Stockholm School of Economics
Department of Finance

December 2013

The difference in operational performance between Secondary Buyouts and Reverse LBOs

Benjamin Chaubert [*] Marco Studer[†]

Abstract

In the aftermath of the financial crisis, more LBOs were exited through a Secondary Buyout (SBO) compared to other exits, such as Reverse LBOs (RLBO). However, there are only few studies, examining the post-exit operational performance of different exit channels. In this thesis we examine the difference in operational performance between SBOs and RLBOs. First, our results suggest that growth firms are more likely to be exited through a RLBO, while SBO investors select firms that exhibit higher profitability. SBOs exhibit lower post-exit operational improvements compared to RLBOs in terms of lower post-exit abnormal sales growth and a stronger deterioration in abnormal EBTIDA/Total Assets margin. When controlling for firm pre-exit characteristics we find that 3 years after transactions SBOs show a 22% lower compounded sales growth and 2,4% lower EBITDA/Total Assets margin compared to RLBOs. Examining the effect of different agency costs on the post-exit operational performance of SBOs and RLBOs, our results suggest that GPs take advantage of cold debt markets to selectively invest in companies that are shed by public market investors during uncertain investment markets. Additionally, our findings suggest that certain GP business models seem more suited to invest in SBOs. For country specialist GPs, we conclude that the negative aspects of specialization, such as limited allocating possibilities, outweigh the positive aspects and lead to a deterioration in profitability. Global GPs on the other hand, seem to possess superior skills that are more suited to achieve operational improvements. Finally, we find that the experienced negative investor returns from the "*go for broke hypothesis"* are not a result of negative operational performance post-exit.

Keywords: SBO, RLBO, Operational performance, Private Equity, Agency costs

We would like to thank our tutor, Professor Per Strömberg for his valuable input and guidance in the shaping of this thesis. All remaining errors are ours.

[*] Major in Finance - 40255@student.hhs.se

[†] Major in Finance - 40256@student.hhs.se

TABLE OF CONTENT

1. INTRODUCTION

For Private Equity (PE) companies[1], also referred to as General Partners (GPs), the choice of an optimal exit strategy can be detrimental in their ability to achieve positive returns for their investors, so called Limited Partners (LPs). Strömberg & Kaplan (2009) show that an increasing number of Leveraged Buyouts (LBOs) are exited through a sale to another GP, a so called Secondary Buyout (SBO). Recently, the increased volume of this form of exits has been criticized by professionals.

> *"Right now in Europe, something like 75% of deals above $500 million in enterprise value are sponsors selling to each other. That's not a sign of health in our market."* - Joseph Baratta, global head of Private Equity at Blackstone – at Bloomberg Dealmakers Summit in London.[2]

Historically, most LBOs have been exited by either listing the company in public markets, in a so called Reverse LBO (RLBO) or sold to a corporate, in a trade sale (Strömberg, 2007). The high share of SBOs is an issue according to Joseph Baratta, because GPs investing in SBOs are missing out on deals, resulting from spin-offs or corporate M&A activity, which are the lifeblood of the Private Equity industry. When industry professionals are growing concerned, academics should ideally be able to present conclusive answers. However, the subject of SBOs is still a young academic topic and most studies focus on the determinants that increase the likelihood of an exit through a SBO rather than studying the potential for operational improvements in these transactions. Other researches focusing on SBOs compared their operating performance with those of Primary Buyouts (PBO), but lack a fair comparison with RLBOs, their exit counterparts. We are deeply interested in how far the potential for operational improvements differ in SBOs compared to PBOs and RLBOs.

In this thesis we therefore examine the difference in operational performance between SBOs and RLBOs. Moreover, we are investigating three different agency issues. First, our results suggest that GPs investing in SBOs do not select inferior firms, but rather that growth firms are more likely to be exited through a RLBO while SBO investors select firms that have higher abnormal operating margins. However, in our findings SBOs exhibit worse post-exit operational improvements compared to RLBOs in terms of lower post-exit abnormal sales growth and a stronger deterioration in abnormal EBTIDA/Total Assets margin. Our further results suggest that GPs take advantage of cold debt markets to selectively invest in companies that are shed by public market investors during uncertain investment markets. Additionally, our findings suggest that certain GP business models seem more suited to invest in SBOs. For country specialist GPs, we find that limited allocating possibilities,

[1] For review of the functioning and terminology of PE investments, see Kaplan & Strömberg (2009).
[2] Accessed on http://www.finalternatives.com/node/25124

outweigh the positive aspects of specialization and lead to deterioration in profitability. Global GPs[3] on the other hand, seem to possess superior skills that are more suited to achieve operational improvements during the next expansion stage for companies in a SBO. Finally, we find no evidences of negative operational performance post-exit when assessing the *"go for broke hypothesis"* and conclude that negative investors returns are a result of increased entry multiples and increased equity investments rather than lower intrinsic operating quality of the firms in these transactions. Even if compelling, our results in terms of agency issues are not able to fully explain the post-exit operational underperformance of SBOs compared to RLBOs.

Previous studies on the operational performance of SBOs have mainly focused on the difference in post-exit operational performance of primary buyouts (PBO) and SBOs. Bonini (2013), on European PE transactions, Wang (2012) and Zhou et al (2013), in an UK context, show that SBOs do perform worse in terms of profitability (EBITDA/Sales, EBIT/Sales) than PBOs. Bonini (2013) even finds that EBITDA/Sales margins revert to industry averages two years after the SBO. While these results are indicative about the deterioration in terms of profitability of SBOs, similar declines in profitability have been found for RLBOs. Early studies on the post-exit operational performance of RLBOs documented a pattern of decreasing profitability in terms of EBITDA/Sales and EBIT/Sales ratios post-exit (see e.g. Degeorge and Zeckhauser, 1993 & Holthausen and Larcker, 1996). For a large sample of RLBOs, Cao (2011) finds that the profitability, in terms of EBITDA/Sales and Net income/Assets remain significantly above industry medians and even outperform their benchmarks, after the transaction. Our study differs from these studies in that we examine the difference of post-exit operational performance of SBOs compared to RLBOs rather than focusing on a single exit channel. This comparison seems more appropriate as both firms experienced initial operational improvements during a PBO (see e.g. Kaplan and Strömberg, 2009) and further improvements are potentially harder to achieve. A similar approach was chosen by Jenkinson and Sousa (2013) for PE investments in Europe, that find higher sales growth for RLBOs and a less pronounced deterioration in terms of EBITDA/Total Asset compared to SBOs. We are the first authors – to the best of our knowledge – that examine the difference in operational performance of SBOs compared to RLBOs including transaction from North America and Europe. In line with previous studies we are hypothesizing that agency issues, resulting from the limited life fund structure of PE investors, are adversely affecting the post-exit operational performance of SBOs.

Degeorge et al (2013) show that lower investor returns of SBOs compared to PBOs can be attributed to transactions made late in the life of a fund. Those results provide support for the *"go for broke hypothesis"* as outlined by Axelson et al (2009). Additionally, in a related paper Axelson et al (2012) find evidence that the higher leverage during hot debt markets leads to lower subsequent

[3] Global GPs are GPs that have a global business model (e.g. KKR). For exact definition, see Table I.

investor returns. Arcot et al (2013) find that SBOs are more likely to happen during these hot debt market conditions, which would make them more likely to experience lower investor returns. Furthermore, Jenkinson and Sousa (2013) relate negative post-exit operational performance of SBOs to a prolonged holding period of the PBO, and Jelic and Wright (2011) suggest that SBOs are more often including firms with inferior pre-exit operational performance compared to RLBOs. Our study is considering both the results of Jenkinson and Sousa (2013) and Jelic and Wright (2011) as control variables in order to study the impact of agency issues on the post-exit operational performance of SBOs. We did not encounter any existing studies on the effect the limited life fund structure of PE investments has on the post-exit operational performance of SBOs.

The data used in this paper was assembled from Capital IQ, Zephyr, SDC VentureExpert and Bureau van Dijk (BVD) databases. Our final dataset consists of 202 SBOs and 220 RLBOs, where we were able to collect operational performance for five subsequent years (Y_{-1} to Y_3) and where characteristics of the buying GP were available. We are calculating abnormal operating performance measures that follow Barber and Lyon (1995) for 2-SIC matched industry codes. In a first step, we are using a Wilcoxon signed-rank procedure to examine the difference in pre-exit and post-exit operational performance between SBOs and RLBOs. First, our results show that SBO firms are not inferior firms and exhibit a profitability and sales growth clearly above comparable companies in their industry. SBO investors seem to select firms that have higher abnormal operating margins, but worse pre-exit sales growth compared to RLBOs, which we suspect is driven by the ability of high growth firms to more easily raise funding in equity markets. Second, examining the post-exit operational performance, our result suggest above industry growth post-exit for both SBOs and RLBOs and that abnormal operating margins do remain economically significant above industry levels. However, we find a significant declining trend in operational profitability, which lead us to suspect that both SBOs and RLBOs do exhibit characteristics that are in line with the *"performance timing hypothesis"* (Degeorge & Zeckhauser, 1993) or the *"market timing hypothesis"* (Cao, 2011), both reporting a decline in operational margins in RLBOs.

In a second step, we are using a robust multivariate regression model including control variables for the pre-exit firm characteristics, in order to assess the difference in post-exit operational performance between SBOs and RLBOs. Our results confirm preliminary findings from the first step median comparison, showing that SBOs exhibit lower post-exit operational improvements compared to RLBOs (3 years after transaction), in particular in terms of Sales growth (-22%) and EBITDA/Total Assets (-2,4%), while the effect on EBITDA/Sales is not significant. In accordance with Barber and Lyon (1995) we suspect the discrepancies in our two profitability ratios to result from the build-up of assets after a transaction. Moreover, our results suggest that smaller firms, in terms of total assets, do have a higher growth potential and that a longer holding period of the PBO does not lead to statistically worse operational improvements as suggested by previous studies.

In a final step, we are expanding the robust multivariate regression model in order to evaluate to what extent agency issues are affecting the post-exit operational performance of SBOs negatively and could, hence explain the performance difference between SBOs and RLBOs. First, we are examining how market conditions affect the post-exit operating performance of SBOs differently than RLBOs, through inclusion of variables that proxy for the state of the debt (High-yield spread) and equity markets (IPO issuances). Our results suggest that SBO investments made during cold debt markets exhibit worse post-exit operational performance compared to other SBOs and RLBOs. Additionally, we do not find a similar effect for RLBOs in terms of equity market conditions. However, accounting for year fixed-effects, we find that RLBOs improve post-exit operational performance in terms of EBITDA/Sales margin during times of high credit spreads. An increase in the credit spread by 1% would therefore lead SBOs to underperform RLBOs by 1,11% in terms of EBITDA/Sales and reduce the EBITDA/Total Assets abnormal margin of SBOs by 0,24%. Our results cannot be explained in terms of the *"pecking-order theory"*, that assumes SBOs to generally be worse quality firms. Instead, we find evidence for the *"cyclical investment behavior hypothesis"*[4], which suggest that GPs take advantage of cold debt markets to selectively invest in companies that are shed by public market investors during uncertain investment markets. Second, we are examining to what extent the specialization of a GP in an industry, country, or a global business model is more suitable to achieve operational improvements in a SBO and how this assessment changes in relation to the level of deal activity, which could limit the allocation potential of specialist GPs when good investment opportunities in the chosen specialization are scarce. Our results point out that specialist GPs with high deal activity achieve worse operational improvements compared to alternative GPs and that global GPs outperform alternative GPs independent of the level of deal activity. In conclusion, our findings indicate that some GP business models are more suited for investments in SBOs. For country specialist GPs[5], we find that the negative aspects of specialization, such as limited allocating possibilities, outweigh the positive aspects, such as expertise and best practices, leading to deterioration in profitability. Global GPs on the other hand, seem to possess superior skills that are more suited to achieve operational improvements during the next expansion stage for companies in a SBO. Finally, we find that the experienced negative investor returns from the *"go for broke hypothesis"* are a result of increased entry multiples and increased equity investments by GPs, rather than negative operational performance post-exit. Even if compelling, our results in terms of agency issues are not able to explain the post-exit operational underperformance of SBOs compared to RLBOs.

[4] We were not able to completely rule out alternative explanations, such as the *"window of opportunity hypothesis"* by Arcot et al (2013) and *"the market timing hypothesis"* by Cao (2011).
[5] A similar effect could not be shown to affect industry specialist GPs, indicating that different specializations might be more suited to achieve operational improvements in a SBO.

Our findings contribute to the evolving literature on SBO and RLBO performance, e.g. Degeorge et al (2013) and Jenkinson and Sousa (2013). In particular, we examine how SBOs and RLBOs differ in their operational performance pre- and post-transaction and assess how far agency issues, resulting from the limited fund life structure of PE investments (Axelson, Strömberg, & Weisbach, 2009), affect the post-exit operational performance of SBOs. First, we are examining the effect of market conditions on the post-exit operational performance of SBOs and RLBOs and find evidence that is not in line with the *"pecking-order theory"* as outlined in Jelic and Wright (2011), but instead we are introducing a new hypothesis. Under the *"cyclical investment behavior hypothesis"* GPs are taking advantage of cold debt markets to selectively invest in companies that are shed by public market investors during uncertain investment markets. As a result, SBOs made during cold debt markets exhibit worse post-exit operational improvements compared to RLBOs. Second, our results suggest that the discussion about specialization of GPs that invest in SBO should be more distinguished. We provide evidence that global GPs are more suited to achieve incremental operational improvements in SBOs than alternative GPs. Additionally we suggest that specialization also has a downside, in terms of limited allocation potential in accordance with the winner-picking-theory of Stein (1997). Finally, we show SBOs bought late in a lifetime of a fund do not exhibit worse post-exit operational performance, indicating that negative investor returns in these transactions (Degeorge, Martin, & Phalippou, 2013) are mostly the results of bad entry pricing for GPs that are pressured to make investments. Our results should be of interest for practitioners that want to understand the functioning of SBO and RLBO markets better and should provide guidance in terms of the choice of a strategically optimal business model. GPs with a narrow specialization in terms of country or industry might consider increasing their allocation potential during periods, where SBOs are the prevailing form of PE investments as it is the case at the time of this thesis. Additionally, global GPs might capitalize on their potential to achieve incremental operational improvements in SBOs through a global expansion strategy for their portfolio companies or introduction of international best-practices. Finally, our results suggest that companies that are bought late in the life time of a fund through a SBO are not necessarily worse companies. Limited Partners (LPs) should therefore take efforts to ensure that GPs are disciplined enough to not overpay for investments in these investments.

The remainder of this paper is structured as follows. In the next chapter we are providing an overview of existing literature explaining the operational performance of SBOs and RLBOs. We subsequently develop different hypotheses based on this literature review. Chapter 4 provides an overview of our data and we introduce our methodology in Chapter 5. We discuss our results and compare them to existing literature in Chapter 6 and test our results for robustness and limitations in Chapter 7.

2. LITERATURE REVIEW

2.1 Leveraged buyouts as a dominant organizational form

The evolution of Leverage Buyout (LBO) firms from being a niche market actor to a constant potential investor across industries and geographies has transformed the financial landscape. Strömberg (2007) indicates that the total value of companies acquired by LBO investors as of 2007 has risen to $3.6 trillion with the median firm staying in LBO ownership for about 9 years. The longevity and economic role of LBO ownership has been a widely discussed issue ever since Jensen (1989) predicted that LBOs would eventually become a dominant organizational form, implying that they are a long-term optimal organizational structure. The alternative view, represented by Rappaport (1990), argues that LBOs are a short-term "shock therapy", as they have a limited life. Kaplan (1991), in an earlier paper, found that LBOs remain private for a median time of 6.7 years and suggests that the majority of LBO organizations are neither short-lived nor permanent. The increase in median time of LBO ownership[6] since Kaplan (1991)'s findings can partly be attributed to an increasing number of buyout transactions exited through sales to other buyout firms, so called Secondary Buyouts (SBO). In a SBO transaction the companies remain under a LBO ownership structure. Strömberg & Kaplan (2009) show that SBOs have grown from 2% of total enterprise value (EV) in the first boom phase of Private Equity (1985 to 1989) to 25% by the second boom phase (2005 to mid-2007). This increase in SBOs provides initial evidence for Jensen (1989)'s arguments. However, only if the firms managed by General Partners (GPs) are better firms in terms of operational performance and more resilient compared to companies under different organizational structures (e.g. public market firms).

2.2 Value creating activities of General Partners

In order to achieve a superior organizational structure, GPs apply three sets of changes to the firms in which they invest (Strömberg & Kaplan, 2009).

First, LBO firms are characterized by an increased amount of leverage. The increased level of debt reduces the agency costs of firms with high free cash flow, as described in Jensen (1986), because of which the management of firms in mature industries chooses to overinvest, rather than returning money to shareholders. An increased level of leverage has a discipline effect on management by increasing interest payments and therefore reducing the free cash flow available to invest in value destructive project. However, if leverage is too high, the resulting inflexibility could lead to an increased occurrence of financial distress.

[6] LBO ownership refers to the whole time that a company remains under ownership of a General Partner, including potential sale to another General Partner. Looking a median holding period of a single LBO Strömberg (2007) found results that were in line with Kaplan (1991).

Second, superior governance mechanisms ensure that the incentives of a firm's management are aligned with the interests of investors. Kaplan (1989) finds that management ownership percentages increase by a factor of four, when firms change from public to private ownership. Additionally, board member of LBO firms are younger and have shorter tenures (Gertner & Kaplan, 1996), a characteristic that even persists after a LBO firm goes public again in a so-called Reverse LBO (RLBO).

Finally, GPs are bringing operational engineering skills to the LBO firms. Acharya et al (2013) show that GPs who are ex-consultants or ex–industry managers are associated with outperforming deals focusing on internal value-creation programs, while ex-bankers or ex-accountants are associated with outperforming deals involving significant mergers and acquisitions.

At the time of the demise of the investment bank Drexel Burnham Lambert and the following steep decrease in LBO activity, Kaplan (1989) was one of the first to evaluate the extent to which LBOs have improved operational performance during the first buyout wave of the 1980s. He presented evidence for an increase in operational performance in the 3 years after a buyout, through increases in operating income, decreases in CAPEX and increases in net cash flow. While initial studies should be interpreted with caution[7] a substantial amount of subsequently published literature broadly agrees that LBOs have a positive effect on the operational performance of target companies (for a summary see: Cumming et al, 2007). However, recent studies also added some exception to this generally positive evaluation of the value creating potential of LBOs. Guo et al (2009) examined how leveraged buyouts from the most recent wave of public to private transactions created value. In contrast to prior studies, they find gains in operating performance being either comparable or only slightly above those observed for benchmark firms. Additionally, Acharya et al (2013) show, using a proprietary dataset, that the increase in profitability is relatively smaller[8] than previously expected and that sales do not outgrow the median sales growth of the industry. Generally, these results suggest that the value creating potential of GPs might differ when looking at different time periods, geographies or GP characteristics and should therefore be evaluated carefully. Looking at economic-wide measures of value creation, Bernstein et al (2010) show that industries with a high share of PE investments have outgrown other industries in terms of productivity and employment. Looking at investor returns, the literature is entirely conclusive and concludes that LBOs do improve the operational performance of firms significantly, but GPs might claim a substantial part of the value creation as compensation (see e.g. discussion in Kaplan and Strömberg, 2009). Interestingly, both Guo et al (2009) and Acharya (2013) show that returns to investors are still significantly positive, even though they did not find

[7] Initial studies had to focus on public to private deals, because of data availability. These deals do though only represent a small part of the LBO universe, which leads to a selection bias. Additionally initial studies focused solely on transactions in the US and most of the early transactions were exited via an IPO, limiting the applicability when discussing operational performance across different exit channels.
[8] Acharya et al (2013) find a margin improvement of 1%, compared to 1.4% to 3.8% reported by Kaplan (1989).

significant operational improvements. This provides evidence that returns to investors results from other sources (e.g. entry and exit pricing).

2.3 Determinants of the exit strategy for LBOs

When choosing an optimal exit route, GPs will try to maximize the return to their investors. An investment can, broadly speaking, be exited via three different channels. The company can be exited through a trade sale, where another private or public company purchases the investment. Second, the investment can be sold to another GP in a SBO and finally the company could be sold to the public equity market with a Reverse LBO[9] (RLBO). According to Strömberg (2007) most LBO firms are exited through a trade sale (39%), followed by SBOs (24%) and RLBOs (13%). As discussed earlier, the share of SBOs has recently sharply increased, while the share of RLBOs decreased from 28% in the early 1980s to 13% today. This increase in the activity of SBOs can partly be explained by the evolution of the PE industry[10], but the reasons behind this strong increase are not unequivocally answered. Many authors have therefore started to discuss reasons to explain the recent surge in SBO activities and in order to compare the operating performance between RLBOs and SBOs we have to understand the characteristics of the firms in these two samples.[11]

2.3.1 Characteristics of deals exited via SBO

The use of SBOs as investments is controversial. According to Rappaport (1990)'s longevity argument an investor in a SBO could not expect any additional improvement in operating performance, as all potential improvements have already been realized during the primary buyout (PBO)[12]. A related hypothesis, by Cumming and MacIntosh (2003), states that GPs would only exit an investment when the marginal value added – resulting from their investments – is less than the marginal costs of their efforts to realize it. Deriving from this hypothesis, proponents of the view that SBOs are mainly a way of capital recycling, argue that a second financial buyer can hardly create additional operational improvements after an initial GP exhausted the company's potential. However, this area of research is not yet conclusive. Degeorge et al (2013) and Sousa (2013) define four broad hypotheses on the determinants, leading to a SBO exit:

"Advantage-to-specialization hypothesis"

The first hypothesis is concerned with differences in GP characteristics that would allow the buying GP to achieve greater improvements compared to the selling GP. Harper and Schneider (2004) raise the point that competition among GPs creates pressure on PE funds to redefine their investment strategies (e.g. create an investment focus on industry, country, or financing stage). Looking at a

[9] In this study we define RLBOs as every transaction, where a GP brings a company to public markets, even if the company has not been public before and has been bought out of private hands by the GP.
[10] More primary buyouts increase the chance of observing more SBOs in the market.
[11] Trade sales cannot be studied, as the performance post-buyout is incorporated in the parent company.
[12] During this thesis we refer to the first LBO as PBO

sample of UK buyouts over the period 1995-2000, Cressy et al (2007) find evidence that industry specialization adds 8.5% to the already existing profitability advantage of buyout companies, therefore confirming the *"advantage-to-specialization hypothesis"*. In cases where a SBO exit route is chosen because the buying GP skills match the current stage of the company better than the selling GP, we could therefore expect a positive impact on operational performance. Newer studies, such as Arcot et al (2013), found that SBOs are not more likely to happen for specialist GPs, therefore contradicting the *"advantage-to-specialization hypothesis"* as a main driver for SBOs as exit channel. Nevertheless the research in this area is not yet conclusive.

"Opportunistic behavior hypothesis"

The second hypothesis is concerned with agency issues that result from the structure of PE funds. One example is the so-called *"go for broke hypothesis"*, according to which GPs might rush to invest any remaining capital at the end of a funds life time, independent of the NPV of the transactions (Axelson, Strömberg, & Weisbach, 2009). As a result of GPs raising capital from Limited Partners (LPs) ex-ante (meaning before the transaction), GPs might choose investments that are not optimal once they have all the capital at disposition. Value destructive investments might, for example be chosen when the PE fund is approaching the end of its investment horizon and has not encountered sufficient positive NPV projects hence investing into project that would not have received funding under different circumstances. SBOs would be expected to suffer strongly from this agency issue, because any company held by another GP is by definition up for sale at one point in the future, leading to lower screening costs for the buying GP. In fact, Arcot et al (2013) show that SBOs are significantly more likely to occur, if the buyer is under pressure to invest. The authors even provide evidence that buyers under pressure pay higher prices and use more equity to finance their SBOs. These facts hint at the possibility of buyers recycling their remaining funds to invest through SBO transactions, hence validating the *"go for broke hypothesis"*.

The *"opportunistic behavior hypothesis"* does not only apply to the buyer in a SBO. Similarly, selling GPs might be under pressure to sell as a result of their need show a successful track record from initial investments when raising a new fund hence, exiting their investments while not all potential improvements have been exhausted (Chung, Sensoy, Stern, & Weisbach, 2012). Additionally, such exits might not yet be ready for a RLBO or a trade sale, therefore leading to an increased share of SBOs for these early exit transactions (Cumming & MacIntosh, 2003). In fact, Arcot et al (2013) confirm this and find evidence that SBOs are also more likely to occur when the seller is under pressure to sell. The *"opportunistic behavior hypothesis"* finds overall high acceptance in literature as a driver for the increased share of SBOs.

"*Mitigated risk hypothesis"*

The third hypothesis emphasizes the lower risk profile of SBOs compared to PBOs. As GPs are repeated seller in the market, there should not be any incentives to sell bad companies to potential future investors. These reputational concerns of the seller mitigate the need of due-diligence for the buyer. Additionally, the financing of the transactions might be easier to obtain, as the existing lenders may be willing to continue providing financing to the company (Arcot, Fluck, Gaspar, & Hege, 2013). Finally, Strömberg (2007) provides evidence that SBOs are significantly more likely to result in an exit compared to other deals, adding to the arguments that SBOs seem to be less risky investments. The *"mitigated risk hypothesis"* has not been widely researched in terms of its effect on the choice of SBOs as an exit strategy.

"Window of opportunity hypothesis"

The final main hypothesis tries to explain the recent growth in SBOs as a reaction to changes in capital markets. Arcot et al (2013) and Wang (2012) find evidences that SBOs happen more likely in times when debt markets are hot and equity markets are cold. This evidence seems related to findings by Axelson et al (2012) who show that favorable credit conditions increase leverage multiples in LBOs. This might lead GPs to choose SBO as an exit channel in times of hot debt markets in order to improve their exit valuation compared to a RLBO or trade sales exit.

2.3.2 Characteristics of deals exited via RLBO

RLBOs differ from standard IPOs in that they exhibit a higher leverage, which results from their earlier organizational structure as a LBO. Additionally, the governance structures implemented under PE ownership tend to persist and the GPs remain active and play an intensive monitoring role (Cao, 2011). While initially RLBOs were seen as an exit channel for companies with strong growth prospects (Wright, Robbie, Thompson, & Starkey, 1994), this one-sided view has been expanded recently around three main hypotheses.

"Grandstanding hypothesis"

Gompers (1996) showed that firms backed by young Venture Capital (VC)[13] firms are younger and more underpriced at their IPO than those of established VC firms. The *"grandstanding hypothesis"* explains this observation by the need of younger VC firms to signal their quality to the market for future fundraisings. Therefore, these VCs choose to disinvest rather sooner than later, in case where a successful exit is possible. Although these results are focused solely on VC firms, one could imagine that they hold true for buyouts as well. Cao (2011) and Brau et al (2003) associated the LBO holding

[13] Venture Capital firms (VCs) are the GPs for early-stage venture investments. While the characteristics of VCs investments differ from GPs investments, we discuss some effects here that have been shown to be unequivocally applicable.

period positively with sales (respectively firm size), suggesting that larger LBOs may require more effort and time to create improvements[14]. This alternative explanation suggests that younger VC firms are mainly investing in smaller firms and are therefore experiencing shorter holding periods. Overall, the findings on the *"grandstanding hypothesis"* are not conclusive yet and it is not clear to what extent they apply to buyouts as well.

"Performance timing hypothesis"

The *"performance timing hypothesis"* is concerned with the fact that GPs tend to time the sale of their investments, in order to choose a time when operational performance is at its peak to trigger the IPO of the company (Degeorge & Zeckhauser, 1993). As a result, it has been shown that the operational performance[15] of RLBOs has been declining after transaction, even though the performance is still comparably better than for benchmarks firms that were never owned in a LBO structure (see e.g. Degeorge & Zeckhauser, 1993 and Holthausen & Larcker, 1996). The existing evidence is though not conclusive, as the decrease in performance might as well result from an overstatement of operational performance prior to buyout (Chou, Gombola, & Liu, 2006) or from clustering effects of RLBOs around positive market conditions (Cao, 2011).

"Market timing hypothesis"

Ritter and Welch (2002) discuss the existing IPO literature and find that "market conditions are the most important factor in the decision to go public". Related to these findings, Cao (2011) finds that GPs tend to shorten the holding period of their investments under more favorable conditions for IPO issuances. Therefore, we would expect a hot IPO market to lead to an increased share of buyouts exiting via RLBO.

2.4 Operational performance

Having explained the characteristics of SBOs and RLBOs we now address the operational performance of those companies. As discussed earlier, the evidences for operational value improvements of LBOs during the first buyout wave of the 1980s broadly agrees that buyouts do improve the operational performance of target companies during the buyout (Cumming, Siegel, & Wright, 2007). Initial studies on post-exit operational performance, such as Holthausen and Larcker (1996), have focused on RLBO exits because of data availability. Recently, more academic studies focus on the operational performance post-exit of SBOs, as the segment has recently outgrown RLBOs in importance (Strömberg, 2007). Additionally, the growth in overall transactions allows for more thorough studies today, as more transactions are available for each exit channel. The

[14] The authors take a correlation between GP size, GP age and their investments size as given
[15] In terms of EBITDA / SALES and other profitability measures

performance of LBOs post-exit can be measured in operational performance or in terms of return (e.g. IRR).

2.4.1 Operational performance of SBOs

Jelic and Wright (2011) examine the operational performance of UK management buyouts and find that SBOs tend to rather perform badly in terms of operational improvements during their primary buyout (PBO), leading to relatively longer holding periods for these PBOs of 4 years compared to 3 years for PBOs exited via trade sales and 2.8 years for RLBO exits. This observation gives support to the criticism that SBOs are back-up exit methods. The authors find though that overall operational performance stabilizes 3 years after the SBO, from where it declines sharply again. These results assign SBOs the potential to stabilize worse performing companies. The results of Bonini (2013) and Jenkinson and Sousa (2013) for European PE transactions and Zhou et al (2013) in an UK context, contradict these findings and show that SBOs do perform worse in terms of profitability (EBITDA / Sales, EBIT / Sales) than PBOs and RLBOs[16]. Bonini (2013) even finds that EBITDA/Sales margins revert to industry averages two years after the SBO. Using a proprietary global dataset Achleitner and Figge (2012) find that the operational performance of SBOs is generally in line with other buyouts, hypothesizing that in a PBO the GP has at first to focus on establishing an optimal governance structure, while in a SBO these structures are already in place. The time savings achieved can be used to implement growth initiatives, rather than only focus on operational improvements. The authors do find a positive but not significant relation between SBOs and higher sales expansion compared to other buyouts. Zhou et al (2013) and Bonini (2013) contradict these findings and show that SBOs exhibit lower sales growth than PBOs. Looking at the returns for investors, Degeorge et al (2013) find an underperformance of 26% in terms of IRR of SBOs compared to PBOs. Additionally, Wang (2012) shows that entry transaction multiples in SBOs are 14% higher. Achleitner and Figge (2012) confirm these finding of higher pricing, but do not find an underperformance of SBOs in terms of IRR. With exception of Achleitner and Figge (2012) the literature seems to agree on a decline in operational performance post-exit for SBOs, which is also reflected in weaker investor returns.

2.4.2 Operational performance of RLBOs

As outlined under the *"performance timing hypothesis"* for RLBOs, early studies documented a pattern of decreasing profitability in terms of EBITDA/Sales and EBIT/Sales ratios post-exit (see e.g. Degeorge and Zeckhauser, 1993 & Holthausen and Larcker, 1996). Cao and Lerner (2009) find evidence that RLBOs outperform the market in terms of investor returns, contradicting the initial findings on decreasing operational performance. However, when looking at the performance for firms that were held private only for less than 12 months, defined as quick-flips, the authors found negative investor returns. In relation to that study, Cao (2011) shows that quick-flips exhibit significantly

[16]Jenkinson & Sousa (2013) are the first authors to consider the differences in operational performances between RLBOs and SBOs

stronger declines in operating performance after a RLBO. For the full sample of RLBOs, the authors do however find that the profitability (EBITDA/Sales and Net income/Assets) remain significantly above industry medians and even outperform their benchmarks, after the transaction.

2.4.3 Explanations for the underperformance of SBOs

Looking at both the existing results for operational performance of SBOs and investor returns in SBOs, the literature tends to view the performance of SBOs below RLBOs and PBOs, which would give support to the viewpoint of Rappaport (1990), that LBOs are a "shock therapy" rather than a long term superior organizational structure. However, recent studies show that this conclusion might be preliminary, as alternative explanations might exist.

Degeorge et al (2013) find evidences suggesting that the *"opportunistic behavior hypothesis"* has a negative impact on operational performance. The authors show that the lower investor returns of SBOs compared to PBOs can be attributed to transactions made late in the life of a fund. Those results provide support for the *"go for broke hypothesis"* as outlined by Axelson et al (2009). Additionally, the authors find affirmation for higher investor returns in connection with the *"advantage-to-specialization hypothesis"*.

Jelic and Wright (2011) find evidence in a sample of UK buyouts that SBOs perform worse prior transaction compared to RLBOs, therefore leading to a sustained negative performance after the transaction. These results stand in contrast to Wang (2012), who found 14% higher transactions multiples for SBOs in the UK, indicating better operational performance expectation for firms in SBOs. The differences between the two studies indicate that pricing in SBOs could potentially not only be derived from the operational performance of firms pre-exit. Even considering Wang (2012)'s results, the experienced operational underperformance of SBOs could still result from worse pre-exit operational performance.

Jenkinson and Sousa (2013) find that LBOs with a shorter holding period before a SBO or RLBO significantly outperform the LBOs with longer holding periods, in terms of total sales, EBITDA, EBITDA / Total Assets and EBITDA / Sales. Several authors (e.g. Jelic & Wright, 2011 and Jenkinson & Sousa, 2013) find that the initial PBO does in average have longer holding period for firms exited via SBOs compared to RLBO exits. SBOs do in fact not incur the quick-flip effect that is common for RLBOs (Jelic & Wright, 2011). The longer holding of SBOs can be a result of SBOs being worse companies or simply mean that the selling GP had more time to achieve greater operational improvements in the portfolio companies. Therefore, it is difficult to estimate in which direction the causality in terms of holding period works for the post-exit operational performance of SBOs. However, as a result of worse quality of SBO firms (indicated by longer holding periods) or as more time allows for greater operational improvements, one could imagine that SBOs should underperform RLBOs post-exit.

A final view on the underperformance of SBOs can be found in Axelson et al (2009)'s *"overinvestment hypothesis"*, which is related to the *"window of opportunity hypothesis"* as outlined earlier. The authors showed that the combination of ex-ante capital raising from LPs and ex-post capital raising from the financing banks, while optimal, leads GPs to overinvest during times when debt funding is easily achievable. In a related paper Axelson et al (2012) find evidence that the higher leverage during hot debt markets leads to lower subsequent investor returns. Arcot et al (2013) find that SBOs are more likely to happen during these hot debt markets, which would make them more likely to suffer from lower investor returns.

Overall the existing literature concludes that SBOs might still be value creating, as long as the transactions are not prone to the outlined agency conflicts.

3. HYPOTHESIS DEVELOPMENT

In the following chapter we are going to use insights from the literature review to develop several hypotheses to be tested later. First, we are mainly focusing on a fair comparison in terms of operating performance pre- and post-exit of SBOs and RLBOs. Thereafter, we are trying to find explanations for found differences in terms of agency costs, resulting from the limited life fund structure of GPs that have been discussed in the literature review.

3.1 Operational performance pre- and post-exit

In order to establish a fair comparison between the operating performance post-exit of SBOs and RLBOs, we have to make sure that the firms in both samples do have similar characteristics and pre-exit operational performance. The pre-exit operational performance can be assessed by either looking at transaction prices, which indirectly reflect the value investors give to a company or by simply looking at the realized operational performance prior to transaction. Jelic and Wright (2011) found that SBOs pre-exit exhibit a more pronounced deterioration in operational performance compared to PBOs. On the other hand Wang (2012) found 14% higher exit multiples for SBOs compared to PBOs, suggesting that SBO companies should exhibit better operational performance. Pricing, however, might be affected by alternative factors, such as bidding competition from other GPs and we therefore put more emphasis on the findings of Jelic and Wright (2011). For RLBOs there are no studies exclusively examining the pre-exit performance, however Holthausen and Larcker (1996) showed that RLBOs have an operational performance significantly above industry peers at the time of their public offering. Furthermore, one can imagine that in order to qualify for an IPO more stringent requirements are placed on the firms in terms of operational performance or potential. To conclude, we expect the outlined evidence on the operational performance pre-exit for SBOs and RLBOs to lead to an outperformance of RLBOs.

Hypothesis A1: SBOs achieve lower pre-exit operational improvements (in terms of sales growth and profitability ratios) than RLBOs.

Following from our discussion to Hypothesis A1, one could imagine that pre-exit operational performance is indicative for the post-exit change in operational performance of SBOs and RLBOs. This would be in line to findings in previous literature that support an underperformance of SBOs compared to PBOs (see e.g. Bonini, 2013). In one of the two existing studies that compared RLBOs with SBOs, Jenkinson and Sousa (2013) found a significant underperformance of SBOs in terms of sales growth and EBITDA/Assets margin[17]. Jelic and Wright (2011) found that RLBOs do exhibit a significantly higher sales growth than SBOs, while both samples reduce profitability post-transaction. Alternatively, one could imagine that sustained governance from GPs should lead to a relatively better performance of SBOs compared to RLBOs. On the other hand, the agency costs resulting from the limited life fund structure of PE investments should lower the operational performance of SBOs. We expect to see a less pronounced difference in terms of profitability, because the exposure of SBO firms to the value creating activities[18] of GPs should mainly lead to a positive effect in terms of profitability. The magnitude of the indicated effects is difficult to estimate and we therefore use two opposite hypotheses. However, hypothesis A2a seems more plausible to us as it is in line with previous literature.

Hypothesis A2a: SBOs continue to exhibit lower post-exit operational improvements (especially in terms of sales growth) compared to RLBOs.

Hypothesis A2b: SBOs exhibit better post-exit operational improvements (especially in terms of operating margins) compared to RLBOs.

Additional to the difference in operational performance between SBOs and RLBOs, we are expecting cross-sectional differences in the operating performance within each sample. One could imagine that SBO companies should show a bigger spread in performance as a result of the previously outlined agency problems and the achievement of substantial operational improvements, depending on the characteristics of the GP. RLBOs on the other hand should show a more uniform post-exit operational performance, as they do not encounter these effects and need to meet a minimum set of characteristic to earn a listing. The selling GP might be more willing to sell companies with a high abnormal operating performance, as all potential improvements are exhausted hence, leaving no room for

[17] The authors found no significant difference in the EBITDA / Sales margin and found that SBOs outperform RLBOs in terms of Free-Cash-Flow generation.
[18] See discussion below "2.2 Value creating activities of General Partners".

additional value creation in the SBO. Alternatively, one could also argue that companies with a low abnormal operating performance are more likely to be sold in these transactions, as the selling GP would be happy to clean his books from bad investments. Independent of which group is more affected; we expect the performance to diverge more widely in the cross-section of SBOs compared to RLBOs.

> *Hypothesis A3: Top-performing SBOs (pre-exit) exhibit development of performance measures that diverges significantly from the development for bottom-performing SBOs. RLBO companies do show less difference in the performance between top-performing and bottom-performing RLBOs.*

The results from our prior hypotheses can then be used to motivate a model that accounts for the difference in the firm characteristics of SBOs versus RLBOs prior to the transaction. When accounting for these differences in the quality of firms, we would expect two remaining factors to influence the difference in the post-exit operational performance of SBOs versus RLBOs. First, the value creating activities of GPs as described by Strömberg and Kaplan (2009) should lead to similar or slightly better post-exit operational performance of SBOs compared to RLBOs. Secondly, the discussed agency problems should lead to a worse performance of SBOs. It is difficult to estimate the magnitude of each of these effects and we are therefore using two opposing hypotheses to discuss our results to this question.

> *Hypothesis A4a: Accounting for the difference in firm characteristics, we expect a lower post-exit operational performance of SBOs compared to RLBOs.*

> *Hypothesis A4b: Accounting for the difference in firm characteristics, we expect a higher post-exit operational performance of SBOs compared to RLBOs.*

In previous literature, SBOs are mostly assigned a worse operational performance post-exit compared to RLBOs. Any remaining difference between the two samples should result from either the value creating characteristics of the LBO structure or agency problems from the LBO organization form. From the broad range of explanations[19] we will focus on testing hypotheses that are related to market conditions, *"advantage-to-specialization hypothesis"* and the *"opportunistic behavior hypothesis"* in order to see how the described agency conflicts could lead to a difference in post-exit operational performance between RLBOs and SBOs.

[19] as outlined in 2.3 Determinants of the exit strategy for LBOs

3.2 The effect of market conditions on the operating performance of SBOs

The financial structure of a LBO is characterized by ex-ante capital raising from LBO investors and ex-post capital raising from financing banks. Axelson et al (2009) show that these characteristics are consistent with an optimal financing arrangement for GPs. However, the authors also show that incentives will lead to overinvestment during hot debt markets and underinvestment in cold debt markets, the so-called *"overinvestment hypothesis"*. Axelson et al (2012) find in fact that an increase in leverage during hot debt markets, coincides with increased transaction multiples and lower investor returns, therefore providing evidence for the *"overinvestment hypothesis"*. Arcot et al (2013) show that SBOs are more likely to occur during good economic times, the so-called *"window of opportunity hypothesis"*. SBOs are therefore going to see a reinforcement of the *"overinvestment hypothesis"*, as a result of more SBO exits during hot debt market conditions. Looking at the post-exit operational performance of SBOs it would however be premature to conclude that an effect similar to the *"overinvestment hypothesis"* should be expected. Instead of the *"overinvestment hypothesis"*, we decided to study the effects of post-exit operational performance by investigating two different hypotheses.

First, assuming SBOs are generally worse quality firms in terms of operational performance compared to RLBOs as outlined in Jelic and Wright (2011), one could imagine that whenever the window for SBOs is very small (i.e. high credit spread), only the worst performing companies would still be divested in a SBO, while during hot debt markets both good and bad firms would find financing and can therefore be exited through a SBO. A similar effect should apply to RLBOs, where during cold IPO markets only the very best companies would still be able to attain funding from public markets. We call this hypothesis the *"pecking-order theory"* of exit channels. SBOs would in this scenario experience lower post-exit operational performance during cold debt markets and RLBOs would experience lower post-exit operational performance during hot equity markets.

Second, market timing has been shown to affect both, buyouts (see e.g. discussion in Kaplan and Strömberg, 2009) and equity markets (Ritter & Welch, 2002) and can therefore be expected to play an essential role for SBOs and RLBOs. Comparing the two channels we would expect to find differences in the magnitude of the effect cyclicality has on post-exit operational performance. One could imagine that GPs exhibit a less cyclical buying behavior compared to public market investors, because GPs would be willing to provide funding to firms during bad economic times, whenever potential investments are undervalued. We call this hypothesis *"cyclical investment behavior hypothesis"*. As shown by Axelson et al (2012), valuations seems to be lower during cold debt markets and GPs could therefore be likely to invest in a firm that is cheap enough to motivate an investment, besides a negative operational performance outlook. Additionally, the value creating activities of GPs are quite likely to provide additional support to this hypothesis, because GPs believe in their skills to turnaround a business. As a result SBOs would exhibit worse post-exit operational

performance during cold debt markets, as GPs purchase companies with negative operational performance outlook. Public market investors would in our opinion though shy away from investment with a negative performance outlook and a similar cyclical effect could not be expected in terms of the IPO market conditions.

Hypothesis B1: SBO investments made during cold debt markets show lower operational improvements post-exit in comparison to other SBO investments and RLBO investments.

Hypothesis B2: RLBO investments made during hot equity markets show lower operational improvements post-exit in comparison to other RLBO investments and SBO investments.

3.3 The effect of specialization on the operating performance of SBOs

Ensuing competition and the increasing size of the PE industry, led to the development of different business strategies of GPs (Harper & Schneider, 2004), such as focus on industry, country, functional skills, etc. As discussed earlier a positive effect of specialization on operating performance post-transaction of LBOs has been shown by Cressy et al (2007). On the other hand, generalist GPs might be better able to allocate capital across different industries (winner-picking model), as hypothesized by Stein (1997) and therefore there might be a downside from a too narrow scope of investments. In a recent study Gompers et al (2009) find that specialization within a VC investor decreases over time, leading VC firms to take rather a generalist business model as they grow older and bigger. Even though VC firms take an increasingly generalist approach over time, the specialization of their investment managers do not exhibit the same magnitude in this development. In conclusion, the authors find that the effect of specialization at the individual level (investment manager) is more important than the firm level specialization. However, firm level findings do still remain relevant and specialization seems to lead to an increased likelihood of a successful exit in venture capital investments (Gompers, Kovner, & Lerner, 2009). Overall, existing results can be interpreted such that both business models (specialist versus generalist GPs) do actually lead to advantages from specialization as long as the investment managers in big generalist GPs remain a specialist. On the contrary, there might be a disadvantage to have a too narrow focus, as this could limit the amount of potential deals (deal sourcing) that the investment manager is able to screen and validate. This effect would be even more important for GPs with a high deal flow, leading to a disadvantage-of-specialization effect for specialist GPs with high investment needs. Related to these findings Lopez de Silanes et al (2013) find diseconomies of scale effect for buyout transactions, where investments in periods with a high number of simultaneous investments underperform significantly. Different business models of GPs (e.g. specialist versus generalist) might be more suitable to circumvent the discussed agency costs.

The trade-off between the positive effects (increased industry / country expertise) and negative effects (difficulties in deal sourcing) of specialization should be more pronounced when looking at SBOs, since the ability to improve the operating performance might require more specific skills in a SBO than a PBO. An example of the positive effects can be found in a SBO, where Carlyle Group and Providence Equity, two PE funds, bought Com Hem AB in December 2005 from EQT Partners. Providence Equity focuses its investments solely to communication and media companies, while Carlyle had gained valuable knowledge from earlier investment in telecommunication companies in the Nordics. The two GPs were able to improve the companies' performance, which ultimately led to the successful sale of Com Hem AB to BC Partners in 2011. In addition to industrial expertise, both Carlyle Group and Providence Equity brought knowledge from their global operations to the table, which helped to further improve Com Hem's operational performance as international industry best-practices could be implemented. We can therefore expect a similar effect in terms of specialization, where GPs with a global business model are more likely to achieve operational improvements in the next expansion phase of a portfolio company.

Degeorge et al (2013) have argued for SBOs as having lower search costs and containing fewer information asymmetries, compared to PBOs. We therefore understand SBOs, as being a possible investment for specialist GPs, when investment opportunities in their area are scarce. The effects that could be encountered are similar to the effect of the *"go for broke hypothesis"*, as GPs feel the pressure to buy resulting from few good investment opportunities within a specialist GPs investment area. Busy specialist GPs (in terms of number of deals made in the last 5 years) would subsequently not encounter sufficient investment opportunities and invest in second-best deals as they are not able to allocate capital across different industries/regions. For companies with a global business model there should though not be any adverse effects of specialization, because their business model is scalable and able to allocate capital across industries/regions.

Hypothesis C1: Specialist GPs with a high need of deal sourcing achieve worse post-exit operational improvements in their SBOs compared to alternative GPs.

Hypothesis C2: GPs with a global business model achieve better post-exit operational improvements in their SBOs compared to alternative GPs and do not suffer from adverse effects in terms of high deal activity.

3.4 The effect of buying pressure on the operating performance of SBOs

Axelson et al (2009) argue that agency conflicts, resulting from the ex-ante capital raising characteristic of GPs, lead to lower performance for SBOs that are bought close to the end of the investment period of a raised fund. The increased pressure to buy, resulting from the limited life

structure of PE funds has been shown to increase prices paid and decrease leverage in SBOs (Arcot, Fluck, Gaspar, & Hege, 2013). In that way, GPs can invest a bigger share of their remaining funds in the target companies. There have been no studies, examining the post-transaction development in terms of operational performance for firms that have been bought by a GP that was under pressure to buy. However, Degeorge et al (2013) show that SBOs bought late in the lifetime of a fund underperform in terms of investor returns compared to other SBOs and PBOs bought late. Additionally, the authors show that the effect is more pronounced for deals that are relatively larger than the usual transaction size for a specific GP. In cases, where the increased buying pressure led the buying GP to not only pay more but also to select a qualitatively worse company, we would see a negative operational performance after the buyout. We expect the effect to be stronger for deals that are relatively bigger in terms of relative investment size as they would allow the buying GP to recycle more of the remaining excess cash in the fund and are likely to be too big companies for the GP to operate efficiently.

> *Hypothesis D1: GPs that are under pressure to buy, achieve less post-exit operational improvements in transactions that are relatively larger than GPs in alternative transactions.*

4. DATA AND DESCRIPTIVE STATISTICS

In this section we explain the data gathering process, resulting in the dataset used to evaluate our hypotheses. We gathered two sets of databases, a Robustness Panel and the Final Panel. The Robustness Panel represents the more extensive initial dataset that we are using at a later stage to check for robustness of our findings for hypothesis A1 to A3. For these hypotheses we are only interested in the operational performance data without additional characteristics of the GPs. For the Final Panel we added firm characteristics and information about the buying GP, which reduced our dataset to a smaller sample that is the base dataset to test all of our hypotheses.

4.1 Initial dataset for robustness analysis (Robustness Panel)

The data used in this paper was assembled from Capital IQ, Zephyr, SDC VentureExpert and Bureau van Dijk (BVD) databases. The Robustness Panel consists of 329 SBOs[20] and 436 RLBOs. In the very beginning our dataset consisted of 1361 SBOs and 615 RLBOs of industrial companies[21] in North America and Europe that were exited between 1980 and 2009 including financial data from Capital IQ. In a next step the SBO dataset was manually expanded with financial data from BVD databases (Orbis). We collected all operational figures that were necessary to calculate the desired operational

[20] By implication we classify so called tertiary buyouts, fourth buyouts, etc. as SBOs.
[21] We excluded financial companies in order to restrict our sample to comparable companies, in accordance with existing papers on this topic.

ratios as listed in Table I. All operational figures were collected for five years prior and five years past the transaction announcement date. The dataset was then reduced to only include the transactions for which i) at least two subsequent years of revenues were available; ii) transaction value was above \$50mn.[22]; iii) data on total revenues in the last full year prior to the transaction was available; iv) the financial data did not seem conflicting[23]; v) information about the identity of the financial buyer was available[24].

4.2 Dataset for hypothesis evaluation (Final Panel)

Our Final Panel consists of 202 SBOs and 220 RLBOs. We expanded our dataset with characteristics for the buying GP in order to test for further hypotheses. An overview of the collected characteristics is included in Table I. Compared to the initial dataset we only kept transactions in our dataset, for which i) financial data of interest were available between years Y_{-1} and Y_{3}.; ii) All characteristics of the buying GP in the SBO sample could be collected; iii) RLBOs were not classified as venture transactions (131 observations were removed)[25].

Table II and Table III summarize the distribution of the transactions in both datasets over time and across countries. Additionally Table IV provides an overview in terms of sample descriptive statistics for the variables outlined in Table I.

4.3 Comparison with related studies and descriptive statistics

We find that our data sample compares well with comparable studies. Jenkinson and Sousa (2013) focused on 194 SBO and 114 RLBO transactions in Europe between 2000 and June 2007, while using data restriction that are similar to our Robustness Panel dataset. Even though our sample size is considerably larger, we still faced a high attrition rate. We considered only transactions that included data observations from Y_{-1} to Y_{3}, which are five consecutive years. For RLBOs, the data availability prior to transaction was a problem as these firms were private and not forced to publish financial reports. For SBOs consequently the same issue remained even after transaction. Most of the operational performance data we used was sourced from Orbis, where we only had access to financial data back to 2002, which limited our earlier data sample to information from Capital IQ. Strömberg (2007) showed that information on Capital IQ has low availability for transactions in earlier periods. In comparison to his extensive sample on buyouts, our data shows a relatively low share of SBOs prior to 2002, which can partly be explained by the limitations we faced in terms of database accesses.

[22] In accordance with existing papers this criteria ensures that our dataset is restricted to larger, non-venture capital transactions. For transactions where the transaction value was not disclosed we limited our dataset to include only transactions where the average available revenues are above \$30mn, which can be motivated by the median observed multiple for the transactions where the transaction value was disclosed (EV/Sales of 1.68x).
[23] Indicated by big fluctuation in financial data, which could not be explained by publicly available information.
[24] For "club deals" we chose only to assess the GP characteristics for the bigger GP in terms of Nb. of deals made, in accordance with previous research, such as Degeorge et al (2013).
[25] When screening our dataset we realized that many companies were VC backed transactions. We screened all transactions in Zephyr, classifying transactions that used rounds of financing as "Venture transactions".

The median size in terms of total assets of the companies in the Final Panel is USDm 539 for RLBOs and USDm 133 for SBOs. The SBO sample is mainly in line with Jenkinson and Sousa (2013), while our RLBO sample includes significantly bigger companies, potentially as a result of the high share of US companies in the sample[26]. For the Final Panel we find that the holding period for RLBOs is 2,85 years, which is lower than the 3,35 years observed for SBOs. The difference between the two samples is in line with most studies on the longevity of PBOs (see e.g. Strömberg, 2007), however the holding period for both is rather below previous findings[27].

5. METHODOLOGY

In the following chapter, we are going to introduce several methodology aspects of our thesis. First, we are using a median comparison to discuss the differences in operating performance of SBOs and RLBOs. Thereafter, we are carefully establishing a multivariate regression specification that allows us to test for effects from the agency costs discussed in the literature review. We are using Matlab® (R2010a) to run all our specifications and tests.

5.1 Abnormal operating performance definition

We use a set of eight different variables to assess the operating performance of companies prior and post transaction date. The first three variables (Operational growth variables) give a sense of the expansion of the company, while the next four variables (Operational profitability) evaluate the profitability of the company's core activities. Finally, we include one variable that evaluates the ability of the company to borrow (Leverage ratio).

- Operational growth variables; Sales Growth, EBITDA Growth, EBIT Growth
- Operational profitability ratio; EBITDA / Sales, EBITDA / Total Assets, EBIT / Sales, EBIT / Total Assets
- Leverage ratio; Net Debt / EBITDA

All our specifications follow Barber and Lyon (1995) in order to properly estimate the effect of SBOs on abnormal performance compared to industry peers. Companies were compared to their industry peers by matching their two-digit SIC code in the same geographic area (i.e. Northern America or Europe) for a given year.

[26] Jenkinson and Sousa (2013) focus their study only on the European market.
[27] Jenkinson and Sousa (2013) find a holding period of 3,9 years for SBOs and 3,35 years for RLBOs.

Abnormal operating growth rates:

$$y_{i,s,g,t} = \frac{X_{i,t} - M_{s,g,t} \; - \; X_{i,t-1} - M_{s,g,t-1}}{(X_{i,t-1} - M_{s,g,t-1})} \qquad (1)$$

Where $y_{i,s,g,t}$ is the year *t* abnormal growth rate for company *i* operating in industry *s*, in geographic region g, while $X_{i,t}$ is the year *t* unadjusted value of the growth variable (Sales, EBITDA, EBIT) for company i, and $M_{s,g,t}$ is the year *t* median value of the growth variable for industry *s* in geographic region g.

Abnormal operating performance and leverage ratios:

$$Y_{i,s,g,t} = \; X_{i,t} - M_{s,g,t} \qquad (2)$$

Where $Y_{i,s,g,t}$ is the year *t* abnormal operating performance ratio for company *i* operating in industry *s* in geographic region g, while $X_{i,t}$ is the year *t* ratio (EBITDA/Sales, EBITDA/Total Assets, EBIT/Sales, EBIT/Total Assets, Net Debt/EBITDA) for company *i*, and $M_{s,t}$ is the year *t* median ratio for industry *s* in geographic region g.

As a result, variables 1 to 3 represent abnormal cumulative growth rates experienced by SBOs and RLBOs above or below their industry peers, while variables 4 to 8 represent the abnormal performance ratios above or below industry peers.

5.2 First-pass comparison of operational performance of SBOs versus RLBOs

In our first-pass analysis, to test hypotheses A1 to A3, we will use a Wilcoxon signed-rank procedure to test for the difference in the location of the median between the reference year (Y_{-1}) and the respective years of interests for each specification and variable (i.e. Y_{-2} to Y_{-4} for hypothesis A1 and Y_{+1} to Y_{+3} for hypothesis A2 and A3). For those hypotheses, we also report the significance of difference on median between the SBO and RLBO sample for each year of interest using a two-sample Wilcoxon rank-sum (Mann-Whitney) test. Previous studies focused as well on median changes in order to mitigate the effect of outliers on the results (Kaplan S. , 1989). Additionally, we are omitting the results of the year of the transaction (Y_0), as the effects could not clearly be allocated to be resulting from before or after the transaction.

As outlined before, we want to evaluate whether a significant part of the difference in operating performance results from pre-exit firm conditions. We are therefore splitting both the SBO and RLBO sample in two sub-samples based on EBITDA/Sales ratio one year prior to transaction, good firms (51 to 95-percentile in terms of pre-exit operating performance) and bad firms (5 to 50-percentile). For each of the four resulting groups we are then repeating the above outlined procedure and use a Wilcoxon signed-rank procedure to test for the difference in the location of the median between the

reference year (Y_{-1}) and the respective years of interests for each specification. Here again, the difference in median between the sub-sample of top performer (respectively bottom performers) firms in the SBO and RLBO sample is evaluated using a Wilcoxon rank-sum (Mann-Whitney) test.

5.3 Regression model specifications

During the data collection process and first step analysis we realized that our data sample showed a large range of values (see boxplot in Figure I and Figure II and previous section Data and Descriptive Statistics), with a few extreme observations for companies performing extremely well or poorly. This overall suggests that our sample suffers from large outliers. If this is proven true, results from a standard OLS procedure might be highly biased by outliers.

Our first basic OLS regression model evaluates the variables affecting the post-exit operational performance of SBOs versus RLBOs is as follow:

$$Y_i = \alpha + \beta SBO_i + \boldsymbol{\delta X_i'} + \varepsilon Credit\ Market_i + u_i \qquad (3)$$

Where

- Y_i is one of three selected post-exit operating performance variables (Sales Growth, EBITDA / Sales margin, EBITDA / Total Assets margin) as defined earlier. For all subsequent analysis we restrict the set of explained variables to these variables to allow for clearer comparison
- SBO_i is a dummy variable that is equal to 1 if the firm is exited through a SBO and 0 if the firm is exited through a RLBO
- X_i is matrix of k exogenous control variables and fixed effect as specified below
- $Credit\ Market_i$ is a control variables for hot/cold credit market environment

The matrix of control variables X_i consists of several variables that have been shown to affect operational performance in prior studies. First, we include pre-exit operational performance figures, such as the logarithm of Sales Growth[28], EBITDA/Sales ratio and EBITDA/Total Assets ratio, all computed one year prior to transaction (Y_{-1}) in order to capture the effect of pre-transaction operational performance on post-exit performance[29]. Additionally, we include control variables at the time of transaction; the logarithm of Total Assets as proxy for the impact of deal size since previous literature found that larger transactions tend to create value through leverage (Achleitner, Braun, Engel, Figge, & Tappeiner, 2010), and additionally the logarithm of the holding period to account for Jenkinson and Sousa (2013)'s findings that PBOs exited quicker tend to outperform post-exit. Unfortunately, data availability on the start of PBO was constrained for a big part of the RLBO

[28] Through the inclusion of Sales growth (Y_{-1}) as a variable our sample size decreases, as a result of missing sales data for some companies at Y_{-2}.

[29] Earlier papers examined the fact that SBO companies seem to perform worse during their PBO than RLBOs (Jelic & Wright, 2011).

sample and this had the effect of reducing our sample size. Those control variables represent our base specification and will be kept in all successive specifications (except the holding period that we relax due to non-significance and data availability limitations). Following this base specification we add a control variable for the credit market environment (i.e. Bank of America Merrill Lynch US High Yield[30]). Finally, we also include a fixed effect for North American companies in order to account for the big share of US companies in our sample of RLBOs.

This simple OLS model is considered our base model, which we use to run several regression diagnostic tests on our dependent and control variables. As we are concerned about the presence of outliers in our sample, we are going to evaluate the impact of those potential outliers by computing the Cook's distance for each observation in our base model (see Figure III). The Cook's distance was developed in Cook (1979) and allows to evaluate to what extent each data point influences the estimate of the coefficient. A high Cook distance suggests high impact on the coefficient (for further guidelines on interpretation of Cook's distance see Chatterjee, Hadi, and Price, 2000). Theory states that values that are further than three times the mean Cook's distance can be considered as outliers. The presence of outliers in our sample can also be visualized when looking at the boxplot of a selection of our main variables before (upper graphs of Figure I and Figure II) and after winsorizing (lower graphs of Figure I and Figure II). We observe that even after winsorizing, many outliers remain in our data sample. Therefore, both approaches conclude that our sample includes many outliers (i.e. observations above the line in Cook's framework) for each of the three dependent variables of the model (i.e. Sales Growth, EBITDA/Sales margin, EBITDA/Total Asset margin). We also plot the studentized residuals against the predicted dependent variable in Figure III, in order to assess the presence of heteroskedasticity. We observe that the variance of residuals does not seem to vary with the fitted values of the explained variable (Y), hence there is no support that residuals might face correlation. We finalize the routine tests by assessing whether the residuals are normally distributed. The plot of residuals can be found in Figure IV, while the ratio variables (EBITDA/Sales and EBITDA/Total Assets) seem reasonably normally distributed, we used the logarithm for the Sales Growth variable to mitigate concerns about non-normality of its distribution. We also report a correlation matrix of the different control variables in Figure V.

Based on our findings above, we decided for a robust regression model rather than a standard OLS in order to limit the impact of the outliers on the estimation of the coefficients. All our specifications follow a *M-estimation* (Maximum likelihood) robust regression (Huber, 1964). This approach can be seen as a weighted least-square problem, also called Iteratively Reweighted Least Square (see e.g. Draper & Smith (1998), where Matlab® uses iterations to optimize the weighting of the residuals until the estimated coefficients converge. The objective function for the weighting of the

[30] An index for US below investment grade corporate debt, spread over LIBOR

estimator follows the *Tukey bisquare* (or biweight) tuning, as it is the more resistant to regression outliers than other common tuning such as the *Huber* and the *Hampel* weighting functions (Andersen, 2008). The benefits of a robust model derive from its ability to underweight the outliers and minimize their impact on the overall regression compared to a standard OLS, which assigns a weight of one to all observations. As a result, unusually large residuals have a much smaller impact on the estimation of the coefficient that in a standard OLS approach, hence improving the overall fit of the regression. We consider this approach to be superior compared to a removal of outlier data points, since there is no reason to believe that they are entry errors, neither that they come from a different distribution. Furthermore, by keeping and underweighting those values we maintain a good sample size while limiting the impact of outliers on the estimated coefficients. Based on those findings, we decide to use robust regression on all our specifications (i.e. test of hypothesis A4 through D1). An important consequence from using robust regression, is that there is no standard procedure to compute R-squared and F-stat statistics. For reference our tables report those values based on a standard OLS procedure but they should be interpreted carefully since they make only limited sense in a robust regression context. The benefit of using OLS statistics is that since robust regression optimize the weight of observations in the worst case the R-squared will be equal to OLS R-squared and most often above. Therefore, we only used R-squared and F-stat to reject a specification if both values are extremely low and therefore indicate insufficient explanatory power of the specification.

In order to examine the effect of market conditions on SBOs and RLBOs' operating performance we are including two interaction variables, to test for hypothesis B1 and B2. The first variable interacts credit market[31] with the SBO Dummy to account for the relation between the availability and price of debt financing on SBO post-exit operational performance. The second variable interacts IPO market[32] with a SBO Dummy to account for effects on post-exit operational performance, resulting from the fact that RLBOs are more likely to occur when the IPO window is favorable (hot market).

For the next steps and the evaluation of hypothesis C1 to D1 we focus exclusively on the SBO sample, hence we relax some of the control variables previously used. As a matter of fact, we removed the SBO dummy variable, similarly we relaxed the PBO holding period variable, allowing us to use a bigger sample. Our robust regression model for hypothesis B1 through D2 is therefore defined as follow:

$$Y_i = \alpha + \boldsymbol{\delta X_i'} + \varepsilon Credit\ Market_i + u_i \qquad (4)$$

[31] In order to estimate the effect of credit market conditions, we use the High Yield Spread as continuous variable in our setting, in accordance with previous research on market conditions (e.g. Axelson et al, 2012)
[32] Number of IPOs during the quarter, retrieved from Ritter and Welch (2002) IPO research database (http://bear.warrington.ufl.edu/ritter/ipodata.htm).

The explained and basic control variables are similar to the ones in equation (3), besides that we removed the control variable for PBO holding period. From this stage, our different specifications will again use raw and interaction variables. Interactions variables allow us to assess the specific trajectory development of transactions when an effect on one variable depends on the level of the other variable.

Since several of our specifications include interaction variable, we offer below a definition, illustrative example, and interpretation procedure of interaction variables. In order to facilitate the interpretation of results with interaction variables, we centralized (also called demeaning) all the continuous variables (i.e. subtract the sample mean from the individual observation) that are used in an interaction term. This way, the coefficient of the interaction variable represents the effect for the average value of the other independent variable in the interaction term. We provide here an illustrative interpretation example (completely unrelated to our findings), where the dependent variable is sales growth and independent variables are a SBO Dummy and a GP's number of deals (centered variable) such that:

$$Sales_{growth} = \alpha + \beta_1 SBOdummy + \beta_2 NbDeals^c + \beta_3 SBOdummy * NbDeals^c$$

The interpretation for non-SBO companies (i.e. *SBOdummy* = 0) is: α is the constant (i.e. intercept) for a GP with an average number of deals, while β_2 is the effect of number of deals for a non-SBO company (i.e. the slope). For a SBO company, $\alpha + \beta_1$ represents the constant for a GP with an average number of deals, while the total effect of deals, or the slope, is given by $\beta_2 + \beta_3$. The coefficient β_3 alone is understood as the specific marginal (positive or negative) effect of GP number of deals for a SBO company (at average level of GP number of deals).

5.4 Concerns over endogeneity and year fixed effect

One of the main concerns in our research methodology is that post-exit operating performance and the choice of the exit channel is very likely to suffer from endogeneity. The underlying intuition is that experienced GPs should be able to estimate which firms are good investments, hence we have to account for the possibility that a strong post-transaction operating performance could have been predicted before the transaction (e.g. based on pre-transaction characteristics), thus influencing the exit-choice during the PBO. Our first pass analysis, and more specifically the result of testing hypothesis A1 (see 6. Empirical findings and Analysis) contradict our intuition for endogeneity as it seems that SBO and RLBO exhibit no significant differences in their operating performance before the transaction. In order to statistically refute the presence of endogeneity in the exit route we follow a Durbin-Wu-Hausman procedure (see Cameron & Trivedi (2005) for procedure reference and discussion on endogeneity).

With respect to the implementation of the Durbin-Wu-Hausman (DWH) test, we first regress the SBO Dummy on all other control variables including our potential instrument ("FED tightening

index[33]"). The FED tightening index appears to be a suitable instrument since a low index suggests that banks are easing requirements and collateral for commercial and industrial loans, hence GPs will tend to favor a SBO exit in such a favorable environment. Secondly, the residuals of the first regression are added as exogenous variable in equation (3). Finally, we analyze the statistical significance of the coefficient associated with residuals in the second regression to assess whether our setup is suffering from an endogeneity bias. This test was not significant at 1% confidence level in any of our explained variable, therefore we strongly conclude that our sample does not have any endogeneity in the choice of the exit route. Due to their non-significance and relatively marginal interest for this paper, results of DWH tests are not reported.

Our findings on the absence of endogeneity on all explained variables are to some extent aligned with Jenkinson and Sousa (2013), who found no endogeneity between exit route and Total assets change, Total sales change, and Net cash-flow change while only EBITDA change seems to exhibit endogeneity with exit route. In light of our findings on hypothesis A1 validated with a Durbin-Wu-Hausman test, and mostly similar conclusion in previous literature we chose to exclusively use the robust regression estimation produce mentioned in the previous paragraph, because it offers more consistent and more efficient estimations than an alternative two-stage Instrumental Variable approach.

Another concern we had in choosing an appropriate methodology were whether or not to include year fixed-effects. Our basic robust regression model does not include year fixed effects, as we believe that annual cyclicality and market timing are already covered in our base control variables through two dimensions. Firstly, all operating variable are computed on an abnormal operating performance by geographic region and year (see definition of equation (1) and (2) above), hence the regression already considers industry cyclicality across time and geographies. Secondly, the control variables for credit market and IPO market do capture some aspects of the cyclicality in the market environment. However, these variables might be very inter-dependent hence, they could suffer from multicollinearity issues. Therefore, when evaluating hypothesis B1 and B2, we include year fixed-effect as a check of the robustness of our results and to mitigate a potential multicollinearity issue. Other than in this specification, our current control variables are believed to fully cover the market timing and cyclicality of the exit transactions. Hence, there is no need to additionally introduce a year fixed effect that would add more noise than relevant information.

[33]Detailed information on this index can be found on the FED board of governor website http://www.federalreserve.gov/boarddocs/snloansurvey/about.htm

6. EMPIRICAL FINDINGS AND ANALYSIS

In the following section we are evaluating the hypotheses outlined earlier and analyse how our findings relate to existing literature.

6.1 Operational performance pre- and post-exit

In order to evaluate hypothesis A1 to A3 we compared the median of our SBO sample versus the median of the RLBO sample to see how the performance pre-exit and post-exit differ and to understand the extent to which previous performance might be an indicator of the post-exit performance. To start, we argued for a lower pre-exit operational performance of SBOs compared to RLBOs in hypothesis A1, which would be in line with findings of Jelic and Wright (2011). The results in Table V led us to reject this hypothesis partly, as we do not see significantly worse pre-exit performance of SBOs along any of our operating performance measurements. However, there are differences in the pre-exit development of our sample firms. In particular our results suggest that RLBOs exhibit 13,13% and 6,07% stronger pre-exit sales growth than SBOs, respectively four and three years before the transaction. On the other hand, SBOs show a higher abnormal operating performance in terms of operating margins (EBITDA/Total Assets and EBIT/Total Assets) at the 5% significance level for Y_{-2}. Looking at the results through time, we find that already four years before transaction the SBO sample exhibits higher profitability ratios and subsequently expands or keep profitability at a similar level to RLBOs. Our results therefore suggest that SBOs do exhibit lower abnormal sales growth but have higher abnormal operating margins compared to RLBOs prior to transaction.

The literature has been divided in terms of how good the quality of SBO firms is. While Bonini (2013) for a sample of European and Wang (2012) for a sample of UK buyouts argue that SBO investors select well-performing companies, Jelic and Wright (2011) find that UK SBO firms are underperforming prior to the SBO[34]. Our results show that SBO firms are not inferior firms and exhibit a profitability and sales growth clearly above comparable companies in their industry. The higher abnormal profitability in SBOs allows the buying GP to take an increased leverage in these transactions, both compared to PBOs and RLBOs. The increased leverage potential of these transactions can explain the higher multiples paid on SBOs, as discussed in Wang (2012). The results suggest that SBO investors select firms that have high abnormal operating margins. In terms of Sales growth we show that SBOs are not inferior firms compared to their industry but compared to RLBOs, which we suspect is driven by the possibility for high growth firms to raise funding in equity markets.

[INSERT TABLE V. HERE]

[34] The authors look at a data sample containing approximately 50% non PE-backed transactions and only UK buyouts. These differences might explain the different findings in our dataset.

After having established that SBOs are not necessarily inferior firms compared to RLBOs pre-transaction, we can analyze how the evolution of the post-exit operational performance differs between the two samples. Looking at Table VI, we find support for our hypothesis A2a that predicts lower operational improvements for SBOs post-exit, especially in terms of sales growth. RLBOs do achieve a median annual abnormal sales growth of 10,01% above industry, compared to 3,37% for SBOs between Y_{-1} and Y_3. The difference between the two samples is significant at each year and across all growth variables of interest. In terms of profitability measures we do not find any significant differences between the two samples and the difference fluctuates around 0%, indicating that both SBO and RLBO show similar abnormal profitability. Looking at the development of each sample, we find that in terms of growth both SBOs and RLBOs are able to achieve above industry growth post-exit. However, in terms of profitability the operational margins are converging from their initial elevated level closer to industry averages. SBOs for example experience a significant decline in their abnormal EBITDA/Sales margin from 4,30% prior to the transaction to 3,02% three years after the transaction. RLBOs experience an initial one time increase in margins, which is subsequently followed by a constant decline in margins, similar to the observations for the SBO sample. However, the decline for SBOs is more pronounced and significant, suggesting that SBOs encounter stronger pressure on margins. Overall, we find that the post-exit operational improvements are more significant for RLBOs, especially in terms of sales and EBITDA growth. Nevertheless, both samples do experience economically significant declines in profitability post-exit, reducing their advantage over industry peers.

The results seem indicative that the pre-exit outperformance of RLBOs in terms of Sales is a good indicator for the future sales growth potential of these firms. Additionally, the effects related to the discussed agency costs from the limited life fund structure seem to outweigh the potential benefits from the value creating activities of GPs. Bonini (2013) found similar results in terms of the magnitude of change in profitability measurements. However, his conclusion that SBO investors select well-performing companies but cannot provide any incremental growth while letting margins decline back to industry levels is not supported in our data. Our findings suggest above industry growth post-exit for both SBOs and RLBOs and that abnormal operating margins do remain economically significant above industry levels. We also observe a decline in operational margins both for RLBOs and SBOs. Our findings are broadly in line with different studies on the performance of SBOs, in particular Jenkinson and Sousa (2013). Compared to the latter authors we find however lower sales growth for both SBOs and RLBOs and smaller difference between the two samples. In terms of profitability, the authors do not find a significant change in terms of EBTIDA/Sales, but a weaker performance of SBOs in terms of EBTIDA/Total Assets. While our findings also find a more significant difference in terms of EBITDA/Total Assets, we would like to emphasize the similar

declining trend in profitability post-exit[35]. These results suggest that both SBOs and RLBOs do exhibit characteristics that are in line with the *"performance timing hypothesis"* (Degeorge & Zeckhauser, 1993) or the *"market timing hypothesis"* (Cao, 2011) that were shown to affect the decline in operational margins in RLBOs.

To conclude, we find RLBOs to be superior in terms of expansion variables (Sales growth, etc.), but find a similar declining pattern in terms of profitability margins. Those conclusions are in line with the timing hypotheses outlined above, as we see a clear peak in abnormal operating profitability one year prior to transaction.

[INSERT TABLE VI. HERE]

To further investigate the differences between the two samples we split both samples in relation to their EBITDA/Sales[36] ratio 1 year prior to transaction, creating totally four sub-samples of top performing SBOs/RLBOs and bottom performing SBOs/RLBOs. The results in terms of post-exit operational improvements can be seen in Table VII(a) for top-performing firms and Table VII(b) for bottom-performing firms. Looking at the results we have to partly reject hypothesis A3, as we see that the divergence in performance between top-performing and bottom-performing firms is rather uniform within each of the SBOs/RLBOs sub-samples. We find a pattern that is more uniform than expected. Interestingly, the abnormal operating profitability of top-performers declines significantly for both samples, while it only economically declines for the SBO bottom-performers and significantly increases for the RLBO bottom-performers. The decline is more pronounced for SBOs, which could be explained by three factors.

First, we would expect that it is easier to increase the abnormal operating profitability margin for companies that exhibit below average EBITDA/Sales margins, than it is to maintain high margin for already top-performing companies. This first effect can explain the observed decline in profitability for both top-performing SBOs and RLBOs as it holds unequivocally.

Second, one has to be cautious in assessing the observed development in terms of EBITDA/Total Assets. Barber and Lyon (1995) have discussed the problems with assessing Asset based profitability measurements, as a result of the build-up in assets measurement problem. New owners of companies can revaluate some of the assets of the companies and additionally activate part of the purchase price as goodwill, therefore increasing Total Assets. This build-up in assets might occur unevenly, as companies with a higher profitability could have more intangible value that can be

[35] The increase in EBITDA/Total Assets around the transaction date might be caused by asset build-up effects that are generally experienced by companies in SBOs and RLBOs (Barber & Lyon, 1995).
[36] The split is at the median in terms of abnormal EBITDA / Sales margin. Removing transactions above the 95% percentile and below the 5% percentile.

activated. We are therefore mainly focusing our evaluation on the abnormal EBITDA/Sales margin and use EBITDA/Total Assets as a sanity check.

Finally, our result can be used to motivate that GPs under pressure to buy might choose to invest in top-performing SBOs, as the selling GP could be more willing to exit these investments. The selling GP has potentially exhausted all operational improvements and would be willing to sell the company to a prospective buyer. Buying GPs are able to pay a premium for these firms, because firms with high abnormal operational margin will result in higher cash generation that allows the GP to increase the leverage in these firms. In fact top-performing SBO firms exhibit a Net debt/EBITDA multiple of 5.5x one year post-transaction, compared to 4.2x for bottom-performing SBO firms. Because of the increased leverage, SBOs can potentially bid more for these companies. GPs that are under pressure to buy find an interesting investment in these transactions, as they are available and the GP under pressure can ensure to bid the highest price, as long as hot debt markets allows for a high leverage. As a result we would then expect a more significant decline in operating performance in these top-performing SBO transactions, as most operational improvements are already exhausted.

It is difficult to estimate how far an effect in terms of the final motivation for the difference between top- and bottom-performing SBOs exists, as the results can be quite distorted by the first two discussed effects. Overall, our results show however, that it is important to account for the pre-exit characteristics of firms when trying to evaluate the difference within or across SBO and RLBO samples.

[INSERT TABLE VII. HERE]

Following our earlier discussion we are introducing a multivariate regression model in order to account for the difference in the quality of firms in the SBO, respectively the RLBO samples. We are summarizing our results for tests on three dependent variables[37] in Table VIII The results show that we can accept hypothesis A4a stating that RLBOs exhibit higher ex-post operational performance compared to SBOs.

The first specification looks only at the difference and level of performance for SBOs and RLBOs through the use of a dummy variable taking the value of 1 for SBO firms. We find that SBOs do exhibit approximately 21,8%[38] lower compounded sales growth than RLBOs between Y_{-1} and Y_{+3} of the transaction. The sales growth for RLBOs is in the first specification represented by the

[37] In order to keep our analysis incisive we focus our analysis only on i) Sales growth, ii) EBITDA/Sales margin, iii) EBITDA/Total Assets margin. We choose these measures as they have been widely studied in related literature and showed encouraging results in earlier tests.
[38] For calculation of the effect of dummy on log variables, see Halvorsen and Palmquist (1980). Formula: growth rate = 100 (exp(coefficient – Var.(coefficient)/2) - 1)

constant[39] and is 35.5%. The magnitude seems surprisingly large, it is however similar to our findings in Table VI, where we compared the medians between SBOs and RLBOs. Interestingly, our data suggest that RLBOs are able to expand the EBTIDA/Total Assets margin by 1,5%, while SBOs decrease their margin by 2,7% (= 1,5%-4,2%). The increase in profitability for RLBOs is not statistically significant, but the SBOs lower profitability of 4,2% is. These findings slightly differ from our preliminary results from Table VI, where we concluded on a similar declining trend across all profitability measures for SBOs and RLBOs. The results for change in EBITDA/Sales margin, while statistically insignificant, suggest similar results to our preliminary findings. The difference between the two profitability measures results obviously from a different development of Sales and Total Assets. A possible explanation is that GPs expand Total Assets more than companies in the public market. The build-up in assets post transaction as discussed in Barber and Lyon (1995) could lead to this effect, in cases where the build-up would be more pronounced for SBOs compared to RLBOs.

In the second specification we include pre-exit operational performance of the sample firms in order to account for the difference in firm quality. We find that a 1% higher sales growth in the last year before the transaction (during 1 year) should increase the 4-year compounded Sales growth by 0,52%, which shows the importance of accounting for the quality of firms pre-exit. Additionally, we find that for each dependent variable, the matching control variable at Y_{-1} has a significant impact. While higher sales growth pre-exit can be seen as a sign of firms with high growth potential, the conclusion in terms of profitability is the opposite. Firms that show high abnormal operating margins experience a reversal in performance, as one can expect that higher abnormal operating margins are a sign of exhausted operational improvement from the first GP during the PBO. In terms of EBTIDA/Sales we find that a 1% higher abnormal margin leads to a significant reduction in the margin of 0,34%. In terms of EBTIDA/Total Assets this effect is more pronounced, as we would expect a 1% higher abnormal margin to result in a significant reduction in the margin of 0,60%. In practice that would mean when a company shows an abnormal margin of 10% at Y_{-1}, it would by Y_{+3} only sustain an abnormal margin of 4% compared to a company that performs exactly at the industry average. The difference in magnitude for these two profitability measures, most likely results from the previously discussed effects from the build-up in asset values after transactions, as discussed in Barber and Lyon (1995). However, even after including all the above-discussed pre-exit characteristics we find that SBOs show on average a 2,40% stronger decline in EBITDA/Total Assets compared to RLBOs.

Finally, we used a third specification, including information on the firm size and the holding period of the PBO. Both showed in previous studies to affect the operational performance post-exit of

[39] The interpretation will not be interesting for the specifications including more variables than only the dummy variable, as we do have non-centered variables.

SBOs and RLBOs (see e.g. Jenkinson and Sousa, 2013). We find statistically significant evidence that smaller firms, in terms of total assets, do have a higher growth potential. In terms of profitability we did not find an effect of the firm size on post-exit operational improvements. A longer holding period did surprisingly not lead to statistically worse operational improvements, even though the findings across the different dependent variables all suggest a small negative impact. The inclusion of holding period removes 93 observations from our sample. Since we did not find a statistically significant impact on operational performance we will remove this variable in future specifications to test hypothesis B1 to D2.

Compared to existing research we report results that are in line with findings by Jenkinson and Sousa (2013), the only authors studying this subject in a comparable setting. The worse operational performance in terms of Sales growth and EBITDA/Total Assets matches their results, as do the outlined findings on Control variables. Our conclusions deviate from their findings as we do not find a significant effect in terms of EBITDA/Sales, moreover the holding period of the PBO does not seem to affect the post-exit operational performance in our sample. To conclude, we feel that our results affirm the hypothesis that SBOs do exhibit lower post-exit operational improvements compared to RLBOs. In a next step we are therefore going to evaluate in what extent agency issues are affecting the performance negatively and could explain the difference.

[INSERT TABLE VIII. HERE]

6.2 The effect of market conditions on the operating performance of SBOs

We used the Final Panel of SBOs and RLBOs transactions, in order to find to which extent market conditions might explain the difference in performance between SBOs and RLBOs. Our results in Table IX suggest that we can accept hypothesis B1, asserting that SBO investments made during cold debt markets perform worse compared to other SBOs and RLBOs. On the other hand, we can reject hypothesis B2 that suggested an adverse effect on the performance of RLBOs during hot equity market conditions. The operational underperformance of SBOs compared to RLBOs remains economically and statistically significant after accounting for market conditions. In Specification 6 we added a year fixed-effect to mitigate our concerns over the presence of multicollinearity, especially between credit conditions and IPO market conditions. While we find our results to be stronger and slightly more significant in Specification 6, there is no strong evidence of such multicollinearity[40]. We centered both market condition variables (i.e. Credit Spread and IPO Market) at the mean of the

[40] Specification 6 will therefore be the only one including year fixed-effect, since keeping the effect would force us to drop some observations in further regressions and reduce sample size and significance.

respective subsample[41]. The coefficient on "SBO Dummy" has therefore to be interpreted as the effect of a SBO transaction for an average level of credit spreads and IPO activity.

First, using specification 5, excluding year fixed-effect, we find a significant negative effect of credit spread on the post-exit EBITDA/Sales margin of SBOs. Additionally, the effect of Credit Spread on RLBOs is economically positive but statistically not significant, therefore our model predicts that an increase in Credit Spread will increase the outperformance of RLBOs compared to SBOs. An increase in credit spreads by 1% from average levels, would result in a deterioration in terms of EBITDA/Sales of approximately 0,55% (= 0,25%-0,80%), while the effect on RLBOs would be an increase in abnormal EBITDA/Sales margin by 0,25%[42]. Additionally, we find a positive effect in terms of EBITDA/Total Assets during positive IPO markets, meaning that SBOs made in strong competition to RLBOs perform better than other SBOs and RLBOs.

Second, using Specification 6 with year fixed-effect, our results on profitability variables win in significance. Interestingly, we find that RLBOs improve post-exit operational performance in terms of EBITDA/Sales margin during times of high credit spreads, while at the same time SBOs continue to experience worse operational performance during cold debt markets. We also find significance for the underperformance of SBOs during cold debt markets in terms of EBITDA/Total Assets. An increase in the credit spread by 1% would therefore lead SBOs to underperform RLBOs by 1,11% in terms of EBITDA/Sales and 0,85% in terms of EBITDA/Total Assets, everything else being equal. The outlined underperformance of SBOs compared to RLBOs, leads these companies, to incur a deterioration in EBITDA/Sales of 0,11% (= 1,00%-1,11%) when credit markets are increasing by 1%. Additionally, the underperformance of SBOs compared to RLBOs in terms of EBTIDA/Sales is now significant, at an average level of Credit Spread and IPO Market, with SBOs exhibiting 2,2% worse deterioration in abnormal EBITDA/Sales margins post-exit. Looking at the results in terms of IPO market conditions, our results confirm earlier findings that find a positive effect in terms of EBITDA/Total Assets for SBOs during positive IPO markets.

Our results clearly show that market condition under which SBOs are made matter for the subsequently experienced operational performance. Our results suggest, that the post-exit operational performance cannot be explained in terms of the *"pecking-order theory"*, that assumes SBOs to generally be worse quality firms. Interestingly, this confirms previous findings in our thesis, where we motivated that the pre-exit operational performance of SBOs is not necessarily inferior to RLBOs. The *"pecking-order theory"* would only have been confirmed in our findings, when cold debt markets lead to both worse post-exit operational performance of SBOs and RLBOs. We find partial support

[41] Credit Spreads were centered around 4,40%, which is the average credit spread at which SBOs in our sample were made.
[42] Latter effect on RLBOs is statistically insignificant. However, we include it in the discussion of the magnitude of the effects to take combined effects into account.

for this in our results with SBOs performing significantly worse in cold debt markets, but RLBOs are performing better in such an environment, which is not strong enough evidence to accept the *"pecking-order theory"*. In addition to that we would also need to see worse post-exit operational performance of SBOs during hot equity markets, but we actually find the opposite effect with improvement in terms of EBTIDA/Total Assets.

Instead, our results are in line with the *"cyclical investment behavior hypothesis"*. As hypothesized, we expect GPs to exhibit a less cyclical investment behavior than public market investors, not only in terms of number of deals, but in terms of an investment's performance outlook. Our results suggest that during cold debt markets, GPs are investing in more companies that have a worse operational performance outlook than public market investors. The rationale behind their investment behavior could be that valuations in periods of high credit spreads are low, as discussed by Axelson et al (2012) and public market investors are apparently not willing to invest in companies with a negative performance outlook during these times. What is more, RLBOs that are made during cold debt markets, exhibit a better post-exit operational performance compared to RLBOs during good economic times. Our findings therefore suggest that during uncertain investment markets, public market investors only commit funding to companies with a very good performance outlook. Similarly to our findings in terms of debt market conditions, we find an effect in terms of equity market conditions that would predict SBOs to perform worse during cold equity markets, which is line with the *"cyclical investment behavior hypothesis"*.

Consequently, we also want to discuss two alternative explanations to our findings that are mainly having an effect on either the sub sample of SBOs or RLBOs. First, in terms of SBO transactions, one could imagine that the *"window of opportunity hypothesis"* as discussed in Arcot et al (2013) could lead to the observed differences in post-exit operational performance. Under this hypothesis, we would expect more SBOs to occur during hot debt markets. If the operational performance outlook of firms during good economic times is better, this would as well result in SBOs made during cold debt markets to show a negative post-exit operational performance. However, the assumption of higher instances of good firms during good economic times is hard to proof in our regression settings and we feel that it is not unequivocally clear whether or not the *"window of opportunity hypothesis"* has an effect on our results. Secondly, in terms of the observed effect on RLBO transactions, one could imagine that the *"market timing hypothesis"* as outlined by Cao (2011) would have a similar effect. GPs are expected to shorten their initially planned investment period, when market conditions for IPOs are favorable and sell their portfolio companies in a RLBO. Consequently, RLBOs should exhibit worse post-exit operational performance during good economic times, which is in line with our findings. However, the *"market timing hypothesis"* does not explain the difference between SBOs and RLBOs, but RLBOs only. Because we are using abnormal operational performance measures, our setting should only show an effect in terms of above industry

operational performance and therefore simple market timing can to some extent be eliminated from the possible explanations. In conclusion, examining all the evidence our results suggest that the *"cyclical investment behavior hypothesis"* is the most likely explanation for the observed differences. Overall, adding controls for the market conditions reinforces the lower (from our previous model) post-exit operational performance of SBOs compared to RLBOs.

Previous research on LBO returns during different market conditions found that the transaction prices paid during negative economic conditions are usually lower (Axelson, Jenkinson, Strömberg, & Weisbach, 2012) and the investment returns on transactions made in these times are better (Kaplan & Schoar, 2005). We add to this discussion by comparing post-exit operational performance of SBOs and RLBOs and conclude that the post-exit operational performance of SBOs is negatively related to credit spreads. At first sight, our findings might seem in contrast to the *"overinvestment hypothesis"* of Axelson et al (2009), which though mainly focuses on the overinvestment in terms of investor returns and not operational performance. GPs can expect positive investor returns, whenever the price paid during cold debt markets is lower than suggested by the negative operational performance outlook. Furthermore, our results from specification 6 indicate that the strongest effect on operational performance is resulting from RLBOs made during cold debt markets that exhibit better post-exit operational improvements in terms of EBTIDA/Sales, rather than SBOs that experience a negative EBITDA/Sales margin development post-exit. Our results therefore suggest that GPs use cold debt markets to selectively invest in companies that are shed by public market investors during uncertain investment markets.

[INSERT TABLE IX. HERE]

6.3 The effect of specialization on the operating performance of SBOs

In order to validate our results for the *"advantage-to-specialization hypothesis"* we reduced our sample to only include SBO transactions, due to the fact that characteristics of the buying GPs cannot be compared to characteristics of public market buyers. The results in Table X(a) to Table X(c) lead us to accept hypothesis C1 stating that specialist GPs with high deal activity achieve worse operational improvements compared to alternative GPs. We also accept hypothesis C2 stating that global GPs outperform alternative GPs. Additionally, the results suggest a different magnitude in the effect for country specialist GPs, compared to industry specialist GPs. Finally, only looking at the raw effect of specialization (Specifications 7, 9 and 11), we do not find strongly significant effects on post-exit operational performance, indicating the importance that deal activity plays for specialist GPs. Since we used a centralized variable for deal activity (Specification 8, 10 and 12), all discussed differences in the Dummy variables for specialization refer to GPs exhibiting an average number of deals over the last 5 years, at the time of the transaction.

The results in Table X(a), Specification 8, suggest that country specialist GPs experience significantly more negative changes in EBTIDA/Sales and EBITDA/Total Assets margins compared to alternative GPs. Our results show that an increase in the deal activity during the last 5 years by 10[43] deals, would lead to a reduction in the abnormal EBITDA/Sales margin of 0,82% (= 0,04%-0,86%) for country specialist GPs. The results suggest that specialist GPs that do undertake many investments and remain country focused, limit their allocation potential[44]. In the case where the GP is restricted in its investments to a single country, he might not find enough valid investments and potentially invest in companies that do not offer positive operational improvements by default of finding better ones. On a cautious note, we want to emphasize that an average deal activity is already a high level for country specialist GPs, which results in the significant effect for the country specialization dummy variable (PE Country Spec. Dummy). As can be seen from our results in Specification 7, not considering deal activity, we do not find a significant underperformance of country specialist GPs irrespective of their deal activity. In conclusion, our results mainly motivate the conclusion that an increased deal activity leads to lower post-exit operational improvements for country specialist GPs, as a result of constrained allocating possibilities.

Table X(b) is estimating the same effect in terms of industry specialization. Surprisingly the results, while not significant, suggest exactly the opposite effect compared to country specialized GPs[45]. However, those results have to be interpreted carefully, because only 17 transactions of our sample do have an industry focused GP (e.g. Providence Equity Partners LLC). The difference in the coefficients might result from differences in terms of knowledge transfer across industries or countries and better deal sourcing opportunities for industry specialist GPs compared to country specialists. However, we will not further use the results of Table X(b) in our discussions as the sub-sample is too small.

In Table X(c) we are reporting the results in terms of GPs with a global business model. Our results provide evidence that GPs with a global business model do achieve superior post-exit improvements in terms of EBTIDA/Sales compared to alternative GPs. Moreover, the interaction in terms of deal activity is not significant, indicating that their business model is more easily scalable as they can easily allocate resources across different industries/regions. Looking at specification 11, which only includes a dummy variable for global GPs, we find that global GPs can achieve 2,45% better EBITDA/Sales margins in SBOs compared to alternative GPs. The effects remain, in Specification 12, when looking at GPs with an average number of deal activity. Additionally, we do not find that an increased deal activity is reducing the post-exit operational performance of global

[43] Table X(a) to Table X(c) is showing the effect in terms of 100 deals. We discuss the effect in terms of 10 deals, as the interpretation is more intuitive economically.
[44] We assume that a GP with many deals in the past, will likely also need to invest in many deals in the future.
[45] We do not discuss results in terms of Sales growth, as the model does not produce enough significant coefficients (based on F-stat of the standard OLS regression).

GP's investments. In conclusion, our results therefore indicate that there is a positive effect of having a global business model when investing in SBOs, irrespective of the deal activity.

As outlined earlier, we expect specialization to have two opposite effects on post-exit operational improvements. First, we would expect specialist GPs and global GPs to possess superior skills to achieve further operational improvements in a SBO. Our results suggest that this might only be the case for global GPs. As in the case of Com Hem AB, a global GP might be able to help a portfolio company during the next steps in the expansion of the business (e.g. global expansion strategy, application of international best-practices). Country specialist GPs in particular and Industry specialist GPs seem though not to possess the skillset necessary to achieve additional operational improvements in a SBO. Second, we would expect the level of deal activity to be informative about the probability that a specialist GP might encounter deal sourcing problems. In cases where the GP has a high deal activity, he might be limited in the number of investments he can make as specialization is constraining the allocation potential. As we discussed above, we find that country specialist GPs actually suffer from this problem and achieve worse post-exit operational performance with an increasing deal activity. Looking at the difference between industry and country specialist GPs, our results suggest that knowledge gathered within one industry could more easily be applied globally in the same industry. On the other hand, knowledge gathered within one country, is more difficult to transfer to other industries in the same country. The difference in results between country and industry specialization seems intuitive, our results are however too weak to motivate this conclusion to be definite. The main conclusion we can make from our results is that there are adverse effects of deal activity on specialized firms and that global GPs might be more suited to achieve operational improvements in a SBO.

Our findings on specialization stand in contrast to findings by Cressy et al (2007) who found industry specialization should add 8.5% in terms of profitability improvements. Our results motivate a more distinguished discussion, depending on the chosen specialization and level of deal activity. Moreover, the results provide an explanation for findings by Gompers et al (2009) who state that specialization within a VC investor decreases over time, leading VC firms to take rather a generalist business model as they grow more experienced. Our results indicate that the move to a generalist GP business model is a natural strategic reorientation, as the scope of possible investments with a country specialized business model is too narrow. On top of that, we show that global GPs seems to possess the skills necessary to provide additional operational improvements to their investment companies and that their business model is scalable, i.e. that they do not suffer from adverse deal sourcing problems. However, on a cautious note we also have to consider Arcot et al (2013), who found that SBOs are not more likely to happen for specialist GPs[46]. Their approach was to look at GPs that invested more than

[46] The authors looked at specialization in terms of industry concentration and size characteristics.

33% of their last investments within a given industry. Our data gathering process differs, as we looked at the statement on the GP's webpage, where the mentioning of a specialization is significantly more limiting than in terms of a percentage of previous investments. In conclusion, our findings show that some GP business models are more suited to invest in SBOs. For country specialist GPs, we find that the negative aspects of specialization, such as limited allocating possibilities, outweigh the positive aspects and lead to a deterioration in profitability. The described effects on country specialist GPs can be used as an additional agency issue, when discussing issues related to the limited life fund structure of GPs. Global GPs on the other hand, seem to possess superior skills that are more suited to achieve operational improvements during the next expansion stage for companies in a SBO.

[INSERT TABLE X. HERE]

6.4 The effect of buying pressure on the operating performance of SBOs

In order to validate the effects buying pressure has on the operating performance of SBOs, we only considered SBO transactions, as public market investors do not exhibit similar ex-ante capital raising characteristics. The results in Table XI lead us to reject hypothesis D1, as we do not find any significant results of a SBO acquired late in the lifetime of a fund on post-exit operational performance.

The setup of our multivariate regression specifications, follows the same procedure as used in Degeorge et al (2013), who found that SBOs bought late (after 2.5 years fund age) do underperform in terms of IRR and a reinforced effect with increased relative deal size (relative to the average GP deal size). Our results suggest no significant difference between transactions that are made 2.5 years after a fund has been raised and alternative transactions, across sales growth, EBITDA/Sales change and EBITDA/Total Assets change. Additionally, an increase in relative deal size does not have a significant impact on abnormal operational profitability for the SBOs bought late.

In accordance with Arcot et al (2013) we can therefore conclude that the experienced negative investor returns from the *"go for broke hypothesis"* are a result of increased entry multiples and increased equity investments by GPs, rather than negative operational performance post-exit. In combination our results provide strong support to the thesis that GPs under pressure to buy do not necessarily choose worse companies for their investments, but rather ensure that they are able to invest by committing more capital and overpaying for the investment.

[INSERT TABLE XI. HERE]

7. LIMITATIONS

In the following chapter we are testing the robustness of our results, by using different sample sizes or approaches. Furthermore, we are evaluating some of our outlined explanations for discrepancies found between our findings and previous literature.

7.1 Robustness of data sample

In this section we take different approaches to evaluate the robustness of our results. The first test of robustness concerns our hypothesis A1 through A3, where we replicate the analysis with the Robustness Panel. The main difference from the previously used Final Panel is that the Robustness Panel includes Venture Capital-backed RLBOs transactions, other differences concern characteristics of the GPs but are not relevant for the assessment of hypothesis A1 to A3. The comparison of pre-transaction results for the Robustness Panel (Table XII) shows only little differences with the Final Panel, besides a slight tendency of SBOs to outperform RLBOs on operating ratios. We observe the biggest difference between the Robustness and Final Panel when comparing the post-transaction performance (Table XIII), especially Sales Growth (Y_{+3}) is almost twice bigger for the sample including VC-backed RLBOs (Robustness Panel). Interestingly, post-transaction operating performance ratios tend to be lower for the Robustness Panel, and on an overall level SBO seems to exhibit better operating ratio than RLBOs when including VC-backed firm, while this difference is not significant in our base sample. Those differences are very much aligned with our expectations, since by definition VC-backed companies tend to be high growth companies, while they might not have reached full profitability. Hence, the higher sales growth and lower profitability of the Robustness Panel is aligned with those facts. Overall, those results do confirm our previous findings on the Final Panel and we are confident the used sample is a more representative and less biased sample of real RLBO transactions.

7.2 Limitation in result interpretation

We see two main areas of concern when it comes to limitations in the interpretation of our results, the first being related to the data sample. While a lot of manual work has been done to collect and validate data, we still feel data availability might be an issue and a source of bias. The Orbis database (BVD) is only accessible back to 2002, while Capital IQ has limited coverage for years before 1998, not to mention that looking at privately owned companies always questions the reliability of the data. In general, our sample shows some discrepancies when compared to earlier studies such as Cao and Lerner (2009) who use a self-constructed database of RLBO between 1980 and 2006. Furthermore, Barber & Lyon (1995) argues for assessing the operating performance up to 5 years post-transaction in order to get a true picture. Unfortunately, we were not able to follow their recommendation as it would have significantly reduced our data sample. The last concern on the data comes from the matching of 2 digit SIC industry codes that might create inflated abnormal operating performance that

would not remain when matching on a 3 or 4 digit basis. Once more, our choice of 2 digit SIC was driven by data availability.

Turning to the methodology, the explanatory power of the regression, based on standard OLS procedure, show rather low level of explanatory power therefore this might suggest that other factors not considered in this paper might have an impact on operational performance. Furthermore, while the robust regression does allow to limit the impact of outliers, some of these extremes values might still be too influential or wrong. Hence, it would be interesting to replicate our approach with a different strategy to handle outliers (e.g. different regression method such as quartile regression, or by removing outliers). Finally, interaction variables should be interpreted carefully, since in some specification only the interaction term is significant while neither the raw interaction in the same specification, nor the raw interaction term in a similar specification but without interaction term, are significant. This raises concerns on the robustness of the significance versus the capture of a mechanical effect. To some extent we could relax this concern by finding similar results with alternatives control variable (i.e. alternative variable for credit market, see next paragraph, and year fixed-effect, see section 5.4 and 6.2), but a different approach might be stronger in validating our results.

Looking at our findings in terms of market conditions in more details, we would like to raise a few limitations in the possibility to explain our results. The effects, discussed in the *"cyclical investment behavior hypothesis"* should be present in both cold and hot debt markets and our model suggest a linear relationship of SBO post-exit operational performance and debt market conditions. However, it is not obvious that this relationship in fact is linear. One could imagine that GPs are mainly exhibiting a less cyclical behavior exclusively during bad economic times, when investors shed any investment that is considered risky (i.e. having a negative operational performance outlook). During good economic times a similar opportunistic behavior is more difficult to motivate. One could argue that our findings might be due to the choice of a specific variable for market conditions. Therefore, we used an alternative measure of the IPO window by computing the percentage of IPO priced above the median point of the original prospectus price range based on Ritter's IPO database[47]. The idea is that a high percentage of IPO priced above their median price range would suggest a strong interest for IPO from investors hence a hot IPO market. The unreported results from this alternative specification returned similar results in every aspect to Specification 5 (Table IX), hence here again we are satisfied with the robustness of our results.

In terms of our findings on the *"advantage-to-specialization hypothesis"*, we encounter limitations in how far our results can be interpreted. First, our variables are measured on a firm level, which does not necessarily give information about specialization on a fund level or level of the

[47] http://bear.warrington.ufl.edu/ritter/ipodata.htm

investment manager. As discussed in Gompers et al (2009), the specialization in terms of investment manager could be more influential on the post-exit operational improvements of SBOs. Additionally, our measure of specialization is not in line with previous literature, where a so-called Herfindahl-Index is used to calculate industry concentration variables. However, our database access was not sufficient to estimate such measurements.

8. CONCLUSION

In this thesis, we collected operational performance data for five subsequent years of 202 SBOs and 220 RLBOs in North America and Europe. Our results suggest that firms in SBO transactions are not inferior quality firms compared to firms in RLBOs, but exhibit a worse operational performance development. We find that SBOs do exhibit approximately 21,8% lower compounded sales growth than RLBOs between Y_{-1} and Y_{+3} of the transaction. We find that SBOs exhibit a worse development in terms of profitability ratios. However, the results are not unequivocally clear as the effect was only found for EBITDA/Total Assets margins, which could be biased by asset build-up effects around the transaction. In a second step, our results indicate that GPs are selectively investing in companies with a negative operational performance during bad economic times. In combination with findings of Axelson et al (2012) we postulate that GPs invest in undervalued companies during cold debt markets, as these companies are shed by public market investors because of their negative operational performance outlook. Furthermore, our findings suggest that certain GP business models are more suited for investments in SBOs. For country specialist GPs, we find that the negative aspects of specialization, such as limited allocating possibilities, outweigh the positive aspects and lead to a deterioration in profitability. Global GPs on the other hand, seem to possess skills that are better suited for the next expansion phase of portfolio companies (global expansion or application of international best-practices). Finally, in combination with findings by Arcot et al (2013) we find that the experienced negative investor returns from the *"go for broke hypothesis"* are a result of increased entry multiples and increased equity investments by GPs, rather than negative operational performance post-exit. However, although potential agency conflicts, resulting from the limited fund life structure of PE investments, might explain variations in the operational performance of SBOs, our results are not conclusive enough to explain the uncovered post-exit operational underperformance of SBOs. Evidently, alternative stories have to be responsible for the uncovered underperformance of SBOs, such as growth prospects, effects from value creating activities of GPs or alternative agency issues than the ones resulting from the limited fund life structure. In absence of these alternative reasons, Rappaport (1990)'s arguments that views LBOs as a short term shock therapy seems more

applicable to our findings than Jensen (1989)'s view of the long term superiority of the LBO organizational form. However, our results added to the current discussion by showing that, under certain circumstances, the initial shock therapy might not have been exhausted and additional operational improvements can be achieved (e.g. global GPs). Further research should focus on alternative explanations for the discovered underperformance of SBOs compared to RLBOs. Moreover, more conclusive findings could be achieved by finding better ways to distinguish between the *"market timing hypothesis"* and the *"cyclical investment behavior hypothesis"*. Finally, further research could examine how far the learning curve is different across different specializations, and how specialization at the investment manager level impact operating performance development.

9. REFERENCES

Acharya, V., Gottschalg, O., Hahn, M., & Kehoe, C. (2013). Corporate Governance and Value Creation: Evidence from Private Equity. *The Review of Financial Studies, 26*(2), 368-402.

Achleitner, A.-K., & Figge, C. (2012). Private Equity Lemons? Evidence on Value Creation in Secondary Buyouts. *European Financial Management (accepted)*.

Achleitner, A.-K., Braun, R., & Engel, N. (2011). Value creation and pricing in buyouts: Empirical evidence from Europe and North America. *Review of Financial Economics, 20*(4), 146-161.

Achleitner, A.-K., Braun, R., Engel, N., Figge, C., & Tappeiner, F. (2010). Value Creation Drivers in Private Equity Buyouts: Empirical Evidence from Europe. *The Journal of Private Equity, 13*(2), 17-27.

Andersen, R. (2008). *Modern methods for robust regression.* London: SAGE.

Angrist, J. D., & Pischke, J.-S. (2008). *Mostly Harmless Econometrics: An Empiricist's Companion.* Princeton University Press.

Arcot, S., Fluck, Z., Gaspar, J.-M., & Hege, U. (2013). Fund Managers under Pressure: Rationale and Determinants of Secondary Buyouts. (working paper).

Axelson, U., Jenkinson, T., Strömberg, P., & Weisbach, M. S. (2012). Borrow Cheap, Buy High? The Determinants of Leverage and Pricing in Buyouts. *Journal of Finance, 68*(6), 2223-2267.

Axelson, U., Strömberg, P., & Weisbach, M. (2009). Why Are Buyouts Levered? The Financial Structure of Private Equity Funds. *Journal of Finance, 64*(4), 1549-1582.

Barber, B. M., & Lyon, J. D. (1995). Detecting abnormal operating performance: The empirical power and specification of test statistics. *Journal of Financial Economics, 41*(3), 359-399.

Bernstein, S., Lerner, J., Sorensen, M., & Strömberg, P. (2010). Private Equity and Industry Performance. *Harvard Business School Working Papers*.

Bloom, N., Sadun, R., & Van Reenen, J. (2009). Do private equity owned firms have better management practices? *Center For Economics Performance occasional papers, 24*.

Bonini, S. (2013). Secondary Buyouts. (working paper).

Brau, J. C., Francis, B., & Kohers, N. (2003). The Choice of IPO versus Takeover: Empirical Evidence. *Journal of Business, 76*(4), 583-612.

Cameron, A. C., & Trivedi, P. K. (2005). *Microeconomics: Methods and Applications.* Cambridge University Press.

Cao, J. (2011). IPO Timing, Buyout Sponsors' Exit Strategies, and Firm Performance of RLBOs. *Journal of Financial & Quantitative Analysis, 46*(4), 1001-1024.

Cao, J., & Lerner, J. (2009). The performance of reverse leveraged buyouts. *Journal of Financial Economics, 91*(2), 139-157.

Chatterjee, S., Hadi, A., & Price, B. (2000). *Regression Analysis by Example* (3rd ed.). New York: Wiley.

Chou, D. W., Gombola, M., & Liu, F. Y. (2006). Earnings Management and Stock Performance of Reverse Leveraged Buyouts. *Journal of Finance and Quantitative Analysis, 41*(2), 407-438.

Chung, J.-W., Sensoy, B. A., Stern, L., & Weisbach, M. S. (2012). Pay for Performance from Future Fund Flows: The Case of Private Equity. *Review of Financial Studies, 25*(11), 3259-3304.

Cook, R. D. (1979). Influential Observations in Linear Regression. *Journal of the American Statistical Association, 74*(365), 167-174.

Cressy, R., Munari, F., & Malipiero, A. (2007). Playing to their Strengths? Evidence that Specialization in the Private Equity Industry Confers Competitive Advantage. *Journal of Corporate Finance, 13*(4), 647-669.

Cumming, D., & Dai, N. (2011). Fund size, limited attention and valuation of venture capital backed firms. *Journal of Empirical Finance, 18*(1), 2-15.

Cumming, D., & MacIntosh, J. G. (2003). Venture-capital exits in Canada and the United States. *University of Toronto Law Journal, 53*(2), 101-200.

Cumming, D., Siegel, D. S., & Wright, M. (2007). Private equity, leveraged buyouts and governance. *Journal of Corporate Finance, 13*(4), 439-460.

Degeorge, F., & Zeckhauser, R. (1993). The reverse LBO decision and firm performance: theory and evidence. *Journal of Finance, 48*(4), 1323-1348.

Degeorge, F., Martin, J., & Phalippou, L. (2013). The Performance of Secondary Buyouts. (working paper).

Draper, N. R., & Smith, H. (1998). *Applied regression analysis* (3rd ed.). New York: Wiley.

Gejadze, M., Giot, P., & Schwienbacher, A. (2012). Private Equity Fundraising, Fund Performance and Firm Specialization. (working paper).

Gertner, R. H., & Kaplan, S. N. (1996). The Value-Maximizing Board. (working paper).

Gompers, P. A. (1996). Grandstanding in the venture capital industry. *Journal of Financial Economics, 42*(1), 133-156.

Gompers, P. A., Kovner, A., & Lerner, J. (2009). Specialization and Success: Evidence from Venture Capital. *Journal of Economics & Management Strategy, 18*(3), 817-844.

Guo, S., Hotchkiss, E. S., & Song, W. (2009). Do Buyouts (Still) Create Value? *Journal of Finance, 66*(2), 479-517.

Halvorsen, R., & Palmquist, P. (1980). The Interpretation of Dummy Variables in Semilogarithmic Equations. *American Economic Review, 70*, 474-475.

Harper, N., & Schneider, A. (2004, August). Private Equity new Challenge. *The McKinsey Quarterly*.

Holthausen, R. W., & Larcker, D. F. (1996). The financial performance of reverse leveraged buyouts. *Journal of Financial Economics, 42*(3), 293-332.

Huber, P. J. (1964). Robust Estimation of a Location Parameter. *The Annals of Mathematical Statistics, 35*(1), 73-101.

Humphery-Jenner, M. (2012). Private Equity Fund Size, Investment Size, and Value Creation. *Review of Finance, 16*(3), 799-835.

Jain, B., & Kini, O. (1994). The Post-Issue Operating Performance of IPO Firms. *Journal of Finance, 49*(5), 1699-1726.

Jelic, R., & Wright, M. (2011). Exits, Performance, and Late Stage Private Equity: the Case of UK Management Buy-outs. *European Financial Management, 17*(3), 560-593.

Jenkinson, T., & Sousa, M. (2013). Keep taking the private equity medicine? (working paper).

Jensen, M. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review, 76*(2), 323-329.

Jensen, M. C. (1989). Eclipse of the Public Corporation. *Harvard Business review, 67*(5), pp. 61-74.

Kaplan, S. (1989). The effects of Management Buyouts on Operating Performance and Value. *Journal of Financial Economics, 24*(2), 217-254.

Kaplan, S. N. (1991). The staying power of leveraged buyouts. *Journal of Financial Economics, 29*(2), 287-313.

Kaplan, S. N., & Schoar, A. (2005). Private Equity Performance: Returns, Persistence, and Capital Flows. *The Journal of Finance, 60*(4), 1791-1823.

Kitzmann, J., & Schiereck, D. (2009). A Note on Secondary Buyouts-Creating Value or Recycling Capital. *iBusiness, 1*(2), 113-123.

Lopez de Silanes, F., Phalippou, L., & Gottschalg, O. (2013). Giants at the Gate: Investment Returns and Diseconomies of Scale in Private Equity . *Journal of Financial and Quantitative Analysis (JFQA), Forthcoming*.

Muscarella, C. J., & Vetsuypens, M. R. (1990). Efficiency and Organizational Structure: A Study of Reverse LBOs. *Journal of Finance, 45*(5), 1389-1413.

Nikoskelainen, E., & Wright, M. (2007). The impact of corporate governance mechanisms on value increase in leveraged buyouts. *Journal of Corporate Finance, 13*(4), 511-537.

Pastor, L., Taylor, L., & Veronesi, P. (2009). Entrepreneurial Learning, the IPO Decision, and the Post-IPO Drop in Firm Profitability. *Review of Financial Studies, 22*(8), 3005-3046.

R. Dennis, C. (1977). Detection of Influential Observations in Linear Regression. *Technometrics (American Statistical Association), 19*(1), 15-18.

Rappaport, A. (1990, January/February). The staying power of the public corporation. *Harvard Business Review, 68*(1), pp. 96-104.

Ritter, J. R. (n.d.). *Ritter research database on IPO*. Retrieved November 26th, 2013, from http://bear.warrington.ufl.edu/ritter/ipodata.htm

Ritter, J., & Welch, I. (2002). A Review of IPO Activity, Pricing, and Allocations. *Journal of Finance, 57*(4), 1795-1828.

Sousa, M. (2013). Why do Private Equity firms sell to each others? (working paper).

Stein, J. C. (1997). Internal Capital Markets and the Competition for Corporate Resources. *The Journal of Finance, 52*(1), 111-133.

Strömberg, P. (2007). The new demography of private equity. (working paper).

Strömberg, P., & Kaplan, S. N. (2009). Leveraged Buyouts and Private Equity. *Journal of Economic Perspectives, 23*(1), 121-146.

Sudarsanam, S. (2005). Exit Strategy for UK Leveraged Buyouts: Empirical Evidence on Determinants. (working paper).

Wang, Y. (2012). Secondary Buyouts: Why Buy and at What Price? *Journal of Corporate Finance, 18*(5), 1306-1325.

Wright, M., Robbie, K., & Albrighton, M. (2000). Secondary management buy-outs and buy-ins. *International Journal of Entrepreneurial Behaviour & Research, 6*(1), 21-40.

Wright, M., Robbie, K., Thompson, S., & Starkey, K. (1994). Longevity and the Life-Cycle of Management Buy-Outs. *Strategic Management Journal, 15*(3), 215-227.

Zhou, D., Jelic, R., & Wright, M. (2013). SMBOs: Buying Time or Improving Performance? *Managerial & Decision Economics*, (published online).

10. TABLES

Table I: Variables definition (1/2)

This table summarizes all variables we used in all our analysis and informs on the sources from where we received the data.

	Description	Data source
Sales growth	$(Sales_t / Sales_{t-1}) - 1$ for t_{-5} to t_{+5}	Capital IQ / Orbis
EBITDA/Sales	$EBITDA_t / Sales_t$ for t_{-5} to t_{+5}	Capital IQ / Orbis
EBITDA/Tot. Assets	$EBITDA_t$ / Total $Assets_t$ for t_{-5} to t_{+5}	Capital IQ / Orbis
EBIT/Sales	$EBIT_t / Sales_t$ for t_{-5} to t_{+5}	Capital IQ / Orbis
EBIT/Tot. Assets	$EBIT_t$ / Total $Assets_t$ for t_{-5} to t_{+5}	Capital IQ / Orbis
Net debt/EBITDA	Net $debt_t$ / $EBITDA_t$ for t_{-5} to t_{+5}	Capital IQ / Orbis
Transaction size	We received most transaction size numbers from Capital IQ. Where no information was available we implied the size based on the average EV / Sales ratio that we observed in the data.	Capital IQ / Orbis
Holding period of PBO	We initially based our results on holding period on a list that included all LBO transaction (30'000 trx.) that we could find via Capital IQ and matched the Company ID with the closest previous transaction. Where this information was not available we tried to find the holding period via manual search in Zephyr database.	Capital IQ / Zephyr
Venture Capital (dummy-var.)	We used information on the seller from Capital IQ and marked all RLBO transactions where the sponsor backing the transaction was a known VC investor. Additionally we checked the remaining transactions if they were receiving financing in rounds via Zephyr, a characteristic that is common for VC firms.	Capital IQ / Zephyr
Relative deal size	We received data on Avg. transaction size for all buying GPs in our sample from SDC and pared this with the transaction size in the relevant transactions.	SDC / Capital IQ
Country spec. (dummy-var.)	We visited the webpage of each buying GP and determined whether their investments exclusively focus on a single country.	GP homepage
Industry spec. (dummy-var.)	We visited the webpage of each buying GP and determined whether their investments exclusively focus on a single industry.	GP homepage
Global GP (dummy-var.)	20 biggest GP ranked by Total Amount Invested (SDC). Only GPs that made investment both in the US and Europe. Finally, no Sovereign Wealth Funds were included in this sub sample.	SDC, GP homepage

Table I: Variables definition (2/2)

This table summarizes all variables we used in all our analysis and informs on the sources from where we received the data.

	Description	Data source
Nb. of deals, last 5Y	The Nb. of deals a GP made 5 years prior and during the year of the transaction. Yearly data on buyout activity was gathered from Capital IQ.	Capital IQ
Buying GP fund age at entry	We matched information on individual fund level of each GP with the transaction date and found at what fund age transactions were made by the buying GP.	Capital IQ
Credit spread during month of transaction	We computed the spread between Bank of America Merrill Lynch US High Yield index (US below investment grade corporate debt) and the 3 month LIBOR	BoA Merill Lynch and Federal Reserve Bank of St. Louis
Nb. of IPO during quarter	We used the Monthly Number of IPO computed by Jay R. Ritter's (Cordell Professor of Finance, University of Florida) for his research purpose (http://bear.warrington.ufl.edu/ritter)	Jay R. Ritter's IPO database
IPO overpricing	We computed the percentage of IPO priced above the median point of the original prospectus price range.	Jay R. Ritter's IPO database
FED Tightening Index	We downloaded data on the FED Tightening Index from the Federal Reserve Bank of St. Louis	Federal Reserve Bank of St. Louis

Table II: Sample description by transaction year and geographic region

This table summarizes the transactions in for both the Robustness Panel and the Final Panel. The Robustness Panel represent data on SBO and RLBO where we observed financial data in at least two consecutive years and financial data one year prior to transaction (Y_{-1}). The Final Panel represents data on SBO and RLBO where revenue figures were available for each year from Y_{-1} to Y_3. Further, we separately show the split in terms of transaction date, for the transactions that received funding in rounds by Venture Capital (VC) investors.

	YEAR														
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**Total**
Robustness Panel: RLBO															
Europe (Primary)				1	2	1	1	1	3	4	7	19	2	1	**42**
United States and Canada (Primary)	9	12	9	26	24	24	11	16	35	42	55	87	18	26	**394**
Total Observations	**9**	**12**	**9**	**27**	**26**	**25**	**12**	**17**	**38**	**46**	**62**	**106**	**20**	**27**	**436**
Robustness Panel: SBO															
Europe (Primary)						1	1	7	21	27	56	84	37	8	**242**
United States and Canada (Primary)		5	3	3	4	1	1	8	16	13	13	14	3	3	**87**
Total Observations		**5**	**3**	**3**	**4**	**2**	**2**	**15**	**37**	**40**	**69**	**98**	**40**	**11**	**329**
Final Panel: RLBO															
Europe (Primary)				1		1	1	1	2	4	6	14	1	1	**32**
United States and Canada (Primary)	3	7	4	6	4	17	8	9	18	21	21	44	10	16	**188**
Real RLBO	3	7	4	7	4	18	9	10	20	25	27	58	11	17	**220**
Europe (Primary)									1			3			**4**
United States and Canada (Primary)	2	3	1	10	12	5	1	5	9	13	25	28	7	6	**127**
Venture firms	2	3	1	10	12	5	1	5	10	13	25	31	7	6	**131**
Total Observations	**5**	**10**	**5**	**17**	**16**	**23**	**10**	**15**	**30**	**38**	**52**	**89**	**18**	**23**	**351**
Final Panel: SBO															
Europe (Primary)						1	1	1	13	18	34	64	27	1	**160**
United States and Canada (Primary)		2	2	1	1		1	6	11	5	6	6		1	**42**
Total Observations		**2**	**2**	**1**	**1**	**1**	**2**	**7**	**24**	**23**	**40**	**70**	**27**	**2**	**202**

Table III: Sample description by headquarter of target companies

This table summarizes all transactions across their headquarters and shows the geographical differences between the samples Robustness (R) Panel and Final (F) Panel.

	Exit route			
	R Panel: RLBO	**R Panel: SBO**	**F Panel: RLBO**	**F Panel: SBO**
Section 1: Headquarter				
United States	383	87	183	42
Canada	11	0	5	0
United Kingdom	8	76	5	47
France	6	62	4	45
Germany	6	37	6	24
Netherlands	4	14	3	5
Ireland	3	0	2	0
Belgium	3	2	3	1
Spain	2	6	2	4
Greece	2	0	2	0
Switzerland	1	3	0	3
Finland	1	11	1	7
Sweden	1	7	1	6
Norway	1	4	0	3
Italy	1	12	0	9
Poland	1	0	1	0
Russia	1	0	1	0
Luxembourg	1	1	1	1
Austria	0	3	0	2
Serbia	0	1	0	1
Portugal	0	1	0	0
Bulgaria	0	1	0	1
Denmark	0	1	0	1
Total	**436**	**329**	**220**	**202**

Table IV: Descriptive statistics

This table reports the sample descriptive statistics for both the Robustness Panel and the Final Panel. It includes operational variables measured at t=0 and deal specific characteristics, which are only reported in the dataset for which we collected them for.

	Exit route							
	Robustness Panel: RLBO		**Robustness Panel: SBO**		**Final Panel: RLBO**		**Final Panel: SBO**	
	Average	**Median**	**Average**	**Median**	**Average**	**Median**	**Average**	**Median**
Firm characteristics at (t=0)								
Total assets (USD mn)	950,60	265,50	468,96	132,60	1413,53	539,75	491,94	133,18
Total sales (USD mn)	761,69	209,30	354,39	148,40	1211,61	481,30	366,07	156,10
EBITDA (USD mn)	105,78	32,45	52,12	20,41	174,91	78,35	61,55	23,75
EBIT (USD mn)	66,90	21,25	32,93	13,29	120,40	50,05	42,52	15,84
Net debt (USD mn)	68,68	13,30	551,47	291,70	526,59	135,5	679,57	406,20
Deal characteristics								
Holding period of PBO (years)					3,57	2,85	3,87	3,35
Rel. Deal size							42,00	15,62
Country spec. (dummy)								36,14%
Industry spec. (dummy)								8,41%
True Global Business model (dummy)								22,77%
Nb. of deals, last 5Y							78,53	34,50
Buying GP fund age at entry (years)							1,93	1,49
Credit spread during quarter					4,99%	3,90%	4,40%	3,37%
Nb. of IPO during quarter					40,86	34,00	37,33	34,00

Table V: SBO and RLBO Pre-Transaction Performance Comparison (Final Panel)

This table provides summary statistics for pre-transaction operating performance of companies depending on their exit route (SBO versus RLBO). The table reports median values for companies with continuously available operating performance metrics from 4 years (Y-4) up to 1 year (Y-1) prior to transaction. Growth variables (Sales, EBITDA, EBIT) represent median cumulative and annualized abnormal increase/decrease in the variable from the year of interest up to 1 year prior to transaction (Y-1). Ratios (EBITDA/Sales, EBITDA/Total Assets, EBIT/Sales, EBIT/Total Assets, Net Debt/EBITDA) represent the abnormal operating performance level for the year of interest, profitability ratios 1 year prior to transaction have been added for reference and comparison. We use a Wilcoxon signed-rank test to test for the difference in the location of the median between the reference year (Y-1) and the respective years of interest (Y-2 to Y-4) for a specific type of transaction. We use a two-sample Wilcoxon rank-sum (Mann-Whitney) test for the difference in median between the SBO and RLBO sample for each year of interest. Significance at the 1%, 5%, and 10% are represented by ***, **, and * respectively.

Growth are compared to 1 year prior transaction		**SBO**				**RLBO**				**Diff in Median (SBO-RLBO)**		
Ratio are absolute level		**Y-1**	**Y-2**	**Y-3**	**Y-4**	**Y-1**	**Y-2**	**Y-3**	**Y-4**	**Y-2**	**Y-3**	**Y-4**
Sales Growth (% increase)	Median Cum.		9,86% ***	10,97% ***	14,06% ***		9,41% ***	17,03% ***	27,20% ***	0,45%	-6,07% *	-13,13% *
(SBO obs=95, RLBO obs=88)	*Median Ann.*		*9,86%*	*5,34%*	*4,48%*		*9,41%*	*8,18%*	*8,35%*	*0,45%*	*-3,08%*	*-4,58%*
EBITDA Growth (% increase)	Median Cum.		21,29% ***	27,53% ***	37,18% ***		22,69% ***	37,07% ***	38,72% ***	-1,40%	-9,55%	-1,54%
(SBO obs=87, RLBO obs=89)	*Median Ann.*		*21,29%*	*12,93%*	*11,11%*		*22,69%*	*17,08%*	*11,53%*	*-1,40%*	*-4,89%*	*-0,52%*
EBIT Growth (% increase)	Median Cum.		22,31% ***	48,12% ***	38,48% ***		21,37% ***	31,60% ***	57,61% ***	0,94%	16,52%	-19,13%
(SBO obs=82, RLBO obs=90)	*Median Ann.*		*22,31%*	*21,70%*	*11,46%*		*21,37%*	*14,72%*	*16,37%*	*0,94%*	*7,94%*	*-6,83%*
EBITDA/Sales	Median	4,77%	3,46% ***	2,37% ***	1,79% ***	3,69%	2,62% **	1,77% *	0,91% **	0,84%	0,61%	0,88%
(SBO obs=87, RLBO obs=88)												
EBITDA/Total Assets	Median	7,16%	5,62% ***	2,79% ***	2,34% ***	1,77%	1,81% *	3,39%	2,53%	3,81% **	-0,60%	-0,18%
(SBO obs=87, RLBO obs=65)												
EBIT/Sales	Median	4,52%	4,14% ***	1,44% ***	2,87% ***	2,69%	2,69% *	1,77%	0,80% **	1,45%	-0,34%	2,07% *
(SBO obs=81, RLBO obs=88)												
EBIT/Total Assets	Median	5,51%	5,39% ***	2,73% ***	1,77% ***	3,39%	2,26% *	2,89%	1,66%	3,13% **	-0,17%	0,11%
(SBO obs=80, RLBO obs=65)												
Net Debt/EBITDA	Median	272,43%	345,31% *	271,27%	301,27%	244,71%	263,02% *	172,59%	178,89%	82,28%	98,68%	122,38%
(SBO obs=31, RLBO obs=64)												

Table VI: SBO and RLBO Post-Transaction Performance Comparison (Final Panel)

This table provides summary statistics for post-transaction operating performance of companies depending on their exit route. The table report median values for companies with continuously available operating performance metrics from 1 year (Y-1) prior to transaction up to 3 years (Y+3) after transaction. Growth variables (Sales, EBITDA, EBIT) represent median cumulative and annualized abnormal increase/decrease in the variable from 1 year prior to transaction (Y-1) up to the year of interest (Y+1, Y+2, Y+3). Ratios (EBITDA/Sales, EBITDA/Total Assets, EBIT/Sales, EBIT/Total Assets, Net Debt/EBITDA) represent the abnormal operating performance level for the year of interest, profitability ratios 1 year prior to transaction have been added for reference and comparison. We use a Wilcoxon signed-rank test to test for the difference in the location of the median between the reference year (Y-1) and the respective years of interest (Y+2 to Y+3) for a specific type of transaction. We use a two-sample Wilcoxon rank-sum (Mann-Whitney) test for the difference in median between the SBO and RLBO sample for each year of interest. Significance at the 1%, 5%, and 10% are represented by ***, **, and * respectively.

Growth are compared to 1 year prior transaction		**SBO**				**RLBO**				**Diff in Median (SBO-RLBO)**		
Ratios are absolute level		**Y-1**	**Y+1**	**Y+2**	**Y+3**	**Y-1**	**Y+1**	**Y+2**	**Y+3**	**Y+1**	**Y+2**	**Y+3**
Sales Growth (% increase)	Median Cum.		10,06% ***	13,87% ***	14,18% ***		27,83% ***	37,28% ***	46,48% ***	-17,77% ***	-23,40% ***	-32,31% ***
(SBO obs=189, RLBO obs=219)	Median Ann.		4,91%	4,43%	3,37%		13,06%	11,14%	10,01%	-9,32%	-8,50%	-9,29%
EBITDA Growth (% increase)	Median Cum.		5,58% ***	17,74% ***	2,66%		33,39% ***	35,13% ***	41,16% ***	-27,82% ***	-17,39% **	-38,50% ***
(SBO obs=166, RLBO obs=218)	Median Ann.		2,75%	5,59%	0,66%		15,50%	10,56%	9,00%	-15,04%	-6,17%	-11,44%
EBIT Growth (% increase)	Median Cum.		-0,16%	16,59% **	8,97%		47,79% ***	44,96% ***	52,66% ***	-47,94% ***	-28,37% ***	-43,70% ***
(SBO obs=153, RLBO obs=219)	Median Ann.		-0,08%	5,25%	2,17%		21,57%	13,17%	11,16%	-27,85%	-10,53%	-13,38%
EBITDA/Sales	Median	4,30%	5,11%	4,77%	3,02% ***	4,68%	5,36% ***	4,61%	3,35%	-0,25%	0,15%	-0,33%
(SBO obs=173, RLBO obs=219)												
EBITDA/Total Assets	Median	5,18%	4,01% **	3,30% **	1,42% ***	3,44%	4,31%	2,80%	2,03%	-0,29%	0,50% *	-0,61%
(SBO obs=167, RLBO obs=217)												
EBIT/Sales	Median	4,48%	4,26%	2,50% **	2,18% ***	2,95%	4,78% ***	3,91%	2,55%	-0,52%	-1,41%	-0,37%
(SBO obs=158, RLBO obs=219)												
EBIT/Total Assets	Median	4,81%	3,05% **	2,15% ***	1,35% ***	2,40%	3,73%	2,45%	1,54%	-0,68%	-0,31%	-0,19%
(SBO obs=152, RLBO obs=217)												
Net Debt/EBITDA	Median	264,59%	430,41% ***	433,82% ***	407,72% ***	199,00%	79,10% ***	117,24% ***	97,22% ***	351,31% ***	316,57% ***	310,50% ***
(SBO obs=40, RLBO obs=218)												

Table VII(a): SBO and RLBO Post-Transaction Performance Comparison sorted by EBITDA/Sales levels 1 year prior to transaction (Final Panel)

This table provides summary statistics for post-transaction operating performance of companies depending on their exit route. SBOs and RLBOs have been sorted in sub-samples based on their EBITDA/Sales performance level at Y-1. The top samples include companies with EBITDA/Sales (Y-1) above the median and below the 95th percentiles. The bottom samples include companies with EBITDA/Sales (Y-1) below the median and above the 5th percentiles. The table report median values for companies with continuously available operating performance metrics from 1 year (Y-1) prior to transaction up to 3 years (Y+3) after transaction. Growth variables (Sales, EBITDA, EBIT) represent median cumulative and annualized increase/decrease in the variable from 1 year prior to transaction (Y-1) up to the year of interest (Y+1, Y+2, Y+3). Ratios (EBITDA/Sales, EBITDA/Total Assets, EBIT/Sales, EBIT/Total Assets, Net Debt/EBITDA) represent the operating performance level for the year of interest, profitability ratios 1 year prior to transaction have been added for reference and comparison. We use a Wilcoxon signed-rank test to test for the difference in the location of the median between the reference year (Y-1) and the respective years of interest (Y+2 to Y+3) for a specific type of transaction. We use a two-sample Wilcoxon rank-sum (Mann-Whitney) test for the difference in median between the SBO and RLBO sample for each year of interest. Significance at the 1%, 5%, and 10% are represented by ***, **, and * respectively.

Compared to 1 year prior to transaction		SBO Top Performers (Percentiles 51 to 99)				RLBO Top Performers (Percentiles 51 to 99)				Top Perf. Diff. in Median (SBO-RLBO)		
		Y-1	Y+1	Y+2	Y+3	Y-1	Y+1	Y+2	Y+3	Y+1	Y+2	Y+3
Sales Growth (% increase)	Median Cum.		9,75% ***	14,49% ***	14,70% ***		29,70% ***	36,83% ***	42,64% ***	-19,94% ***	-22,34% ***	-27,94% ***
(SBO obs=84, RLBO obs=107)	*Median Ann.*		*4,76%*	*4,61%*	*3,49%*		*13,88%*	*11,02%*	*9,28%*	*-10,53%*	*-8,08%*	*-7,86%*
EBITDA Growth (% increase)	Median Cum.		5,90% **	8,01% ***	5,59% *		31,70% ***	34,65% ***	44,92% ***	-25,80% ***	-26,64% **	-39,33% ***
(SBO obs=84, RLBO obs=107)	*Median Ann.*		*2,91%*	*2,60%*	*1,37%*		*14,76%*	*10,43%*	*9,72%*	*-13,86%*	*-9,81%*	*-11,74%*
EBIT Growth (% increase)	Median Cum.		4,15%	14,83% **	16,01% **		41,15% ***	42,18% ***	52,97% ***	-37,00% ***	-27,34% *	-36,96%
(SBO obs=76, RLBO obs=107)	*Median Ann.*		*2,05%*	*4,72%*	*3,78%*		*18,81%*	*12,45%*	*11,21%*	*-20,63%*	*-10,10%*	*-10,90%*
EBITDA/Sales	**Median**	**11,67%**	**10,87% ** **	**10,31% *** **	**9,48% *** **	**10,24%**	**11,89%**	**10,16% ** **	**9,74% *** **	**-1,03%**	**0,15%**	**-0,26%**
(SBO obs=84, RLBO obs=107)												
EBITDA/Total Assets	Median	10,86%	5,58% ***	5,59% ***	4,54% ***	6,02%	6,23%	4,04% ***	3,67% ***	-0,65%	1,55% **	0,88%
(SBO obs=80, RLBO obs=107)												
EBIT/Sales	Median	10,79%	9,87% **	7,63% ***	6,36% ***	8,79%	10,35%	7,60% **	8,25% **	-0,48%	0,03%	-1,89%
(SBO obs=76, RLBO obs=107)												
EBIT/Total Assets	Median	9,35%	5,26% ***	3,45% ***	2,79% ***	5,58%	5,26%	3,35% **	2,84% **	0,00%	0,11%	-0,05%
(SBO obs=72, RLBO obs=107)												
Net Debt/EBITDA	Median	280,96%	545,59% ***	500,69% ***	458,34% ***	242,82%	74,42% ***	157,51% ***	108,46% ***	471,17% ***	343,18% ***	349,88% ***
(SBO obs=20, RLBO obs=107)												

Table VII(b): SBO and RLBO Post-Transaction Performance Comparison sorted by EBITDA/Sales levels 1 year prior to transaction (Final Panel)

This table provides summary statistics for post-transaction operating performance of companies depending on their exit route. SBOs and RLBOs have been sorted in sub-samples based on their EBITDA/Sales performance level at Y-1. The top samples include companies with EBITDA/Sales (Y-1) above the median and below the 95th percentiles. The bottom samples include companies with EBITDA/Sales (Y-1) below the median and above the 5th percentiles. The table report median values for companies with continuously available operating performance metrics from 1 year (Y-1) prior to transaction up to 3 years (Y+3) after transaction. Growth variables (Sales, EBITDA, EBIT) represent median cumulative and annualized increase/decrease in the variable from 1 year prior to transaction (Y-1) up to the year of interest (Y+1, Y+2, Y+3). Ratios (EBITDA/Sales, EBITDA/Total Assets, EBIT/Sales, EBIT/Total Assets, Net Debt/EBITDA) represent the operating performance level for the year of interest, profitability ratios 1 year prior to transaction have been added for reference and comparison. We use a Wilcoxon signed-rank test to test for the difference in the location of the median between the reference year (Y-1) and the respective years of interest (Y+2 to Y+3) for a specific type of transaction. We use a two-sample Wilcoxon rank-sum (Mann-Whitney) test for the difference in median between the SBO and RLBO sample for each year of interest. Significance at the 1%, 5%, and 10% are represented by ***, **, and * respectively.

Compared to 1 year prior to transaction		SBO Bottom Performers (Percentiles 1 to 50)				RLBO Bottom Performers (Percentiles 1 to 50)				Bottom Perf. Diff. in Median (SBO-RLBO)		
		Y-1	Y+1	Y+2	Y+3	Y-1	Y+1	Y+2	Y+3	Y+1	Y+2	Y+3
Sales Growth (% increase)	Median Cum.		8,30% ***	9,79% ***	12,86% ***		26,51% ***	36,38% ***	48,87% ***	-18,21% ***	-26,59% ***	-36,01% ***
(SBO obs=84, RLBO obs=107)	*Median Ann.*		*4,07%*	*3,16%*	*3,07%*		*12,48%*	*10,90%*	*10,46%*	*-9,56%*	*-9,79%*	*-10,56%*
EBITDA Growth (% increase)	Median Cum.		6,68% *	20,24% ***	-2,61%		48,30% ***	39,81% ***	34,51% ***	-41,62% ***	-19,57%	-37,12% ***
(SBO obs=84, RLBO obs=107)	*Median Ann.*		*3,29%*	*6,34%*	*-0,66%*		*21,78%*	*11,82%*	*7,69%*	*-23,59%*	*-7,00%*	*-10,95%*
EBIT Growth (% increase)	Median Cum.		-2,26%	16,83%	2,81%		59,22% ***	53,15% ***	54,03% ***	-61,48% ***	-36,32% ***	-51,22% ***
(SBO obs=76, RLBO obs=107)	*Median Ann.*		*-1,14%*	*5,32%*	*0,69%*		*26,18%*	*15,27%*	*11,40%*	*-37,94%*	*-13,97%*	*-16,43%*
EBITDA/Sales	**Median**	**-0,79%**	**-0,42% ***	**-0,05% ** **	**-1,77%**	**-1,34%**	**0,01% *** **	**-0,47% *** **	**-0,97% *** **	**-0,43%**	**0,43%**	**-0,81%**
(SBO obs=84, RLBO obs=107)												
EBITDA/Total Assets	Median	1,90%	1,93%	1,28%	0,19%	0,10%	2,12% ***	1,73% ***	1,55% *	-0,20%	-0,45%	-1,36%
(SBO obs=80, RLBO obs=107)												
EBIT/Sales	Median	0,48%	0,58%	-0,34%	-0,62%	-0,86%	1,46% ***	0,24% ***	-0,03% **	-0,89%	-0,58%	-0,59%
(SBO obs=76, RLBO obs=107)												
EBIT/Total Assets	Median	1,92%	1,25%	1,52%	-0,39% *	0,16%	2,02% ***	1,69% **	1,17%	-0,78%	-0,17%	-1,56%
(SBO obs=72, RLBO obs=107)												
Net Debt/EBITDA	Median	167,20%	424,78% ***	395,57% ***	384,70% ***	145,24%	79,59% ***	100,91% ***	81,53% ***	345,18% ***	294,67% ***	303,17% ***
(SBO obs=20, RLBO obs=107)												

Table VIII: Robust multivariate regression results comparing RLBO versus SBO

This table reports the result of a robust regression (Tukey bisqaure tuning) estimation of three different dependent variables; Log(Sales growth) (Y_{-1},Y_{+3}), change in EBITDA/Sales (Y_{-1},Y_{+3}), change in EBITDA/Total Assets (Y_{-1},Y_{+3}) on a SBO dummy variable (indicating whether the transaction is a SBO=1 or a RLBO=0) and different control variables. We are using three alternative specifications for each dependent variable. Other exogenous variables include operational performance measurements at Y_{-1} and the log of Total Assets at Y_0, to proxy for the size of the company. We included the log of the holding period of the PBO in the third specification for each depending variable, which reduced our sample size due to data availability. We are including a US dummy, indicating whether the companies' headquarters are located in Northern America. Winsorized data series at the 5th and 95th percentile are marked with ^{w}. Significance at the 1%, 5%, and 10% are represented by ***, **, and * respectively, standard errors are presented in parentheses.

	Log(Sales Growth) (Y-1,Y+3)			EBITDA/ Sales change (Y-1,Y+3)			EBITDA/ Tot Assets change (Y-1,Y+3)		
Control Variable	Specification 1	Specification 2	Specification 3	Specification 1	Specification 2	Specification 3	Specification 1	Specification 2	Specification 3
Constant	0,3434 ***	0,2684 ***	0,7396 ***	-0,0047	0,0146	-0,0020	0,0150	0,0339 ***	0,0619 *
	(0,079)	(0,081)	(0,182)	(0,011)	(0,011)	(0,026)	(0,015)	(0,013)	(0,033)
SBO Dummy	-0,2367 ***	-0,1773 **	-0,2028 **	-0,0113	-0,0085	-0,0058	-0,0420 ***	-0,0240 *	-0,0349 **
	(0,079)	(0,079)	(0,089)	(0,012)	(0,011)	(0,012)	(0,016)	(0,013)	(0,015)
Log(Sales Growth)^w (Y-1)		0,5247 ***	0,3102 **		0,0353 **	0,0141		0,0059	-0,0338
		(0,105)	(0,133)		(0,015)	(0,019)		(0,017)	(0,024)
EBITDA/Sales^w (Y-1)		0,0419	0,4215		-0,3356 ***	-0,2279 ***		-0,0461	-0,0160
		(0,256)	(0,318)		(0,036)	(0,045)		(0,041)	(0,056)
EBITDA/Tot Assets^w (Y-1)		-0,5016 *	-0,5920 *		-0,0804 **	-0,0588		-0,6028 ***	-0,5693 ***
		(0,279)	(0,324)		(0,039)	(0,045)		(0,044)	(0,057)
Log(Tot Assets)			-0,0758 ***			0,0022			-0,0019
			(0,024)			(0,003)			(0,004)
Log(Holding Period)			-0,0364			-0,0022			-0,0040
			(0,050)			(0,007)			(0,009)
US Company Fixed Effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
Observations	347	347	254	343	343	250	343	343	250
R Squared (standard OLS)	0,09	0,13	0,11	0,01	0,26	0,16	0,03	0,39	0,34
F-stat (standard OLS)	16,35	13,07	4,20	1,19	29,93	6,58	4,47	53,17	17,75
p-value (standard OLS)	0,00	0,00	0,00	0,30	0,00	0,00	0,01	0,00	0,00

Table IX: Robust multivariate regression to evaluate the effect of market conditions on operational performance of SBOs and RLBOs

This table reports the result of a robust regression (Tukey bisqaure tuning) estimation of three different depending variables (Log(Sales growth) (Y_{-1},Y_{+3}), change in EBITDA/Sales (Y_{-1},Y_{+3}), change in EBITDA/Total Assets (Y_{-1},Y_{+3}) on a SBO dummy variable (indicating whether the transaction is a SBO=1 or a RLBO=0) and different control variables, which we introduced in Table VIII. We included a variable to proxy for the state of debt markets, represented by the credit spread of high yield debt over LIBOR and a variable to proxy for the state of equity markets, represented by the number of IPOs in a given quarter. The interaction variables of Credit spread/IPO market with the SBO dummy indicates the level dependent effect of Credit spread/IPO market on SBOs compared to RLBOs. On Specification 6 exclusively, we introduce a year fixed-effect to take into consideration when the transaction occurred. Winsorized data series at the 5th and 95th percentile are marked with [w]. Significance at the 1%, 5%, and 10% are represented by ***, **, and * respectively, standard errors are presented in parentheses.

	Log(Sales Growth) (Y-1,Y+3)			EBITDA/ Sales change (Y-1,Y+3)			EBITDA/ Tot Assets change (Y-1,Y+3)		
Control Variable	Specification 4	Specification 5	Specification 6	Specification 4	Specification 5	Specification 6	Specification 4	Specification 5	Specification 6
Constant	0,9086 ***	0,8954 ***	0,6658 ***	0,0105	0,0224	-0,0024	0,0291	0,0400	0,0066
	(0,144)	(0,149)	(0,237)	(0,021)	(0,022)	(0,036)	(0,024)	(0,025)	(0,040)
SBO Dummy	-0,2482 ***	-0,2494 ***	-0,2630 ***	-0,0080	-0,0101	-0,0222 *	-0,0234 *	-0,0261 **	-0,0343 **
	(0,078)	(0,079)	(0,084)	(0,011)	(0,012)	(0,013)	(0,013)	(0,013)	(0,014)
Log(Sales Growth)[w] (Y-1)	0,4206 ***	0,4063 ***	0,3556 ***	0,0357 **	0,0348 **	0,0357 **	0,0061	0,0068	0,0082
	(0,102)	(0,104)	(0,109)	(0,015)	(0,015)	(0,017)	(0,017)	(0,017)	(0,018)
EBITDA/Sales[w] (Y-1)	0,3934	0,3372	0,3851	-0,3378 ***	-0,3273 ***	-0,3183 ***	-0,0481	-0,0357	-0,0227
	(0,256)	(0,262)	(0,271)	(0,038)	(0,039)	(0,041)	(0,043)	(0,044)	(0,046)
EBITDA/Tot Assets[w] (Y-1)	-0,9437 ***	-0,9073 ***	-0,9074 ***	-0,0786 *	-0,0903 **	-0,0817 *	-0,5969 ***	-0,6108 ***	-0,6082 ***
	(0,276)	(0,280)	(0,288)	(0,041)	(0,042)	(0,044)	(0,046)	(0,047)	(0,049)
Log(Tot Assets)	-0,1051 ***	-0,1027 ***	-0,1050 ***	0,0007	-0,0010	-0,0002	0,0008	-0,0009	-0,0008
	(0,020)	(0,021)	(0,022)	(0,003)	(0,003)	(0,003)	(0,003)	(0,004)	(0,004)
Credit Spread[c]		-0,0118	0,0249		0,0025	0,0100 ***		0,0015	0,0061
		(0,015)	(0,025)		(0,002)	(0,004)		(0,003)	(0,004)
Credit Spread[c] * SBO Dummy		0,0088	0,0130		-0,0080 **	-0,0111 ***		-0,0042	-0,0085 *
		(0,023)	(0,026)		(0,003)	(0,004)		(0,004)	(0,004)
IPO Market[c]		0,0000	-0,0037		0,0002	0,0000		-0,0003	-0,0006
		(0,001)	(0,002)		(0,000)	(0,000)		(0,000)	(0,000)
IPO Market[c] * SBO Dummy		0,0012	0,0029		-0,0004	-0,0002		0,0010 **	0,0012 **
		(0,002)	(0,003)		(0,000)	(0,000)		(0,000)	(0,000)
US Company Fixed Effect	Included	Included	Included	Included	Included	Included	Included	Included	Included
Year Fixed Effect	Not Included	Not Included	Included	Not Included	Not Included	Included	Not Included	Not Included	Included
Observations	347	347	347	343	343	343	343	343	343
R Squared (standard OLS)	0,20	0,21	0,23	0,26	0,27	0,32	0,39	0,41	0,43
F-stat (standard OLS)	14,44	8,67	4,29	19,98	12,50	6,39	35,98	22,60	10,62
p-value (standard OLS)	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

Table X(a): Robust multivariate regression to evaluate the *"advantage-to-specialization hypothesis"*

This table reports the result of a robust regression (Tukey bisqaure tuning) estimation of three different depending variables (Log(Sales growth) (Y_{-1},Y_{+3}), change in EBITDA/Sales (Y_{-1},Y_{+3}), change in EBITDA/Total Assets (Y_{-1},Y_{+3}) on different control variables, which we introduced in Table VIII. Additionally, we added a control variable for credit conditions, as we found a significant effect of credit spreads on operational performance, as reported in Table IX. In order to validate our hypothesis we included a variable called "PE Nb. Deals Last 5Y", which proxies for the level of deal activity of a GP during the last 5 years and additionally one specialization dummy-variable for country specialist GPs. Winsorized data series at the 5th and 95th percentile are marked with ^{w} and variables marked with ^{c} are centered around their mean. Significance at the 1%, 5%, and 10% are represented by ***, **, and * respectively, standard errors are presented in parentheses.

	Log(Sales Growth) (Y-1,Y+3)		EBITDA/ Sales change (Y-1,Y+3)		EBITDA/ Tot Assets change (Y-1,Y+3)	
Control Variable	Specification 7	Specification 8	Specification 7	Specification 8	Specification 7	Specification 8
Constant	0,5491 **	0,5432 **	-0,0148	-0,0127	0,0502	0,0505
	(0,220)	(0,221)	(0,029)	(0,028)	(0,038)	(0,037)
Log(Sales Growth)^{w} (Y-1)	-0,2818	-0,2556	0,0004	-0,0025	-0,0442	-0,0426
	(0,232)	(0,234)	(0,031)	(0,030)	(0,039)	(0,039)
EBITDA/Sales^{w} (Y-1)	0,0211	0,0511	-0,1584 **	-0,1697 **	-0,0726	-0,0797
	(0,536)	(0,544)	(0,071)	(0,069)	(0,091)	(0,091)
EBITDA/Tot Assets^{w} (Y-1)	-0,4220	-0,5275	-0,0711	-0,0800	-0,4980 ***	-0,5147 ***
	(0,475)	(0,502)	(0,062)	(0,063)	(0,080)	(0,083)
Log(Tot Assets)	-0,0706 *	-0,0707 *	0,0027	0,0026	-0,0076	-0,0075
	(0,040)	(0,040)	(0,005)	(0,005)	(0,007)	(0,007)
Credit Spread^{c}	-0,0041	-0,0067	-0,0041 *	-0,0047 **	-0,0061 **	-0,0066 **
	(0,017)	(0,018)	(0,002)	(0,002)	(0,003)	(0,003)
PE Country Spec. Dummy	-0,0540	-0,0981	0,0059	-0,0270 *	-0,0008	-0,0383 *
	(0,095)	(0,131)	(0,012)	(0,016)	(0,016)	(0,021)
Nb Deals (100)(PE) Last 5Y^{cw}		0,0507		0,0041		0,0101
		(0,065)		(0,008)		(0,011)
Count. Spec. Dum * Nb Deals (100) Last 5Y^{cw}		-0,1849		-0,0859 ***		-0,1038 ***
		(0,232)		(0,029)		(0,038)
US Company Fixed Effect	Included	Included	Included	Included	Included	Included
Observations	347	347	343	343	343	343
R Squared (standard OLS)	0,04	0,04	0,14	0,19	0,36	0,39
F-stat (standard OLS)	0,89	0,74	3,15	3,58	11,16	9,74
p-value (standard OLS)	0,52	0,67	0,00	0,00	0,00	0,00

Table X(b): Robust multivariate regression to evaluate the *"advantage-to-specialization hypothesis"*

This table reports the result of a robust regression (Tukey bisqaure tuning) estimation of three different depending variables (Log(Sales growth) (Y_{-1},Y_{+3}), change in EBITDA/Sales (Y_{-1},Y_{+3}), change in EBITDA/Total Assets (Y_{-1},Y_{+3}) on different control variables, which we introduced in Table VIII. Additionally, we added a control variable for credit conditions, as we found a significant effect of credit spreads on operational performance, as reported in Table IX. In order to validate our hypothesis we included a variable called "PE Nb. Deals Last 5Y", which proxies for the level of deal activity of a GP during the last 5 years and additionally one specialization dummy-variable for industry specialist GPs. Winsorized data series at the 5th and 95th percentile are marked with ^{w} and variables marked with ^{c} are centered around their mean. Significance at the 1%, 5%, and 10% are represented by ***, **, and * respectively, standard errors are presented in parentheses.

	Log(Sales Growth) (Y-1,Y+3)		EBITDA/ Sales change (Y-1,Y+3)		EBITDA/ Tot Assets change (Y-1,Y+3)	
Control Variable	Specification 9	Specification 10	Specification 9	Specification 10	Specification 9	Specification 10
Constant	0,5020 **	0,4954 **	-0,0052	-0,0084	0,0522	0,0519
	(0,198)	(0,201)	(0,026)	(0,026)	(0,034)	(0,035)
Log(Sales Growth)^{w} (Y-1)	-0,2442	-0,2412	0,0029	0,0013	-0,0392	-0,0393
	(0,235)	(0,238)	(0,030)	(0,031)	(0,040)	(0,040)
EBITDA/Sales^{w} (Y-1)	0,0526	0,1123	-0,1445 **	-0,1516 **	-0,0577	-0,0556
	(0,546)	(0,554)	(0,070)	(0,071)	(0,092)	(0,094)
EBITDA/Tot Assets^{w} (Y-1)	-0,4544	-0,4982	-0,0842	-0,0677	-0,5138 ***	-0,5088 ***
	(0,490)	(0,509)	(0,062)	(0,065)	(0,082)	(0,086)
Log(Tot Assets)	-0,0651 *	-0,0629	0,0013	0,0018	-0,0078	-0,0078
	(0,038)	(0,038)	(0,005)	(0,005)	(0,006)	(0,006)
Credit Spread^{c}	-0,0050	-0,0038	-0,0042 *	-0,0041 *	-0,0062 **	-0,0062 **
	(0,017)	(0,018)	(0,002)	(0,002)	(0,003)	(0,003)
PE Industry Spec. Dummy	-0,0962	1,0886 *	-0,0208	0,0296	-0,0190	0,0214
	(0,173)	(0,578)	(0,022)	(0,072)	(0,028)	(0,096)
Nb Deals (100)(PE) Last 5Y^{cw}		0,0412		-0,0047		0,0006
		(0,058)		(0,007)		(0,010)
Ind. Spec. Dum * Nb Deals (100) Last 5Y^{cw}		2,0351 *		0,0964		0,0771
		(1,071)		(0,133)		(0,175)
US Company Fixed Effect	Included	Included	Included	Included	Included	Included
Observations	347	347	343	343	343	343
R Squared (standard OLS)	0,04	0,06	0,14	0,15	0,36	0,36
F-stat (standard OLS)	0,86	1,02	3,24	2,60	11,20	8,64
p-value (standard OLS)	0,54	0,43	0,00	0,01	0,00	0,00

Table X(c): Robust multivariate regression to evaluate the *"advantage-to-specialization hypothesis"*

This table reports the result of a robust regression (Tukey bisqaure tuning) estimation of three different depending variables (Log(Sales growth) (Y_{-1},Y_{+3}), change in EBITDA/Sales (Y_{-1},Y_{+3}), change in EBITDA/Total Assets (Y_{-1},Y_{+3}) on different control variables, which we introduced in Table VIII. Additionally, we added a control variable for credit conditions, as we found a significant effect of credit spreads on operational performance, as reported in Table IX. In order to validate our hypothesis we included a variable called "PE Nb. Deals Last 5Y", which proxies for the level of deal activity of a GP during the last 5 years and additionally one specialization dummy-variable for GPs with a global business-model. Winsorized data series at the 5th and 95th percentile are marked with [w] and variables marked with [c] are centered around their mean. Significance at the 1%, 5%, and 10% are represented by ***, **, and * respectively, standard errors are presented in parentheses.

	Log(Sales Growth) (Y-1,Y+3)		EBITDA/ Sales change (Y-1,Y+3)		EBITDA/ Tot Assets change (Y-1,Y+3)	
Control Variable	Specification 11	Specification 12	Specification 11	Specification 12	Specification 11	Specification 12
Constant	0,5478 **	0,5660 **	0,0096	0,0013	0,0632 *	0,0595
	(0,213)	(0,217)	(0,028)	(0,027)	(0,036)	(0,037)
Log(Sales Growth)[w] (Y-1)	-0,2707	-0,2638	-0,0016	-0,0069	-0,0459	-0,0485
	(0,232)	(0,237)	(0,030)	(0,030)	(0,039)	(0,040)
EBITDA/Sales[w] (Y-1)	0,0483	0,1260	-0,1435 **	-0,1644 **	-0,0645	-0,0698
	(0,539)	(0,545)	(0,069)	(0,069)	(0,091)	(0,093)
EBITDA/Tot Assets[w] (Y-1)	-0,4837	-0,5286	-0,0972	-0,0810	-0,5080 ***	-0,5127 ***
	(0,489)	(0,506)	(0,062)	(0,062)	(0,082)	(0,085)
Log(Tot Assets)	-0,0778 *	-0,0771 *	-0,0026	-0,0021	-0,0110	-0,0107
	(0,043)	(0,044)	(0,005)	(0,005)	(0,007)	(0,007)
Credit Spread[c]	-0,0062	-0,0049	-0,0044 **	-0,0048 **	-0,0063 **	-0,0066 **
	(0,018)	(0,018)	(0,002)	(0,002)	(0,003)	(0,003)
Global PE Dummy	0,0732	0,0356	0,0245 *	0,0321 **	0,0202	0,0211
	(0,117)	(0,136)	(0,014)	(0,016)	(0,019)	(0,022)
Nb Deals (100)(PE) Last 5Y[cw]		0,0863		-0,0274 **		-0,0140
		(0,105)		(0,013)		(0,018)
Global PE Dum. * Nb Deals (100) Last 5Y[cw]		-0,0683		0,0250		0,0185
		(0,135)		(0,017)		(0,023)
US Company Fixed Effect	Included	Included	Included	Included	Included	Included
Observations	347	347	343	343	343	343
R Squared (standard OLS)	0,04	0,05	0,15	0,18	0,37	0,37
F-stat (standard OLS)	0,87	0,77	3,54	3,29	11,50	8,93
p-value (standard OLS)	0,53	0,65	0,00	0,00	0,00	0,00

Table XI: Robust multivariate regression to evaluate *"go for broke hypothesis"*

This table reports the result of a robust regression (Tukey bisqaure tuning) estimation of three different depending variables (Sales growth (Y_{-1},Y_{+3}), change in EBITDA/Sales (Y_{-1},Y_{+3}), change in EBITDA/Total Assets (Y_{-1},Y_{+3}) on different control variables, which we introduced in Table VIII. Additionally we added different exogenous variables; i) SBO bought late, a dummy variable equal to 1 when the transaction has been made later than 2.5 years after the fund has been raised, ii) Rel. Investment Size, a continuous variable indicating the relative deal size for a specific buying GP (compared to its average transaction size). Winsorized data series at the 5th and 95th percentile are marked with ^{w} and variables marked with ^{c} are centered around their mean. Significance at the 1%, 5%, and 10% are represented by ***, **, and * respectively, standard errors are presented in parentheses.

	Log(Sales Growth) (Y-1,Y+3)		EBITDA/ Sales change (Y-1,Y+3)		EBITDA/ Tot Assets change (Y-1,Y+3)	
Control Variable	Specification 13	Specification 14	Specification 13	Specification 14	Specification 13	Specification 14
Constant	0,4546 **	0,5071 **	-0,0117	-0,0046	0,0458	0,0537
	(0,201)	(0,208)	(0,026)	(0,027)	(0,034)	(0,036)
Log(Sales Growth)^{w} (Y-1)	-0,2744	-0,2811	-0,0036	-0,0045	-0,0458	-0,0437
	(0,234)	(0,236)	(0,030)	(0,031)	(0,040)	(0,040)
EBITDA/Sales^{w} (Y-1)	-0,0529	-0,1132	-0,1654 **	-0,1743 **	-0,0810	-0,0830
	(0,544)	(0,554)	(0,071)	(0,072)	(0,092)	(0,094)
EBITDA/Tot Assets^{w} (Y-1)	-0,3142	-0,2298	-0,0593	-0,0510	-0,4841 ***	-0,4791 ***
	(0,494)	(0,497)	(0,064)	(0,064)	(0,083)	(0,083)
Log(Tot Assets)	-0,0599	-0,0717 *	0,0019	0,0003	-0,0073	-0,0090
	(0,038)	(0,040)	(0,005)	(0,005)	(0,006)	(0,007)
Credit Spread^{c}	-0,0026	-0,0048	-0,0038 *	-0,0041 *	-0,0058 *	-0,0061 **
	(0,018)	(0,018)	(0,002)	(0,002)	(0,003)	(0,003)
SBO Bought late Dummy	0,0588	0,0800	0,0089	0,0100	0,0082	0,0087
	(0,109)	(0,109)	(0,014)	(0,014)	(0,018)	(0,018)
Rel. Invest. Size^{cw} (1000)		0,9903		0,0512		0,1261
		(1,462)		(0,186)		(0,242)
SBO Bought late Dum. * Rel. Invest. Size^{cw}(1000)		2,4925		0,2564		0,1423
		(2,744)		(0,346)		(0,449)
US Company Fixed Effect	Included	Included	Included	Included	Included	Included
Observations	347	347	343	343	343	343
R Squared (standard OLS)	0,04	0,06	0,14	0,15	0,36	0,36
F-stat (standard OLS)	0,94	1,07	3,23	2,67	11,21	8,66
p-value (standard OLS)	0,48	0,39	0,00	0,01	0,00	0,00

Table XII: SBO and RLBO Pre-Transaction Performance Comparison (Robustness Panel)

This table provides summary statistics for pre-transaction operating performance of companies depending on their exit route (SBO versus RLBO). The table reports median values for companies with continuously available operating performance metrics from 4 years (Y-4) up to 1 year (Y-1) prior to transaction. Growth variables (Sales, EBITDA, EBIT) represent median cumulative and annualized abnormal increase/decrease in the variable from the year of interest up to 1 year prior to transaction (Y-1). Ratios (EBITDA/Sales, EBITDA/Total Assets, EBIT/Sales, EBIT/Total Assets, Net Debt/EBITDA) represent the abnormal operating performance level for the year of interest, profitability ratios 1 year prior to transaction have been added for reference and comparison. We use a Wilcoxon signed-rank test to test for the difference in the location of the median between the reference year (Y-1) and the respective years of interest (Y-2 to Y-4) for a specific type of transaction. We use a two-sample Wilcoxon rank-sum (Mann-Whitney) test for the difference in median between the SBO and RLBO sample for each year of interest. Significance at the 1%, 5%, and 10% are represented by ***, **, and * respectively.

		SBO				RLBO				Diff in Median (SBO-RLBO)		
		Y-1	**Y-2**	**Y-3**	**Y-4**	**Y-1**	**Y-2**	**Y-3**	**Y-4**	**Y-2**	**Y-3**	**Y-4**
Sales Growth (% increase)	Median Cum.		8,89% ***	8,06% ***	13,86% ***		17,21% ***	33,70% ***	54,89% ***	-8,32% ***	-25,64% ***	-41,02% ***
(SBO obs=161, RLBO obs=152)	*Median Ann.*		*8,89%*	*3,95%*	*4,42%*		*17,21%*	*15,63%*	*15,70%*	*-8,32%*	*-13,77%*	*-16,14%*
EBITDA Growth (% increase)	Median Cum.		16,47% ***	20,39% ***	37,18% ***		25,21% ***	37,78% ***	38,72% ***	-8,73%	-17,39%	-1,54%
(SBO obs=147, RLBO obs=157)	*Median Ann.*		*16,47%*	*9,72%*	*11,11%*		*25,21%*	*17,38%*	*11,53%*	*-8,73%*	*-9,11%*	*-0,52%*
EBIT Growth (% increase)	Median Cum.		17,97% ***	29,64% ***	34,58% ***		26,78% ***	29,14% **	51,43% ***	-8,81%	0,51%	-16,85%
(SBO obs=137, RLBO obs=161)	*Median Ann.*		*17,97%*	*13,86%*	*10,41%*		*26,78%*	*13,64%*	*14,83%*	*-8,81%*	*0,25%*	*-5,97%*
EBITDA/Sales	Median	3,38%	2,59% **	2,61% ***	1,84% ***	2,62%	1,28% ***	0,14% ***	-0,39% ***	1,30% ***	2,46% **	2,23% ***
(SBO obs=146, RLBO obs=152)												
EBITDA/Total Assets	Median	6,42%	4,96% ***	3,60% ***	1,74% ***	1,19%	-0,02% ***	1,07%	0,58% *	4,97% ***	2,52% **	1,17% *
(SBO obs=144, RLBO obs=101)												
EBIT/Sales	Median	3,58%	2,55% ***	1,88% ***	1,80% ***	2,38%	0,71% ***	0,03% ***	-0,66% ***	1,84% ***	1,84% ***	2,45% ***
(SBO obs=136, RLBO obs=152)												
EBIT/Total Assets	Median	5,25%	4,32% ***	2,98% ***	1,77% ***	1,67%	0,61% ***	1,04% **	-0,04% ***	3,70% ***	1,94% **	1,81% **
(SBO obs=132, RLBO obs=101)												
Net Debt/EBITDA	Median	292,67%	338,98% ***	298,38%	308,34%	199,00%	263,02% ***	122,08%	177,34%	75,96%	176,30% **	131,00% **
(SBO obs=55, RLBO obs=100)												

Table XIII: SBO and RLBO Post-Transaction Performance Comparison (Robustness Panel)

This table provides summary statistics for post-transaction operating performance of companies depending on their exit route. The table report median values for companies with continuously available operating performance metrics from 1 year (Y-1) prior to transaction up to 3 years (Y+3) after transaction. Growth variables (Sales, EBITDA, EBIT) represent median cumulative and annualized abnormal increase/decrease in the variable from 1 year prior to transaction (Y-1) up to the year of interest (Y+1, Y+2, Y+3). Ratios (EBITDA/Sales, EBITDA/Total Assets, EBIT/Sales, EBIT/Total Assets, Net Debt/EBITDA) represent the abnormal operating performance level for the year of interest, profitability ratios 1 year prior to transaction have been added for reference and comparison. We use a Wilcoxon signed-rank test to test for the difference in the location of the median between the reference year (Y-1) and the respective years of interest (Y+2 to Y+3) for a specific type of transaction. We use a two-sample Wilcoxon rank-sum (Mann-Whitney) test for the difference in median between the SBO and RLBO sample for each year of interest. Significance at the 1%, 5%, and 10% are represented by ***, **, and * respectively.

		SBO				RLBO				Diff in Median (SBO-RLBO)		
		Y-1	**Y+1**	**Y+2**	**Y+3**	**Y-1**	**Y+1**	**Y+2**	**Y+3**	**Y+1**	**Y+2**	**Y+3**
Sales Growth (% increase)	Median Cum.		10,94% ***	11,65% ***	10,50% ***		49,64% ***	68,97% ***	83,28% ***	-38,70% ***	-57,32% ***	-72,77% ***
(SBO obs=248, RLBO obs=350)	*Median Ann.*		*5,33%*	*3,74%*	*2,53%*		*22,33%*	*19,11%*	*16,35%*	*-21,71%*	*-24,71%*	*-27,76%*
EBITDA Growth (% increase)	Median Cum.		6,89% ***	18,55% ***	-3,22%		45,39% ***	41,52% ***	42,03% ***	-38,50% ***	-22,97% ***	-45,26% ***
(SBO obs=217, RLBO obs=350)	*Median Ann.*		*3,39%*	*5,84%*	*-0,82%*		*20,58%*	*12,27%*	*9,17%*	*-21,58%*	*-8,33%*	*-13,98%*
EBIT Growth (% increase)	Median Cum.		0,88%	12,16% **	6,52%		51,37% ***	66,92% ***	52,97% ***	-50,49% ***	-54,76% ***	-46,45% ***
(SBO obs=199, RLBO obs=351)	*Median Ann.*		*0,44%*	*3,90%*	*1,59%*		*23,03%*	*18,62%*	*11,21%*	*-29,64%*	*-23,23%*	*-14,46%*
EBITDA/Sales	Median	3,88%	4,38%	3,55%	2,04% ***	2,46%	4,23% ***	2,94% ***	2,05% ***	0,15%	0,60% *	0,00%
(SBO obs=225, RLBO obs=350)												
EBITDA/Total Assets	Median	5,19%	3,85% **	2,97% ***	1,22% ***	1,25%	1,81% ***	0,81% **	0,25%	2,04% ***	2,16% ***	0,97% ***
(SBO obs=219, RLBO obs=347)												
EBIT/Sales	Median	3,78%	3,60%	2,28% **	1,51% ***	1,71%	3,60% ***	2,05% ***	0,78% ***	0,00%	0,24% **	0,73%
(SBO obs=206, RLBO obs=350)												
EBIT/Total Assets	Median	4,70%	2,67% **	1,71% ***	1,26% ***	0,56%	1,51% ***	0,88% **	0,26%	1,17% **	0,83% ***	1,00% **
(SBO obs=200, RLBO obs=347)												
Net Debt/EBITDA	Median	306,39%	425,63% ***	426,31% ***	405,30% ***	111,49%	50,91% ***	81,83% ***	58,50% ***	374,72% ***	344,48% ***	346,79% ***
(SBO obs=51, RLBO obs=348)												

11. FIGURES

Figure I: Boxplot of dependent variables before and after winsorizing for the diagnostic standard OLS specification

The upper graphs report the boxplot of the dependent variables before winsorizing. The lower graphs report the same variables after winsorizing data points below the 5th percentile and above the 95th percentile. The top and bottom edges of the box, report the 25th and 75th percentiles respectively. The line inside the box represents the median. The end of the whiskers represent the most extreme data point not considered as an outlier by Matlab®, while outliers are plotted individually outside the whiskers.

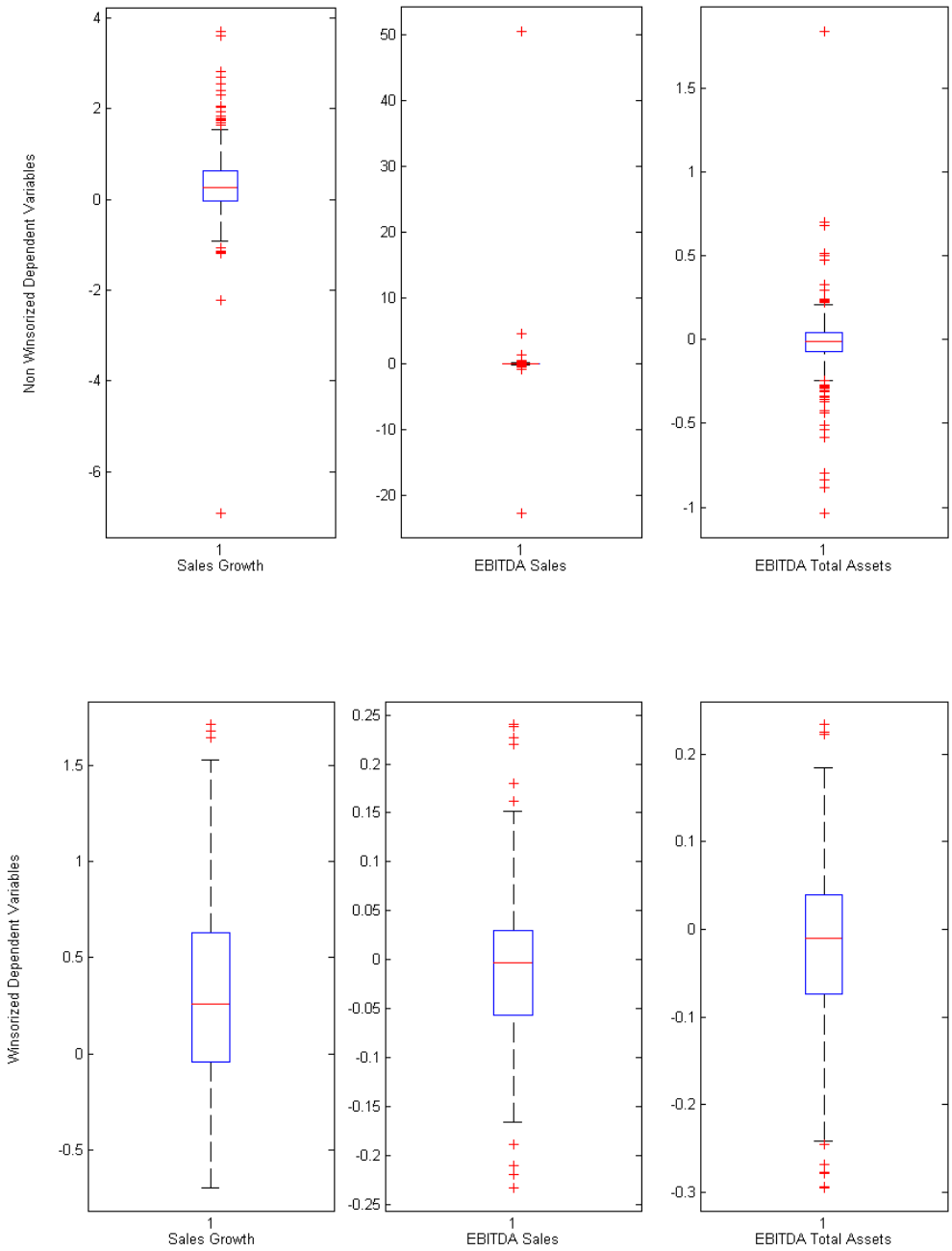


Figure II: Boxplot of the main control variables before and after winsorizing for the diagnostic standard OLS specification

The upper graphs report the boxplot of the main control variables before winsorizing. The lower graphs report the same variables after winsorizing data points below the 5th percentile and above the 95th percentile. The top and bottom edges of the box, report the 25th and 75th percentiles respectively. The line inside the box represents the median. The end of the whiskers represent the most extreme data point not considered as an outlier by Matlab®, while outliers are plotted individually outside the whiskers.

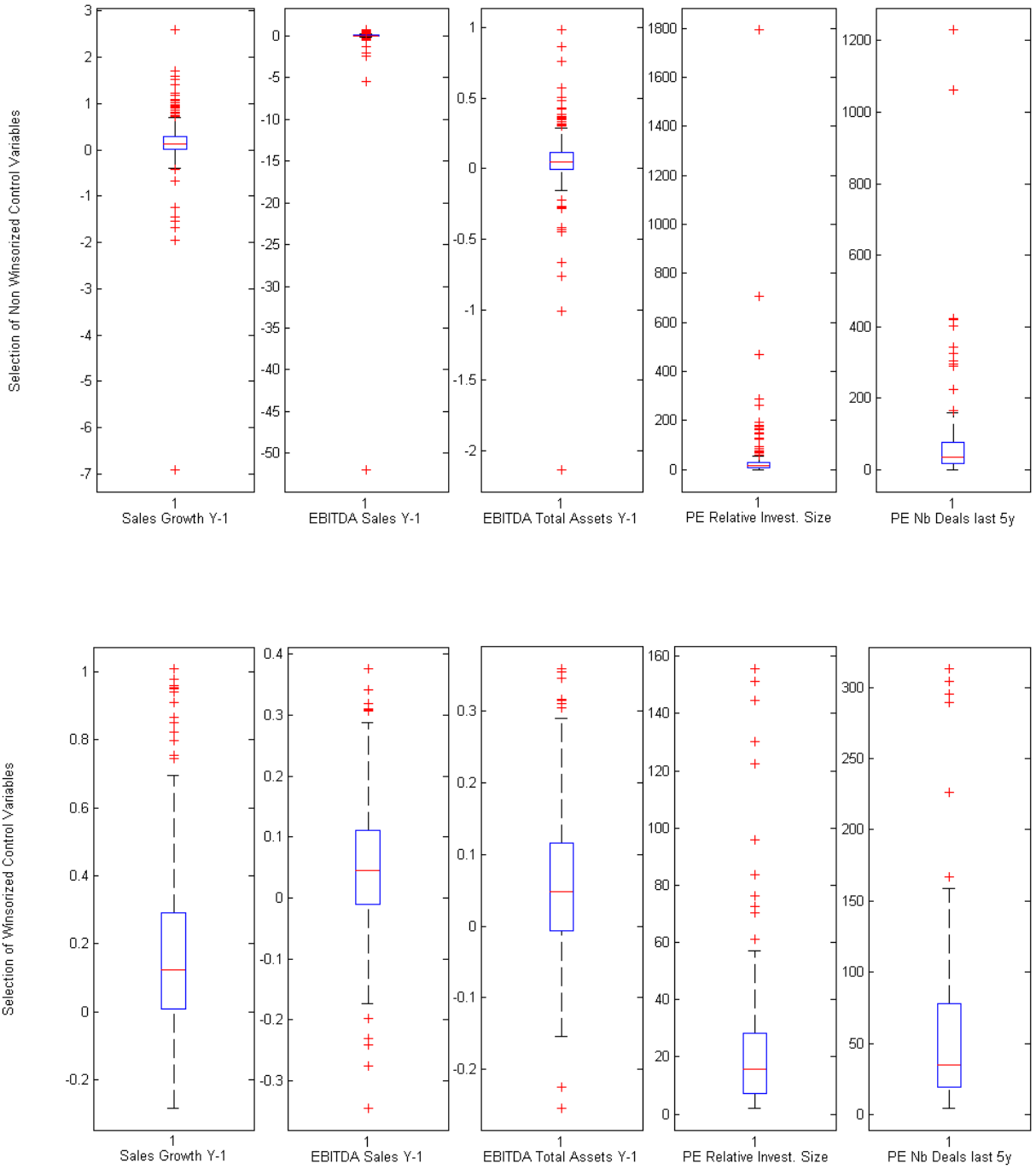


Figure III: Plot of Cook's distance and residuals for the diagnostic standard OLS specification (1/2)

The upper part of the figure provides the Cook's Distance of each data point in our sample. The Cook's distance D_i is given by the scaled change in fitted values according to the following formula, where y_j is the overall fitted value, $y_{j\ i}$ is the fitted value excluding observation *i*, and *pMSE* is the multiplication of the number of coefficients in the model with the Mean Square Error.

$$D_i = \frac{\sum_{j=1}^{n} y_j - y_{j\ i}^{\ 2}}{pMSE},$$

The dotted lines represent 3 times the mean Cook distance value, the threshold above which observations are considered outliers.

The lower part of the figure provides the plot of the residual on the y axis with its corresponding predicted dependent variable on the x axis. Suspicion of heteroskedasticity would result in correlation between dependent variable and residuals hence showing a pattern in the layout of the data points.

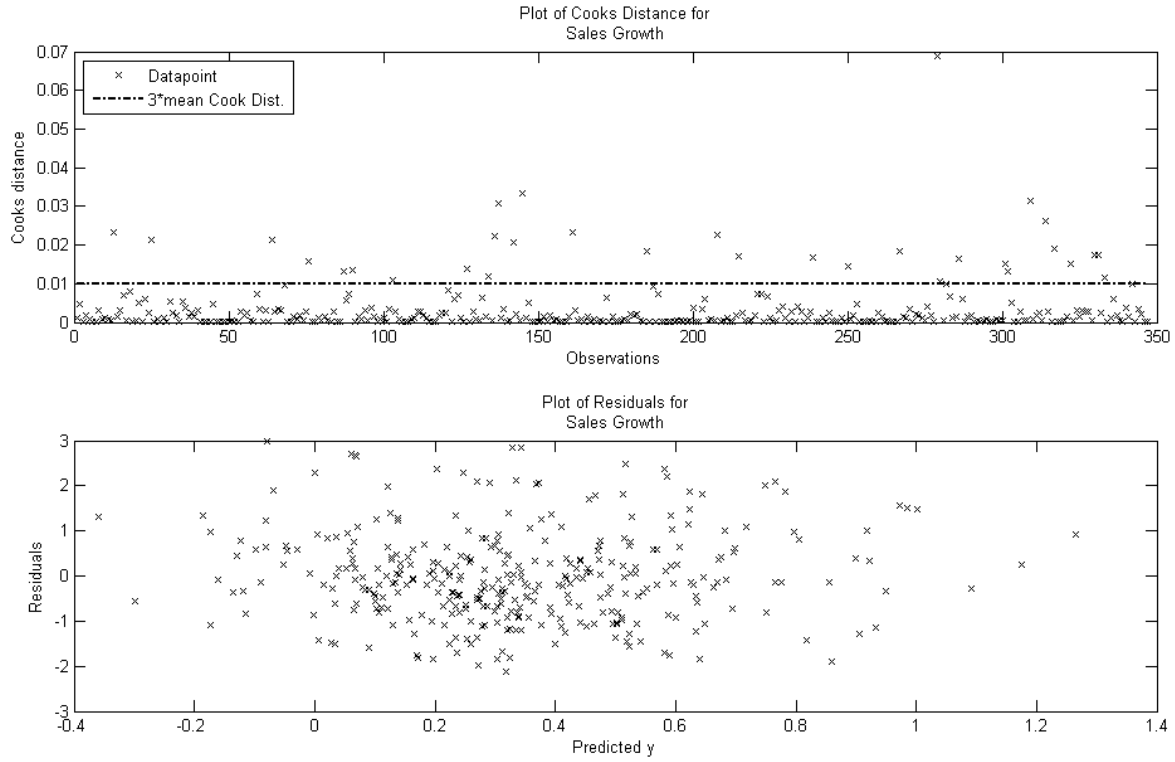
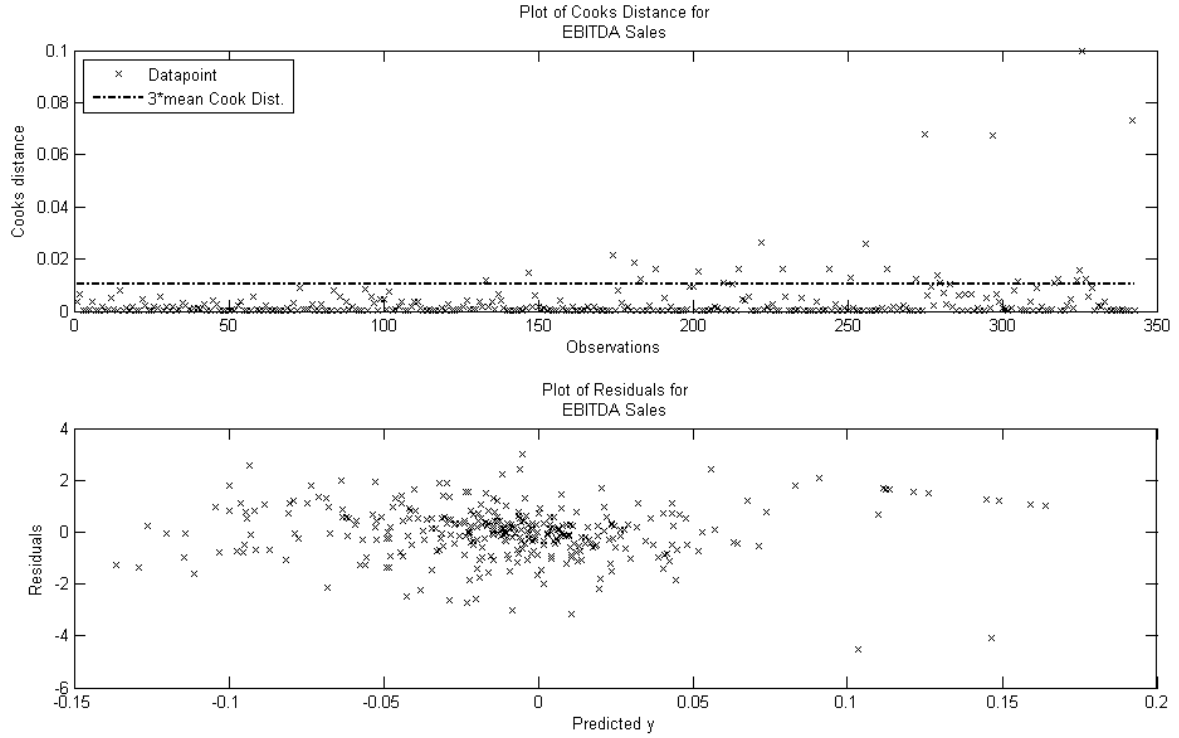


Figure III: Plot of Cook's distance and residuals for the diagnostic standard OLS specification (2/2)



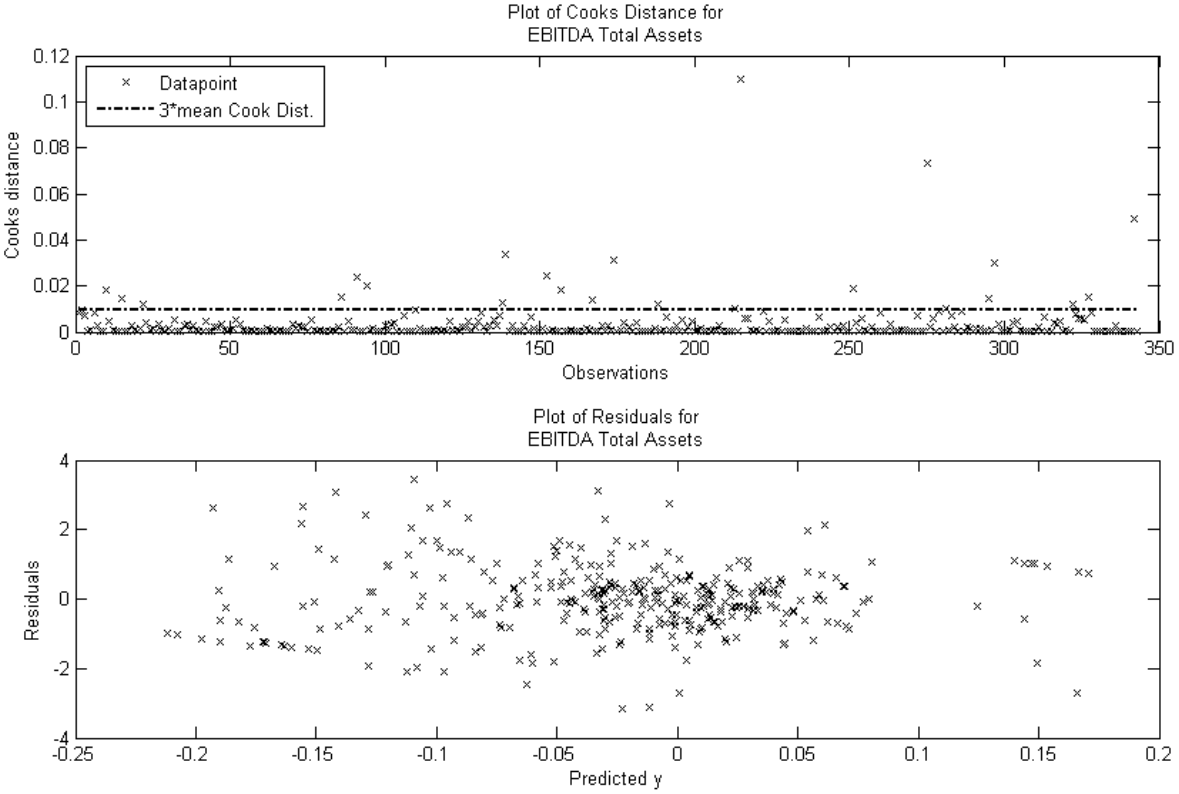


Figure IV: Distributions of residuals for the basic OLS specification

This figure reports the clustered distribution of residuals for the basic OLS specification, in order to facilitate a visual evaluation whether residuals are normally distributed as assume by standard OLS procedure.

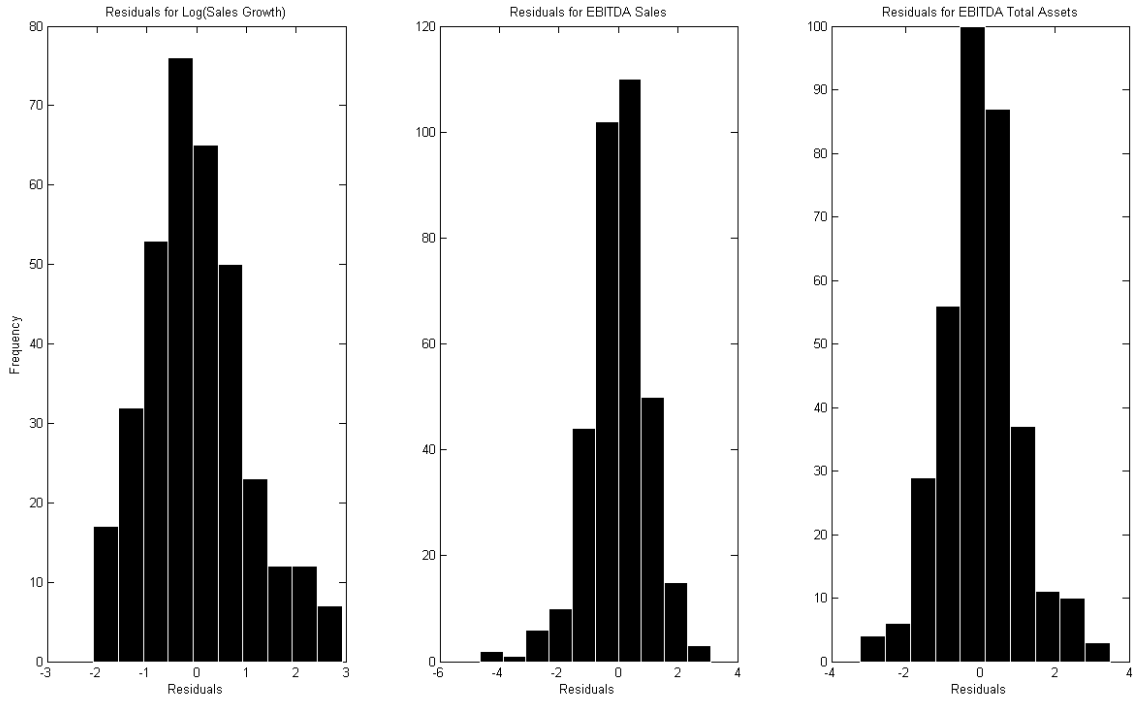


Figure V: Correlation matrix of the main control variables

This table reports the correlation coefficients between our main control variables. A coefficient close to 0 suggests no correlation while a coefficient close to unity in absolute term would show high correlation hence a risk of multicollinearity.

Control variables correlation	Log(Sales Growth) (Y-1)	EBITDA/Sales (Y-1)	EBITDA/Tot Assets (Y-1)	Log(Tot Assets)	Credit Spread	IPO Market
Log(Sales Growth) (Y-1)	1,000	-0,110	-0,009	-0,047	-0,025	0,036
EBITDA/Sales (Y-1)	-0,110	1,000	0,566	0,152	-0,146	0,040
EBITDA/Tot Assets (Y-1)	-0,009	0,566	1,000	-0,161	-0,100	-0,005
Log(Tot Assets)	-0,047	0,152	-0,161	1,000	-0,015	-0,058
Credit Spread	-0,025	-0,146	-0,100	-0,015	1,000	-0,391
IPO Market	0,036	0,040	-0,005	-0,058	-0,391	1,000