# Secondary buyouts and the strategies of PE investors

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**Abstract**

The sale of portfolio companies between private equity firms, Secondary Buyouts (SBOs), has increased dramatically over the last decade. Using a unique hand-collected dataset, this paper sheds further light on the determinants of the performance of this type of investment. We investigate in particular the impact of General Partners (GP) strategies, target firm size and investment style. We distinguish between deals in which the portfolio company is move to larger GPs in terms of target enterprise to deals in which then smaller GP takes over the portfolio company. We show that in particular these latter deals subsequently underperform. Using a sample or realized SBOs in Europe between 2002 and 2012, we find that the underperformance stems from a too high acquisition price and the inability to create additional operational value.

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Private equity has become a common asset class especially among institutional investors such as pension funds and sovereign wealth funds around the world. The market has developed since its significant breakthrough in the 1970s in the United States and in the 1990s in Europe, with over $3 trillion under management today. Subsequently, the private equity market has developed a mature and deep secondary market[3] which enables secondary buyout (SBO) to be transacted among private equity managers (General Partner – GP). The percentage of SBOs, that is when a PE firms exits a portfolio company by selling it to another PE firm, increased sharply in the last decade and accounts for around 40% of global private equity transactions (Strömberg 2008).

The aim of this paper is to shed light on the underlying nature of SBO transactions and study its impact on deal performance and the portfolio company. We differentiate SBOs by GPs most common strategy differentiation, which is the target EV of companies. We categorise GP types into small-, mid-, large- and mega-buyout[4]. Their strategy differs in such that it is common that small buyout GPs to acquire companies from strategic sellers to improve the efficiency of the underlying companies after having been abandoned by the sellers because they are not considered as core businesses by the sellers. The acquirer in this case would improve efficiency and governance and subsequently sell it via SBO. The subsequent buyer of the next larger category would implement further operational improvement such as market expansion. Such deals imply that the buyer has the skill set that the seller does not have. An example of such transaction is when Cinven (mid buyout GP) acquired a healthcare company

[3] Secondary transaction is defined when a private equity company (GP) buys or sells an asset from another private equity company

[4] According to Preqin, small buyout with vintage 1997 – 2004 have EV target up to $300 million, mid buyout target range is $301-$750 million, large buyout's range is $751-2000 million and mega buyout's range is above $2 billion

from Triton (small buyout) in 2007. Subsequently, Cinven expanded the company's market to emerging markets and introduced new products as part of the operational improvement. The investment generated an IRR of 31% for Cinven. On the other hand, large buyout GPs could sell assets to mid-buyout GPs, but the strategies here are less clear[5]. A negative illustration of this type of deal is the acquisition by Equistone (small buyout GP) of an industrial company from Apax (large buyout GP) in 2007. The investment did not turn out as planned and was written off in 2012.

We split SBOs into two groups to reflect the nature of the underlying SBO deals mentioned above. SBO Type I is an SBO deal when the buying GP have a bigger target enterprise value than the selling GP, such as the above illustrated purchase of Cinven from Triton. SBO Type II is an SBO deal when the buying GP have a smaller entreprise value target than the selling GP as illustrated above when Equistone acquired an asset from Apax. We find that there is a significant difference in the performance of the two types of SBO. Type I SBOs overperform significantly, supporting GPs claim that there is still room for GPs to generate an attractive return through operational improvement in SBOs. Moreover, GPs with experience investing into SBOs outperform those GPs who invest rarely into SBOs, indicating that one needs a certain skillset to bring the portfolio company to the next stage of its development. On the other hand, we find that SBO Type II underperform significantly. Several robustness checks, such as computing the SBO Type as a continuous variable or creating SBO Type terciles, yield qualitatively similar returns.

[5] Interviewed GPs investing in such deals claimed that the reason behind such transactions is perhaps the pressure to buy or due to the difference in skill sets between the seller.

In the next step, we investigate potential reasons for this underperformance: overpaying, lack of operational improvements respectively the leverage effect. We show that these type of SBOs fail to generate operational improvement while there is no difference in leverage and pricing attributes between the two groups. Type II deals suffer from a higher distress cost because the leverage level used in such deals is not supported by operational improvements. GPs with experience in SBOs are aware of this situation and do not invest at these price levels. Prior performance of the portfolio company does not affect these finding.

The data used in this analysis is obtained from the private equity portfolio of a mid-sized Dutch pension fund who has been investing in the asset class since 2002. We hand-collect this data from underlying investments in 26 direct funds; there are 389 companies whereby 137 transactions were realised and unrealised SBO (both Type I & II) of investments made prior to 2013.

We add to the literature by looking from a different angle into underlying differences in the nature of SBOs. Prior papers look into the return of SBOs as well as the development of the portfolio company in a SBO. Bonini (2015), Sousa (2010) and Wang (2012)) show that the low hanging fruits have been realised by the first GP owners and document lower operating performance gains of the SBO than the PBO. Degeorge, Martin and Phalippou (2016) report that the average performance of SBOs is worse than PBOs. Consistent with Arcot *et al.* (2015), they document that this underperformance is driven by the 'go for broke' hypothesis (Axelson, Strömberg and Weisbach (2009)). They find that SBOs bought near the end of the investment period of the buying fund underperform significantly due to the buying pressure of the investing fund. On the other hand, do SBO invested in the first years of the fund life perform as good as primary buyouts (PBOs). Consistent with this paper, Degeorge, Martin and Phalippou (2016)

show that a different skill set and specialisation of the GPs help to unlock value creation in SBOs.

## 1. Background

This study aims to shed light on the value drivers in SBOs. In particular, we want to differentiate the impact of the three main value creation drivers: operational improvement, leverage effect and market multiple expansion (EV/EBITDA), also known as pricing as documented by Kaplan and Stromberg (2009).

The first return driver in leveraged buyouts is the operational improvement. Kaplan (1989a) and Guo, Hotchkiss and Song (2011) show that operational improvement is one of the performance drivers in private equity. This finding is confirmed by a research by Capital Dynamics (2014) which shows that 51% of private equity return comes from operational improvement, 18% from pricing and 31% from leverage effect. Operational improvement can be observed in the increase in cash flow; higher sales growth, margin expansion and better capital expenditure and working capital (Kaplan (1989b)) management. The two reasons put forward for the operational improvement are improved incentive alignment and governance, and operational efficiency (Kaplan and Stromberg (2009)). The alignment and governance improvement take place in the form of increased managerial ownership (Leslie and Oyer (2008)) and the higher leverage level to discipline management (Jensen (1989)). Governance improvement is implemented through better reporting and GPs follow the progress of the underlying companies closely (Acharya *et al.* (2013)). Operational efficiency is achieved by the underlying companies through the support of the GPs with relevant operational experience (Sousa (2010)).

The second return driver we investigate is the use of leverage to improve equity return. The higher leverage level increases the equity beta as shown by Modigliani and Miller (1958). Higher leverage also means higher tax shield, which consequently increases the available cash flow to equity holders (Kaplan (1989a)). The higher and earlier cash flow available to equity holders is beneficial for the calculation of IRR due to the time-sensitivity nature of the return-calculation method.

The third return driver we measure is the pricing skill of the GPs. This is the skill that the GPs have in terms of selecting the right market, time and sector on top of the negotiation skill (Achleitner, Braun and Engel (2011)). This skill is typically called 'buy low, sell high' and plays an important role in determining the equity return (Wang (2012)).

This paper is the first effort in the literature to document the effects of the three drivers on the two types of SBO. We built on the hypotheses used by Achleitner and Figge (2014) and Degeorge, Martin and Phalippou (2016) for this study in order to set the framework of the empirical analyses to compare the performance difference between the two types of SBO and differences in the performance drivers.

Previous studies have considered a SBO as one category. We see a stark increase percentage of exits of SBOs of up to 40% as shown Figure 1.

Figure 1

This increase allows us to investigate a more nuanced view on SBOs in this study. SBO Type I may benefit from the hypothesis of 'reduced risk' as presented in the research of Achleitner and Figge (2014) and that is the reason why GPs engage in such deals. The previous GPs have put in place better governance and process that are suitable for private equity

investments (Bonini (2015), Manchot (2010)). The buying GPs could focus directly on either organic or inorganic growth. Organic growth means that a company increases its efficiency or gain bigger market share through better utilisation of its existing assets. Inorganic growth means that a company grows its market reach or share through buy-and-build strategy. Organic growth leads to margin expansion while inorganic growth leads to size growth but does not necessarily lead to margin expansion. Thus, the 'reduced risk' hypothesis argues that there is room for operational improvement as one of the performance drivers for SBO Type I.

The second theory we test is the presence of 'forced seller'. This condition is applicable to both types of SBO. Forced sellers (GPs) have the pressure to exit their investments before realising the full operational potential of the investments and put them in a weaker negotiation position. The reason for GPs to be forced sellers could be rooted from the typical fund structure and fund raising cycle. A typical private equity fund has a lifetime of ten years with a possibility to extend for a few years. Consequently, the average holding period of private equity funds is around 4 years (Strömberg (2008). Thus, GPs might be pressured to sell their investments due to the holding period and lifetime constraints. Additionally, GPs might be in position of forced seller because they need to realise investments to generate track record for the purpose of fund raising. GPs start fund raising for new funds towards the end of the current fund's investment period or when the current fund has invested 75% of its commitment[6]. The need to generate track record regardless whether they have fully realised all return drivers come from the fact that investors (LPs – limited partners) place a high significance on GPs' track record during their due diligence, especially the track record on realised investments. Given the illiquid nature of private equity, LPs pay a close attention to realised investments of GPs because they show

[6] Observed from PPMs of the Funds' data used in this research

the GPs ability to exit investments. An anecdotal saying in the market is that it is easier to buy than to sell. Thus, the presence of forced seller situation means that SBO do not necessarily mean they are bad deals because the sellers exit their investments pre-maturely which means the buyers can still generate attractive returns through the operational improvement and pricing skill. Both types of SBO are exposed to the same constraints and hence both types of SBO benefit from this situation. The results from prior literature is ambiguous so far with Arcot *et al.* (2015) show the negative impact on SBOs and Degeorge, Martin and Phalippou (2016) finding no impact on performance.

Skill-set or what is hypothesised as 'smart money' by Achleitner, Braun and Engel (2011) argues that GPs have different skill set. The skill-set can differ in terms of network, strategy (e.g. buy & build, asset stripping, etc.), target size, geographic reach and industry specific knowledge. Jensen (1989) wrote in his research paper that each GP represent the best owner for a company in the different stages of its development. Every GP involved in SBO can be assumed to have something unique that is suitable for the corresponding stage of the firm and hence the 'smart money' hypothesis is assumed to have a positive impact on operational improvement while holding other factors constant. The benefit of 'smart money' is applicable to both types of SBO but Jensen's vision is believed to be SBO Type II.

After having discussed the potential return drivers of SBO, we now turn to the possibility for GPs to do bad deals (poor return). Private equity funds have an investment period of 5 years and this constraint can pressurise GPs to invest and make them into 'forced buyer' (Axelson *et al.* (2013)). The situation of 'forced buyer' situation is further exacerbated by the fact that the management fee calculation is based on commitment during the investment period and invested capital post investment period. Hence, GPs are incentivised to deploy capital in

order to maximise their revenue from management fee instead of carried interest. Metrick and Yasuda (2010) show that the mean of total revenue of GPs is $17.80 per $100 under management; $11.64 comes from fixed revenue and the remaining from variable revenue. As a consequence, 'forced buyer' leads to lower return due to the higher price paid by the buyers. Degeorge, Martin and Phalippou (2016) extends the work Axelson, Strömberg and Weisbach (2009) by analysing the effect of 'forced buyer' when doing SBO. They find that SBO done during the later phase of the investment period underperform SBO investments made in the earlier stage of the investment period. They coin the situation as 'go for broke'. They also find that larger 'go for broke' deals deteriorate returns.

As stated earlier, the reason for SBO Type II is unknown and the two possible reasons could be i) to 'burn capital' or ii) conviction in their own skill set (smart money) especially in operational improvement. SBO Type II does not follow the typical firm's development stage based on their market capitalisation. It is possible that Type II is used to 'burn capital' regardless of the investment period because the GPs focus on deploying capital as quickly as possible in order to raise a successor fund. This is done to maximise the fixed revenue of the GPs. This behaviour was particularly strong in the years leading up to 2008. A report by MacArthur *et al.* (2014) shows that the total capital raised globally in 2008 was 3x larger than in 2003. Consequently, the dry powder piled up and it was 2.6x bigger than in 2003. The situation combined with the importance of fixed revenue over variable revenue and ease of doing SBO[7] could be reasonably used for the argument that GPs might 'burn capital' regardless of the stage of their investment period. Thus, the typical SBO Type II would be bigger in EV

[7] SBO is more efficient to transact because they are already structured for private equity investments compared to PBO

or equity investment because of the pressure to deploy capital and the focus of the investment is less on generating return as reasoned by Axelson, Strömberg and Weisbach (2009).

Table 1

Table 1.1 shows the frequency of SBO Type I & II relative to the deal sample data (including PBO). It shows that SBO Type I decreases from 2005-2009 when the pressure to invest was high. On the other hand, the share of SBO Type II increased steadily during the period from 4.3% in 2004 to 19.1% in 2008. SBO Type II deals happened more frequently than Type I during the last two years prior to the collapse of Lehman Brother while usually it was less frequent than Type I (2005-2006). Table 1.2 shows that the average equity deviation of SBO Type I is 0.96 compared to 1.16 of Type II. This shows that Type II deals have an average equity size that is larger than the average equity investment size of the corresponding fund as can be seen in table 4.2. The average EV deviation of Type I is 0.74 for Type I and 1.46 for Type II. Type II deals typically have a larger EV compared to the average EV of the corresponding fund. Last but not least, the pressure to invest could be observed from the sample data used in this research. On average, the last investment made by the Funds was 11 months before the end of their respective investment period. They also reached 75% of invested capital level 27 months prior to the end of their respective investment period.

Therefore, this research classifies deals where GPs with smaller acquisition EV target bought from GPs with bigger acquisition EV target as SBO Type II as an avenue to ‘burn capital’ as the characteristics of this type of deals are consistent with the characteristics found by Degeorge, Martin and Phalippou (2016) and on deals that are used to ‘go for broke’.

The other possible reason for Type II deal is that the buying GPs overestimate their own skill set (smart money). Based on several discussions with the practitioners of buying GPs of Type II, GPs claimed that they have the unique skill set to make the deals successful through operational improvement. We test this claim by investigating if we see significant operational improvement of Type II deals.

## 2. Methodology

The research adopts an empirical research to analyse whether the performance of SBO Type I differs significantly from SBO Type II and further analyse the drivers behind the performance. The method used in this research is mainly based on the approach used by Achleitner and Figge (2014). They compare SBOs against PBOs while this paper highlights the heterogeneity of SBOs and compares two types of SBO.

Type I is consistent with the hypothesis of 'reduced risk' and it is believed to be the vision of Jensen (1989). SBO Type I follows the natural progression of a company's development and each GP is the suitable owner for its corresponding development stage.

'Forced buyer' situation is believed to take place across all deal types within leveraged buyout as all GPs are exposed to the same constraint. GPs can 'go for broke' to deploy capital as quickly as possible so that they could raise the successor fund quickly to maximise their fixed revenue (management fee). One of the characteristics of 'going for broke' deals is that the deal size is bigger than the average investment size in order to burn capital. Therefore, the before-mentioned characteristics of 'go for broke' as found by Degeorge, Martin and Phalippou (2016) is used to categorise SBO deals into SBO Type II as mentioned in the previous chapter.

The data collected and used in the research is compiled from the private equity portfolio of a mid-sized Dutch pension fund that has been investing in the asset class since 2002. The investment focus of the portfolio is the European mid-buyout market. The data contains financial measures of the underlying data such as Economic Value (EV), EBITDA and Net Debt at entry and at exit on investments made up until December 2012, and the corresponding equity performance of the investment at exit or as of December 2013. We gathered qualitative data to determine to the type of SBO by compiling the information of the previous owner of the assets. Ex-ante information of GPs such as target EV of the GPs in the portfolio was compiled as well as the previous owner[8] of the underlying assets in order to determine whether the transaction is PBO, or SBO Type I or II. In the rare cases, measuring the ex-ante target EV of the GPs was not possible we used the investment strategy statement of the GP or consulted directly with the party involved to determine the type of SBO[9]. The seller's holding period was gathered from information available on the internet such as AltAssets. The data on cost of debt was gathered from the monthly yield of the Credit Suisse European Leveraged Loan index, which is the most used index for leveraged loans. The information was provided by a major player in the leveraged loans market.

The hypotheses used in the research are the following:

Forced Seller: GPs have to sell before realising the three return drivers and hence there is still room for the buyer to generate return through the three drivers

Forced buyer: GPs have to buy assets and will pay more, which leads to lower return

[8] There is no data on how many times the companies have been in the hand of GPs

[9] When the proxy is not available, the author consulted a Fund of Funds portfolio manager to determine whether the SBO is Type I or II based on the portfolio manager's experience

Reduced Risk: the previous GPs have put in the place the suitable governance structure and processes for buyout investors and subsequently the buyer could focus on operational improvement and obtain higher leverage

Smart money: GPs have different skill sets and there is room for operational improvement for the SBO buyer

A summary table of the hypotheses and the expected impacts can be found in the appendix (table 1.3).

The analyses were carried out using robust OLS-regressions on a cross-section data set. The regression models used are:

(1) $IRR_{it} = SBO\ Type\ II\ Dummy_{it} + EV_{it} + Experience_{it} + Cost\ of\ Debt_{it} + Market\ Return_{it} + Investment\ Period_{it} + Seller's\ Holding\ Period_{it} + Interaction_{it} + SBO\ Dummy * Experience_{it} + Entry\ Margin_{it} + Entry\ Margin_{it}^2 + Deal\ Period_{it} + EV\ Tercile_{it} + \alpha_i + u_{it}$

(2) $Multiple_{it} = SBO\ Type\ II\ Dummy_{it} + EV_{it} + Experience_{it} + Cost\ of\ Debt_{it} + Market\ Return_{it} + Investment\ Period_{it} + Seller's\ Holding\ Period_{it} + Interaction_{it} + SBO\ Dummy * Experience_{it} + Entry\ Margin_{it} + Entry\ Margin_{it}^2 + Deal\ Period_{it} + EV\ Tercile_{it} + \alpha_i + u_{it}$

(3) $\Delta EBITDA_{it} = SBO\ Type\ II\ Dummy_{it} + EV_{it} + Experience_{it} + Investment\ Period_{it} + Seller's\ Holding\ Period_{it} + Interaction_{it} + SBO\ Dummy * Experience_{it} + Entry\ Margin_{it} + Entry\ Margin_{it}^2 + \alpha_i + u_{it}$

(4) $\Delta EBITDA\ Margin_{it} = SBO\ Type\ II\ Dummy_{it} + EV_{it} + Experience_{it} + Investment\ Period_{it} + Seller's\ Holding\ Period_{it} + Interaction_{it} + SBO\ Dummy * Experience_{it} + Entry\ Margin_{it} + Entry\ Margin_{it}^2 + \alpha_i + u_{it}$

$$(5)\ Entry\ Leverage_{it} = SBO\ Type\ II\ Dummy_{it} + EV_{it} + Experience_{it} + Cost\ of\ Debt_{it} + Investment\ Period_{it} + Seller's\ Holding\ Period_{it} + Interaction_{it} + SBO\ Dummy * Experience_{it} + Entry\ Margin_{it} + Entry\ Margin_{it}^2 + \alpha_i + u_{it}$$

$$(6)\ Entry\ Debt/Equity_{it} = SBO\ Type\ II\ Dummy_{it} + EV_{it} + Experience_{it} + Cost\ of\ Debt_{it} + Investment\ Period_{it} + Seller's\ Holding\ Period_{it} + Interaction_{it} + SBO\ Dummy * Experience_{it} + Entry\ Margin_{it} + Entry\ Margin_{it}^2 + \alpha_i + u_{it}$$

$$(7)\ Entry\ \frac{EV}{EBITDA_{it}} = SBO\ Type\ II\ Dummy_{it} + EV_{it} + Experience_{it} + Cost\ of\ Debt_{it} + Forced\ Buyer_{it} + Seller's\ Holding\ Period_{it} + Interaction_{it} + SBO\ Dummy * Experience_{it} + Entry\ Margin_{it} + Entry\ Margin_{it}^2 + Sector\ Multiple_{it} + Entry\ ND/EBITDA_{it} + Deal\ Period_{it} + Equity\ Tercile_{it} + \alpha_i + u_{it}$$

Model 1-2 test whether there is a performance difference between the two types of SBO. The subsequent specifications are used to analyse the three performance drivers of buyout deals to support the findings of specifications 1-2.

The main independent variable is SBO Type II Dummy. It is a dummy variable, which has a value of 0 when the deal is classified as Type I and otherwise has a value of 1 (Type II). The used control parameters are considered based on the reasons mentioned in the previous chapter and above (hypotheses). 'Investment Period', 'Deal Period' and 'Deal period Interaction' are used as control variables to capture the effect of 'forced buyer'. 'Investment Period' is a dummy variable which has a value of 0 if the investment was made in the first half of the investment period otherwise it has a value of 1. Deal Period is a dummy variable of 0 when the deals took place in Q2 and Q3; otherwise it has a value of 1. The reason for this classification is to capture the spill over effect of 'forced buyer' deals in Q4 that could not be completed in time and hence closed in Q1. Equity and EV Tercile is measured by the deviation of the equity and EV size of each deal from the average equity investment size. A deviation up

to 100% is classified as 1, a deviation between 100% and 150% is classified as 2 and value 3 is given to a deviation larger than 150%. EV Terciles are used to analyse whether skill is subject to size (i.e. GPs do not have the skill to manage companies that are beyond their average investment size). Equity Terciles are used to analyse the effect of equity investment size on pricing.

Seller's Holding Period is used as a control variable to better capture the effect of the 'forced seller' hypothesis. 'Interaction' is the interaction variable between the two previously-mentioned variables. 'SBO dummy * Experience' is an interaction variable to capture the effect of experience when doing SBO Type II deals. 'Entry Margin' and its quadratic function are used to control whether there is a diminishing effect of margin on the independent variables. It is also used to observe the presence of diminishing benefit of 'smart money' particularly on skill set.

Variables such as 'cost of debt' and 'sector multiple' are used to control for market condition. Market return is measured by the annualised total return of MSCI Europe over the holding period of the asset. The index was selected as the focus of the portfolio is in Europe. Cost of debt is the yield of Credit Suisse European Leveraged Loans index at the time of entry. This is the closest available proxy to the real cost of debt of buyout transactions compared to other researches as the price also contains the illiquidity premium required by the market to provide debt to buyout assets which are not liquid. Previous researches used proxies such as spread between high yield bonds over Treasury. This proxy would only be suitable when the underlying assets are mostly mega buyout. Those assets are large enough to tap into the high yield market while most of the buyout assets do not have such privilege. Sector multiple is the

EV/EBITDA multiple of the corresponding GICS sector of each asset and observed at entry point.

## 3. Data and descriptives

This chapter describes the data set used in this research and the descriptive statistics is presented. The sample data consists of transactions that took place up until the end of 2012 of realised and unrealised investments made up until December 2012. The equity performance is measured per December 2013. This is done to make sure that the investment has the time to partially realise the improvement plans. This approach is also consistent with the approach used by Bonini (2015). The oldest deal was done in 2003. The compiled data represents investments made by 16 GPs in 25 different funds.

### 3.1.Limitation & Selection Bias

The data used in this research was provided by a mid-sized Dutch pension fund that has been investing in private equity since 2002. The compiled data consists of 389 deals made in 2004 – 2012. 137 deals of the 389 are SBO whereby 84 deals are labelled as SBO Type I and 53 deals are Type II made in 25 different funds by 16 GPs. The 26 represented funds have a diversified strategy which means that the strategy of the Funds is sector- and country-agnostic, and this is a reflection of the strategy of the pension fund. The pension fund does not invest in sector-specific fund. The data used in this research is limited but it has representations from all quartiles in terms of performance which gives sufficient comfort that the dataset fairly represents the population.

The dataset does suffer from selection bias. The pension fund invests only in GPs with proven track records. However, the selection bias in the dataset works against finding a poor

performance for SBO Type 2 as these tend to perform better than funds initiated the first time Kaplan and Schoar (2005).

### 3.2. Correlation

The independent variables are not highly correlated with the independent variables as can be seen from table 2 in the appendix. The highest observed correlation is 0.55 between IRR and Delta EBITDA which is consistent with the findings of previous studies that operational improvement is the key return driver of private equity. The correlation between Entry EV/EBITDA and Entry ND/EBITDA is 0.52. The high correlation is a possible sign of endogeneity problem between the two factors. A DWH (Durbin-Wu-Hausman) test is carried out on model 7.

Table 2

We see several surprising observations from the correlation table. The correlation between cost of debt and entry ND/EBITDA is 0.32. It is thought to be higher as cheap debt commonly leads to higher leverage level. Entry margin and delta margin has a correlation of -0.7292. It is expected that higher entry margin has less room for further improvement but the magnitude of the correlation is much higher than expected. The last interesting observation is the correlation of -0.2618 between experience and cost of debt. Anecdotally, a lot of GPs claim that they have dedicated experienced debt team which would enable them to obtain the best debt term for the investments. The claim seems to be true based on this simple correlation analysis; experienced GPs can get cheaper debt.

### 3.3.Data description: PBO vs. SBO

Table 3

Table 3 shows the financial characteristics of PBO and SBO to provide a more complete picture before moving on to the descriptive statistics between the two types of SBO. The table confirms the finding of previous studies. This dataset shows that the average performance of PBO is 21% better than SBO, but the deviation of PBO IRR is almost 3x higher than SBO. However, the median performance of PBO is slightly lower than SBO. The high variation in PBO performance compared to SBO is to be expected because SBO performance distribution is expected to centre around the mean due to 'risk reduction'. On the other hand, the 'home run' deals are expected to take place much more often within PBO because the first owners reap most of the low hanging fruits as hypothesised as market wisdom (Achleitner, 2011). When the performance distribution of both types is normalised by removing IRRs above 99$^{th}$ percentile, the median performance of PBO is lower than SBO and has a lower standard deviation. The average performance of PBO is 10% higher than SBO but the median IRR of PBO is 1% lower than SBO. The standard deviation of PBO IRR is 0.498 while SBO is 0.547. This is the proof that the higher SD of PBO performance is due to the presence of 'home runs' and the presence of it is weaker in SBO.

Figure 2

Figure 2 shows the performance distribution of PBO and SBO. There are 5 deals out of 249 that have IRR above 200% which caused the highly positive skewness. The performance distribution of SBO is centred around zero compared to PBO and the probability of write off is also slightly higher, consistent with prior literature (Degeorge, Martin and Phalippou (2016)). The histogram of SBO Type I and Type II shows that the inferior performance of SBO is mainly caused by SBO Type II. The density of write off (-1) of Type II is higher than 0.6 while Type I's is around 0.3 which is lower than PBO. Type I performance distribution also shows a

positive skewness compared to Type II however the skewness of Type I is less positive than the skewness of PBO performance distribution.

Moving on to the other financial parameters in Table 3, the average Multiple of SBO is lower than PBO. The average entry margin of PBO is higher than SBO but the median is lower. The average delta margin of PBO is 4.7% while it is -1.4% for SBO. The average entry EV of PBO is significantly higher than the entry EV of SBO but the median measurement of both types do not differ significantly. The average entry multiple paid by PBO is slightly higher than SBO (9.64 vs. 9.02) but the median shows that SBO paid a higher entry multiple of 0.6x higher than PBO. The average entry leverage (ND/EBITDA) of PBO is significantly higher than SBO (3.8 vs. 0.83) but the median shows that the entry leverage of SBO is higher than PBO. The average and median entry gearing (Debt/Equity) of PBO is lower than SBO. The average entry gearing of PBO is 3.05 while SBO is 3.5. This is consistent with the hypothesis of 'risk reduction' which states that SBO deals able to obtain higher leverage.

### 3.4. SBO Type I vs. Type II

Table 4

The key financial metrics mentioned in the previous page are broken down in Table 4 into the respective type of SBO and compared. Table 4 shows that there is a significant difference in terms of performance between the two types of SBO. The mean IRR of SBO Type I is 10.2% while the average IRR of SBO Type II is -11.6%. The negative average of Type II despite similar return deviation with Type I is due to the more frequent write-off taking place in Type II. The statistical significance of the difference between the two types is less evident in terms of money multiple. The standard deviation of IRR of SBO Type I is comparable to

Type II. This finding supports the reduced risk theory and consequently the return distribution is rather concentrated around the mean. The seller's holding period does not show a significant mean difference between the two groups which might indicate that the presence of forced seller plays a less significant a role in the return of the SBO buyers.

Moving on to the financial matrices of the underlying companies at entry, the entry EBITDA margin average of SBO Type I is lower than Type 2 but the difference is not significant. The delta margin, measured by the difference between exit and entry margin, shows no significant difference between the two groups but it is interesting to notice that the mean and median of delta margin of SBO Type 2 is negative. This means that the average SBO Type II do not show operational improvement which shows the overconfidence of 'smart money' by GPs who did Type II deals.

The entry EV of SBO Type II is higher than Type I and the difference is significant which is consistent with the findings of Degeorge, Martin & Phalippou (2016). This is to be expected because SBO Type II deals are usually coming from upper mid-buyout or large buyout GPs which target or have companies that are bigger than the small- or mid-buyout GPs. The price multiple paid on SBO Type II deals is also higher than Type I and the difference is significant. This is an indication that SBO Type II deals are done due to 'forced buyer' situation which leads the buyers to pay more for the asset. The entry leverage measured by Net Debt/EBITDA show no significant difference between the two groups however there is a significant difference between the groups based on the Debt/Equity (gearing) ratio. The average gearing ratio of SBO Type I of 0.51 is significantly lower than 1.142 of Type II. The same goes for the median gearing ratio of the two groups.

## 4. Findings

In this chapter we present the findings of the multivariate analyses. The regression analyses on performance measured by IRR and Multiple will be presented first and followed by regression analyses on the three return drivers. A year fixed-effect is applied to the regression to control for time-effect which is essential given that there is a strong time-effect in this dataset; the time period of the dataset covers both bad and good vintage years. All specifications are heteroskedastic as tested using Modified Wald test. Therefore, the standard error of the regression is calculated using the robust method.

## 4.1. Performance

The performance of the two groups are analysed using a dummy variable while controlling for other factors to observe the effects of the hypotheses.

### 4.1.1. Variables

The model 1 & 2 as described in the Methodology chapter are used to analyse the performance difference between the two groups. The dependent variable is gross IRR and Multiple. They are the common performance measurements used in the market. Gross IRR is a performance measurement based on monthly cash flow before fees and carried interest. Multiple is measured based on proceeds over costs.

The deal-specific control variables used in these models are transaction size, experience of the GP, investment period, seller's holding period and entry margin. The experience of the GP is measured in the number of previous funds managed by the GPs. The market effect is also controlled for by using the variables of cost of debt and market return.

### 4.1.2. Empirical result

Table 5

Table 5 shows the empirical results of the multivariate regression. Specification 1 shows that SBO Type II generates an IRR that is 20.4% lower than Type I. This finding is consistent with the univariate analysis result shown on Table 3. Specification 2 includes the variable of Investment Period. It shows that SBO Type II generates an IRR that is 20.6% lower than the counterpart with a high level of significance while Investment Period as a measure for 'forced buyer' is not significant.

*Specification 3 & 4* include variables to control for deal size and market condition. SBO Type II Dummy shows a weak significance in explaining the difference in performance while Investment Period remains insignificant. Transaction size (EV) has a negative impact on return but it is not statistically significant. Experience and its interaction variable (SBO * experience) is insignificant. Cost of debt has a negative impact on performance but has a weak statistical significance. An increase of 1% in cost of debt decreases the IRR by around 7%. The impact of cost of debt on return in consistent with the findings of Bonini (2015) that buyouts performance is affected by debt availability, however statistically weak in our regression. Market return has no influence on return which is consistent with the reasoning that Private Equity provides portfolio diversification. The proxy for 'forced buyer' (investment period) is consistently insignificant in affecting return but the forced seller proxy (seller's holding period) shows a strong and significant impact. An additional 1% in holding period by the previous owner increases the IRR of the buyer by 28%. This is consistent with the forced seller hypothesis. Last but not least, EBITDA margin is included in the model to analyse whether GPs are overconfident in judging their operational skill set when it comes to improving operations of the underlying companies because companies that have high margin has less room for improvement. *Specification 3* shows that entry margin contributes positively to

performance but it is statistically weak; 10% entry margin would generate 8.7% IRR *ceteris paribus*. Adding a quadratic function to entry margin (spec. 4) shows that the benefit of entry margin diminishes and both variables are statistically significant. This finding could be useful in assessing the claims of mid-buyout GPs that they only buy the leading companies in the sector which is defined by margin most of the times. *Specification 4* includes additional 'forced buyer' control variables. This specification finds that SBO Type II would generate 41.2% less IRR than Type I but has a weak statistical significance. Seller's holding period is again significant as in Spec 3. SBO dummy * experience yields a different result in this specification; an additional fund experience would contribute an additional 7.9% when doing SBO Type II and has a weak statistical significance. The effect of entry margin on IRR is statistically significant at 5% in this specification. An increase in entry margin would boost the IRR by 25.4% but the effect diminishes as shown by the negative coefficient of its quadratic function. The remaining variables show the same effect as in spec 3. The additional 'forced buyer' variables show no impact on IRR. 'Deal period' and its interaction variable with Investment Period (IP * Deal Period) has an impact on IRR of -0.104 and 0.007 respectively but they are statistically insignificant. These results show that the deals done in Q4 do not underperform the deals done in the mid-year. There is also no proof that SBO done in the second-half of investment period and in Q4 underperform. This finding also shows that the leveraged buyout market performance is not impacted by acquisition timing caused by yearly investment target. 'EV Tercile' measures whether the deviation of the EV investment size relative to the corresponding average EV investment size. The variable shows a negative effect of 0.012 on IRR but it is statistically insignificant. This shows that the performance of SBO is not affected by the EV size which is contrary to the belief that it takes a different skill to manage a large company (compared to a smaller company).

Table 6

The regression analysis using Multiple as the independent variable (Table 6) confirms the inferior performance of SBO Type II; spec 3 shows that SBO Type II would generate a multiple that is 1.44 lower than Type I and it is significant at 1% level. Cost of debt has no explanatory power on return multiple. The SBO Dummy * experience variable shows a strong effect on performance. An additional fund experience would increase the return multiple by 0.26. This means that experience helps when it comes to SBO Type II deals. Entry margin has a positive effect on performance as an increase of entry margin would increase performance by 0.24 but it is statistically insignificant. *Spec 4* shows a similar result as spec 3. SBO Type II leads to a multiple that is 1.37 lower than Type I and it is statistically significant. The interaction effect between SBO Type II dummy and experience is positive; an additional experience of 1 previous fund would contribute 0.26 to the multiple when doing SBO Type II. The 'forced buyer' variables and EV Tercile are statistically insignificant. The effect of Entry Margin and its quadratic function is not significant in explaining the return multiple. The coefficients of transaction size (EV), experience and market return are not statistically significant. 'Forced seller' surprisingly has no explanatory effect on return multiple.

It can be concluded that the analyses show that there is a performance difference between the two groups. SBO Type II underperforms Type I based on its effect on IRR and multiple. The smart money hypothesis is applicable in this case as the sellers exercised their skill in maximising return on their investments which is done at the cost of the buyers. The condition of 'forced buyer' is not statistically significant. Experience helps when doing SBO Type II deal. The impact is positive and helps to alleviate the negative effect of SBO Type II. The statistical significance of 'Cost of debt' is weak. This finding is in contrary to the finding

of Bonini (2010). This finding could perhaps be explained by the fact that the observed period has a structural falling cost of debt. Entry margin has a diminishing effect on performance which should be seen as a precaution to investors. Leveraged buyout (not special situation) GPs typically target companies with high margin might just suffer from a winner's curse in the context that companies that are efficient have little room left for further improvement. This is especially true given that experience has no explanatory power in generating performance. These results show that SBO Type II deals which are used to 'burn capital' have a different return than SBO Type I and confirm that SBO deals cannot be treated as one group.

### 4.2.Operational Improvement

The change in EBITDA and EBITDA margin are used as dependent variable and regressed against SBO Dummy and other control variable to analyse whether there is a difference in operational improvement between the two groups.

#### 4.2.1. Variables

The dependent variables used in this case are the delta EBITDA and delta Margin[10]. Delta EBITDA is winsorised at 99$^{th}$ percentile. Delta EBITDA alone is not enough to measure operational improvement because it can easily be achieved through acquisition which will increase the EBITDA while saying nothing about the efficiency of the companies. In other words, the change in EBITDA only measures the inorganic growth of the underlying companies. Company size (EV) is included as a control parameter since bigger and/or more mature companies have less room for growth. Entry margin is included as control parameter

[10] Delta EBITDA is measured by the difference in Exit and Entry EBITDA. Delta Margin is measured by the difference in Exit and Entry EBITDA margin

because companies with poor margin have better potential for margin expansion compared to profitable companies

### 4.2.2. Empirical result

Table 7

Table 7 shows the regression result of delta EBITDA. The regression result shows that SBO Type II shows a lower EBITDA growth of around 80% (*spec 3*) compared to SBO Type I. This shows that SBO Type II acquired companies that have little room for EBITDA growth. This is can be expected because SBO Type II are larger compared to Type I and growth potential becomes smaller as companies become larger. This supported by the effect of size on EBITDA growth. Size has a negative impact on delta EBITDA; a 10% increase in size reduces the growth by 14% (*spec 4*). It is interesting to see that experience plays no role in EBITDA growth. However, the experience interaction variable is significant and positive with a coefficient of 0.19. This means that more experienced GPs could still generate EBITDA growth when doing Type II deals. The effect of forced buyer and seller is very strong and significant on EBITDA growth. It is surprising to see that forced buyer actually have a strong positive impact of 123% growth of EBITDA. The effect of forced seller is obvious; forced sellers have not exhausted all return potential and hence the buyers still have room for operational improvement. An increase of 1% in seller's holding period increases the growth by 0.2%. The interaction variable of forced buyer and seller shows that GPs in 'forced buyer' situation lead to a lower EBITDA growth when the asset has been held for quite some time by the seller. Entry margin has a diminishing effect on growth as can be seen in the quadratic function of margin albeit weak significance.

Table 8

Moving on to EBITDA margin expansion (Table 8), the descriptive statistics shows a tell-tale sign that SBO Type II margin expansion is negative while Type I is slightly positive. It is confirmed by the multivariate regression. Type II deals lead to a 26% lower margin expansion and it is highly significant. Experience is again having no explanatory value but its interaction parameter does. An additional experience in terms of number of funds in GPs' track record generates a 6% higher margin expansion. Forced buyer as an independent variable has no impact on margin expansion but forced seller variable and the interaction parameter do. An additional year under the holding of the seller increases the potential margin expansion by 8%. A GP in 'forced buyer' mode who bought an asset from forced seller has a positive impact on margin expansion even though the significance of the parameter is weak. This finding is consistent with the above-mentioned finding that the SBO sellers divest their non-star performers and consequently is still room for margin improvement for the buyers.

Last but not least, the impact of entry margin is negative on margin expansion which is consistent with the idea that margin expansion is more difficult for profitable companies. Or in other words, there is no endless potential for margin improvement. Specification 4 shows that entry margin is statistically insignificant but its quadratic variable shows a negative coefficient and significant at 1% level. This shows that the effect of entry margin on margin growth is linear and negative. Therefore, specification 3 is the better model to explain the delta margin effect.

The findings show that there is no evidence of 'smart money' or 'reduced risk' in SBO Type II because SBO Type II has a negative impact on operations. In fact, this finding shows

that SBO Type II shows negative ‘reduced risk’ behaviour driven by the GPs’ overconfidence in their unique skill set (smart money).

## 4.3.Leverage

This section discusses role of leverage in the two groups of SBO.

### 4.3.1. Variables

The independent variables used in this section are the Entry Net Debt/EBITDA and Entry Debt/Equity. Both variables are normalised by using natural logarithm and also winsorised at 99th percentile.

### 4.3.2. Empirical result

Table 9

Table 9 shows the empirical result of the multivariate regression of Entry Net Debt/EBITDA. Initially, SBO Type II deal shows a higher entry leverage level albeit weak significance. The explanatory value of SBO Dummy becomes insignificant once control parameters are introduced to the model. The most important determinant to entry leverage level is transaction size, cost of debt and entry margin. This means that there is no significant difference in entry leverage used by GPs when doing Type I and Type II SBO as also supported by the simple t-test shown in table 4 (descriptive statistics).

A 1% increase in EV leads to 0.93% increase in entry leverage and the relationship is highly significant. This finding is consistent with the finding of Achleitner, Braun and Engel (2011). This research also finds that higher EV leads to a higher entry leverage level because larger firms has a more stable lending base and less information asymmetries through among

other things, better reporting system. This finding is supported by previous studies such as Axelson, Strömberg and Weisbach (2009).

The explanatory power of cost of debt on entry leverage is unexpected. An increase of 1% in cost of debt increases 17% of entry leverage and the significance of the variable is weak while previous studies show a very strong explanatory power. Entry margin has a significant explanatory power on entry leverage; higher margin leads to a higher leverage. This is consistent with the theory that leverage is used as a signalling mechanism[11]. A quadratic variable of entry margin is added in specification 4 and the result shows that entry margin has no impact on entry leverage. This means that specification 3 is the better model.

Table 10

Table 10 shows the regression result entry leverage measured by entry Debt/Equity (entry gearing). Again the result shows a similar pattern as above; there is no significant difference in the ratio between the two groups. EV has a positive effect on entry gearing; a 1% increase in EV increases the entry gearing by 0.3%. Experience is statistically significant in this model which was not in the previous model. An increase in experience would reduce the entry debt/equity ratio by 22.6%. In this model, forced buyer, forced seller and the interaction parameter have strong explanatory powers which do not exist in the previous model. GPs who are pressured to invest use a significantly less gearing (124%). Assets purchased from forced seller also show less gearing. However, GPs going for broke increases the gearing when acquiring asset from forced seller as shown by the coefficient of the interaction variable. The total effect of the three variables is negative which shows that these factors have a negative

[11] Higher leverage is used as a signal mechanism that the buyer has confidence in the success of the investment

impact on entry gearing. This could mean that the acquiring GPs might be aware that the deals are risky and hence do not load up the companies with debt. This behaviour could be seen as a signal (information asymmetry) by the investors. GPs involved in SBO Type II are aware of the increased risk of the deals and hence do not lever the deals as much as Type I given the above-mentioned condition.

It is shown here that there is no difference in the entry leverage level between the two types of SBO. This is consistent with the expectation of the 'risk reduction' hypothesis since both types of SBO have the same characteristic in that the previous owner has reduced the information asymmetry and consequently the new owners could obtain higher leverage (compared to PBO).

## 4.4.Pricing

This section discusses whether there is a pricing difference between the two groups.

### 4.4.1. Variables

The independent variable used in this section is the Entry EV/EBITDA which is the common pricing and valuation parameter used in the private equity space. The independent variable is normalised using natural logarithm and winsorised at $99^{th}$ percentile.

### 4.4.2. Empirical result

Table 11

Table 11 shows the regression result on pricing. SBO Type II Dummy has a positive coefficient albeit a weak statistical significance as can be seen in *spec 4*. The result shows that SBO Type II pays a higher price of 20% relative to Type I. Market parameters such as cost of debt and sector multiple also do not have any influence on pricing. The insignificance of cost

of debt in explaining pricing is surprising given that previous studies find strong relationship between the two variables (e.g. Achleitner, Braun and Engel (2011); Axelson *et al.* (2013)). Experience has no impact on entry pricing but its interaction variable shows a negative effect and statistically significant. A 1 additional fund under management would decrease the entry pricing by 5.6% and it is statistically significant at 5%. This is consistent with the effect of the interaction variable on return (IRR & multiple).

Seller's holding period as a proxy of forced seller is insignificant which is surprising. The 'forced seller' hypothesis argues that it should have a positive impact on pricing but this research finds no significance in its positive effect on pricing (cheaper).

The condition of 'forced buyer' does increase pricing by 15.6% (spec 3) but it is only significant at 10% level which is not convincing enough. The effect of investment period is statistically not significant when other control variables are added (spec 4). The effect of transaction size on pricing shows a very strong significance; a 1% increase in EV increases the pricing by 12%. This finding is similar to the small cap premium of Fama & French three-factor model. Entry margin surprisingly shows a negative coefficient of -0.18. A 1% margin increases reduces the entry multiple by 1.7%. This shows that GPs are aware that margin expansion is more difficult with profitable companies and hence do not pay a premium for potential growth. The 'IP * Deal Period' variable shows negative effect on pricing and it is statistically significant at 10%. The coefficient shows that a GP would pay 22% higher entry price when it finds itself in a 'forced buyer' and 'going for broke' situation. Equity Tercile has a negative coefficient which means that GPs would pay a lower price when they are trying to 'burn capital'. A tercile higher would reduce the entry pricing by 10%. The effect of the variable is not as expected but it is not enough to compensate the higher pricing paid for SBO

Type II based on the effects of SBO Type II Dummy and EV (SBO Type II EV is larger than Type I as can be seen in the descriptive statistics).

*Specification 5* replaces cost of debt with entry leverage to control for the effect of entry leverage on pricing. The specification is based on a standard OLS with year fixed-effect. Tests of endogeneity show that the specification does not show endogeneity problem. A description of the test could be found in the next section. Specification 5 shows similar result as specification 4. The impact of entry EV is smaller; 1% increase in EV increases the pricing by 8.7% instead of 12%. The experience interaction variable (SBO dummy * experience) is insignificant in this specification. The impact of entry margin on pricing is similar to specification 4. Entry leverage does increase pricing. A 1% increase in entry leverage reduces entry pricing by 0.182%. The effect of entry leverage (ND/EBITDA) on pricing is positive but its statistical significance is weak. A 1% increase in entry leverage would increase the pricing by 0.05%. Equity tercile shows a negative coefficient and significant at 10% which means that a bigger equity investment size would decrease the price by 10.5%. This helps to mitigate the size premium effect on pricing. The effect of deal period on entry price is not significant but its interaction variable with investment period is significant at 10%. The coefficient shows that a GP would pay 16.5% higher entry price when it finds itself in a ‘forced buyer’ and ‘going for broke’ situation.

Table 11 shows that the sellers exercise their negotiation and pricing skill by maximising exit prices. It also shows that SBO Type II is used as an avenue to burn capital as it pays a higher entry price mainly due to the size premium. The higher entry price contributes to the lower return generated by SBO Type II.

#### 4.4.3. Endogeneity test

. Achleitner, Braun and Engel (2011); Axelson *et al.* (2013) find endogeneity between leverage and pricing. In this case, specification 3 of table 11 is used to test for endogeneity. The endogenous variable is entry leverage and the instrument is cost of debt. The correlation between the two variables is 0.32 which confirms the relevance of cost of debt as an instrument. Entry leverage (entry ND/EBITDA) is regressed against cost of debt as part of the first stage regression. The result of the regression is that cost of debt has a positive coefficient that is significant at 1% level and a t-test on cost of debt shows an F-value of 7.89. This means that there is no endogeneity problem in specification 5 based on the rule of thumb of $F < 10$ shows that OLS is a better option than 2SLS.

An additional test is done to ensure that there is no endogeneity in the specification by running a regression on specification 5 with an additional variable which is the residual of the first stage regression (Durbin Wu Hausman test). It shows that the residual is insignificant (t-value of -0.46). This confirms that specification 5 has no endogeneity problem and hence OLS is unbiased and efficient.

The absence of endogeneity in specification 5 is rather puzzling given the proven endogeneity between leverage and pricing. However, the test has shown that leverage is an exogenous variable in this dataset.

### 3.1.1. Robustness test

We create two types of SBOs to differentiate between companies which are sold to a GP with a higher (respectevly lower) EV portfolio company target than the buyer, to avoid that results are driven by deals in whichs the GPs have a very similar target EV, we run two additional specifications. As a first robustness test, we compute a continuous variable based on

the difference in target EV portfolio. In a second robustness test, we create terciles, with the middle terciles representing similar target EV sizes and the smallest, resp. largest, tercile representing SBOs Type I, resp. Type II. Results remain qualitatively similar.

A possibility to explain the underperformance of Type II that these portfolio companies are inherent underperformer, and for this reason the larger GP are selling these to GPs seeking on average lower EV companies. To test this hypothesis, we add the return of the seller as a control variable to all regressions. In order to add the IRR of the seller, we match our data with another dataset provided by LPs. Unfortunately, this matching reduced the sample size dramatically and leaves us with only 35 observations. While the results remain qualitative similar, we lose significance due to the smaller sample size.

### 3.2. Conclusion on empirical results

This finding shows that SBO should not be analysed as one group given the presence of performance difference between the two groups.

The performance analyses show that Type II generates inferior performance compared to its counterpart which confirms that Type II is the SBO deals done by GPs to ‘go for broke’. The effect of ‘forced buyer’ is statistically insignificant but there is a sign of the benefit of ‘forced seller’. Experience consistently shows to have no effect on performance but it does help when investing in SBO Type II. There is also proof that there is a diminishing effect of entry margin on return.

The performance analyses on operational improvement show that SBO Type II has a negative impact on it. Experience helps in generating a better operational improvement in Type II deals. The dynamics between forced buyer and seller shows an overall positive effect on

EBITDA growth but not on margin expansion. The analyses confirm that margin expansion is difficult to implement on profitable companies. Overall this shows that there is a limit to the benefit of ‘smart money’ and the negative effect of Type II is not sufficiently counterbalanced by the other factors.

In terms of leverage, the study finds no difference in the entry leverage level. The impact of EV on entry leverage is positive which shows that bigger acquisitions are mostly financed with higher leverage. The dynamic of ‘forced buyer’ and ‘forced sellers’ leads to a lower entry debt/equity ratio which can be seen as a lack of confidence by GPs when investing in SBO in the presence of the two situations. The negative effect of experience on entry leverage also could be seen as a signal that SBO deals should be approached more conservatively (lower debt),

Last but not least, the analyses on pricing show a difference between the two groups. The effect of ‘forced buyer’ is not evident and ‘go for broke’ deals do not pay more than Type I. GPs pay size premium but require a discount on margin as the upside to efficient companies is smaller.

It can be concluded that the reason SBO Type II deals underperform its counterpart is because the deals fail to generate operational improvement (negative smart money effect) and GPs pays more for SBO Type II while using the same leverage structure as Type I deals which still has potential for operational improvement. ‘Smart money’ theory has its limit reached its inflection point with Type II deals. The combination of the factors shows that GPs involved in Type II deals suffer from increased distress cost caused by the leverage level because they think that ‘smart money’ has limitless potential.

## 5. Conclusion

SBO have gained a negative reputation based on market wisdom which states that SBO are overpriced and the market wisdom is supported by previous studies. The argument for market wisdom is that GPs will only divest once they have exhausted all return potentials and hence leaving the following buyer with very little room to generate return via operational improvement. The only way for SBO to generate an attractive return is by using excessive leverage especially when cost of debt is low.

This research also shed a new light on SBO; This research compares the performance of SBO Type I and Type II and the return drivers. The study shows that there is a significant difference in the performance of the two types of SBO. Type I proves that there is still room for GPs to generate an attractive return through operational improvement and this research found robust evidence of such claim. The research finds that SBO Type II fail to generate operational improvement while there is no difference in leverage and pricing attributes between the two groups. The impact of 'forced buyer' on performance is insignificant in this dataset. However, its negative effect (lower) on entry leverage could be seen as a signalling mechanism that the GPs are not convinced by the deals. Type II deals suffer from a higher distress cost because the leverage level used in such deals is not supported by operational improvement.

The research has its limitations and they are mainly the limited sample size and selection bias. The impact of the limitations could manifest in biased results. However, there is a certain level of comfort that the results are sufficiently robust because the finding is somewhat similar to Achleitner, Braun and Engel (2011). On top of it, there is a suspicion that the number of previous private equity owners would play a role in determining return and its drivers based on the diminishing impact of entry margin on return. This indicates that there is

a limit to the benefit of ‘smart money’ effect. Such factor was not included in this research due to the unavailability of the data. It would be beneficial to carry out this research with the additional before-mentioned variable to control for performance difference between the two types of SBO. On top of it, it is useful to research on the performance difference between PBO and SBO Type I. A preliminary analysis shows that they do not show any significant difference in performance and its drivers. It also shows a slightly better risk-return profile than PBO based on the calculated average return over standard deviation of the returns. A confirmation of the preliminary analysis could prove that SBO are just as good as PBO. It can potentially disprove the wisdom that SBO is inferior to PBO because it is incorrect to treat all SBO as equal.

To conclude, this study shows that not all SBO are equal. The findings confirm that SBO Type II generate inferior performance mainly because of the failure to implement operational improvement based on the analyses.

## Appendix A: Variable Description

SBO Type I: SBO deal when the seller (GP) has a smaller target EV than the buyer

SBO Type II: SBO deal when the seller (GP) has a bigger target EV than the buyer

SBO Type II Dummy: a dummy variable with 0 (zero) value when it is SBO Type I. A value of 1 when it is SBO Type II.

EV: Enterprise Value

Experience: the experience of the GP (Private Equity manager) measured by the number of previous funds managed by the GP

Cost of Debt: the yield of the Credit Suisse European Leveraged Loans Index

Market Return: equity return of MSCI Europe

Multiple: Total cash received from the investment plus its current valuation divided by the total cash invested.

Investment Period: a dummy variable. A value of 0 (zero) when a deal happens in the first half of the fund's investment period, otherwise a value of 1

Seller's Holding Period: the holding period of the seller before the asset is sold as either SBO Type I or II

Interaction: is the interaction term between Investment Period and Seller's Holding Period

SBO Dummy * experience: is the interaction term between SBO Type II Dummy and Experience

Entry Margin: EBITDA margin

EV Tercile: is the deviation of a deal's EV relative to the corresponding fund's average EV size. It has a value of 1 when the deviation is up to 1, a deviation between 1 – 1.5 has a value of 2 and a deviation above 1.5 has a value of 3

Deal Period: is a dummy variable. Deals that took place in Q2 and Q3 have a value of 0, otherwise 1. Q4 and Q1 are group together to capture the spill over effect of deals in Q4 that could not be closed on time and hence postponed to Q1

IP * Deal Period: is an interaction term between Investment Period and Deal Period

References

Acharya, Viral V., Oliver F. Gottschalg, Moritz Hahn, and Conor Kehoe, 2013, Corporate governance and value creation: Evidence from private equity, *Review of Financial Studies* 26, 368-402.

Achleitner, Ann-Kristin, Reiner Braun, and Nico Engel, 2011, Value creation and pricing in buyouts: Empirical evidence from Europe and North America, *Review of Financial Economics* 20, 146-161.

Achleitner, Ann-Kristin, and Christian Figge, 2014, Private equity lemons? Evidence on value creation in secondary buyouts, *European Financial Management* 20, 406-433.

Arcot, Sridhar, Zsuzsanna Fluck, José-Miguel Gaspar, and Ulrich Hege, 2015, Fund managers under pressure: Rationale and determinants of secondary buyouts, *Journal of Financial Economics* 115, 102-135.

Axelson, Ulf, Tim Jenkinson, Per Strömberg, and Michael S. Weisbach, 2013, Borrow cheap, buy high? The determinants of leverage and pricing in buyouts, *The Journal of Finance* 68, 2223-2267.

Axelson, Ulf, Per Strömberg, and Michael S. Weisbach, 2009, Why are buyouts levered? The financial structure of private equity funds, *The Journal of Finance* 64, 1549-1582.

Bonini, Stefano, 2015, Secondary buyouts: operating performance and investment determinants, *Financial Management* 44, 431-470.

Capital Dynamics, 2014, **Study – Value Creation in Private Equity**, .

Degeorge, Francois, Jens Martin, and Ludovic Phalippou, 2016, On secondary buyouts, *Journal of Financial Economics* 120, 124-145.

Guo, Shourun, Edith S. Hotchkiss, and Weihong Song, 2011, Do buyouts (still) create value? *The Journal of Finance* 66, 479-517.

Jensen, Michael C., 1989, Eclipse of the public corporation, *Harvard Business Review.* , 61-74.

Kaplan, Steven, 1989a, Management buyouts: Evidence on taxes as a source of value, *Journal of Finance* , 611-632.

Kaplan, Steven, and Per Stromberg, 2009, Leveraged Buyouts and Private Equity, *Journal of Economic Perspectives* 23, 121-146.

Kaplan, Steven, 1989b, The effects of management buyouts on operating performance and value, *Journal of Financial Economics* 24, 217-254.

Kaplan, Steven, and Antoinette Schoar, 2005, Private Equity Performance: Returns, Persistence, and Capital Flows, *Journal of Finance* 60, 1791-1823.

Leslie, Phillip, and Paul Oyer, 2008, *Managerial incentives and value creation: Evidence from private equity* .

MacArthur, H., S. Varma, G. Elton, and B. Halloran, 2014, Bain & Company's Global Private Equity Report 2014, .

Manchot, Philipp, 2010, Untersuchungsgegenstand Secondary Buyout, in Anonymous *Secondary Buyouts* (Springer).

Metrick, Andrew, and Ayako Yasuda, 2010, The Economics of Private Equity Funds, *Review of Financial Studies* 23, 2303-2341.

Modigliani, Franco, and Merton H. Miller, 1958, The cost of capital, corporation finance and the theory of investment, *The American Economic Review* , 261-297.

Sousa, Miguel, 2010, Why do private equity firms sell to each others? *SSRN Working Paper Series* .

Strömberg, Per, 2008, The new demography of private equity, *The global impact of private equity report* 1, 3-26.

Wang, Yingdi, 2012, Secondary buyouts: Why buy and at what price? *Journal of Corporate Finance* 18, 1306-1325.

# Table 1

The below tables show the basic descriptive statistics of our sample. The data used in this analysis is obtained from the private equity portfolio of a mid-sized Dutch pension fund which has been investing in the asset class since 2002. The data consists of the underlying investments in 26 direct funds; there are 389 companies whereby 137 transactions were realised and unrealised SBO (both Type I & II) of investments made prior to 2013.

**Table 1.1: Frequency**

| Year | Type I | Type II |
|---|---|---|
| 2004 | | 4.3% |
| 2005 | 20% | 11.1% |
| 2006 | 18.6% | 11.4% |
| 2007 | 15.9% | 22% |
| 2008 | 14.9% | 19.1% |
| 2009 | 6.3% | 6.3% |
| 2010 | 33.3% | 10.3% |
| 2011 | 35.3% | 11.8% |
| 2012 | 48.3% | 13.8% |

**Table 1.2: Size**

| SBO Type | Equity Deviation | EV Deviation | Count |
|---|---|---|---|
| I | 0.964 | 0.744 | 82 |
| II | 1.163 | 1.459 | 53 |

**Table 1.3: Hypothesis**

| | **Return** | **Operational improvement** | **Leverage** | **Pricing** |
|---|---|---|---|---|
| Forced seller | NA | **+** | NA | **+** |
| Forced buyer | **-** | NA | NA | **-** |
| Reduced risk | NA | **+** | **+** | NA |
| Smart money | NA | **+** | NA | NA |

# Table 2

## Correlation Table

Correlation tables between of main variables. The data used in this analysis is obtained from the private equity portfolio of a mid-sized Dutch pension fund which has been investing in the asset class since 2002. The data consists of the underlying investments in 26 direct funds; there are 389 companies whereby 137 transactions were realised and unrealised SBO (both Type I & II) of investments made prior to 2013. See appendix A for variable descriptions.

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | IRR | 1 | | | | | | | | | | |
| 2 | EV | 0.0066 | 1 | | | | | | | | | |
| 3 | Experience | 0.1216 | 0.185 | 1 | | | | | | | | |
| 4 | Cost of Debt | -0.2388 | 0.0916 | -0.2618 | 1 | | | | | | | |
| 5 | SHP | 0.1878 | -0.0425 | 0.1442 | -0.1517 | 1 | | | | | | |
| 6 | Entry Margin | 0.0497 | 0.2137 | -0.1093 | 0.0489 | -0.0829 | 1 | | | | | |
| 7 | Delta EBITDA | 0.5542 | -0.0931 | 0.1294 | 0.0156 | 0.082 | -0.052 | 1 | | | | |
| 8 | Delta Margin | 0.2138 | -0.0934 | 0.1732 | -0.0733 | 0.2133 | -0.7292 | 0.3252 | 1 | | | |
| 9 | Entry ND/EBITDA | -0.1963 | 0.3491 | 0.0027 | 0.3215 | -0.1643 | 0.191 | -0.0083 | -0.1845 | 1 | | |
| 10 | Entry D/E | 0.0792 | 0.4473 | -0.0826 | 0.1559 | -0.0544 | 0.2289 | -0.0444 | -0.0107 | 0.3879 | 1 | |
| 11 | Entry EV/EBITDA | -0.119 | 0.1721 | -0.0233 | 0.2051 | -0.0344 | -0.1162 | 0.2074 | 0.0574 | 0.521 | -0.0066 | 1 |

SHP = Seller's holding period

# Table 3

## Descriptive Statistics – PBO vs. SBO

| | PBO | | | | SBO | | | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Median | SD | Obs | Mean | Median | SD | Obs |
| IRR | 0.226 | 0.125 | 1.440 | 250 | 0.019 | 0.130 | 0.584 | 136 |
| Multiple | 2.104 | 1.600 | 2.238 | 251 | 1.739 | 1.490 | 1.605 | 135 |
| Entry Margin | 0.332 | 0.144 | 0.620 | 243 | 0.316 | 0.180 | 0.545 | 135 |
| Delta Margin | 0.047 | -0.005 | 0.925 | 234 | -0.014 | -0.001 | 0.508 | 133 |
| Entry EV (mln) | 1,440 | 394 | 3,170 | 252 | 886 | 391 | 1,340 | 136 |
| Entry EV/EBITDA | 9.637 | 7.819 | 26.791 | 251 | 9.023 | 8.486 | 3.142 | 136 |
| Entry ND/EBITDA | 3.813 | 3.644 | 2.725 | 252 | 0.825 | 4.375 | 43.331 | 137 |
| Entry D/E | 3.048 | 1.436 | 6.144 | 248 | 3.522 | 1.841 | 5.346 | 137 |
| IRR * | 0.100 | 0.117 | 0.498 | 248 | 0.001 | 0.129 | 0.547 | 135 |

*The 99$^{th}$ percentile IRR removed

# Table 4

## Descriptive Statistics – SBO Type I vs. Type II

The data used in this analysis is obtained from the private equity portfolio of a mid-sized Dutch pension fund which has been investing in the asset class since 2002. The data consists of the underlying investments in 26 direct funds; there are 389 companies whereby 137 transactions were realised and unrealised SBO (both Type I & II) of investments made prior to 2013. SBO Type I is defined as a transaction in which the selling PE fund has a smaller target EV size than the buying PE fund. SBO Type II is defined as a transaction in which the selling PE fund has a larger target EV size than the buying PE fund. See appendix A for variable descriptions.

| | SBO Type I | | | | | SBO Type II | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Mean** | **Median** | **SD** | **Obs** | **t-test** | **Mean** | **Median** | **SD** | **Obs** |
| IRR | 0.102 | 0.140 | 0.570 | 84 | 2.149*** | -0.116 | 0.062 | 0.586 | 52 |
| Multiple | 1.897 | 1.425 | 1.770 | 84 | 1.469* | 1.480 | 1.600 | 1.261 | 51 |
| Seller's holding period | 4.963 | 5.000 | 2.715 | 82 | 0.606 | 4.686 | 5.000 | 2.302 | 51 |
| Entry Margin | 0.278 | 0.165 | 0.370 | 82 | -0.994 | 0.374 | 0.223 | 0.739 | 53 |
| Delta Margin | 0.032 | 0.002 | 0.311 | 82 | 1.330 | -0.088 | -0.011 | 0.718 | 52 |
| Entry EV (mln) | 589 | 293 | 820 | 84 | -3.333*** | 1340 | 962 | 1800 | 52 |
| Entry EV/EBITDA | 8.657 | 8.113 | 2.698 | 84 | -1.737** | 9.613 | 8.981 | 3.703 | 52 |
| Entry ND/EBITDA | 4.077 | 4.107 | 2.415 | 84 | 1.107 | -4.328 | 5.476 | 69.692 | 53 |
| Entry D/E | 0.508 | 0.498 | 1.082 | 75 | -3.371*** | 1.142 | 1.010 | 0.967 | 51 |

*** significant at 1%, ** significant at 5%, * significant at 10%

# Table 5

## Regression Result of Performance (IRR)

The table shows the estimates of an OLS regression. Dependent variable is IRR. SBO Type I is defined as a transaction in which the selling PE fund has a smaller target EV size than the buying PE fund. SBO Type II is defined as a transaction in which the selling PE fund has a larger target EV size than the buying PE fund. Interaction is the interaction term between Investment Period and Seller's Holding Period. See appendix A for variable descriptions.

| | Dependent variable: Multiple | | | |
|---|---|---|---|---|
| | Spec 1 | Spec 2 | Spec 3 | Spec 4 |
| SBO Type II Dummy | -0.204 | -0.206 | -0.459 | -0.412 |
| | (-2.87)*** | (-2.90)*** | (-1.860)* | (-1.720)* |
| EV | | | -0.002 | -0.0197 |
| | | | (-0.030) | (-0.350) |
| Experience | | | -0.012 | -0.007 |
| | | | (-0.230) | (-0.130) |
| Cost of Debt | | | -7.307 | -7.118 |
| | | | (-1.930)* | (-1.700)* |
| Market Return | | | 0.551 | 0.581 |
| | | | (0.250) | (0.260) |
| Investment Period (IP) | | 0.034 | 0.395 | 0.316 |
| | | (0.630) | (1.310) | (1.150) |
| Seller's holding period | | | 0.280 | 0.272 |
| | | | (2.430)** | (2.220)** |
| Interaction | | | -0.086 | -0.052 |
| | | | (-0.340) | (-0.200) |
| SBO dummy * experience | | | 0.087 | 0.079 |
| | | | (1.240) | (1.090)* |
| Entry Margin | | | 0.087 | 0.254 |
| | | | (1.810)* | (2.130)** |
| Entry Margin ^2 | | | | -0.034 |
| | | | | (-2.010)** |
| EV Tercile | | | | -0.012 |
| | | | | (-0.160) |
| Deal Period | | | | -0.104 |
| | | | | (-0.570) |
| IP * Deal Period | | | | 0.007 |
| | | | | (0.040) |
| Year | Yes | Yes | Yes | Yes |
| Observation | 136 | 136 | 128 | 128 |
| R-squared | 0.033 | 0.039 | 0.151 | 0.168 |

*** significant at 1%, ** significant at 5%, * significant at 10%

# Table 6

## Regression Result of Performance (Multiple)

The table shows the estimates of an OLS regression. Dependent variable is Multiple. SBO Type I is defined as a transaction in which the selling PE fund has a smaller target EV size than the buying PE fund. SBO Type II is defined as a transaction in which the selling PE fund has a larger target EV size than the buying PE fund. Interaction is the interaction term between Investment Period and Seller's Holding Period. See appendix A for variable descriptions.

| | Dependent variable: Multiple | | | |
|---|---|---|---|---|
| | Spec 1 | Spec 2 | Spec 3 | Spec 4 |
| SBO Type II Dummy | -0.491 | -0.517 | -1.435 | -1.374 |
| | (-1.150) | (-1.230) | (-6.160)*** | (-5.710)*** |
| EV | | | -0.201 | -0.268 |
| | | | (-1.030) | (-1.300) |
| Experience | | | -0.019 | -0.001 |
| | | | (-0.120) | (-0.001) |
| Cost of Debt | | | -16.335 | -16.627 |
| | | | (-1.210) | (-1.180) |
| Market Return | | | -3.580 | -3.458 |
| | | | (-0.780) | (-0.760) |
| Investment Period (IP) | | 0.392 | 0.728 | 0.634 |
| | | (2.470)** | (0.700) | (0.670) |
| Seller's holding period | | | 0.457 | 0.456 |
| | | | (1.350) | (1.250) |
| Interaction | | | 0.215 | 0.336 |
| | | | (0.240) | (0.380) |
| SBO dummy * experience | | | 0.264 | 0.261 |
| | | | (3.500)*** | (4.350)*** |
| Entry Margin | | | 0.239 | 0.814 |
| | | | (1.450) | (1.580) |
| Entry Margin ^2 | | | | -0.113 |
| | | | | (-1.530) |
| EV Tercile | | | | -0.007 |
| | | | | (-0.040) |
| Deal Period | | | | -0.085 |
| | | | | (-0.500) |
| IP * Deal Period | | | | -0.251 |
| | | | | (-0.860) |
| Year Dummy | Yes | Yes | Yes | Yes |
| Number of observations | 135 | 135 | 127 | 127 |
| R-squared | 0.016 | 0.013 | 0.119 | 0.133 |

*** significant at 1%, ** significant at 5%, * significant at 10%

# Table 7

## Regression Result of Operational Improvement (ΔEBITDA)

The table shows the estimates of an OLS regression. Dependent variable is change in EBITDA of the portfolio company from entry compared to the tine of exit of the PE firm. SBO Type I is defined as a transaction in which the selling PE fund has a smaller target EV size than the buying PE fund. SBO Type II is defined as a transaction in which the selling PE fund has a larger target EV size than the buying PE fund. Interaction is the interaction term between Investment Period and Seller's Holding Period. See appendix A for variable descriptions.

| | Dependent variable: ΔEBITDA | | | |
|---|---|---|---|---|
| | Spec 1 | Spec 2 | Spec 3 | Spec 4 |
| SBO Type II Dummy | -0.308 | -0.323 | -0.803 | -0.777 |
| | (-1.400) | (-1.450) | (-2.790)*** | (-2.630)*** |
| EV | | | -0.109 | -0.139 |
| | | | (-1.570) | (-1.840)* |
| Experience | | | 0.051 | 0.059 |
| | | | (0.540) | (0.590) |
| Investment Period | | -0.265 | 1.251 | 1.234 |
| | | (1.150) | (4.640)*** | (4.850)*** |
| Seller's holding period | | | 0.207 | 0.211 |
| | | | (2.180)** | (2.520)** |
| Interaction | | | -0.360 | -0.368 |
| | | | (-2.160)** | (-2.710)*** |
| SBO dummy * experience | | | 0.192 | 0.190 |
| | | | (2.330)** | (2.280)** |
| Entry Margin | | | -0.012 | 0.286 |
| | | | (-0.140) | (1.510) |
| Entry Margin ^2 | | | | -0.058 |
| | | | | (-1.930)* |
| Year | Yes | Yes | Yes | Yes |
| Observation | 131 | 131 | 121 | 121 |
| R-squared | 0.017 | 0.016 | 0.073 | 0.081 |

*** significant at 1%, ** significant at 5%, * significant at 10%

# Table 8

## Regression Result of Operational Improvement (ΔMargin)

The table shows the estimates of an OLS regression. Dependent variable is Multiple.. SBO Type I is defined as a transaction in which the selling PE fund has a smaller target EV size than the buying PE fund. SBO Type II is defined as a transaction in which the selling PE fund has a larger target EV size than the buying PE fund. Interaction is the interaction term between Investment Period and Seller's Holding Period. See appendix A for variable descriptions.

| | Dependent variable: **ΔMargin** | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| SBO Type II Dummy | -0.179 | -0.166 | -0.256 | -0.241 |
| | (-1.140) | (-1.200) | (-2.960)*** | (-1.680)* |
| EV | | | 0.024 | -0.033 |
| | | | (0.740) | (-1.20) |
| Experience | | | 0.013 | 0.022 |
| | | | (0.490) | (0.950) |
| Investment Period | | -0.275 | -0.031 | -0.493 |
| | | (-1.13) | (-0.19) | (-0.860) |
| Seller's holding period | | | 0.075 | 0.080 |
| | | | (1.54) | (2.240)** |
| Interaction | | | 0.160 | 0.135 |
| | | | (1.05) | (1.730)* |
| SBO dummy * experience | | | 0.055 | 0.059 |
| | | | (3.560)*** | (2.060)** |
| Entry Margin | | | -0.539 | 0.123 |
| | | | (-5.62)*** | (1.02) |
| Entry Margin ^ 2 | | | | -0.127 |
| | | | | (-5.770)*** |
| Year | Yes | Yes | Yes | Yes |
| Observation | 133 | 133 | 126 | 126 |
| R-squared | 0.013 | 0.033 | 0.653 | 0.653 |

*** significant at 1%, ** significant at 5%, * significant at 10%

# Table 9

## Regression Result of Leverage Effect (Entry Net Debt/EBITDA)

The table shows the estimates of an OLS regression. Dependent variable is Entry Net Debt/EBITDA.. SBO Type I is defined as a transaction in which the selling PE fund has a smaller target EV size than the buying PE fund. SBO Type II is defined as a transaction in which the selling PE fund has a larger target EV size than the buying PE fund. Interaction is the interaction term between Investment Period and Seller's Holding Period. See appendix A for variable descriptions.

| | Dependent variable: **Entry Leverage** | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| SBO Type II Dummy | 0.888 | 0.875 | -0.845 | -0.869 |
| | (1.80)* | (1.82)* | (-0.52) | (-0.53) |
| EV | | | 0.928 | 0.965 |
| | | | (6.14)*** | (5.34)*** |
| Experience | | | -0.189 | -0.198 |
| | | | (-0.61) | (-0.65) |
| Cost of Debt | | | 17.123 | 17.857 |
| | | | (1.87)* | (1.89)* |
| Investment period | | 0.400 | 0.652 | 0.663 |
| | | (0.500) | (0.630) | (0.650) |
| Seller's holding period | | | -0.251 | -0.258 |
| | | | (-0.860) | (-0.860) |
| Interaction | | | -0.310 | -0.297 |
| | | | (-0.670) | (-0.640) |
| SBO dummy * experience | | | 0.390 | 0.390 |
| | | | (0.850) | (0.850) |
| Entry Margin | | | 0.428 | 0.010 |
| | | | (2.24)** | (0.01) |
| Entry Margin ^2 | | | | 0.076 |
| | | | | (0.510) |
| Year | Yes | Yes | Yes | Yes |
| Observation | 135 | 135 | 128 | 128 |
| R-squared | 0.045 | 0.022 | 0.403 | 0.407 |

*** significant at 1%, ** significant at 5%, * significant at 10%

# Table 10

## Regression Result of Leverage Effect (Entry Net Debt/Equity)

The table shows the estimates of an OLS regression. Dependent variable is Entry Net Debt/EBITDA.. SBO Type I is defined as a transaction in which the selling PE fund has a smaller target EV size than the buying PE fund. SBO Type II is defined as a transaction in which the selling PE fund has a larger target EV size than the buying PE fund. Interaction is the interaction term between Investment Period and Seller's Holding Period. See appendix A for variable descriptions.

| | Dependent variable: **Debt/Equity** | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| SBO Type II Dummy | 0.691 | 0.704 | 0.089 | 0.091 |
| | (4.75)*** | (4.59)*** | (0.14) | (0.14) |
| EV | | | 0.322 | 0.312 |
| | | | (4.73)*** | (3.57)*** |
| Experience | | | -0.228 | -0.226 |
| | | | (-3.14)*** | (-3.22)*** |
| Cost of Debt | | | -1.121 | -1.389 |
| | | | (-0.22) | (-0.27) |
| Investment period | | -0.307 | -1.236 | -1.233 |
| | | (-1.290) | (-2.590)** | (-2.540)** |
| Seller's holding period | | | -0.187 | -0.185 |
| | | | (-2.260)** | (-2.390)** |
| Interaction | | | 0.723 | 0.718 |
| | | | (2.970)*** | (2.880)*** |
| SBO dummy * experience | | | 0.143 | 0.144 |
| | | | (0.910) | (0.920) |
| Entry Margin | | | 0.112 | 0.221 |
| | | | (1.38) | (0.57) |
| Entry Margin ^ 2 | | | | -0.021 |
| | | | | (-0.33) |
| Year | Yes | Yes | Yes | Yes |
| Observation | 126 | 126 | 119 | 119 |
| R-squared | 0.084 | 0.113 | 0.360 | 0.363 |

*** significant at 1%, ** significant at 5%, * significant at 10%

# Table 11

## Regression Result of Pricing (Entry EV/EBITDA)

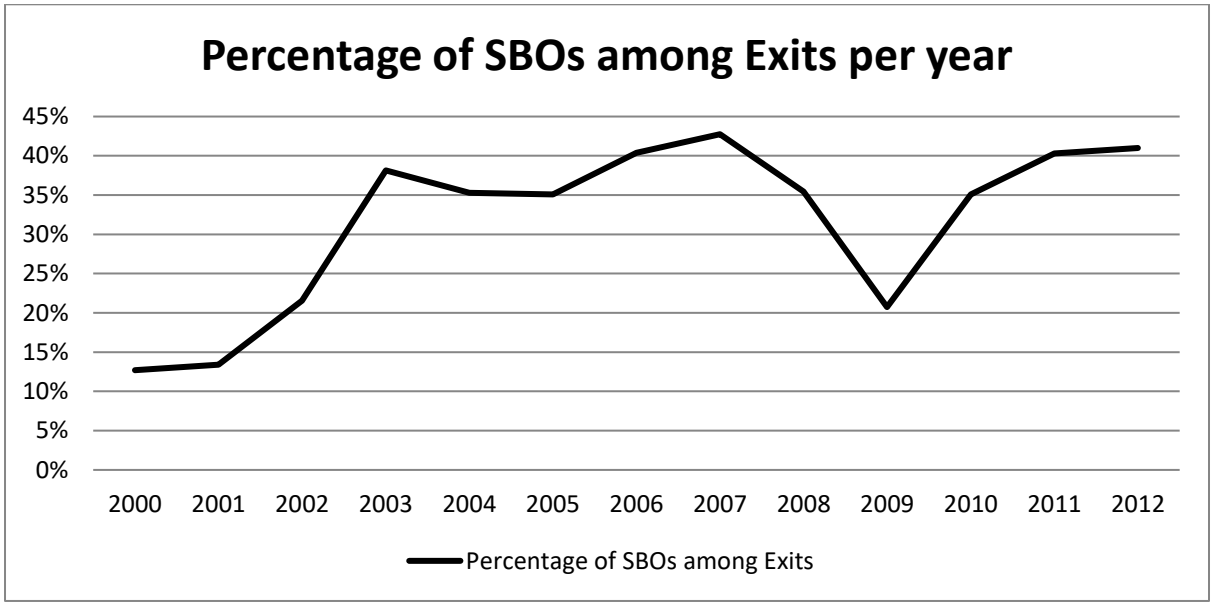
The table shows the estimates of an OLS regression. Dependent variable is Entry EV/EBITDA. SBO Type I is defined as a transaction in which the selling PE fund has a smaller target EV size than the buying PE fund. SBO Type II is defined as a transaction in which the selling PE fund has a larger target EV size than the buying PE fund. Interaction is the interaction term between Investment Period and Seller's Holding Period. See appendix A for variable descriptions.

| | Entry EV/EBITDA | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| SBO Type II Dummy | 0.081 | 0.078 | 0.035 | 0.202 | 0.150 |
| | (1.130) | (1.100) | (0.24) | (1.760)* | (1.230) |
| EV | | | 0.111 | 0.121 | 0.087 |
| | | | (7.890)*** | (10.55)*** | (3.600)*** |
| Experience | | | -0.038 | -0.024 | -0.019 |
| | | | (-0.840) | (-0.64) | (-0.710) |
| Cost of Debt | | | 3.926 | 3.609 | |
| | | | (1.350) | (1.390) | |
| Investment Period | | 0.068 | 0.156 | 0.040 | -0.060 |
| | | (1.100) | (1.680)* | (0.290) | (-0.440) |
| Seller's holding period | | | -0.067 | -0.072 | -0.075 |
| | | | (-0.800) | (-0.82) | (-0.790) |
| Interaction | | | 0.001 | -0.009 | 0.031 |
| | | | (0.010) | (-0.160) | (0.450) |
| SBO dummy * experience | | | -0.032 | -0.056 | -0.051 |
| | | | (-0.690) | (-2.090)** | (-1.600) |
| Entry Margin | | | -0.180 | -0.168 | -0.182 |
| | | | (-3.010)*** | (-2.870)*** | (-3.200)*** |
| Entry Margin ^2 | | | | | |
| Sector Multiple | | | -0.001 | -0.001 | 0.000 |
| | | | (-1.200) | (-0.760) | (-0.110) |
| Entry ND/EBITDA | | | | | 0.046 |
| | | | | | (1.940)* |
| Equity Tercile | | | | -0.104 | -0.105 |
| | | | | (-1.660)* | (-1.730)* |
| Deal Period | | | | -0.119 | -0.112 |
| | | | | (-1.240) | (-1.280) |
| IP * Deal Period | | | | 0.221 | 0.165 |
| | | | | (1.890)* | (1.750)* |
| Year | Yes | Yes | Yes | Yes | Yes |
| Observation | 136 | 136 | 128 | 128 | 127 |
| R-squared | 0.0218 | 0.0138 | 0.2331 | 0.2987 | 0.3392 |

*** significant at 1%, ** significant at 5%, * significant at 10%

## Figure 1

The below figure shows the percentage of exits via a SBO in percentage per year between 2000 and 2012. Other exit types are IPOs, trade sales and bankruptcies. Data is derived by Pitchbook.



# Figure 2

## IRR distribution of total sample

The below graphs depict the distribution of IRR returns of different cross-sections of our sample. The data used in this analysis is obtained from the private equity portfolio of a mid-sized Dutch pension fund which has been investing in the asset class since 2002. The data consists of the underlying investments in 26 direct funds; there are 389 companies whereby 137 transactions were realised and unrealised SBO (both Type I & II) of investments made prior to 2013.

**Figure 2.1: PBO IRR**

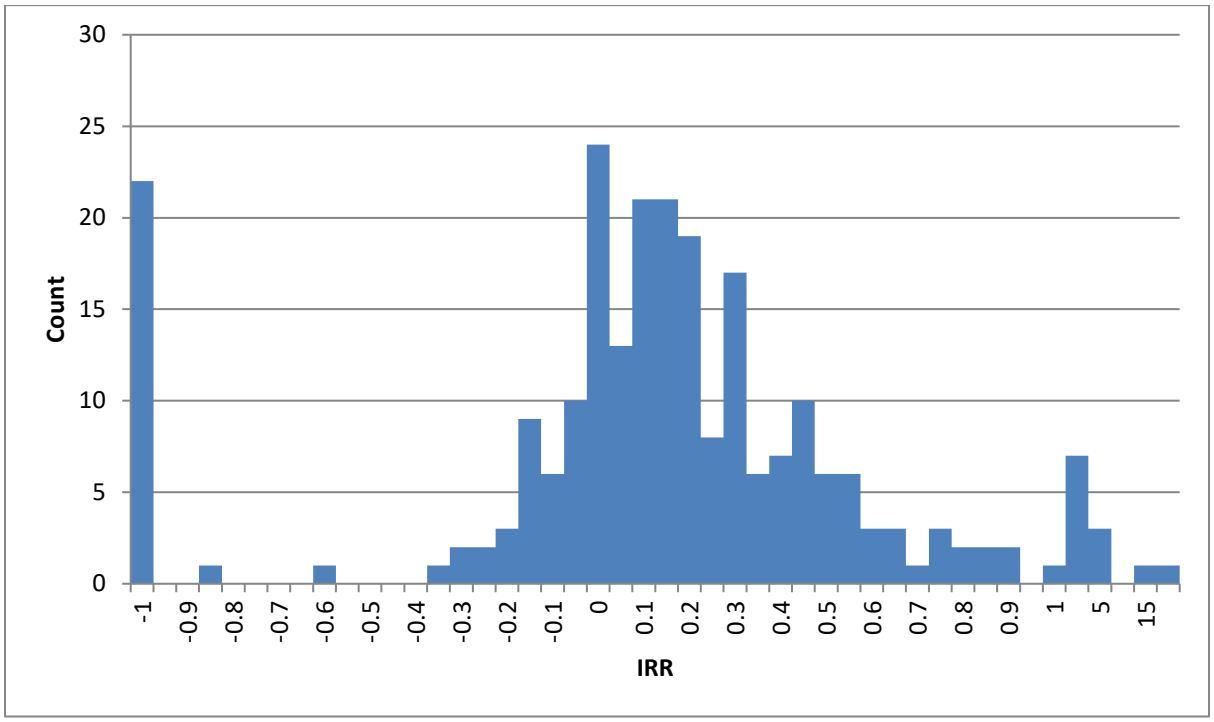


**Figure 2.2: PBO (Primary buyout) IRR above 99$^{th}$ percentile are removed**

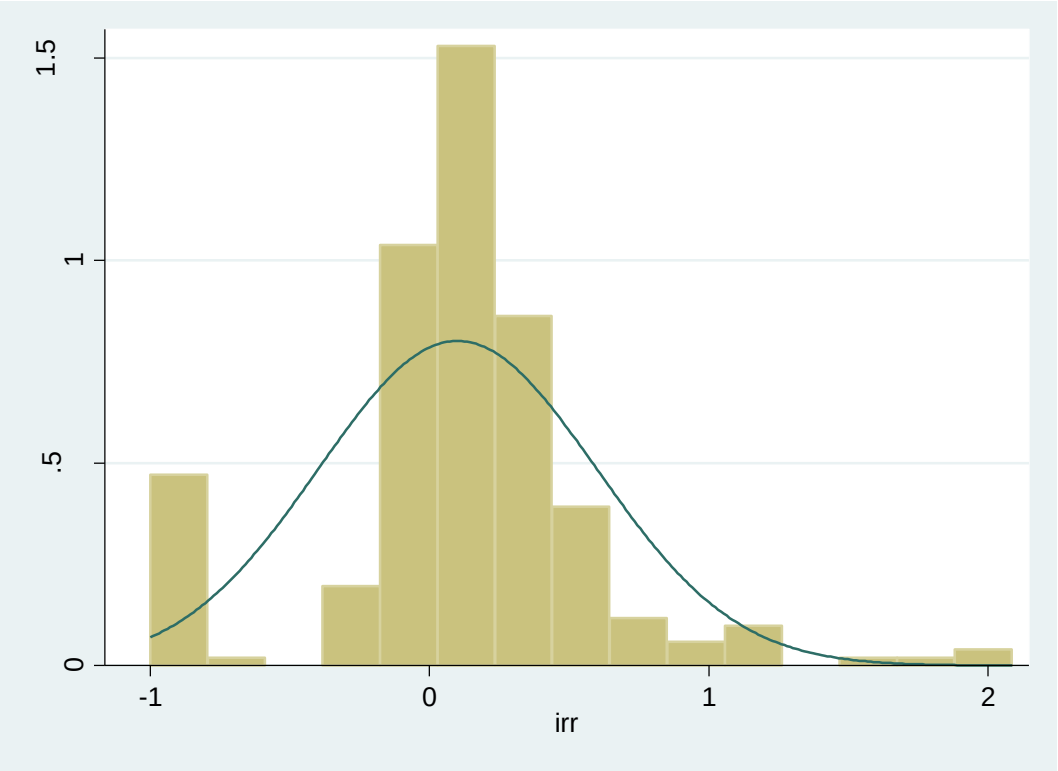



**Figure 2.3: SBO IRR**

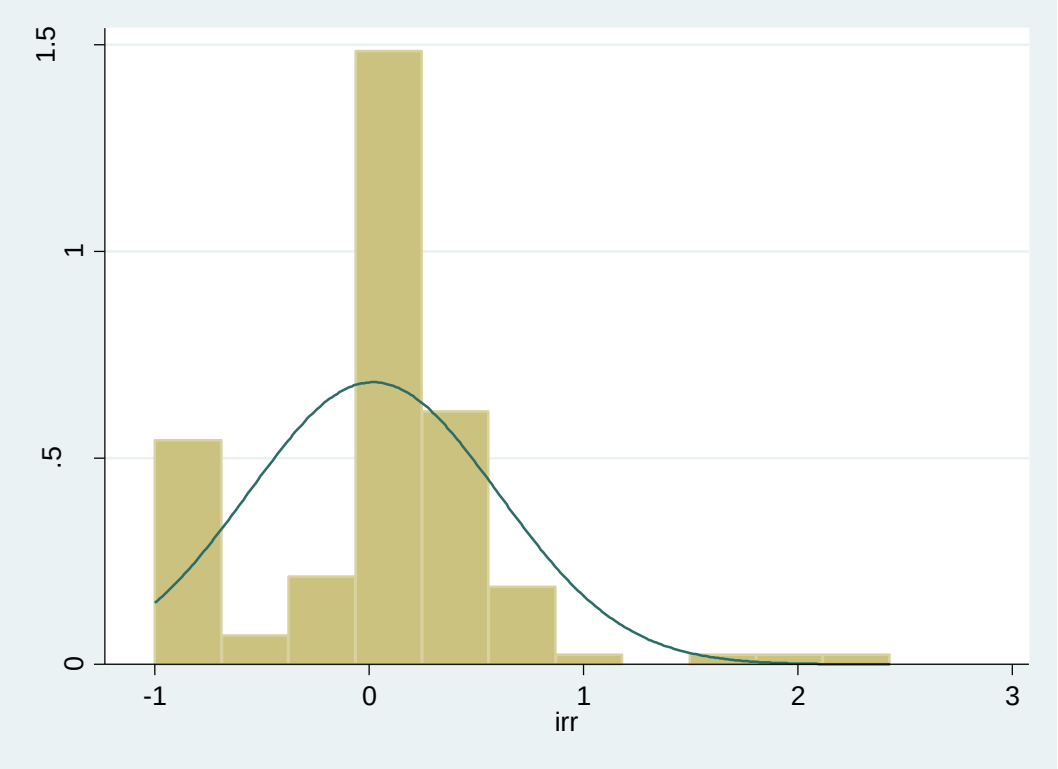


**Figure 2.4: SBO IRR above 99$^{th}$ percentile are removed**

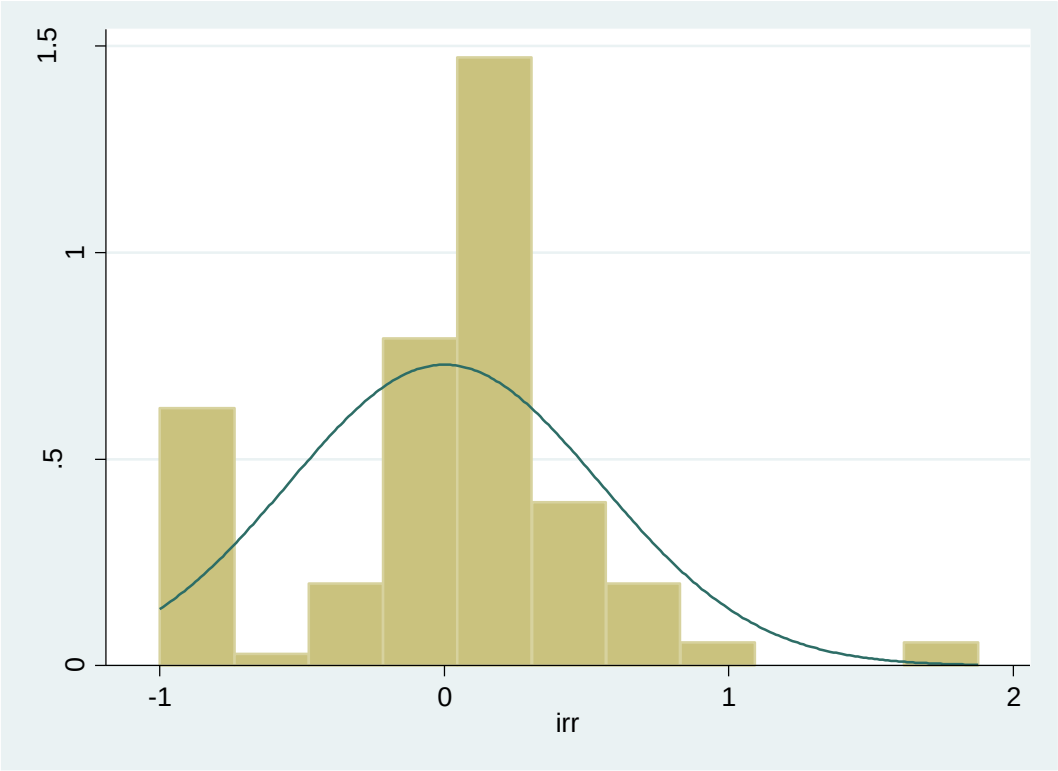


**Figure 2.5: IRR of SBO Type I transactions**

Return of SBO Type I. This deal type is defined as a transaction in which the selling PE fund has a smaller target EV size than the buying PE fund.

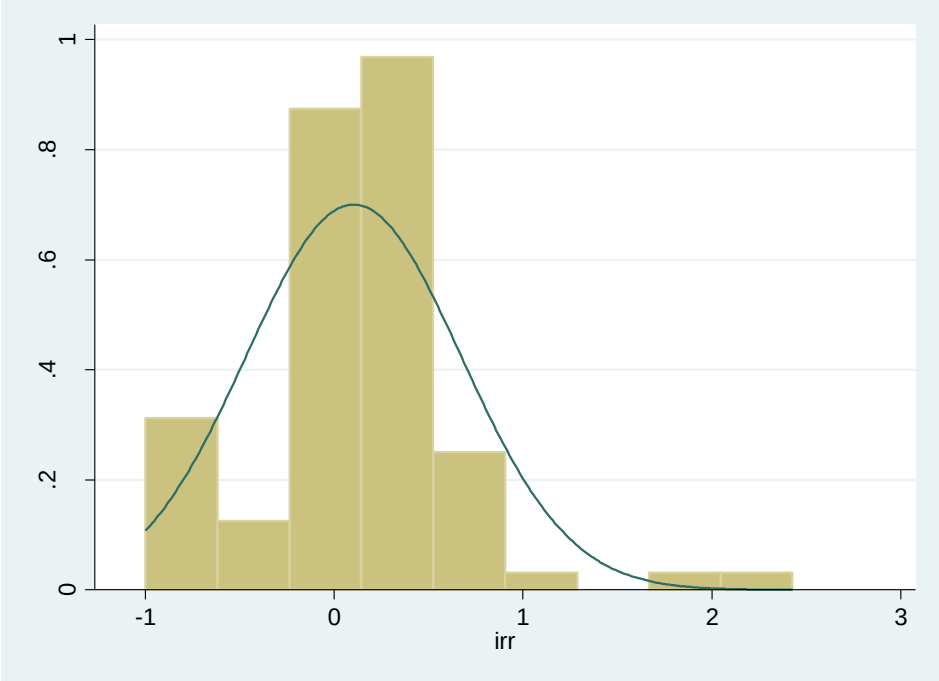
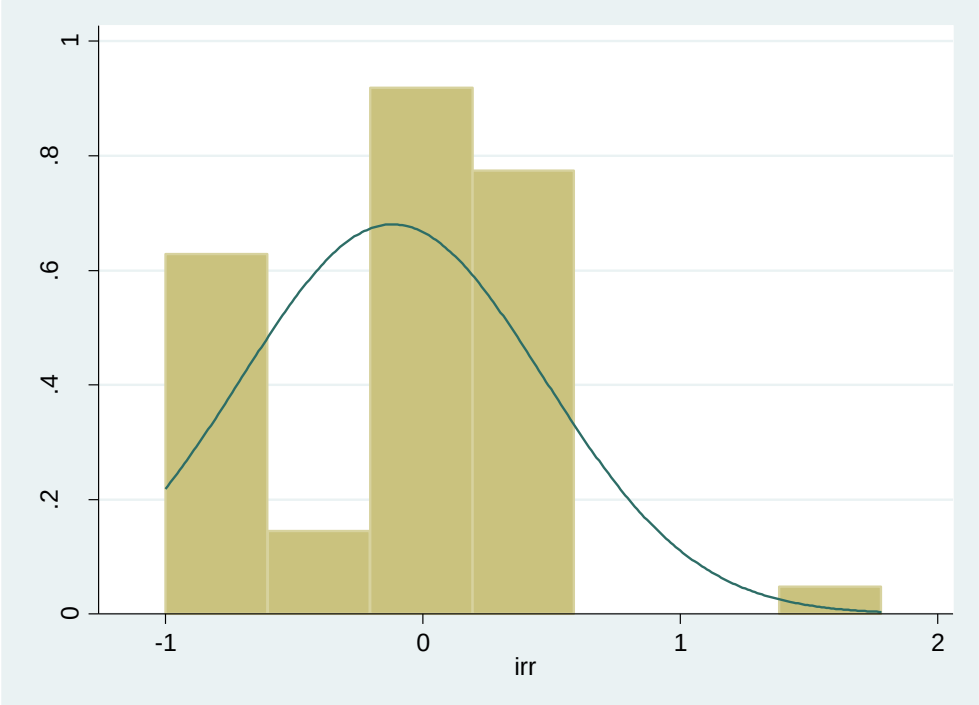



**Figure 2.6: IRR of SBO Type II transactions**

Return of SBO Type II. This deal type is defined as a transaction in which the selling PE fund has a larger target EV size than the buying PE fund.



# Appendix

## Table A1

### Regression Result of Leverage Effect (Entry Net Debt/EBITDA)

The table shows the estimates of an OLS regression. Dependent variable is Entry Net Debt/EBITDA.. SBO Type I is defined as a transaction in which the selling PE fund has a smaller target EV size than the buying PE fund. SBO Type II is defined as a transaction in which the selling PE fund has a larger target EV size than the buying PE fund. See appendix A for variable descriptions.

| | Dependent variable: **Entry Leverage** | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| SBO Type II Dummy | -0.20606 | -0.206377 | -0.947356 | -1.74428 |
| | -0.48 | -0.47 | -1.39* | -1.35* |
| EV | 1.15034 | 1.180316 | 1.112992 | 1.202214 |
| | 10.29*** | 9.14*** | 9.15*** | 9.11*** |
| Cost of Debt | 14.5728 | 13.73221 | 17.39547 | 16.80287 |
| | 1.08 | 1.1 | 1.27 | 1.29* |
| Experience | | -0.0715 | | -0.30843 |
| | | -0.47 | | -1.21 |
| SBO dummy * experience | | | 0..2352146 | 0.487643 |
| | | | 1.26 | 1.33* |
| Year | Yes | Yes | Yes | Yes |
| Observation | 135 | 135 | 128 | 128 |
| R-squared | 0.045 | 0.022 | 0.403 | 0.407 |

*** significant at 1%, ** significant at 5%, * significant at 10%

# Table A2

## Regression Result of Leverage Effect (Entry Net Debt/Equity)

The table shows the estimates of an OLS regression. Dependent variable is Entry Net Debt/EBITDA.. SBO Type I is defined as a transaction in which the selling PE fund has a smaller target EV size than the buying PE fund. SBO Type II is defined as a transaction in which the selling PE fund has a larger target EV size than the buying PE fund. See appendix A for variable descriptions.

| | Dependent variable: **Debt/Equity** | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| SBO Type II Dummy | 0.357898 | -0.357994 | 0.342298 | -0.3468 |
| | 1.72** | -1.80** | 0.99 | -1.48* |
| EV | 0.406157 | 0.466974 | 0.40531 | 0.475411 |
| | 3.86*** | -5.32*** | 4.1*** | 5.78*** |
| Cost of Debt | 5.469582 | 3.777261 | 5.526337 | 5.04254 |
| | 2.1*** | 1.66** | 2.41*** | 2.26*** |
| Experience | | -0.147421 | | -0.2606 |
| | | -2.04** | | -2.97*** |
| SBO dummy * experience | | | 0.004901 | 0.221459 |
| | | | 0.08 | 2.71*** |
| Year | Yes | Yes | Yes | Yes |
| Observation | 135 | 135 | 128 | 128 |
| R-squared | 0.406157 | 0.466974 | 0.40531 | 0.475411 |

*** significant at 1%, ** significant at 5%, * significant at 10%

# Table A3

## Regression Result of Pricing (Entry EV/EBITDA)

The table shows the estimates of an OLS regression. Dependent variable is Entry EV/EBITDA. SBO Type I is defined as a transaction in which the selling PE fund has a smaller target EV size than the buying PE fund. SBO Type II is defined as a transaction in which the selling PE fund has a larger target EV size than the buying PE fund. Interaction is the interaction term between Investment Period and Seller's Holding Period. See appendix A for variable descriptions.

| | **Entry EV/EBITDA** | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| SBO Type II Dummy | 0.153907 | 0.195332 | 0.266924 | 0.185483 | 0.178967 |
| | 1.47* | 3.31*** | 6.0*** | 4.43*** | 2.70*** |
| Log (EV) | 0.039925 | 0.033708 | 0.032639 | 0.090399 | 0.086551 |
| | 2.16** | 2.21** | 2.18** | 3.71*** | 3.23*** |
| Log (EBITDA margin) | -0.10255 | -0.1023 | -0.01068 | -0.11174 | -0.10327 |
| | -2.78*** | -2.8*** | -2.71*** | -2.72*** | -2.82*** |
| Log (EBITDA growth) | 0.096753 | 0.095273 | 0.092576 | 0.087354 | 0.086761 |
| | 3.78*** | 3.71*** | 3.3*** | 2.87*** | 2.18** |
| Log (Debt/EBITDA) | 0.05356 | 0.054533 | 0.054089 | | |
| | 3.13*** | 3.75*** | 3.25*** | | |
| Experience | -0.01653 | | | | |
| | -0.43 | | | | |
| SBO experience | -0.03282 | -0.04616 | -0.07004 | -0.04798 | -0.04481 |
| | -0.97 | -3.58*** | -6.50*** | -3.64*** | -2.36*** |
| cost of debt | 2.494261 | 2.525875 | 2.278616 | 2.864386 | 2.650619 |
| | 0.93 | 0.94 | 0.84 | 1.04 | 0.96 |
| Prev Mult | | | 0.048178 | 0.061619 | 0.062394 |
| | | | 0.33 | 0.47 | 0.46 |
| Inv Period | | | | | 0.028087 |
| | | | | | 0.3 |
| sellholdperiod | | | | | -0.01769 |
| | | | | | -1.33* |
| Inv period * sellholdperiod | | | | | |
| | | | | | -0.00605 |
| | | | | | -0.42 |
| | | | | | 0.178967 |
| Year | Yes | Yes | Yes | Yes | Yes |
| Observation | 128 | 128 | 117 | 117 | 127 |
| R-squared | 0.0218 | 0.0138 | 0.2331 | 0.2987 | 0.3392 |

*** significant at 1%, ** significant at 5%, * significant at 10%