



How does a buy-and-build strategy influence private equity portfolio company performance?

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Abstract

As value creation in private equity investments is shifting from financial engineering to operational improvements, this paper evaluates such an alternate investment strategy. I investigate the effect of a buy-and-build strategy on private equity portfolio firm performance. These particular firms serve as platforms for follow-on acquisitions. The sample contains deals engaged by the private equity firms from 1996 till 2015. I find that value is only created if the portfolio firm is a scalable more established company, whereas the private equity firm extends its usual investment horizon to build a consolidation in a more fragmented market. These findings contribute to ordinary mergers and acquisitions literature. The thesis provides implications on an alternate investment practice for private equity firms and a new manner of growth for potential target companies.

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1. Introduction

Private equity firms generally execute buyouts through raising funds focusing on a significant proportion of debt financing. Accordingly, these buyouts are also referred to as leveraged buyouts (LBOs). As Hurduzeua & Popescua (2015) explain, investors increasingly started to substitute equity for debt in their deal financing in the 1980s. This was supported by the rise of noninvestment-grade debt instruments. The first LBO merger wave started due to these so called “junk-bonds”, enabling noninvestment-grade companies to attract additional debt financing. As a result of their risky nature, investors demanded a higher interest in return for providing this kind of debt financing. As more junk bond issuers started to default, the junk bond market crashed at the end of the 80s diminishing LBO activity. Renneboog & Vansteenkiste (2017) further state that LBO activity reignited especially starting from the 2000s. Debt market conditions were favourable, in which the use of debt securitization was increasing. Additionally, the Sarbanes-Oxley Act increased the cost of being publicly listed, surging the interest of performing a LBO. As the first LBO wave was predominantly originating from the US, the second one was also fuelled by activity in Europe. In this period new sources of subordinated debt financing were developed and regulation on LBO activity was mitigated throughout Europe. After the crash of the subprime mortgage market and as such the start of the financial crisis, the second LBO merger wave ended in the US as well as in Europe.

Brigl, Nowotnik, Pelisari, Rose, & Zwillenberg (2012) explain that although debt market conditions improved after the financial crisis, value creation by private equity firms is shifting from financial engineering, in previous LBO merger waves, to establishing operational synergies. Besides financial engineering and operational improvement, multiple expansion is another key value driver in private equity deals. In particular, private equity parties apply the concept of buy-low-sell high. In their paper they suggest that in ordinary LBOs this manner of value creation is declining due to increasing acquisition premiums. As such, private equity firms are more and more focusing on margin improvements for their portfolio companies. Accordingly, in further research of Brigl, Jansen, Schwetzler, Hammer, & Hinrichs (2016) is shown that private equity firms increasingly enable these operational synergies by implementing an inorganic growth strategy. An increasing amount of portfolio companies serve as initial platforms to be involved in a strategy of growing through follow-on acquisitions. In their research on deals performed from 1998 till 2012, the amount of deals involving add-ons increased from 20% in 2000 to 53% in 2012.

This thesis provides further insights on existing literature regarding private equity firms participating in this buy-and-build strategy. In particular, I am mainly interested in the effect of private equity firms executing this strategy on portfolio company performance. As the shift in private

equity firms participating in a buy-and-build strategy is increasingly being observed, literature on this investment practice on portfolio company performance is lacking. A further evaluation of this strategy provides implications for private equity firms on value creation and potential target companies to reignite growth. In addition, it can loosen scrutiny on ordinary private equity practices by for instance the SEC and target companies.

Earlier research of Hammer, Knauer, & Pflücke (2017) already shed light on the determinants of follow-on acquisitions in private equity financed buyouts from 1997 till 2010. They also show what purpose the private equity party should fulfil regarding their expertise and experience. In particular, their target selection capabilities, the manner in which they create operational improvements and their ability to determine optimal exit routes for the consolidation. In this thesis, I am interested if these determinants of follow-on acquisition also have an effect on portfolio company performance. Guo, Hotchkiss, & Weihong (2011) focus on the general value creation mechanisms implemented by private equity firms to improve target company performance. In their sample of public to private buyouts executed from 1990 to 2006 they observe that to a small degree firms participating in leverage buyouts outperform industry peers. In addition, Acharya, Gottschalg, Hahn, & Kehoe (2013) already find a positive effect of being a financial partner opposed to one with an operating background in an inorganic growth strategy. A financial partner outperforms the other by 9.1% on their abnormal performance measure of EBITDA to Sales. In this paper, I examine if private equity firms adopting an alternative acquisition strategy also lead to portfolio firms outperforming industry peers. On a sample of 288 exited deals from 1984 to 2006, Chapman & Klein (2009) find that fund returns measured in equity returns are mainly determined by the initiation of follow-on acquisitions. As their only significant variable, performing an add-on positively increases fund performance by 19.88%. Thus, on a fund-level the private equity performance improves by following a buy-and-build strategy. This thesis investigates if similar results can be found regarding portfolio company performance. Similarly as Hammer, Knauer, & Pflücke (2017), Borell & Heger (2013) support the theory on the selection expertise of private equity firms for building a consolidation. Their sample covers the period from 2000 till 2008. In addition, they provide compelling evidence on private equity firms improving asset utilization in the consolidated firm. As they already find an improvement in target company efficiency, I also examine target company profitability. Moreover, this paper focuses on improvement of portfolio company efficiency and profitability, in which special interest is devoted to the determinants of follow-on acquisitions.

The implications of this thesis are based on a sample of deals from 1999 till 2015 with known pre-entry and post-exit target financials on mainly private to private deals. I investigate the effect of a by private equity implemented buy-and-build strategy on portfolio company performance. As such,

I also lay emphasis on private equity firm characteristics and capabilities. This thesis does not focus on fund returns. In addition, special interest is devoted to other influences on corporate performance. In specific, I extrapolate the effect of the buy-and-build strategy by taking into consideration debt market conditions and company/sector wide influences on performance. Besides operating efficiency, I am interested if the buy-and-build strategy improves profitability.

Accordingly, the findings of this thesis provide empirical evidence of value creation for private equity portfolio firms involved in a buy-and-build strategy. These findings are particularly present regarding sector adjusted- profitability opposed to efficiency. However, solely executing follow-on acquisitions without taking into account specific buy-and-build characteristics does not add value. In particular, the private equity firm creates value if it extends its usual investment horizon to build a consolidation in a more fragmented market, in which the acquisition of a scalable more established platform is involved to build upon.

This paper follows a particular structure to evaluate the main question. In the following section I discuss relevant literature. The composition of the dataset is explained in section 3. In section 4 the empirical analysis is performed. The results are checked for robustness in section 5. The main question is answered and implications on earlier- and further research are discussed in section 6.

2. Theoretical framework

In this section earlier literature is analysed to illustrate the different drivers of synergies exploited in a buy-and-build strategy. For the hypotheses, I investigate the most important similarities in portfolio company characteristics involved in this strategy, provided by Brigl, Jansen, Schwetzler, Hammer, & Hinrichs (2016). Furthermore, I examine theories on the effects of these characteristics on portfolio company performance.

2.1 Portfolio company age

As explained in Smit (2001), the buy-and-build strategy can be separated in sequential stages. At first the buyer acquires a platform. Ideally, this platform is already a well-established firm. The buyer leverages up unique competitive advantages that are present at the platform firm, such as, an established network, competitive assets in place and other core competencies and efficiencies. Subsequently, the platform is used to build upon with follow-on acquisitions. The first hypothesis evaluates the first stage of this investment strategy.

Rousseau (2010) provides insights on the private equity investor fulfilling the role of initiating the acquisition of a platform investment and creating value. He states that value is created in a buy-and-build strategy through industry knowledge of the platform firm and private equity firm acquisition experience. If the platform firm has adequate resources, the private equity firm should be able to re-allocate these resources and further exploit these in a more efficient and profitable manner. Empirical evidence on private equity platform characteristics is provided by the study of Borell & Heger (2013). They find that platform investments are most likely profitable asset rich firms. These platform characteristics are further evaluated in the paper of Holloway, Lee, & Tao (2016) on cross-border buyouts. They argue that growth in foreign markets are achieved by establishing an initial foothold in this market. Preferably, these footholds are established inorganically, through the acquisition of a well-established firm already operating in that market. The acquiring firm gains an extensive network within a foreign market and valuable in-house operational abilities. Similarly, in a buy-and-build strategy the initial platform serves as a foothold in a particular industry for the private equity firm.

Thus, as private equity parties prefer investing in matured companies as their initial platform, I am particularly interested if this also increases the portfolio company performance. General findings on matured firms indicate that these firms are more productive, however, enjoy less growth opposed to young firms (Ayyagari, Demirguc-Kunt, & Maksi, 2011). The study of Caiazza (2015), sheds light on explaining company innovation in matured industries. By establishing collaborations such as joint ventures and mergers and acquisitions, these firms can maintain a

sufficient level of innovation. Consequently, if indeed private equity firms prefer investing in matured platforms, it can also positively affect portfolio company performance through enabling additional growth opportunities through follow-on acquisitions.

As such, the following hypothesis is composed, investigating this particular nature of the platform firm and its effect on portfolio company performance.

Hypothesis 1: The effect of follow-on acquisitions on portfolio company profitability and efficiency improves relatively to industry peers pre-entry to post-exit if the initial platform is a more established firm.

2.2 Portfolio company size

As the acquisition of the platform firm is not a stand-alone investment, solely leveraging upon assets in place is not sufficient. In a buy-and-build strategy the platform should also be scaled and built upon.

Chapman & Klein (2009) find that inorganic growth occurs commonly in big asset rich firms, which are able to commit resources for acquiring follow-on acquisitions. They further increase consolidation efficiency by implementing their competitive advantages and reallocating their assets to the add-ons. In particular, the ability to share operating activities, exploit similar technologies, production facilities and business departments. In addition, Hammer, Knauer, & Pflücke (2017) find that firms classified as platforms by previous private equity owners are more common to fulfil this role again in secondary buy-outs.

The following hypothesis focuses on the relationship between the initial platform investments characteristics and corporate performance. Literature describe that the implementation of a buy-and-build strategy is most likely with a scalable platform.

Hypothesis 2: The effect of follow-on acquisitions on portfolio company profitability and efficiency improves relatively to industry peers pre-entry to post-exit if the initial platform is scalable in size.

2.3 Holding period

The duration of the private equity investment could have different influences on private equity fund returns and the performance of their investments depending on which buyout strategy is implemented.

In a buy-and-build strategy operating synergies are exploited through consolidating follow-on acquisitions into the platform firm. In this chain of investments, the earlier ones are essential for

establishing opportunities for those in the future. In the paper of Aktas, Bodt, & Roll (2005) they find evidence that strategic buyers learn from their earlier acquisitions along this path. They are also more likely to prolong this chain of investments in a similar direction if previous ones were successful. Through these acquisitions the buyer improves its knowledge of the industry and its capabilities for a quicker selection process of add-on investments. These selection capabilities will be already present when the private equity firm has extensive initial acquisition experience in that particular industry (Meglio, King, & Risberg, 2017). Furthermore, I devote interest to the integration process among the consolidated firms. Schweiger & Goulet (2000) state that a buyer should take the appropriate time to optimally implement these processes. The integration process will involve removing abundant activities among the firms in the consolidation. According to Chakrabarti & Mitchell (2016) the optimal holding period of a successful integration prolongs when more common activities are present. In addition Holland & Salama (2010) argue that besides asset integration and other financial due diligence, synergies can only be accomplished if special interest is devoted to optimally integrating cultural differences between the acquiring and targeted firm. Thus, although the private equity firm learns to efficiently integrate follow-on acquisitions into the initial platform, the overall time to perform a buy-and-build strategy is longer. In particular, to integrate one or multiple follow-on acquisition requires more time and resources than an usual stand-alone buyout. However, Bansraj & Smit (2017) argue that in a buy-and-build strategy an optimally integrated consolidated firm enhances exit opportunities, which prevents unnecessary prolongation of the holding period. Hammer, Knauer, & Pflücke (2017) do agree upon the fact that building a consolidation usually takes more time. Consequently, they find evidence that add-ons are only executed if these acquisitions can be performed and integrated quickly.

Nevertheless, in ordinary private equity acquisitions private equity funds are more constrained to their short investment horizon. Private equity firms are expected to exit their investments when conditions result in optimal fund returns. On average private equity firms exit their investments four years post-entry due to the illiquid nature of this asset class. Holding periods exceeding this average are even perceived to erode private equity fund returns stated in Hammer, Knauer, & Pflücke (2017). As a result, Lerner, Sorensen, & Strömberg (2011) state that private equity firms are occasionally accused of short-termism for the sake of protecting fund returns. In these so called “quick flips” unexploited synergies can still be present.

As such, based on other empirical research there should be a different effect on target company performance of the duration of the portfolio investment depending whether the private equity firm executes a buy-and-build strategy or not.

Hypothesis 3: Portfolio company profitability and efficiency deteriorate relatively to industry peers pre-entry to post-exit in ordinary buyouts if the holding period is extended. This effect is not present in buy-and-build deals.

2.4 Industry concentration

Building a more efficient consolidation with an initial platform and its follow-on acquisitions opposed to their stand-alone values, is the main rationale of executing the buy-and-build strategy. The selection process is essential as the earlier investments pave the way for further ones. As such, optimal corporate performance of the consolidation depends on the firms it is composed of. For the following hypothesis, I focus on the degree of industry concentration to stimulate this selection process. Literature on the industry life cycle provides additional implications on differences between firms operating in a fragmented- or concentrated market.

Earlier research of Borell & Heger (2013) already points out that general buyout activity is more common in fragmented industries. Literature on the acquisition probability for buy-and-build deals find similar results. Particularly, Hammer, Knauer, & Pflücke (2017) find empirical evidence that low industry concentration also increases add-on probability. As an explanation, Bansraj & Smit (2017) state that building a consolidation in a fragmented market is more attractive, for the simple reason that it contains a wide selection of potential platform firms and build up targets.

Focusing on entry barriers and the type of competition, the presence of dominant players is also less of a concern in these kind of industries, stated in Smit (2001). With low entry barriers, these industries contain more companies with firm-specific growth opportunities, which can be exploited further on (Karniouchina, Carson, Short, & Ketchen Jr, 2013). Specifically, these firms differ in their asset base and applied technologies. This heterogeneity between firms diminishes with industry concentration. Based on empirical evidence, Lumpkin & Dess (2001) argue that these kind of companies deteriorate value when they seek market share leadership at the expense of foregone cash flows and profits. Thus, as explained by Smit (2001), in an industry with a lack of dominant players, consolidating these growth firms provides an alternate manner of achieving market share leadership and potential improvement of portfolio company performance. For instance through economies of scale and scope. As one of the few dominant players, the consolidated firm integrates the assets, establishing further synergies. Consequently, improving the probability to attract following value enhancing strategic buyers (Bansraj & Smit, 2017). Especially in a fragmented market such a consolidated firm is more likely to exit through a more profitable manner, for instance an initial public offering (Hammer, Knauer, & Pflücke, 2017). In addition, they also expect that the likelihood of attracting concerns of anti-trust authorities is lower in such industries.

Nevertheless, growth through acquisitions can also benefit firms operating in consolidated industries. As Karniouchina, Carson, Short, & Ketchen Jr (2013) argue that these industries are mainly composed of dominating matured firms, differences between firms in terms of competitive advantages are scarce. As growth stabilizes, this homogenous nature of the firms implies that competition between them will be more aggressive focusing on price practices and market leadership. Following a buy-and-build strategy provides an alternate manner for a matured dominant firm to gain competitive advantages and stay ahead of industry peers. Specifically, opposed to price practices, reciprocating a path of follow-on acquisitions is not as straightforward.

Accordingly, the amount of firms and their characteristics differ by the degree of industry concentration. The following hypothesis is composed to provide insights if these have additional implications on the corporate performance of the platform firm as well.

Hypothesis 4: The effect of follow-on acquisitions on portfolio company profitability and efficiency improves relatively to industry peers pre-entry to post-exit if the initial platform is operating in a more fragmented market.

2.5 Non-buy-and-build characteristics

I am mainly interested in the effects of the buy-and-build strategy on portfolio company performance. However, I do acknowledge that other non-buy-and-build influences affect performance. At first, throughout the hypotheses, light is shed on value creation initiated by the private equity firm through for instance prior acquisition experience and operational expertise. These characteristics are perceived to increase with private equity firm size (Schweiger & Goulet, 2000).

As the buy-and-build strategy is a rather new phenomenon in private equity, other value creation mechanisms were already being implemented. Private equity firms are for instance perceived to improve corporate governance in their portfolio firms (Kaplan & Strömberg, 2009). They can take part of the target company board and choose to resign existing management. Additionally, private equity firms generally require the management to acquire a stake in their own company, resolving agency problems. Regarding the buy-and-build strategy, these governance mechanisms are particularly important for the integration process of establishing an efficient consolidation.

Furthermore, an established private equity firm also improves liquidity through an increased accessibility to external finance. In particular, according to Achleitner, Braun, Engel, Figge, & Tappeiner (2010) banks are more willing to provide finance to companies backed by these firms

opposed to companies lacking such a sponsor. Despite public scrutiny, the levering effect in private equity buyouts is one of the main sources of portfolio company value creation. Whereas debt is the cheaper form of external company finance opposed to equity, it also inclines management to pay interest payments further resolving agency problems (Jensen, 1986). Although rising debt ratios increase the probability of company defaults, benefits occur due to interest tax shields (Myers, 1984). Studies on debt market conditions, further emphasize the importance of leverage. Axelson, Jenkinson, Strömberg, & Weisbach (2013) show that favourable debt market conditions stimulate additional external (debt) finance. In particular, the optimal amount of leverage for portfolio company investments increases with favourable debt market conditions. As such, these conditions affect deal prices, target company capital structure and thereby fund returns and most importantly portfolio company performance. Hammer, Knauer, & Pflücke (2017) find that increasing credit spreads negatively affect add-on investment probability. Consequently, debt market conditions affect the buy-and-build strategy.

Besides operational improvements and financial engineering, private equity firms implement multiple expansion as one of their key sources of value creation. As Achleitner & Figge (2012) explain, private equity firms apply their negotiation- and market timing skills to execute a buy-low-sell-high strategy on their portfolio investments. This concept is also present in a buy-and-build strategy, in which the sum of the individual stand-alone investments should be exceeded by the sale of the more efficient consolidation.

Thus, improved governance, optimal financial engineering and determining timely entry- and exit methods are important in private equity value creation. Nevertheless, I lay emphasis on the findings of Brigl, Jansen, Schwetzler, Hammer, & Hinrichs (2016) that investment practises are shifting to operational improvement in private equity buyouts. As such, I expect the specific buy-and-build effects to remain even if these non-buy-and-build characteristics are taken into consideration.

3. Data

In this section I present the construction of the different datasets to conduct my research. Several sources are exploited for retrieving data on executed deals, deal- and sector financials and debt market conditions. I also show the composition of all variables used.

For this research I am particularly interested in deals financed by private equity firms. These deals are obtained from the Bureau van Dijk Zephyr database. To investigate the effect of a buy-and-build strategy on portfolio company performance executed by private equity firms, I gather private equity entry- and exit data. Entry data is based on completed acquisitions, institutional buyouts (IBOs) & management buyouts (MBOs). This results in a total of 33,006 deals. For my exit deal data I obtain all deals in which a private equity firm exited its investment. Accordingly, an additional amount of 27,750 deals are retrieved. The entry- and exit deals are combined and duplicate deals are removed. The combined dataset contains a total of 54,837 deals.

To identify deals with a known entry- and exit date, I sort the data on unique target company IDs (target BvD ID number) and entry years. Sorting on target BvD ID numbers also tackles possible company name changes. Entry- and exit couples are determined if (one of) the entry acquirer(s) is equal to (one of) the exit vendor(s). Acquirers and vendors are both described using their company names and BvD ID numbers. Accordingly, 3,189 deals with a known entry- and exit date are determined and summarized in Table I.

Table I – Entry- and exit years

In this table the amount of PE-entry and exits are shown for each year. The holding period (in months) is the difference between entry- and exit year. The mean of the holding period for each year is displayed.

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Entry	1	25	32	59	80	87	101	143	246	289	309
Exit			5	9	16	18	24	32	78	115	154
Holding period	56.0	52.6	46.3	60.9	61.1	61.1	51.9	50.6	53.8	58.3	62.7

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Entry	372	251	164	224	231	211	161	108	70	23	2
Exit	215	160	90	192	202	254	260	345	320	361	340
Holding period	64.1	59.6	54.9	51.0	47.3	39.4	33.2	26.0	18.6	8.6	0.5

Total	3,189										
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For my sample, Table I shows a major increase in private equity buyout activity from 2002 till 2007. Post-crisis (after 2009), buyout activity does not return to its pre-crisis level, whereas a considerable increase of private equity exits is observed. The holding period is defined as the difference between entry- and exit year expressed in months. The mean of the holding period for each year is displayed in the table. An increase in the holding period is observed for the years ahead

of the crisis. Presumably, due to private equity firms not willing to divest when market conditions are unfavourable. One observation is considered as an outlier and therefore dropped.

Additionally, target company information and annual financials along with other deal- and private equity characteristics are obtained from the Zephyr database for the extrapolated 3,189 deals. The target BvD ID numbers are used to retrieve acquisitions in which these targets acted as acquirers before the exit date. This particular dataset consists of 5,687 observations. Similarly, I examine 38,105 deals in which the private equity investors had also participated into before exiting the 3,189 main deals of interest.

Table II – Deals by exit type

In this table the amount of buyouts are shown to their respective exit type and average holding period.

IBOs, MBOs and IPOs are defined as institutional-, management buyouts and initial public offerings respectively. Additionally, It shows how many of these are classified as buy-and-build (B&B) deals. B&B deals are the ones in which the portfolio company performs at least one follow-on acquisition during the holding period. The holding period is defined as the difference between entry and exit (in months).

Exit type	Acquisition	IBO	MBO	IPO	Other
Observations	1737	1199	112	17	124
% of total	54.5%	37.6%	3.5%	0.5%	3.9%
Holding period	50.8	56.2	46.3	25.5	-
B&B deals	460	443	29	7	38
% of obs.	26.5%	36.9%	25.9%	41.2%	30.6%
Holding period	59.7	63.7	50.9	28.9	-
Total	3189				

In Table II the exit types of the deals are displayed. I use the terminology of the Zephyr database for classifying the deals. As can be seen, the majority of the buyouts are acquisitions and IBOs. Sub-deal types are not shown, however, I observe that more than 40% of the deals are sold to a subsequent private equity firm. The buy-and-build deals are the ones in which the portfolio company performs at least one follow-on acquisition during the holding period. The highest percentage (41.2%) of observations involving follow-on acquisitions relative to their exit type are the initial public offering (IPO) exit deals. For each exit type, I observe longer holding periods for the buy-and-build deals relative to the overall sample.

Table III shows the distribution of deals by industry classification. For this table industries are classified following the 2 digit SIC codes defined by SIC-NAICS LLC (2017). The majority of the deals are executed in the asset rich manufacturing sector. In a particular set of 335 of these deals a follow-on acquisition was involved. The majority of the buy-and-build deals (376) are executed in the services sector.

Table III – Deals by industry

In this table the amount of buyouts are shown to their respective industry. Additionally, It shows how many of these are classified as buy-and-build (B&B) deals. B&B deals are the ones in which the portfolio company performs at least one follow-on acquisition during the holding period. Industries are classified following the 2 digit SIC codes defined by SIC-NAICS LLC (2017).

Industry	Observations	% of total	B&B deals	% of obs.
Agriculture, Forestry, Fishing	20	0.6%	7	35.0%
Mining	28	0.9%	7	25.0%
Construction	53	1.7%	17	32.1%
Manufacturing	1349	42.3%	335	24.8%
Transportation & Public Utilities	258	8.1%	80	31.0%
Wholesale Trade	169	5.3%	61	36.1%
Retail Trade	210	6.6%	53	25.2%
Finance, Insurance, Real Estate	144	4.5%	39	27.1%
Services	955	29.9%	376	39.4%
Public Administration	3	0.1%	1	33.3%
Total	3189			

To compute industry performance averages, I transform the four digit target company US sic codes from the deals with a known entry- and exit year into three digit ones. This particular US sic code list is used to retrieve financials of public traded firms on a global scale. An appended dataset is constructed obtaining annual public financials gathered from Compustat Global and North America. This appended dataset contains 640,685 observations. After the retrieval of these financials industry averages are computed.

Debt market conditions data is based on the US bond market. I exploit the Federal Reserve Bank of ST. Louis FRED database for US national economic data. The data includes 5,438 observations on US bond yield spreads covering the period from my first entry- till the last exit deal of interest.

The steps taken to construct the data set are summarized in the appendix (Table XI).

3.1 Descriptives

In this subsection I provide a thorough clarification to construct all variables used. To disentangle the effects of different sources on company performance, variables are grouped to identify buy-and-build, private equity and general company performance control characteristics.

Throughout this research, private company financials are used. However, due to their private nature, these financials are not available in abundance. I apply criteria to ensure an adequate amount of observations to conduct valid research. Financials are used pre- and post-entry (exit). If pre-entry financials are missing, financials of one or two years earlier are used instead (vice versa for post-exit financials). Similarly, if post-entry financials are missing, the financials of the year

thereafter are used (vice versa for pre-exit financials). The continuous independent- and dependent variables are trimmed for outliers.

3.1.1 Buy-and-build variables

For this thesis, I am mainly interested if a private equity initiated buy-and-build strategy adds value to portfolio company performance. In a buy-and-build strategy the private equity firm acquires a platform to build upon with further add-on acquisitions. To identify platform characteristics, the effects of target company firm- age and size are considered. Firm age serves to identify if the target company can be considered as “well-established”. The logarithmic value of pre-entry sales is used as a proxy for firm size. Regarding, the building aspect of the strategy, consolidation opportunities should be more available if the private equity investor establishes a platform in a fragmented market. A Herfindahl-Hirschman Index (HHI) is constructed to measure the degree of industry concentration. The HHI is defined as followed:

Formula I – Herfindahl-Hirschman Index

$$\text{Herfindahl – Hirschman Index} = \sum_{i=1}^N s_i^2$$

Where s_i stands for the market share of a company and N the total number of companies. The degree of industry concentration is considered high the closer the HHI reaches one on a scale of zero to one.

As proposed, consolidating a platform investment with following add-on acquisitions takes more time than the ordinary four years duration of private equity investments. To investigate the effect of this holding period, the difference between the entry- and exit date is taken. This period is measured in months. For the acquisition strategy of the portfolio firm, I examine if it acts as an acquirer while being held. To broaden the scope of the add-on research, I also examine if the private equity firm acquires additional targets in the holding period. Correspondingly, I compose two variables which count the number of acquisitions initiated by the portfolio company and the private equity firm. Furthermore, in several cases, multiple private equity parties are involved in the same deal. For these “club” deals, I substitute the add-on variable by using its appropriate total acquisitions alternative. Furthermore, dummy variables are used to measure the effects of initiated follow-on acquisitions. By its categorization, the dummy variables are set to one if there is at least one add-on involved.

3.1.2 Private Equity variables

Whether private equity parties do or do not apply a buy-and-build strategy, several other mechanisms affect the company performance of their investments. Variables are determined to take into consideration governance, financial- and operational engineering enabled due to the presence of the private equity investor.

The effect of financial engineering is observed by the change in pre- to post-entry leverage. Leverage is calculated by taking the ratio of total- liabilities to assets. The variable equity participation is used as a proxy for management alignment and improved governance. A dummy variable is set to one if portfolio company management, directors or employees participated in the acquisition of the company shares at private equity entry. The effect of management alignment is also influenced if multiple private equity investors are involved in a single deal. A dummy variable, club deal, takes the value of one if this is the case. Club deals enable investors to co-invest in bigger deals and mitigate risk. However, management alignment can be more complicated due to differing interests among investors.

The ability to integrate companies with different cultural backgrounds is measured using the geographical private equity investment preferences. Private equity firms acting on a global scale are also perceived to be bigger and more well-established. Large private equity funds are expected to enjoy a bigger network of potential fund sources and possess superior negotiation skills regarding financing terms. The geographical preference of the private equity firm is divided into a global, regional or domestic category. A classification of global is given if the private equity firm prefers investing in multiple continents. Deals out of a regional preference are those in which the private equity firm prefers investing in multiple countries within the continent. Classified as domestic are the cases in which it invests in a single- or its neighbouring country. Deals categorized as domestic are predominantly executed in the US. Club deals, in which multiple private equity parties are involved operating together on a global (regional) scale, are classified as global (regional) if they were not already.

Operational synergies are also observed by examining if the private equity investor already has acquisition experience in the industry of the target company. A dummy variable takes the value of one if this is the case. An additional dummy variable is created to measure the degree of general acquisition experience of the private equity firm. I take the average of deals committed by all the private equity parties involved in a deal pre-entry. If this average is among the highest 25% opposed to other private equity firms(clubs), the variable Active PE is set to one.

3.1.3 Company performance control variables (firm fixed effects)

Company performance is also affected by influences on a company, sector or macro-economic level without any further interference of the private equity investor. The initial company profitability is examined by its pre-entry EBITDA to sales or assets (depending on the post-exit profitability measure). I am particularly interested in abnormal company profitability. Accordingly, the profitability measures are adjusted to industry peers. Similarly, initial abnormal company efficiency is taken into account by composing sector adjusted pre-entry sales to assets. For initial portfolio company leverage, the variable pre-entry leverage is used.

Regarding macro-economic influences, I control for pre-entry debt market conditions. Following the methodology of Axelson, Jenkinson, Strömberg, & Weisbach (2013). I proxy debt market conditions by investigating the high yield spread. The high yield spread implemented throughout this research, consists of the BofA Merrill Lynch Option-Adjusted Spreads (OASs). The OASs is calculated by deducting the US spot treasury rate from the BofA Merrill Lynch US High Yield Master II Index value. The high yield index value is composed of bonds rated on average below investment grade by Moody's, S&P and Fitch with a minimum maturity of a year.

3.1.4 Dependent variables

Company performance is examined by using three measures. Two for investigating profitability and one for efficiency. Profitability is examined by composing the change in pre-entry to post-exit industry adjusted EBITDA to sales and assets. Similarly, the change in pre-entry to post-exit industry adjusted sales to assets is calculated for efficiency. If post-exit financials are missing or do not meet the criteria, pre-exit ratios of one year before are used for all measures of performance.

In summary, a short description of all the variables used throughout this research are displayed in the appendix (Table XII).

3.2 Summary statistics

In Table IV the summary statistics of the continuous independent variables are shown. In the table a distinction is made whether follow-on acquisitions (B&B) are involved or not (Non-B&B). Due to the private nature of our target companies, only for a minority of these firms financials are obtained. This can be observed by the low amount of observations for the dependent- and some of the independent variables. The mean values of the dependent variables show that private equity firms in buy-and-build deals appear to improve the sector adjusted change in EBITDA to sales and efficiency, however, deteriorate EBITDA to assets opposed to non-buy-and-build deals. For both groups the mean values of the independent variables at pre-entry level solely seem to be positive on efficiency. As such, private equity parties appear to favour acquiring firms, which outperform

industry peers on efficiency pre-entry. The table also shows that the buy-and-build portfolio firms seem to be less efficient on average. Additionally, both groups of firms are already highly levered pre-entry and experienced little change in this ratio post-entry. Debt market conditions are similar as well. Firm characteristics regarding target size, firm age and industry concentration appear similar. However, the groups differ in their holding periods. On average the buy-and-build deals show an investment horizon of five years, whereas the other ones are held for four. The mean logarithmic values of target size are interpreted as private equity firms invest in portfolio companies generating approximately 35mln dollars of sales. The mean values for firm age can be considered young and the deals are executed in less concentrated markets according to their HHI.

Table IV – Summary statistics continuous variables

In this table the summary statistics are presented for the continuous variables of this research. For every variable the total amount of observations and the mean are displayed. Additionally, it shows how many of these are classified as (non-)buy-and-build (B&B) deals. B&B deals are the ones in which the portfolio company performs at least one follow-on acquisition during the holding period.

Variable	B&B	Mean	Non-B&B	Mean
SA EBITDA/sales change	139	-0.175	324	-0.077
SA EBITDA/assets change	149	-0.233	356	-0.285
SA sales/assets change	159	-0.200	408	-0.253
Target size	188	10.452	489	10.363
Firm age	357	14.709	909	15.670
Holding period	976	59.892	2,213	48.920
Herfindahl-Hirschman Index	643	0.246	1,354	0.268
leverage change	195	0.007	485	-0.007
High yield spread	976	5.626	2,213	5.695
SA pre-entry EBITDA/sales	159	0.016	385	-0.003
SA pre-entry EBITDA/assets	173	0.051	426	0.035
SA pre-entry sales/assets	186	0.156	476	0.203
Pre-entry leverage	254	0.590	639	0.634

Table V – Summary statistics dummy variables

In this table all the dummy variables are shown in which they are equal to one. This is also displayed as a percentage the total observations.

Variable	Obs.	% of total
PE add-on	2,599	81%
Target add-on	977	31%
Active PE	761	24%
PE operational synergy	317	10%
Equity participation	361	11%
PE global preference	608	19%
PE regional preference	400	13%
PE domestic preference	617	19%
Club deal	1,166	37%
Total	3,189	

In Table V the dummy variables used throughout the regressions are presented. As can be seen, the majority of private equity firms acquire at least one other company, while holding the

main companies of interest. Approximately one third of the portfolio companies execute acquisitions in the holding period. Effects of the PE operational synergy variable can only be measured for 10% of the sample, however, operational effects can also be observed out of the geographical preference of the private equity firm. Data on this measure is widely available throughout the sample. Due to a small amount of observations for the equity participation variable, effects of management alignment and improved governance can be complemented by the club deal dummy.

4. Empirical Analysis

In this section the empirical analysis is provided. For each hypothesis I explain the methods used. The hypotheses are examined if they can be answered as expected. Analysis of the hypotheses provides the underlying influences of the performance of the buy-and-build strategy. Influences on portfolio company performance are measured by applying ordinary least squares regressions. For each hypothesis the appropriate constructed variables are used. Additionally, I provide the methods to adjust the standard errors of the regression coefficients. The results are analysed according to insights provided by earlier research.

4.1 Standard errors

The standard errors of the estimated coefficients are adjusted for particular concerns to assure unbiased results. Through performing residual plots on the unadjusted regressions (not shown in the paper), it can be seen that the variances between the predicted values and residuals are not constant throughout the sample. In addition, in the sample of 3,189 deals with a known entry- and exit year, some of the portfolio company investments occur in multiple cases, although, with differing entry years. Occasionally, these observations appear right after each other. Accordingly, I correct for probable clustering among residuals for observations with identical target company BvD IDs by using clustered standard-errors. These standard errors also deal with the issue of heteroscedasticity. Due to missing the majority of private company financials for both the dependent- and independent variables, I am dealing with a small sample size for the regressions. The issue is tackled by bootstrapping the regressions. Through implementing a bootstrap, the observations are resampled and the regressions are repeated for a certain amount of replications. In addition of implementing clustered standard errors, the regression results are the output of 1000 replications using a bootstrap approach.

4.2 Base results

At first, I examine the general effect on corporate performance when the private equity firm and its portfolio company perform an acquisition without considering the buy-and-build characteristics. This regression is considered as the base regression and is formulated as follows:

Formula II - Base regression

$$\text{Performance measure} = \alpha + \beta_1 * \text{Ta add-on} + \beta_2 * \text{PE add-on} + \beta_3 * \text{Club deal} + \beta_4 * \text{High yield} + \beta_5 * \text{SA pre-entry performance} + \beta_6 * \text{Pre-entry leverage} + \varepsilon$$

Where α stands for the constant and β for the coefficient of the variables summarized in Table XII. Furthermore, for every hypothesis I add the appropriate constructed variable to the base regression. These constructed variables capture the effects of establishing a platform in the first stage of the buy-and-build strategy. As I am mainly interested in the building stage, interaction terms are examined in addition. These interaction terms focus on performing follow-on acquisitions as a portfolio firm, taking one of the buy-and-build characteristics into account as well. The method provides insights in the ideal circumstances of performing this strategy on portfolio company performance. For some of the firms I use post-entry (pre-exit) financials of one year ahead (before). Accordingly, the regressions are constrained to a minimum holding period of two years.

The tables in which the regression results are displayed follow a similar framework. For the main variables of interest they show the coefficient and, if present, its significance on sector adjusted portfolio company profitability or efficiency. The adjusted standard errors are presented below their corresponding coefficients. Furthermore, the tables display which sets of additional control variables are taken into consideration.

Table VI – OLS regression - Base

The table shows the ordinary least square regressions on the respective measure of profitability or efficiency. Target (PE) add-on is a dummy variable which takes the value of one if the portfolio (private equity) firm performs an acquisition during the holding period. The (significant) effect of the coefficients is displayed with their standard errors below in brackets. The table also shows the different sets of control variables used, the amount of observations and the fit of the model.

	SA EBITDA/Sales change	SA EBITDA/Assets change	SA Sales/Assets change
Target add-on	-0.205	-0.024	0.082
	-0.197	-0.133	-0.127
PE add-on	0.397*	0.001	0.148
	-0.240	-0.210	-0.173
Private equity effects	No	No	no
Year fixed effects	No	No	no
Firm fixed effects	Yes	Yes	yes
Constant	Yes	Yes	yes
Observations	253	265	310
R-squared	0.020	0.011	0.009

* Statistical significance at the 1% level.

** Statistical significance at the 5% level.

*** Statistical significance at the 10% level.

The results of the base regression are presented in Table VI. The regressions show the general effects of executing an acquisition during the holding period as a portfolio company and the private equity itself. It can be seen that in general there is no significant effect of performing an acquisition as a portfolio company on its performance. However, I find evidence of an improvement of 39.7% in the change of sector adjusted profitability measured in EBITDA to sales if the private equity executed an additional acquisition during the holding period.

4.3 Hypothesis 1 – Portfolio company age

The effect of follow-on acquisitions on portfolio company profitability and efficiency improves relatively to industry peers pre-entry to post-exit if the initial platform is a more established firm.

In the buy-and-build strategy acquiring the initial platform determines the remaining path of follow-on acquisitions. As such, the selection of a suitable platform is essential. The benefits of a buy-and-build strategy should be optimally achieved if the platform is a well-established firm in its industry. A matured firm survived multiple downturns and should enjoy some kind of competitive advantage over its industry peers. The private equity firm levers upon these competitive advantages and apply these further on in the building stage. Accordingly, the private equity firm gains an extensive network and valuable in-house operational abilities.

Table VII – OLS regression - Hypothesis 1

The table shows the ordinary least square regressions on the respective measure of profitability or efficiency. The corresponding variable and interaction term are added to the base regression to test for the first hypothesis. Target (PE) add-on is a dummy variable which takes the value of one if the portfolio (private equity) firm performs an acquisition during the holding period. Firm age is expressed in years. The (significant) effect of the coefficients is displayed with their standard errors below in brackets. The table also shows the different sets of control variables used, the amount of observations and the fit of the model.

	SA EBITDA/Sales change	SA EBITDA/Assets change	SA Sales/Assets change
Target add-on	-0.978*** -0.361	-0.209 -0.227	0.106 -0.214
PE add-on	0.492* -0.295	0.114 -0.217	0.151 -0.172
Firm age	-0.007 -0.007	-0.012* -0.006	0.002 -0.006
TA add-on*firm age	0.043** -0.018	0.014* -0.008	0.002 -0.008
Private equity effects	no	No	No
Year fixed effects	no	No	No
Firm fixed effects	yes	Yes	Yes
Constant	yes	Yes	Yes
Observations	214	223	251
R-squared	0.058	0.048	0.017

* Statistical significance at the 1% level.

** Statistical significance at the 5% level.

*** Statistical significance at the 10% level.

Accordingly, the variable firm age and its interaction term are added to the base regression. If the target company does not participate in a buy-and-build strategy (on a stand-alone basis), I do not expect that buying a more established firm automatically adds value to target company performance. Nevertheless, if competitive advantages are levered up and applied in the building stage, the interaction term is expected to show a positive effect on platform company performance.

Table VII shows the regression results for the first hypothesis. On the change in EBITDA to sales, I observe that the negative impact of performing a follow-on acquisition can be reversed. The total effect on portfolio company performance becomes positive if the acquired firm is at least 23 years old. In contrast to EBITDA to sales, for EBITDA to assets I observe a significant negative effect of firm age on portfolio company performance. This effect is reversed if this firm serves as a platform for a follow-on acquisition, based on the significant positive effect of the interaction term. The regression on sales to assets does not provide additional evidence on the effect of firm age on target company efficiency.

As Ayyagari, Demirguc-Kunt, & Maksi (2011) mentioned, due to their initial asset base these firms are more productive opposed to younger less established firms. However, they enjoy less overall growth. In addition Karniouchina, Carson, Short, & Ketchen Jr (2013) explained that, due to the homogenous nature of matured companies, competition between them will be more aggressive, focusing on price and market leadership. As such, in accordance with Caiazza (2015), the buy-and-build strategy is an alternate manner of value creation for matured firms, in which a collaboration with financial sponsors enables additional growth opportunities. Contrarily, solely buying a well-established firm deteriorates portfolio company performance. As Karniouchina, Carson, Short, & Ketchen Jr (2013) already noted that these firms enjoy little organic growth, I suppose that private equity firms can only re-ignite it inorganically.

The findings are as expected and in favour of the hypothesis. Portfolio company performance is improved if a more established firm serves as a platform to build upon. In ordinary private equity buyouts acquiring such firms deteriorates profitability.

4.4 Hypothesis 2 – Portfolio company size

The effect of follow-on acquisitions on portfolio company profitability and efficiency improves relatively to industry peers pre-entry to post-exit if the initial platform is scalable in size.

The essence of selecting an appropriate platform is further emphasized in the following hypothesis. The initial portfolio investment should function as a platform to build upon with follow-on acquisitions. Ideally, in a buy-and-build strategy this platform is already a big firm that can be further scaled in size. As such, follow-on acquisitions stimulate asset reallocation in the consolidation. The portfolio firm increases in size and improves its performance. I do not expect that buying a scalable firm necessarily adds value to corporate performance on a stand-alone basis. To the base regression the proxy for portfolio company size is added and its interaction term. As such,

for this regression I expect a positive effect of the interaction term on portfolio company performance.

Table VIII – OLS regression - Hypothesis 2

The table shows the ordinary least square regressions on the respective measure of profitability or efficiency. The corresponding variable and interaction term are added to the base regression to test for the second hypothesis. Target (PE) add-on is a dummy variable which takes the value of one if the portfolio (private equity) firm performs an acquisition during the holding period. Target size is the logarithmic value of pre-entry sales. The (significant) effect of the coefficients is displayed with their standard errors below in brackets. The table also shows the different sets of control variables used, the amount of observations and the fit of the model.

	SA EBITDA/Sales change	SA EBITDA/Assets change	SA Sales/Assets change
Target add-on	-5.372*	-4.200	-2.031
	-2.981	-2.975	-1.282
PE add-on	0.498*	-0.144	0.154
	-0.292	-0.248	-0.184
Target size	-0.054	-0.211	0.060
	-0.146	-0.160	-0.080
TA add-on*size	0.491*	0.416	0.208*
	-0.296	-0.295	-0.120
Private equity effects	no	No	No
Year fixed effects	no	No	No
Firm fixed effects	yes	Yes	Yes
Constant	yes	Yes	Yes
Observations	184	160	258
R-squared	0.051	0.057	0.035

* Statistical significance at the 1% level.

** Statistical significance at the 5% level.

*** Statistical significance at the 10% level.

Table VIII displays the regression results for the second hypothesis. When target size and its interaction term are added, performing an add-on as a portfolio company negatively affects the change in EBITDA to sales. However, if target size increases in the interaction term, this negative effect can be reversed and out weighted. Approximately, corresponding with its logarithmic value, the negative effect is reversed if the company generates a minimum of 56 million dollars of sales. I find similar results on EBITDA to assets, however, the coefficients are not significant. Efficiency can be improved by executing a follow-on acquisition on a platform, based on the positive significant coefficient of the interaction term. The change in sector adjusted portfolio company sales to assets improves approximately by 20.8% if pre-entry sales are scaled with a factor of 1.7 in the interaction term. On a stand-alone basis, buying a scalable firm does not lead to efficiency improvements.

The insights of Rousseau (2010) comply with my research on the performance of a buy-and-build strategy. Specifically, they explained when the platform already possesses valuable assets in place, the private equity firm further scales these assets. Findings of this paper are also in line with those of Chapman & Klein (2009). Big asset rich firms are able to commit their resources in the

acquisition of follow-on acquisitions. Overall profitability and efficiency are improved by reallocating their assets to the follow-on acquisitions and vice-versa. The findings for this hypothesis partly differ from those of Borell & Heger (2013), whereas they only found evidence of increased asset utilization.

The results support hypothesis (2). To improve the performance of the portfolio firm in a buy-and-build strategy, the private equity party should invest in big firms, which can be further scaled in size.

4.5 Hypothesis 3 – Holding period

Portfolio company profitability and efficiency deteriorate relatively to industry peers pre-entry to post-exit in ordinary buyouts if the holding period is extended. This effect is not present in buy-and-build deals.

Private equity firms are usually constrained to a short investment horizon, in which they implement their experience and expertise to improve the company performance of their investments. Contrarily, optimally integrating the assets and business cultures of the follow-on acquisitions with the platform investment requires a longer investment horizon. Correspondingly, I already observed a longer average holding period for the buy-and-build deals in my sample opposed to the overall sample. As such, I investigate a possible difference in the effect of private equity investment duration on performance by adding the holding period variable and its interaction term to the base regression. Opposed to stand-alone deals, I do not expect a negative influence of the holding period in the interaction term on portfolio company performance.

Table IX presents the results for the third hypothesis. I find different implications of the holding period on the change in EBITDA to sales. On a stand-alone basis a prolongation of the holding period (in months) shows a significant negative effect on this measure of portfolio company profitability. For every additional year this measure of performance deteriorates by 8.4%. The coefficient of the interaction term is non-significant and positive, implicating that a prolongation of the holding period perhaps positively influences performance. I find support of this proposition on the regression on the other profitability measure. The coefficient of the holding period on a stand-alone basis shows a similar effect as on EBITDA to sales, however, a prolongation of the holding period improves the change in portfolio company EBITDA to assets when the platform is used to build upon with a follow-on acquisition. It seems that the negative effects of a follow-on acquisition and the duration of the investment can be reversed if enough time is taken for executing a buy-and-build strategy. Performing a follow-on acquisition does not necessarily add value, according to the

negative significant coefficient of the variable target add-on. On portfolio company efficiency, I find similar results as those for EBITDA to assets. Based on the significant positive coefficient of the interaction term, a prolongation of the holding period improves efficiency if the platform is used to build upon with a follow-on acquisition. The sector adjusted change in sales to assets improves by 14.4% if the holding period is prolonged for a year.

Table IX – OLS regression - Hypothesis 3

The table shows the ordinary least square regressions on the respective measure of profitability or efficiency. The corresponding variable and interaction term are added to the base regression to test for the third hypothesis. Target (PE) add-on is a dummy variable which takes the value of one if the portfolio (private equity) firm performs an acquisition during the holding period. Holding period is expressed in months. The (significant) effect of the coefficients is displayed with their standard errors below in brackets. The table also shows the different sets of control variables used, the amount of observations and the fit of the model.

	SA EBITDA/Sales change	SA EBITDA/Assets change	SA Sales/Assets change
Target add-on	-0.350 <i>-0.485</i>	-0.566* <i>-0.342</i>	-0.569 <i>-0.374</i>
PE add-on	0.439* <i>-0.243</i>	0.025 <i>-0.209</i>	0.150 <i>-0.171</i>
Holding period	-0.007* <i>-0.004</i>	-0.005* <i>-0.003</i>	-0.003 <i>-0.003</i>
TA add-on* Holding period	0.003 <i>-0.008</i>	0.010* <i>-0.006</i>	0.012* <i>-0.006</i>
Private equity effects	No	no	No
Year fixed effects	No	no	No
Firm fixed effects	Yes	yes	Yes
Constant	Yes	yes	Yes
Observations	253	265	310
R-squared	0.030	0.022	0.021

* Statistical significance at the 1% level.

** Statistical significance at the 5% level.

*** Statistical significance at the 10% level.

The findings of this paper are in line with the learning by doing theory of Aktas, Bodt, & Roll (2005). In a buy-and-build strategy, the private equity firm gains additional industry knowledge and improves its selection capabilities along their path of follow-on acquisitions. Rousseau (2010) argued that these improved capabilities of the private equity firm further supports exploiting portfolio company's assets in place. Therefore improving profitability and efficiency positively. In addition, in a buy-and-build strategy several firms have to be integrated into a consolidation. The integration process involves removing multiple abundant operating activities and overcoming cultural differences. As Schweiger & Goulet (2000) stated, the appropriate time has to be taken to optimally integrate the target firm with the acquirer. Eventually, portfolio company performance improves. Following a buy-and-build strategy can thereby also counter accusations of short-termism for private equity firms discussed in Lerner, Sorensen, & Strömberg (2011).

Theory of Hammer, Knauer, & Pflücke (2017) is partly in line with the results. As my findings focus on target company performance, they already argued that the prolongation of the holding period erodes fund returns in ordinary private equity buyouts. As such, in ordinary buyouts private equity firms are still constrained to their short investment horizon due to the initial illiquid nature of this asset class. Although in a buy-and-build-strategy, investing funds in private equity still remains illiquid, this constraint seems looser. In addition, the private equity firm exits when conditions are optimal. As unexploited improvements can still be present in ordinary buyouts argued by Lerner, Sorensen, & Strömberg (2011), Bansraj & Smit (2017) explain that the appropriate time taken to create an optimally integrated consolidation establishes exit opportunities on its own.

Accordingly, I find evidence in favour of hypothesis (3). Portfolio company performance measured in both efficiency and profitability is positively affected in a buy-and-build strategy if the private equity firm prolongs the holding period. However, as expected the results regarding a prolongation of the holding period in an ordinary private equity buyout, shows differences. In ordinary buyouts, without considering additional inorganic growth, profitability is negatively influenced by extending the investment horizon.

4.6 Hypothesis 4 – Industry concentration

The effect of follow-on acquisitions on portfolio company profitability and efficiency improves relatively to industry peers pre-entry to post-exit if the initial platform is operating in a more fragmented market.

Buyouts generally occur in fragmented markets with ample potential acquisition targets. Similar to Borell & Heger (2013) and Hammer, Knauer, & Pflücke (2017), on average the buyouts in my sample are mainly performed in fragmented markets. Selecting the appropriate follow-on acquisitions determines the path of further ones and the overall performance of the consolidation. Through building a dominant player I expect that especially in such a market the buy-and-build strategy should reap the highest benefits regarding portfolio company performance. To the base regression the Herfindahl-Hirschman index variable and its interaction term are added. On a stand-alone basis, performing an acquisition in a fragmented is not expected to necessarily add value to the performance of the portfolio firm. However, I should find a positive effect of the interaction term, focusing on building a consolidation in a fragmented market.

Table X shows the regression results for the fourth hypothesis. On a stand-alone basis, investing in a concentrated market seems to have a positive impact on the change in portfolio company EBITDA to sales, based on the non-significant coefficient of the HHI variable. However, as

can be seen for the interaction term, building a consolidation with a follow-on acquisition in a concentrated market could decrease profitability by 159.5% (a HHI of one) at a maximum. The effect of the interaction term on EBITDA to assets seems similarly, although, non-significant in this case. The regression on sales to assets does not provide additional evidence of performance improvements.

Table X – OLS regression - Hypothesis 4

The table shows the ordinary least square regressions on the respective measure of profitability or efficiency. The corresponding variable and interaction term are added to the base regression to test for the fourth hypothesis. Target (PE) add-on is a dummy variable which takes the value of one if the portfolio (private equity) firm performs an acquisition during the holding period. The Herfindahl-Hirschman Index can only take a value on a scale from zero to one. The (significant) effect of the coefficients is displayed with their standard errors below in brackets. The table also shows the different sets of control variables used, the amount of observations and the fit of the model.

	SA EBITDA/Sales change	SA EBITDA/Assets change	SA Sales/Assets change
Target add-on	0.312 <i>-0.317</i>	-0.050 <i>-0.261</i>	-0.200 <i>-0.241</i>
PE add-on	0.124 <i>-0.333</i>	-0.004 <i>-0.269</i>	0.138 <i>-0.220</i>
Herfindahl-Hirschman Index	0.682 <i>-0.637</i>	-0.114 <i>-0.468</i>	-0.335 <i>-0.383</i>
TA add-on*Herfindahl	-1.595* <i>-0.961</i>	-0.666 <i>-0.656</i>	0.953 <i>-0.604</i>
Private equity effects	no	no	No
Year fixed effects	no	no	No
Firm fixed effects	yes	yes	Yes
Constant	yes	yes	Yes
Observations	161	172	204
R-squared	0.034	0.044	0.036

* Statistical significance at the 1% level.

** Statistical significance at the 5% level.

*** Statistical significance at the 10% level.

If private equity parties indeed enjoy particular selection capabilities, my findings confirm the proposition of Bansraj & Smit (2017). Specifically, these industries contain more potential valuable platform firms, which can be further exploited through a buy-and-build strategy. My results are in line with the proposition of Smit (2001). He argued that market share leadership through consolidating firms is particularly accessible in industries with a lack of other dominant players. As the only dominant player in the industry, the consolidation gains competitive advantages due to economies of scale and scope. As such, the portfolio company improves its performance. Additionally, no time has to be devoted to deal with anti-trust authorities, as particular interferences are less common in these industries.

However, Karniouchina, Carson, Short, & Ketchen Jr (2013), argued that concentrated industries contain mainly dominant mature companies. Nevertheless, my findings on industry concentration are not in line with this theory.

Thus, for all of the performance measures, the degree of industry concentration does not affect performance in stand-alone deals. Nevertheless, building a consolidation in a more concentrated market does deteriorate profitability. The findings support hypothesis (4).

5. Robustness

This section provides a robustness check on the analysis of the hypotheses. In the previous regressions private equity engineering mechanisms and year fixed effects are not taken into consideration. Nevertheless, I do acknowledge that these effects can alter the results. Controlling for private equity interference governance, financial- and operational engineering variables are added to the base regression. In addition, a dummy for every entry- and exit year is added to this adjusted base regression. The dummies control for year fixed effects. Accordingly, the earlier regressions are repeated. This particular set of regressions serves as a robustness check. However, I expect that the influences of the variables of interest on portfolio company performance will remain.

The Tables XIII till XVI (shown in the appendix) replicate the regression output, however, additionally controlling for private equity mechanisms and year fixed effects. The tables show that the effects observed in the previous regressions mainly remain. However, I do find differences. On the first hypothesis, I observe that the effect of the interaction coefficient of target size on efficiency remains similar, nevertheless, slightly falls outside the 10% significance interval. Regarding the second hypothesis, the coefficient of firm age on the change in sector adjusted EBITDA to sales becomes negatively significant. However, this effect was already observed in the regression on EBITDA to assets. The interaction effect of firm age loses its significance on EBITDA to assets, however, this effect remains on EBITDA to sales. The stand-alone value of the holding period for the third hypothesis loses its significance for the profitability measures. This is also present for the interaction term on sales to assets. Nevertheless, the positive significance of the interaction term remains on EBITDA to assets.

Thus, as expected, the results confirm that although other non-buy-and-build influences affect company performance, the main matters of interest will remain. Performing a buy-and-build strategy adds value to the performance of the portfolio company if particular criteria are met. The initial platform company is already a more established firm, which is scalable in size. The appropriate time has to be considered to apply the integration process within the consolidation, in which value is created the more time the private equity firm takes. Ideally, the consolidation is built in a more fragmented market.

6. Conclusion

In this section the main results are used to answer the research question. I provide an evaluation to which degree the findings contribute to earlier- and potential further research. As the insights of the thesis are not exclusively compelling for academic research, recommendations to particular stakeholders are mentioned. Additionally, I shed light on potential limitations of the thesis.

In this paper the effect of a private equity initiated buy-and-build strategy on portfolio company performance was investigated. Empirical evidence was provided of value creation for private equity portfolio firms involved in this strategy. These findings were particular present regarding sector adjusted- profitability opposed to efficiency. However, solely executing follow-on acquisitions without taking into account specific buy-and-build characteristics did not add value. Specifically, the private equity firm created value if it extended its usual investment horizon to build a consolidation in a more fragmented market, in which the acquisition of a scalable more established platform was involved to build upon.

The findings of the paper contributed to earlier literature on private equity and the buy-and-build strategy in particular. Guo, Hotchkiss, & Weihong (2011) showed the effects of the interference of private equity firms in ordinary buyouts on target company performance. As private equity investment practices are shifting, I investigated if these firms created value in an alternate acquisition strategy. Chapman & Klein (2009) confirmed this proposition, although solely on private equity fund level. Brigl, Jansen, Schwetzler, Hammer, & Hinrichs (2016), provided the most similar characteristics present in a buy-and-build strategy, whereas Hammer, Knauer, & Pflücke (2017) explained the role of private equity firms to optimally apply these and improve add-on probability. Besides fund performance and add-on probability, throughout this research I additionally showed that these characteristics are essential for creating value in the portfolio company. As Borell & Heger (2013) already found that private equity firms enjoy superior selection expertise and improve asset utilization, I also found an improvement in sector adjusted portfolio company profitability.

As I showed that a buy-and-build strategy created abnormal value over industry peers if particular criteria were met, I propose increasingly applying it in current M&A. The implications of the paper are compelling for private equity investment practices and potential target companies. As value creation by private equity firms is shifting from financial engineering to operational synergies, the buy-and-build strategy provides the ideal manner to improve target company performance. This particular shift also loosens scrutiny on their usual investment practices. Applying this inorganic growth strategy enables private equity firms to extend their usual investment horizon, whereas it

attracts additional exit opportunities. In addition, earlier research already showed that besides target company performance, private equity firms also improve their fund performance. Additionally, it should stimulate management and their companies, which are showing lacking organic growth, to engage in collaborations with a financial sponsor to grow inorganically. An optimally integrated consolidation stimulates innovation and efficient asset reallocating for the portfolio firm.

As with private equity studies in general, private equity firms are not obliged to disclose particular information of their portfolio firms. In particular, for the majority of the firms in the sample, financials were missing. As such, the findings were susceptible to a small sample bias. Another limitation of this research remains, if the companies disclosing their financials differed in their nature opposed to the ones which did not. Additional sample selection biases could be present due to the investment preference of the private equity firms. In particular, it seemed that the portfolio companies in the sample were already outperforming industry peers on efficiency pre-entry. Furthermore, this thesis only focussed on the pre-entry to post-exit change in financials of the initial platform investments. As such, target company performance of the follow-on acquisitions and further post-exit developments were not evaluated. The performance of private equity targets held less than two years were not investigated as well.

The findings of the paper are compelling for further research on mergers and acquisitions and the buy-and-build strategy in particular. As value creation in private equity buyouts is shifting from financial engineering to (inorganic) operational improvements, further research could be committed to revisit usual mergers and acquisition research. Hammer, Knauer, & Pflücke (2017) already observed an increase in exit opportunities for deals involving add-ons. Therefore, as I found that portfolio firms involved in a buy-and-build targets improve their profitability and efficiency, does this for instance also increase acquisition premiums paid for potential platform firms? Additionally, I acknowledge that this research only focussed on the change in pre-entry to post-exit improvement in financials of the portfolio firm. Research could also be devoted to further post-exit developments of the portfolio firm and the follow-on acquisitions as well. In particular, the post-exit research period could be extended by for instance five or ten years, whereas performance developments of the add-on companies are also taken into account. In this paper I investigated private equity firms executing this particular inorganic strategy. As a financial buyer initiated the consolidation, do the findings also hold if another kind of buyer performs the strategy? In addition on lifecycle theory, implications to reignite growth for matured companies acting as platform firms could be further investigated. For instance, after participating in a buy-and-build strategy, do these firms improve in measures of innovation?

7. Bibliography

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8. Appendix

Table XI – Data selection procedure

In this table the steps are provided to construct the sample. The data source and the amount of observations is shown.

To do	Observations	Source
Retrieve entry deals on PE completed acquisitions, IBOs & MBOs	33,006	Zephyr
Retrieve exit deals on all private equity firm exits	27,750	Zephyr
Append entry- and exit data. Delete duplicates	54,837	-
Couple deals if (one of) the entry acquirer(s) is equal to (one of) the exit vendor(s)	3,190	-
Drop observation with holding period of 1,352 months	3,189	-
Retrieve financials of main deals list using target BvD ID numbers	3,189	Orbis
Retrieve all acquisitions performed by the portfolio firms pre-exit using target BvD ID numbers	5,687	Zephyr
Retrieve all acquisitions performed by the private equity firms pre-exit using acquirer BvD ID numbers	38,105	Zephyr
Retrieve global annual public company financials	640,685	Compustat
Retrieve US bond yield spreads	5,438	FRED

Table XII – Summary of dependent- and independent variables

In this table a short summary is given of all the dependent- and independent variables used throughout the regressions.

Variable	Description
SA EBITDA/sales change	Change in sector adjusted pre-entry to post-exit EBITDA to sales
SA EBITDA/assets change	Change in sector adjusted pre-entry to post-exit EBITDA to assets
SA sales/assets change	Change in sector adjusted pre-entry to post-exit sales to assets
PE add-on	Dummy for PE initiated add-on acquisition in holding period
Target add-on	Dummy for PE investment initiates add-on acquisition in holding period
Target size	Natural logarithm of PE investment sales pre-entry
Firm age	Firm age of PE investment pre-entry (in years)
Holding period	Period between entry- and exit date (in months)
Herfindahl-Hirschman Index	Herfindahl-Hirschman Index measuring industry consolidation pre-entry
Leverage change	Change in pre- to post-entry liabilities to assets
Active PE	Dummy for PE firm is among highest 25% for total executed deals pre-entry
PE operational synergy	Dummy for PE initiates acquisitions in target sector pre-entry
Equity participation	Dummy for management, employees or director stock participates in own company acquisition
PE global preference	Dummy for global geographic investment preference of PE
PE regional preference	Dummy for regional geographic investment preference of PE
PE domestic preference	Dummy for domestic geographic investment preference of PE
Club deal	Dummy for multiple PE investors involved in PE investment
High yield spread	Difference between BofA Merrill Lynch US High Yield Master II Index value and US spot treasury rate pre-entry
SA pre-entry EBITDA/sales	Sector adjusted pre-entry EBITDA divided by sales
SA pre-entry EBITDA/assets	Sector adjusted pre-entry EBITDA divided by assets
SA pre-entry sales/assets	Sector adjusted pre-entry sales divided by assets
Pre-entry leverage	Pre-entry- liabilities to assets

Table XIII – OLS regression - Hypothesis 1(robust)

The table shows the ordinary least square regressions on the respective measure of profitability or efficiency. The corresponding variable and interaction term are added to the base regression to test for the first hypothesis. The (significant) effect of the coefficients is displayed with their standard errors below in brackets. Private equity- and year fixed effects are added as a robustness check. The table also shows the different sets of control variables used, the amount of observations and the fit of the model.

	SA EBITDA/Sales change	SA EBITDA/Assets change	SA Sales/Assets change
Target add-on	-7.118**	-1.993	-1.915
	-3.561	-3.663	-1.393
PE add-on	1.132***	0.37	0.017
	-0.333	-0.255	-0.221
Target size	-0.049	-0.089	0.064
	-0.144	-0.182	-0.088
TA add-on*size	0.662*	0.184	0.197
	-0.355	-0.364	-0.130
Private equity effects	yes	yes	yes
Year fixed effects	yes	yes	yes
Firm fixed effects	yes	yes	yes
Constant	yes	yes	yes
Observations	184	159	257
R-squared	0.307	0.322	0.157

* Statistical significance at the 1% level.

** Statistical significance at the 5% level.

*** Statistical significance at the 10% level.

Table XIV – OLS regression - Hypothesis 2(robust)

The table shows the ordinary least square regressions on the respective measure of profitability or efficiency. The corresponding variable and interaction term are added to the base regression to test for the second hypothesis. The (significant) effect of the coefficients is displayed with their standard errors below in brackets. Private equity- and year fixed effects are added as a robustness check. The table also shows the different sets of control variables used, the amount of observations and the fit of the model.

	SA EBITDA/Sales change	SA EBITDA/Assets change	SA Sales/Assets change
Target add-on	-1.356***	-0.244	0.214
	-0.357	-0.26	-0.243
PE add-on	0.913**	0.236	-0.041
	-0.356	-0.246	-0.222
Firm age	-0.015*	-0.013*	0.001
	-0.008	-0.007	-0.006
TA add-on*firm age	0.054***	0.014	-0.003
	-0.018	-0.010	-0.010
Private equity effects	yes	yes	yes
Year fixed effects	yes	yes	yes
Firm fixed effects	yes	yes	yes
Constant	yes	yes	yes
Observations	214	222	250
R-squared	0.313	0.181	0.162

* Statistical significance at the 1% level.

** Statistical significance at the 5% level.

*** Statistical significance at the 10% level.

Table XV – OLS regression - Hypothesis 3(robust)

The table shows the ordinary least square regressions on the respective measure of profitability or efficiency. The corresponding variable and interaction term are added to the base regression to test for the third hypothesis. The (significant) effect of the coefficients is displayed with their standard errors below in brackets. Private equity- and year fixed effects are added as a robustness check. The table also shows the different sets of control variables used, the amount of observations and the fit of the model.

	SA EBITDA/Sales change	SA EBITDA/Assets change	SA Sales/Assets change
Target add-on	-0.309	-0.729*	-0.492
	-0.562	-0.389	-0.397
PE add-on	0.816***	0.161	0.034
	-0.294	-0.221	-0.204
Holding period	0.011	-0.011	0.016
	-0.020	-0.017	-0.015
TA add-on* Holding period	0.00	0.012*	0.010
	-0.009	-0.007	-0.007
Private equity effects	yes	yes	yes
Year fixed effects	yes	yes	yes
Firm fixed effects	yes	yes	yes
Constant	yes	yes	yes
Observations	253	264	309
R-squared	0.204	0.125	0.130

* Statistical significance at the 1% level.

** Statistical significance at the 5% level.

*** Statistical significance at the 10% level.

Table XVI – OLS regression - Hypothesis 4(robust)

The table shows the ordinary least square regressions on the respective measure of profitability or efficiency. The corresponding variable and interaction term are added to the base regression to test for the fourth hypothesis. The (significant) effect of the coefficients is displayed with their standard errors below in brackets. Private equity- and year fixed effects are added as a robustness check. The table also shows the different sets of control variables used, the amount of observations and the fit of the model.

	SA EBITDA/Sales change	SA EBITDA/Assets change	SA Sales/Assets change
Target add-on	0.246	-0.064	-0.119
	-0.406	-0.294	-0.236
PE add-on	0.366	0.054	0.153
	-0.378	-0.259	-0.256
Herfindahl-Hirschman Index	0.978	0.000	-0.416
	-0.765	-0.509	-0.408
TA add-on*Herfindahl	-1.917*	-0.659	0.891
	-1.076	-0.705	-0.604
Private equity effects	Yes	Yes	yes
Year fixed effects	Yes	Yes	yes
Firm fixed effects	Yes	Yes	yes
Constant	Yes	Yes	yes
Observations	161	172	204
R-squared	0.267	0.267	0.211

* Statistical significance at the 1% level.

** Statistical significance at the 5% level.

*** Statistical significance at the 10% level.