (e.g. Jain and Kini, 1995; Meles et al., 2014), a linear regression model is employed in order to test the research hypotheses. Ordinary least square regression (OLS) are used in order to construct a function where firm operating performance is explained by the various independent variables (Equation 3). The equation is formulated as follows:

$$(3)\ \Delta Perf_{i,t} = \alpha + \beta_1 PE_i + \delta X_{i,t} + \varepsilon_{i,t}$$

where specific firms are signified by i (i = 1,2,…,112) and years post the divestment year is signified by t (t = 0,1,2,3). PE represents a dummy variable which controls for PE-backing, control variables are signified by X and the random error for the function is signified by ε.

Equation 3 is used as basis for the regression analysis. The PE variable can be replaced by other variables that may explain the post exit operating performance. These tested variables have already been further elaborated in the previous section and an additional model which tests for these variables (Equation 4) can be presented as follows:

$$(4)\ \Delta AdjPerf_{i,t} = \alpha + \beta_1 VC_i + \beta_2 FTBO_i + \beta_3 IPO_i + \beta_4 SSB_i + \beta_5 SFB_i + \delta X_{i,t} + \varepsilon_{i,t}$$

The variables in Equation 4 that have not already been explained above are further described in Table 1. The additional model is a differences-in-differences model (Equation 4) and is included in order to provide further results to support the conclusions. In addition, the fact that it has already been adjusted for the operating performance of the matched firm enables more accurate analysis on some of the independent variables as well as reduce time distorting effects on the analyses. Both

regression models are unbalanced panel data regression models, which are used to provide with more degrees of freedom and to reduce the co-linearity among the explanatory variables.

Furthermore, Breusch-Pagan tests are conducted to test if the variables in either model suffers from heteroscedasticity. The test indicated that both models suffered from heteroscedasticity. Due to precautionary reasons, all the regression analyses are therefore run with robust standard errors. The regression analyses are run through Stata.

In addition to the OLS regression analyses, univariate analyses are also conducted in MS Excel as a preliminary analysis. The OLS regression analyses are employed in order to examine whether the results from the univariate analyses holds when controlling for other variables that might impact the operating performance of the selected firms. Hence, the results from the OLS regression models are more important and thus the conclusions from this study are to a higher degree based on these results.

Furthermore, in order to check if the variables have high correlation that potentially could distort the results, a correlation matrix analysis in Stata are conducted for the variables in Table 4 and 5. The output from these tests can be viewed in Table 6 and 7.

Table 1. Description of variables

Variables	Symbol	Description
Operating performance 1	ΔPerf1	The difference between ROA over the post-exit period and ROA of the year before the divestment[a]
Operating performance 2	ΔPerf2	The difference between EBITDA over the post-exit period and EBITDA of the year before the divestment[a]
Operating performance 3	ΔPerf3	The difference between EBITDA-margin over the post-exit period and EBITDA-margin of the year before the divestment[a]
Adjusted operating performance 1	ΔAdjPerf1	The difference between the ΔPerf1 of each PE-backed company with that of its matched company[a]
Adjusted operating performance 2	ΔAdjPerf2	The difference between the ΔPerf2 of each PE-backed company with that of its matched company[a]
Adjusted operating performance 3	ΔAdjPerf3	The difference between the ΔPerf3 of each PE-backed company with that of its matched company[a]
PE backing	PE	Dummy variable which is set at 1 when companies are backed by a PE investor and 0 otherwise[b]
VC backing	VC	Dummy variable which is set at 1 when companies are backed by a VC investor and 0 otherwise[b]
BO backing	BO	Dummy variable which is set at 1 when companies are backed by a BO investor and 0 otherwise[b]
First time BO	FTBO	Dummy variable which is set at 1 when companies are first time BOs and 0 otherwise[b]
Initial public offering	IPO	Dummy variable which is set at 1 when PE investors' exit through an IPO and 0 otherwise[b]
Sale to strategic buyer	SSB	Dummy variable which is set at 1 when PE investors' exit through a sale to strategic buyer and 0 otherwise[b]
Sale to financial buyer	SFB	Dummy variable which is set at 1 when PE investors' exit through a sale to financial buyer and 0 otherwise[b]
Size	TA	Natural logarithm of the total asset[a]
Capital ratio	CR	The book value of total equity divided by total assets[a]
Labour productivity	LP	Natural logarithm of the sales divided by number of employees[a]
Capital productivity	CP	Natural logarithm of the sales divided by fixed assets[a]
Regional GDP growth rate	GDP	The national GDP growth rate between two consecutive years[c]
Industry	Industry	Dummy variables each equal to 1 if the company operates in the corresponding sector and zero otherwise[b]

Sources: a) Retriever and company annual reports b) Capital IQ and PE-investors' websites c) SCB

Results and analysis

Sample statistics

As depicted in Table 2a, the industries that are most frequent in the data set comprises Industrials, Information Technology, Consumer Discretionary and Healthcare. Relatively few companies are found in the sectors of Materials and Consumer Staples. As expected, BO-investors are weighted towards mature industries such as Consumers and Industrials and VC-investors are weighted towards fast-growing sectors such as Information Technology. The CIQ-industry set also contains Financial Services, Utilities, Energy and Telecommunication Services. However, no company in the dataset were found in these sectors. The three first sectors were expected to show low frequency in the data set as they are unpopular industries by PE-investors due to either: i) unfeasibility to adopt the BO-model with high leverage; ii) marginal growth opportunities in the sector; iii) the companies in the sector are often too big to invest in; iv) the companies are too dependent on exogenous factors in order to succeed. Telecommunication Services are more surprisingly to be absent in the data set and could potentially be explained by a narrow listing by CIQ for the sector – only 181 companies are currently registered in this sector in Sweden.

As depicted in Table 2b, exit routes varies profoundly depending on different investment phases within PE. VC-backed firms demonstrate a bias towards sale to strategic buyer versus BO-backed firms that are relatively more prone to exit via financial buyer or through an IPO. Obviously, this bias have an impact on the result when testing for H_5, which will be discussed further in the following sections.

Table 2a. Sample distribution by sector

Sector	PE-backed firms		VC-backed firms		BO-backed firms	
	Number	%	Number	%	Number	%
Consumer Discretionary	20	17.9	2	1.8	18	16.1
Consumer Staples	7	6.3	1	0.9	6	5.4
Healthcare	16	14.3	8	7.1	8	7.1
Industrials	36	32.1	6	5.4	30	26.8
Information Technology	25	22.3	20	17.9	5	4.5
Materials	8	7.1	2	1.8	6	5.4

Notes: This table presents the distribution of the data set between sectors according to Capital IQ

Table 2b. Sample distribution by exit route

	IPO	SFB	SSB	Total	
				Number	%
VC-backed firms	0	5	34	39	34.8
BO-backed firms	11	23	39	73	65.2
-of which are FTBO	*9*	*18*	*30*	*57*	*50.9*

Notes: This table presents the distribution of the data set between exit routes

Univariate analysis

Table 3 depicts the univariate analysis for the data set. As expected, the PE-backed versus non PE-backed companies exhibit few statistically significant differences pre-exit since they were selected as matching firms, confirming that the comparable firm approach adopted by Tian (2012), is working in accordance to plan (Panel A). However, capital productivity is significantly lower for PE-backed firms and VC-backed firms versus non PE-backed and VC-matched firms respectively. This could potentially be explained by the lower amount of capital utilized by the non PE-backed firms in the dataset – also statistically significant. As expected, there are statistically significant differences between VC-backed and BO-backed firms in almost every variable, reflecting the differences in firm characteristics with respect to size, profitability, solvency and capital efficiency between VC-backed and BO-backed firms. VC-backed firms exhibiting higher efficiency measures might seem surprising at a first glance, however this could merely reflect the bias towards different sectors for VC-backed and BO-backed firms respectively. BO-backed firms exhibit a bias towards capital intense industries such as Industrials and Materials. Conversely, VC-backed firms exhibit a bias towards capital light industries such as IT.

In Panel B, the post exit period performance is analysed. The groups PE-backed firms and VC-backed firms exhibit statistically significant improvement in all operating measures, while BO-backed firms only exhibit statistically significant improvements in $\Delta Perf2$ relative to the matched firms. Differences in post exit operating performance between BO-backed firms and VC-backed firms are also statistically significant.

Table 3. Descriptive sample statistics

	PE-backed firms (1)	Non PE-backed firms (2)	(1) - (2)	VC-backed firms (3)	VC-matched firms (4)	(3) - (4)	BO-backed firms (5)	BO-matched firms (6)	(5) - (6)	(3) - (5)
Panel A – Firm characteristics (pre-exit year)										
TA (SEK mln)	661.0	545.6	115.4*	98.2	94.2	4.0	961.7	786.8	174.9*	-863.5***
CR (per cent)	39.4	37.1	2.4	37.7	26.9	10.8	40.4	42.5	-2.1	-2.7
CP (per cent)	0.9	2.5	-1.6*	2.2	6.4	-4.1**	0.1	0.4	-0.3	2.1***
LP (per cent)	29.9	32.1	-2.2	59.8	59.1	0.7	13.9	17.7	-3.8	45.9***
ROA (per cent)	1.3	3.5	-2.2	-7.5	-2.7	-4.9	6.0	6.8	-0.8	-13.6***
EBITDA (SEK mln)	69.5	56.0	13.6	4.6	7.6	-3.0	104.2	81.8	22.4	-99.7***
EBITDA-margin (per cent)	2.3	4.3	-2.0	-8.7	-7.2	-1.6	8.2	10.4	-2.3	-16.9***
Panel B – Firm change in performance (post-exit period)										
ΔPerf1 (per cent)	5.4	-0.4	5.8***	13.7	-4.8	18.6***	1.0	1.9	-1.0	12.8***
ΔPerf2 (SEK mln)	34.4	13.9	20.5***	10.7	-1.1	11.8***	47.0	21.9	25.1**	-36.3***
ΔPerf3 (per cent)	5.2	-0.8	6.0**	10.6	-4.1	14.7***	2.3	1.0	1.3	8.3
AdjΔPerf1 (per cent)	5.8	-	-	18.6	-	-	-1.0	-	-	19.5***
AdjΔPerf2 (SEK mln)	20.5	-	-	11.8	-	-	25.1	-	-	-13.3
AdjΔPerf3 (per cent)	6.0	-	-	14.7	-	-	1.3	-	-	13.4**

Notes: This table presents the means for the variables relating to some firm characteristics (Panel A) and firm change in operating performance over the post-exit period (Panel C). Panel A reports average values based on the year before the divestment, while Panel C reports average values over the post exit period. The variables are described in Table 1. The test for mean difference is a standard t-test, allowing for unequal variance. *, ** and *** indicate statistical significance at 10%, 5% and 1% levels, respectively.

Hypothesis results and analysis

From the findings in both Table 3 and Table 4, it can be concluded that PE-backed firms exhibit statistically significant improvement in operating performance over the post exit period for Δ*Perf1*, relative to its' matched firms. Both the univariate analysis in Table 3 and the OLS regression analysis in Table 4 (Equation 3) exhibit statistical significance at 1% and 10% level respectively. Several control variables also show statistical significance with the model in Table 4. Since there are differences in the dependent variable between VC-backed firms and BO-backed firms, this would also be reflected in the control variables. VC-backed firms clearly exhibit higher profitability gains over the post exit period relative to BO-backed firms, which for example explains why TA show statistically negative significance with Δ*Perf1*. When excluding the independent variable PE, the test model's explanatory power, measured as Adj. R^2, is lower than when adding the PE variable, which also is the case when testing for the other variables and thus confirms the models robustness. This also confirms the conclusion that the PE-backing variable indeed adds explanatory power when testing for the post exit performance, measured as Δ*Perf1*. This enables the rejection of the null hypothesis and to be able conclude that PE-backed firms exhibit higher operating performance post exit measured as Δ*Perf1* (H_1). In addition, Δ*Perf3* also show statistically significant improvement over the post exit period, which supports the conclusion that the PE-backed firms outperform their matched firms post exit. Hence, it can be concluded that the results are expected, according to H_1, and in line with the findings of previous research.

From the findings in Table 3 and Table 4, it can also be concluded that VC-backed firms exhibit statistically significant improvements in operating performance over the post exit period relative to its' matched firms, measured as Δ*Perf1*. Both the univariate analysis in Table 3 and the OLS regression analysis in Table 4 exhibit statistical significance at 1% and 5% levels respectively. In addition, the second model, (*Adj*Δ*Perf*), also exhibits improvements in operating performance post exit for VC-backed firms relative to BO-backed firms at 10% statistical significance level. Furthermore, the robustness tests Δ*Perf2* and Δ*Perf3* in Table 4 and *Adj*Δ*Perf2* in Table 5, exhibit statistical significant improvements in operating performance over the post exit period at 1%, 10% and 1% levels respectively. Hence, the null hypothesis can be rejected and it can be concluded that VC-backed firms exhibit larger profitability gains over the post exit period relative to the matched firms, as H_2

states. It can be concluded that the results are expected according to H_2 and in line with the findings from previous research.

Converse with the results when examining the VC variable, Table 4 shows that BO-backed firms do not exhibit statistically significant improvements in operating performance over the post exit period relative to its' matched firms. Important to note is also the fact that neither operating performance measure (Δ*Perf1*, Δ*Perf2* and Δ*Perf3)* show statistically significant improvements in operating performance, which ensures us that the results are homogenous and converse with the results from testing the PE and the VC variable. Although Δ*Perf2* in the univariate analysis exhibit statistically significant higher EBITDA in the post exit period, the results from Table 4 are more important since it controls for the other independent variables. Hence, the null hypothesis cannot be rejected and it cannot be concluded that BO-backed firms exhibit higher profitability over the post exit period than its' matched firms, as H_3 states. The results are contrary to expectations, according to H_3.

As mentioned in the hypothesis section, one variable were added in an attempt to shed some additional light in the context of BO-backed firms post exit operating performance. However, testing for the FTBO-variable, it can be concluded from Table 4 and Table 5 that this group does not exhibit statistically significant improvements in operating performance over the post exit period, relative to secondary or third time BO. Analogous with the results from testing for the BO-variable, the results are homogenous across all operating performance measures in Table 4 as well as in Table 5. Although, important to note is that the coefficients are positive for almost all the tests in both regression models. In addition, the *Adj*Δ*Perf1* and the *Adj*Δ*Perf3* variable exhibits quite high t-values, and thus nearly confirms that FTBO exhibit higher profitability gain over the post exit period relative to secondary and third BOs. Important to note is that the performance of matched firms are considered in Table 5 but not in Table 4. Nevertheless, as the results from Table 4 and Table 5 are somewhat inconclusive and not statistically significant, H_4 cannot be confirmed. Hence the null hypothesis cannot be rejected and it is therefore not possible to conclude that first time BO-backed firms exhibit higher profitability over the post exit period than secondary and third BOs. Although, the findings suggests that this indeed would constitute a promising and interesting area for future studies.

When testing for the last hypothesis (H_5), the results are depicted in Table 4 and Table 5. As can be seen in the output tables, the results are inconclusive and requires some elaboration; In Table 4, the results are derived from differences in operating performance of only PE-backed firms while Table 5 adjusts for the difference between PE and non PE-backed firms as well. Hence, when testing for the second model (*Adj*Δ*Perf*) with regards to different exit routes, the model considers the differences in operating performance between the PE-backed firms and the matched firms. This could not be done in the first model (Δ*Perf*) since it simply was not possible to include the matched firms as single observations. For this reason the second model is assigned greater importance as it adjusts for the operating performance changes exhibited by the matched firms as well. In Table 5 it cannot be concluded that there are statistically significant differences in changes in operating performance measures between firms exhibiting different exit routes measured as *Adj*Δ*Perf1*. However, as there are statistically significant differences in *Adj*Δ*Perf2* (and Δ*Perf2* for the first model), this is deemed to be specifically important to address; since there is a strong bias towards VC-backed firms in the group SSB, the firms included here tend to be smaller and thus are less likely to exhibit large gains in EBITDA over the post exit period relative to BO-backed firms. Hence, it is somewhat expected that this group exhibit less changes in EBITDA, as also is stated in the output of Table 5. Ideally, for this type of test you would ultimately want to examine the different exit routes for every subgroup of PE (VC and BO respectively). However, this was not feasible as the data set was too small. However, an important and interesting finding in Table 5 is that IPO firms exhibit statistically significant lower profitability over the post exit period, measured as *Adj*Δ*Perf3*. This is also confirmed by the findings from Table 4 (Δ*Perf3*). Even though these results are statistically significant, it would be inappropriate to conclude that IPO firms perform worse during the post exit period, based on at least three reasons: i) since the data set is constrained to only comprise 11 IPO firms there is an underlying lack of robustness in the test; ii) the test results are inconclusive from the different operating measures; iii) as mentioned previously, there are large differences between VC-backed and BO-backed firms that are insufficiently accounted for in the test. To conclude, based on these findings, the null hypothesis cannot be rejected stating that there are no differences between firms in terms of operating performance improvement over the post exit period. Also important to note is that this test only test two exit routes (IPO

and SSB) against a third exit route (SFB). However, testing has also been conducted for every exit route as a reference group and it can be concluded that the findings from this analysis confirms the conclusions already stated above.

Table 6 and 7 show correlation matrixes between the independent variables in Table 4 and 5. None of the correlations exceed a value of 0.6, why it is deemed that none of the variables distort the results from the regression analyses.

In addition to testing all years simultaneously in the regression analyses, single years have been tested to provide with further results from the data set[4]. At large, the results further support the conclusions already stated. However, an interesting finding is that year 1 and especially year 2 post exit indicate strong profitability increase, measured as ROA, relative to the matched firms, but with a stagnating effect three years post exit. This is the case both from the univariate and the regression analyses. One reason for why this might be the case could be that a large amount of the firm sample were divested in the year of 2006. In 2009 – three years post 2006 – the effects from the turmoil following the financial crisis had major implications on firm operating performance, especially for PE-backed firms. This could indeed be a plausible explanation of the general decline in firm operating performance three years post exit. It could also be argued that this finding could be seen as an argument for the short term value added hypothesis, since there is a decline in operating performance in the third year post exit. If the data set would have contained more years, it would have been feasible to make more firm conclusions regarding this finding.

[4] Since four different years were tested, four additional sets of tables could have been included in the result section. However, since the results largely confirm the conclusions from the test involving all years, this have only been described in the text.

Table 4. Results from OLS regressions starting from equation 3

	Δ in ROA					Δ in EBITDA					Δ in EBITDA-margin				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	ΔPerf1	ΔPerf1	ΔPerf1	ΔPerf1	ΔPerf1	ΔPerf2	ΔPerf2	ΔPerf2	ΔPerf2	ΔPerf2	ΔPerf3	ΔPerf3	ΔPerf3	ΔPerf3	ΔPerf3
PE	0.030*					8.512					0.043*				
	(1.70)					(1.17)					(1.66)				
VC		0.089**					11.481***					0.124*			
		(1.99)					(2.95)					(1.91)			
BO			-0.003					3.371					0.003		
			(-0.23)					(0.29)					(0.20)		
FTBO				0.021					-5.736					0.038	
				(1.24)					(-0.24)					(0.71)	
IPO					0.025					-16.887					-0.105*
					(0.78)					(-0.39)					(-1.94)
SSB					0.024					-58.983***					-0.030
					(1.23)					(-4.02)					(-0.80)
TA	-0.014*	-0.013	0.000	0.016**	-0.013	24.109***	0.354	36.933***	55.271***	33.970***	0.018	0.043	0.024***	0.034**	0.043*
	(-1.76)	(-0.56)	(0.07)	(2.46)	(-1.32)	(5.23)	(0.14)	(7.45)	(6.84)	(5.36)	(1.58)	(1.23)	(3.57)	(2.56)	(1.84)
CR	-0.007	0.001	-0.063**	-0.075**	-0.061	-7.729	0.750	5.811	59.064	-3.908	-0.005	-0.035	-0.068*	-0.096	0.003
	(-0.18)	(0.02)	(-2.28)	(-2.23)	(-1.23)	(-0.70)	(0.18)	(0.22)	(1.46)	(-0.26)	(-0.10)	(-0.43)	(-1.88)	(-1.44)	(0.05)
LP	0.111***	0.115**	0.082***	-0.008	-0.005	16.883***	-0.799	58.455**	22.862	31.434***	0.108***	0.099**	0.202***	0.380***	0.149***
	(2.61)	(2.06)	(2.89)	(-0.17)	(-0.21)	(3.23)	(-0.31)	(2.20)	(0.40)	(3.84)	(3.17)	(2.22)	(5.42)	(4.03)	(3.36)
CP	-2.444**	-2.429**	2.498***	10.968**	-0.077	116.717***	-3.463	1 134.694	4399.775	121.963	-0.531**	-0.288	0.706	-18.158*	-1.415
	(-2.45)	(-2.31)	(2.82)	(2.06)	(-0.15)	(3.96)	(-0.26)	(1.38)	(0.69)	(1.11)	(-2.44)	(-0.96)	(0.61)	(-1.72)	(-0.99)
GDP	0.113	-0.121	0.276*	0.442**	0.183	192.145*	-15.611	328.151**	191.023	85.697	0.027	-0.624	0.376*	0.439	0.105
	(0.47)	(-0.21)	(1.73)	(2.24)	(0.60)	(1.82)	(-0.34)	(2.21)	(0.80)	(0.50)	(0.10)	(-0.94)	(1.80)	(1.12)	(0.26)
Industry	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Intercept	0.181	0.173	0.000	-0.216**	0.246*	-286.119***	-3.508	-457.535***	-689.671***	-342.217	-0.146	-0.375	-0.297	-0.417**	-0.307
	(1.62)	(0.65)	(0.01)	(-2.28)	(1.73)	(-5.09)	(-0.12)	(-6.97)	(-6.05)	(-4.68)	(-1.12)	(-1.01)	(-3.22)	(-2.22)	(-1.11)
N	896	312	584	292	448	896	312	584	292	448	896	312	584	292	448
Adj R^2	0.204	0.246	0.062	0.056	0.083	0.098	0.056	0.113	0.140	0.157	0.043	0.070	0.074	0.120	0.081
Prob > F	0.000	0.000	0.000	0.004	0.012	0.000	0.020	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.005

Notes: Panel regression analysis of change in operating performance of a sample of 112 Swedish PE-backed and 112 non-PE-backed firms is reported. The variables IPO and SSB are tested against SFB, why this variable is not included in the test. The variables are described in Table 1.

*, ** and *** indicate statistical significance at 10%, 5% and 1% levels, respectively.

Table 5. Results from OLS regressions starting from equation 4

	Adj.Δ in ROA			Adj.Δ in EBITDA			Adj.Δ in EBITDA-margin		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	AdjΔPerf1	AdjΔPerf1	AdjΔPerf1	AdjΔPerf2	AdjΔPerf2	AdjΔPerf2	AdjΔPerf3	AdjΔPerf3	AdjΔPerf3
VC	0.121*			41.099***			0.026		
	(1.89)			(2.79)			(0.37)		
FTBO		0.043			21.766			0.100	
		(1.63)			(0.79)			(1.52)	
IPO			-0.012			17.402			-0.152**
			(-0.21)			(0.37)			(-2.32)
SSB			0.040			-39.088**			-0.002
			(1.30)			(-2.43)			(-0.05)
TA	0.012	-0.013	0.001	28.915***	29.669***	21.156***	0.057***	0.036***	0.064**
	(0.58)	(-1.17)	(0.07)	(3.71)	(3.14)	(3.22)	(2.82)	(2.59)	(2.52)
CR	0.117	-0.127***	0.139	15.326	-31.599	11.178	0.203*	-0.230**	0.239**
	(1.15)	(-2.94)	(1.29)	(0.98)	(-0.84)	(0.70)	(1.76)	(-2.55)	(2.02)
LP	0.011	0.071	0.041	9.862	56.951	21.846***	0.173***	0.238***	0.183***
	(0.17)	(1.59)	(0.74)	(1.13)	(1.45)	(2.93)	(2.84)	(2.75)	(3.20)
CP	0.436	2.718**	0.622	24.343	1567.832	108.052	1.311	0.726	1.364
	(0.38)	(2.25)	(0.57)	(0.25)	(1.48)	(1.11)	(0.44)	(0.47)	(0.46)
GDP	0.342	0.254	0.314	-192.845	-407.810	-210.734	0.263	0.147	0.268
	(0.69)	(0.82)	(0.63)	(-1.00)	(-1.51)	(-1.10)	(0.50)	(0.37)	(0.52)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	448	292	448	448	292	448	448	292	448
Intecept	-0.172	-0.034	-0.072	-344.668***	-2.798	-199.034***	-0.631**	-0.084	-0.739**
	(-0.62)	(-0.67)	(-0.27)	(-3.48)	(-0.06)	(-2.61)	(-2.37)	(-1.29)	(-2.33)
Adj R^2	0.071	0.138	0.067	0.064	0.016	0.074	0.089	0.187	0.095
Prob > F	0.001	0.000	0.003	0.002	0.004	0.002	0.000	0.000	0.000

Notes: Panel regression analysis of change in operating performance of a sample of 112 Swedish PE-backed and 112 non-PE-backed firms is reported. The variables IPO and SSB are tested against SFB, why this variable is not included in the test. The variables are described in Table 1.

*, ** and *** indicate statistical significance at 10%, 5% and 1% levels, respectively.

Table 6. Correlation matrix between variables used in Table 4

Variables		1	2	3	4	5	6	7	8	9	10	11
1	PE	-	-	-	-	-	-	-	-	-	-	-
2	BO	-	-	-	-	-	-	-	-	-	-	-
3	VC	-	-	-	-	-	-	-	-	-	-	-
4	IPO	-	-	-	-	-	-	-	-	-	-	-
5	SFB	-	-	-	-	-	-	-	-	-	-	-
6	SSB	-	-	-	-	-	-	-	-	-	-	-
7	FTBO	-	-	-	-	-	-	-	-	-	-	-
8	TA	**0.169**	**0.591**	**-0.591**	**0.297**	**0.100**	**-0.277**	0.225	-	-	-	-
9	CR	0.041	**0.150**	**-0.150**	**0.167**	-0.026	**-0.080**	-0.042	**0.282**			
10	LP	-0.026	**-0.475**	**0.475**	**-0.157**	**-0.088**	**0.179**	-0.136	**-0.561**	**-0.196**		
11	CP	**-0.123**	**-0.294**	**0.294**	**-0.070**	**-0.085**	**0.121**	-0.102	**-0.415**	**-0.157**	**0.328**	
12	GDP	0.000	0.033	-0.033	-0.007	0.016	-0.010	0.093	-0.015	-0.045	0.008	-0.014

Notes: This table shows Pearson pairs-wise correlation matrix. Bold texts indicate statistically significant at 1% level or more.

Table 7. Correlation matrix between variables used in Table 5

Variables		1	2	3	4	5	6	7	8	9
1	VC									
2	FTBO	-								
3	SSB	-	-							
4	SFB	-	-	-						
5	IPO	-	-	-	-					
6	TA	**-0.568**	-0.020	**-0.313**	**0.108**	**0.343**				
7	CR	-0.043	0.031	**-0.116**	-0.025	**0.223**	**0.196**			
8	LP	**0.485**	0.180	**0.172**	-0.074	**-0.168**	**-0.490**	**-0.095**		
9	CP	**0.378**	0.133	**0.166**	**-0.114**	**-0.100**	**-0.372**	**-0.156**	**0.232**	
10	GDP	-0.033	0.043	-0.010	0.016	-0.007	-0.019	-0.060	0.014	-0.015

Notes: This table shows Pearson pairs-wise correlation matrix. Bold texts indicate statistically significant at 1% level or more.

Conclusions

In this study the post exit operating performance of Swedish PE-backed firms is examined in relation to the operating performance for a sample of matched firms in the period between 2004 and 2009. The aim is to assess whether the effects of PE-backing persist over time. In order to investigate the post exit performance, the change in some specific profitability metrics over 3 years post exit are measured, including the exit year. The data set consists of 112 PE-backed firms along with an equal amount of matched firms in other ownership forms. VC-backed and BO-backed firms are tested specifically as well as potential differences in performance with regards to different exit routes. This paper builds on previous studies by addressing a new geography as well as adding one profitability metric that further explains the post exit operating performance. In addition, in order to be able to delve more deeply into the post exit operating performance of BO-backed firms in particular, one variable that potentially could explain the lack of superior post exit operating performance exhibited by BO-backed firms in previous studies have been added. This variable takes into account whether the BO-backed firm has been owned previously by a PE-investor or not.

The empirical results show that PE-backed firms exhibit superior performance post exit relative to their matched firms, which to a large extent is driven by the superior performance of the VC-backed firms. The conclusions from both the univariate analysis and when controlling for other determinants of post exit performance are homogenous and in line with previous research (Meles et al., 2014). VC-backed firms exhibit outstanding profitability gains over the post exit period, which should really be further recognised. The findings support the long term value added hypothesis of VC-backed firms. One additional comprehensive explanation as to why VC-backed firms exhibit such superior performance could potentially be that VC-backed firms that are able to exit by definition are successful firms and thus are not surprising to exhibit superior operating performance. Since there are a lot of firms in a VC-portfolio that are not able to exit, the testing of firms that only are exited ultimately leads to a bias of successful and superior firms, or more importantly, that have very high probability of being profitable in the years to come. In the light of this setting it is perhaps not surprising that VC-backed firms exhibit superior operating performance in relative to the matched firms during the post exit period. Although

important to note is that this does not however alter the conclusion that VC-investors indeed creates long term value in their portfolio companies that also seem to persist over time.

Converse to the findings of VC-backed firms are the findings from BO-backed firms that could be concluded not to exhibit higher profitability gains over the post exit period relative to their matched firms. The results are in line with previous findings. Despondently, the additional variable added in an attempt to explain the post exit performance of BO-backed firms a bit further did not provide any further information. Contrary to expectations, no superior post exit performance could be exhibited by initial BO-backed firms relative to firms that had been owned by BO-investors previously. Although, the coefficients were positive for almost all the metrics as well as exhibiting high t-values (although not statistically significant at 10% level), which makes this an interesting area for future studies – potentially comprising a larger data set.

No firm conclusions could be made with regards to whether post exit performances were different between firms with different exit routes. IPO firms exhibited a decline in operating performance but since the results were not uniform across the different operating metrics and the data set was too small, it have been decided not to form any firm and general conclusions regarding IPO firms specifically merely based on these findings. An interesting topic for future studies might be to gather a data set large enough to test the post exit operating performance for the subgroups of PE (VC and BO respectively). This would be more appropriate since the subgroups exhibited different bias for different exit routes and hence would certainly yield more interesting results.

Another reflection concerning the test results is that the added independent variables, ($\Delta Perf3$[5] and $Adj\Delta Perf3$[6]), indeed were an important contribution to the analyses. As was explained in the previous section, differences between firm sizes had distorting implications for the results of the independent variable $\Delta Perf2$[7]. Hence, $\Delta Perf3$ and $Adj\Delta Perf3$ constituted important robustness tests in the models.

[5] Change in EBITDA margin over the post exit period
[6] Change in EBITDA margin over the post exit period subtracted for the change by the matched firm
[7] Change in EBITDA over the post exit period

The conclusions in this study has implications for entrepreneurs as well as investors in PE-backed firms as it could constitute a contributing factor to solve for moral hazard problem arising from PE-investors decision to exit their investment. Since the PE-backed firms exhibited higher profitability during the post exit period, both the entrepreneur and the new investor could rely on the fact that PE-investors do not compromise on the company's long term operating performance when exiting their investments. Needless to say, since only VC-backed firms exhibited higher profitability over the post exit period one could argue that this conclusion largely depends on the composition of the sample between VC- and BO-backed firms. However, the fact that the matched firms did not exhibit higher profitability gains relative to BO-backed firms could be argued as being a testimony against the short term value added hypothesis in BO-backed firms, which also is an important conclusion.

The fact that BO-backed firms did not demonstrate superior post exit operating performance relative to the matched firms was also unexpected given the earlier discourse regarding superior returns demonstrated by BO-investors. A legitimate question is if BO-investors in the future can persist to produce excess returns if they simultaneously do not create operational long term value according to the long term value added hypothesis? One could however argue that BO-investors perhaps contribute with operational value added inputs, but that these measures perhaps more often materializes more quickly than for VC-backed firms and thus are not visible during the post exit period. This is of course only speculations but seems to be an additional promising area of future research.

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