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The Determinants of the Buy-and-Build Strategy: an Empirical Analysis of the UK

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Abstract

The purpose of this study is to assess the determinants of the buy-and-build strategy at the industry-, company- and financial market level. The empirical analyses are built upon a deal sample comprising 964 buy-and-build deals and 1,401 traditional LBOs that have taken place in the UK between 2008 and 2016. Empirical results indicate that buy-and-build strategies are more likely to occur in fragmented markets with a sufficient amount of exit and follow-on opportunities. Moreover, companies that are subject to operational underperformance are more likely to be part of a buy-and-build strategy as a follow-on. Companies with superior operational performance have a higher probability of being part of a buy-and-build strategy as a platform. Acquisition experience prior to the initial buyout increases the likelihood a company will be part of a buy-and-build strategy as a platform. At the financial market level, this study finds evidence that favourable debt market conditions fuel platform acquisitions. Empirical results do not indicate a similar relation between follow-on companies and debt market conditions. Additionally, some evidence is found to suggest that optimistic equity market conditions increase the number of completed platform and follow-on deals.

JEL classification: G24; C34
Keywords: Buy-and-Build; Private Equity; Mergers and Acquisitions

Contents

1 Introduction

The private equity industry has pondered the financial economics literature since the emergence of leveraged buyouts in the 1980s. The subsequent decade exhibited significantly less public leveraged buyouts suggesting that the private equity industry would play a less dominant role in the financial world as was expected in the 80s. However, the last decade has seen a tremendous amount of capital committed to the private equity firms fueling the acquisitions of private companies. Traditionally, private equity investors create value through a combination of financial, operational and governance engineering. Whilst an extensive amount of papers finds excess returns generated by the private equity firms, some researchers argue that these traditional value creation levers are no longer a granted source of value enhancing. The buy-and-build strategy as an additional value-adding source has therefore seen emergence in the recent decade. The aim of this strategy is to turn a company, referred to as the platform, into an larger sized and efficient single entity through the acquisitions of smaller sized follow-on companies. However, this strategy is subject empirical scarcity and this study will therefore supplement the literature with an empirical analysis of the buy-and-build strategy. In particular, this study examines the determinants of the buy-and-build strategy with the following research question

What are the determinants of the buy-and-build strategy in the United Kingdom?

The answer to this research questions is built upon empirical analyses at the industry-, company- and financial market level. These conditions are determinted based on the literature and thereafter assessed with statistical regressions. The geographical area of this study is limited to the United Kingdom since both public and private companies in this country are obligated to provide company financials due to strict disclosure requirements. These company financials are essential in defining the determinants of the buy-and-build strategy at the company level.

This study contributes to the current literature with empirical analyses of the buy-and-build strategy. The literature with regard to this strategy is subject to empirical scarcity. In particular, the contribution of this study to the literature is as follows. First, additional explanatory variables are added to the industry regression models which enables this study to determine the optimal degree of industry concentration. Moreover, this study uses industry-adjusted financial metrics and examines the importance of acquisition experience as a determinant of the buy-and-build strategy for platforms. Moreover, additional explanatory variables are added to the financial market regressions deepening

the understanding of the buy-and-build strategy. Supplementary, logistic and probit regressions are run to check empirical results in the current literature.

The empirical results of this study suggest that buy-and-build strategies are more likely to appear in industries that are more fragmented and have a higher amount of exit and follow-on opportunities compared to industries that have not seen any buy-and-build activity. This study does not find evidence to suggest that buy-and-build strategies are occuring in less volatility industries. Companies with superior operational performance are more likely to be part of a buy-and-build strategy as a platform. Results are more ambiguously with regard to follow-ons although there is some evidence to suggest that companies with lower operational performance have a higher probability to be acquired as a follow-on. Company size is positively related to the platform company suggesting that the likelihood a company will be part of a buy-and-build strategy as a platform increases with size. The opposite holds for follow-on companies indicating a negative relation between size and the likelihood a company will be part of a buy-and-build strategy. Acquisition experience prior to the buyout has an additional positive impact on the probability a company will fill in the role of platform in a buy-and-build strategy. With regard to financial market determinants, this study finds empirical evidence to suggest that more platform acquisitions are completed during favourable debt market conditions. However, empirical results indicate that a opposite relation holds for follow-ons suggesting that debt financing is less relevant. This study finds some evidence that more platform and/or follow-ons transactions are completed in times of optimistic equity markets.

The remainder of this study is structured as follows. Section 2 will discuss the relevant literature with regard to the private equity sector and the buy-and-build strategy in particular. Section 3 introduces and elaborates the statistical models whilst section 4 presents the data and descriptive statistics. The empirical results are presented in section 5. Section 6 concludes.

2 Literature review

2.1 Traditional value creation levers

The effort devoted to private equity by financial academics has seen an enormous development ever since Jensen (1986, 1989) wrote in his seminal paper about the value creation potential of leveraged buyouts. Although leveraged buyouts almost completely vanished in the 1990s, Jensen argued that the leveraged buyouts would become the most implemented transaction structure in the future (Kaplan and Strömberg, 2009). Recent numbers suggest that the private equity sector and its leveraged buyouts, is indeed popular among investors since the amount of capital committed to the private equity industry has seen a tremendous growth over the last decades. Acclaimed by the financial economics literature, the private equity industry has been able to create excess returns in a relatively short time period (Highson and Stucke, 2012; Robinson and Sensoy, 2013; Ang, Chen, Goetzmann and Phalippou, 2013). More in particular, Kaplan and Schoar (2005) examine the returns net of management fees providing evidence to suggest that private equity firms on average outperform the S&P 500 index. The methods private equity firms commonly apply in order to generate these excess returns are widely discussed in the literature. Traditionally, private equity firms apply financial, governance and operational engineering to their portfolio companies in order to enhance the enterprise value (Kaplan and Strömberg, 2009). These engineering techniques are commonly referred to as the traditional value creation levers.

Jensen (1986, 1989) introduces the free cash flow theory referring to the value-adding potential of leveraged buyouts due to the disciplining effects of debt. The commitment to make future interest and principal payments leaves no room for inefficient cash allocation at the discretion of managers. As a result, leverage reduces agency costs between managers and shareholders due to an alignment of incentives as a result of leverage. However, the empirical results of these beneficial effects, classified as financial and governance engineering, are ambiguously. Lehn and Poulsen (1989), Kaplan (1989) and Muscarella and Vetsuypens (1990) find a positive relation between the increased leverage and operational performance of leveraged buyout companies whereas Opler and Timan (1993) and Renneboog et al. (2007) find no support in favour of Jensen's free cash flow theory.

Kaplan (1989) devotes his study to leveraged buyouts and finds that management ownership significantly increases after the buyout transactions aligning incentives between management and the private equity firm. More in particular, operating performance increases after the transaction and is primarily caused by improved incentives

rather than management replacement (Kaplan, 1989). More in particular, his study finds that improvements in operating performance following a leveraged buyout are the result of an increase in operating income, a decrease in capital expenditures and a net cash flows increase. Consistent with this result, Smith (1990) and Lichtenberg and Spiegel (1990) find similar evidence to suggest that leveraged buyout improve operating performance. More recently, Acharya et al. (2013) find higher abnormal performance following the buyout that is related to sale improvements and operating margin increases. However, Guo et al. (2011) find no statistically significant differences in operating performance of companies following a leveraged buyout.

Another study that examines the set of value-enhancing techniques applied by private equity firms is the paper of Kaplan and Strömberg (2009) who argue that private equity firms impose management with significant investments in the target company. This results in an alignment in incentives between the private equity firm and management due to the exposure of management to up- and downside return potential Kaplan and Strömberg (2009). Moreover, the study of Kaplan and Strömberg (2009) argues that the equity investor closely monitors the performance of management and is not hesitant in replacing underperforming management. Additionally, private equity investors more frequently meet with management and usually operate with smaller board compositions (Gertner and Kaplan, 1996).

The paper of Tykvová and Borell (2012) provides a critical note on the private equity industry and examines the increase in financial distress after a buyout completed by a private equity firm. The empirical evidence of Tykvová and Borell suggests that distress risk increases after the buyout. However, companies that are backed by private equity firm do not exhibit significantly higher bankruptcy rates compared to the control sample of companies that have not been part in a private equity transaction. Another critical note is documented by Moody's (2010) who state that the rate of bankruptcy amongst companies owned by private equity firms was significantly high during the financial crisis due to high amounts of debt facilitating insolvency problems.

Over the last decade the private equity business model has seen the emergence of an additional value-adding source, known as the buy-and-build strategy, as the previous discussed traditional sources of value creation are no longer self-evident (Hammer et al., 2017). Hammer et al. (2017) argue that governance improvements are no longer a granted source of value creation as firms nowadays have more developed corporate governance policies diminishing the return potential private equity investors gain through governance engineering. The increasing necessity to understand this serial acquisition driven strategy is becoming increasingly relevant as persistency of private equity perfor-

mance is under pressure due to increasing competitive environment within the private equity industry (Braun et al., 2017). Moreover, literature suggests that leveraged buyouts with acquisitions generate higher returns compared to leveraged buyouts without this acquisition appetite. The next section will elaborate the buy-and-build strategy and introduces the relevant academic literature.

2.2 The emergence of a new value creation lever

In the recent decade, the buy-and-build strategy has grown in popularity among private equity firms confirming the rising importance of this strategy as an additional value creation strategy. There is a general consensus among academics what the buy-and-build strategy exactly comprises. Smit (2001) argues that a buy-and-build is an acquisition driven strategy with the purpose to consolidate a certain industry. The first step in the buy-and-build strategy is to acquire a target company that fills in the role of a platform. The platform company is a well-established industry player with a sustainable competitive advantage over other industry players through noticeable capabilities and unique resources (Smit, 2001). In the next phase the platform company identifies and acquirers follow-on companies with the assistance of the private equity firm. The goal is to transform the platform company into an efficient and value-maximizing single entity through the acquisitions of follow-ons (Smit, 2001; Borell and Heger, 2013). Smit (2001) refers to the buy-and-build strategy as a "serial acquisition strategy" and is according to Borell and Heger (2013) a partnership in which the private equity firm provides funding and negotiation techniques to the platform company facilitating the follow-on acquisitions.

Although the field of mergers and acquisitions has been examined extensively in the literature, acquisitions backed by private equity firms are far less dominant in the literature. Currently, the literature primarily focuses on the return potential associated with the buy-and-build strategy. Nikoskelainen and Wright (2007) empirically confirm the return potential documenting that leveraged buyout returns are dominantly driven by acquisitions during the holding period of the portfolio company. Similar results are found by Acharya et al. (2013) providing evidence to suggest that leveraged buyouts with follow-on acquisitions have superior operational performance using deal-level data. Smit (2001) argues that these increased returns stem from the beneficial effects associated with leverage as discussed previously. The platform company benefits from the leverage effect as the follow-on acquisitions are generally financed with high amounts of debt

(Smit, 2001). Particularly, the high levels of debt create profitable tax shields and align the incentives of management with its shareholders (Smit, 2001). The second value-adding source of the buy-and-build strategy stems from synergies that are classically associated with acquisitions. Economies of scale are a significant source of synergistic value since the platform company consolidates an industry through the acquisition of several smaller follow-on companies (Smit, 2001).

Borell and Heger (2013) empirically address the sources of value creation of the buy-and-build strategy and find that private equity firms combine platform companies with follow-on companies with the purpose to allocate resources more efficiently. Once the platform company and follow-on acquisitions are transformed into an efficient value maximizing company with an established market position, the private equity firm has the option to exit in three ways: (1) a sale to a competitor or other industry company, (2) sale to another private equity firm or (3) through an initial public offering (Borell and Heger, 2013). However, these positive and significant empirical results do not enhance the understanding of the determinants of the buy-and-build strategy. This study will therefore focus on the determinants of the buy-and-build strategy at the industry-, company- and financial market level and contributes empirically to current literature that is subject to empirical void. An exponent of the current literature on determinants of the buy-and-build strategy is the paper of Bansraj and Smit (2017). This study departs from Bansraj and Smit (2017) by providing a more comprehensive picture of the determinants of the buy-and-build strategy. More in particular, this study performs additional statistical analyses in the form of logit and probit regressions and takes into account additional determinants of the buy-and-build strategy.

The following section will introduce the determinants of the buy-and-build strategy based on strategic management-, mergers and acquisitions- and private equity literature.

2.3 Determinants of the buy-and-build strategy

2.3.1 Industry determinants

The first set of determinants is at the industry level and suggests that private equity firms apply buy-and-build strategies to consolidate fragmented markets in order to achieve market power and economies of scale (Brown, Dittmar and Servaes, 2005; Smit, 2001). A fragmented industry has no clear market leader and is characterized by a majority of small industry players (Borch and Brastad, 2003). Hammer et al. (2017) find that a

moderate degree of fragmentation within an industry increases the likelihood of executing a buy-and-build strategy. Fragmented industries are particularly interesting because these have consolidation potential since the private equity firm gains from synergies and efficiencies (Anapolsky, 1998). This is in line with the paper of Huyghebart and Luypaert (2010) who find that that highly concentrated industries have less room for value potential achieved through mergers and acquisitions activity. Moreover, Bansraj and Smit (2017) argue that fragmented industries are particularly interesting because of the high supply of follow-on opportunities due to presence of several small companies. This is an essential requisite of the buy-and-build strategy enabling the private equity firm to cherry pick and identify a sufficient amount of potential follow-on candidates. These follow-on companies are thereafter integrated with the platform company, which was acquired in the initial buyout. A sufficiently high number of follow-on targets enables the private equity firm to transfer the distinct core capabilities and unique resources of the platform company onto the follow-on company (Smit, 2001). The previous discussion results in the following hypothesis

Hypothesis 1: the likelihood of implementing a buy-and-build strategy is higher in fragmented markets with the presence of an adequate number of follow-on targets.

The exit following a holding period of four to five years (Jelic, 2011; Acharya et al., 2013; Jenkinson and Sousa; 2015; Degeorge et al., 2015) is an acknowledged feature of the private equity industry which enables the private equity firm to realize its return. A commonly applied exit route is the sale to a strategic buyer (trade sale), that is, a company that is active within the same industry as the platform company (Borell; Heger, 2013 and Strömberg, 2007). The presence of a sufficient number of exit options in form of larger sized companies enlarges the probability a buy-and-build strategy is executed. Moreover, Bansraj and Smit (2017) argue that the presence of more exit opportunities in the form of larger sized firms results in a more "competitive bidding setting". This results in higher bids and increases the return the private equity firm realizes through the exit. The previous discussion results in the following hypothesis

Hypothesis 2: the availability of an attractive amount of exit options in the form of sufficiently sized companies increases the likelihood of executing a buy-and-build strategy.

The papers of McDonald and Siegel (1986) and Dixit and Pindyck (1994) confirm the notion that uncertainty influences the investment decision. More recently, Bhagwat, Dam and Harford (2016) find evidence to suggest that periods of high uncertainty decrease the appetite of firms for mergers and acquisitions activity. As the buy-and-build

strategy consists of a chain of follow-on acquisitions that require time to fully integrate with the platform company, this study expects that the degree of uncertainty is an important determinant whether to proceed in a buy-and-build strategy. At the same time, Borell and Heger (2013) document that private equity firms select fast-growing industries in order to fully benefit from the growth within an industry through the use of mergers and acquisitions. However, Brigl et al. (2016) argue the opposite and document that buy-and-build strategies are more likely to occur in industries with low growth rates. This study departs from the theoretical explanation of Borell and Heger (2013) and expects to find similar results to those of Brigl et al. (2016). The previous discussion results in the following hypothesis

Hypothesis 3: industry uncertainty and higher industry growth rates are expected to negatively impact the probability a buy-and-build strategy will be executed.

2.3.2 Platform and follow-on determinants

The second set of buy-and-build determinants is at the company level and exists of platform and follow-on determinants. Platform companies are expected to differ sufficiently in terms of operational performance and size and are therefore examined individually in this study. The subsequent section will introduce these differences and discusses relevant determinants of the buy-and-build strategy at the platform and follow-on company levels.

Smit (2001) is among the first to write about the theoretical concepts of the buy-and-build strategy and introduces a conceptual framework for the buy-and-build strategy. Smit (2001) argues that the platform company, acquired in the initial buyout and part of the first stage of the buy-and-build strategy, is a well-established and reputed firm with a sustainable competitive advantage over other industry players stemming from unique capabilities and resources. Moreover, Smit (2001) argues that these unique capabilities and resources are transferred onto the follow-on company. This suggests that there are notable differences between the platform and follow-on companies prior to the transaction. The paper of Borell and Heger (2013) addresses this notion and finds limited empirical support. There theoretical explanation for the differences between platform and follow-on companies is built upon the paper of Harford (2005). His study finds that superior operational performance and significant amounts of cash flow generations due to qualified management are most likely to be characteristics of an acquirer. Since the platform company fills in the role of an acquirer in the buy-and-build strategy, this study

attributes the characteristics described in the paper of Harford (2005) to the platform company. The opposite holds for the follow-on company since Barnes (2000) finds evidence to suggest that poor performing companies, measured by return on sales, return on assets and profitability relative to sales and equity, are more likely to be a target. The previous discussion results in the following hypothesis

Hypothesis 4: platform companies are better performing companies compared to follow-on companies prior to the transaction.

From the perspective of the private equity firm, a firm with qualified management combined with high and stable cash flow generation makes generally speaking attractive private equity targets. However, this type of company has generally less room for improvement potential in operational performance. Underperforming companies also make attractive private equity targets since these firms are subject to operational improvements and upside potential in the enterprise value. These companies are particularly interesting for the buy-and-build strategy because the value enhancement in the buy-and-build strategy stems from operational engineering and is unlocked by revenue accelerations and margin improvements (Brigl et al, 2012; Brigl et al., 2016; Bansraj and Smit, 2017). Therefore, underperforming companies make attractive follow-on targets (Bansraj and Smit, 2017). As discussed previously, this is not the case for the platform company since the platform company exhibits unique resources and capabilities (Smit, 2001). Based on the previous outlining the following hypothesis is formulated

Hypothesis 5: follow-on companies with potential improvability in operating performance prior to the transaction are more likely to be part of a buy-and-build strategy.

The buy-and-build strategy is more likely to appear if follow-on companies are sufficiently sizable as these type of companies contribute to the collection of 'a size premium and provide a larger financial base' (Bansraj and Smit, 2017). From the perspective of the platform company, M&A literature concludes that firm size is positive related to the probability of being an acquirer (Trahan, 1993; Maksimovic and Philips, 2001; Harford, 2005). Moreover, Brigl et al. (2016) find that buy-and-build activities increase with the size of the platform company. Applicable to both platform and follow-on companies, Borrell and Heger (2013) conclude that target companies should require a critical minimum size for it to be a potentially interesting target in order to compensate for the high transaction costs. Hammer et al. (2017) find that size increases the probability of add-on acquisition activity. Therefore, this study expects that firm size is positively related to the likelihood a buy-and-build strategy is executed to both platform and follow-on

companies. Based on this the following hypothesis is constructed

Hypothesis 6: platform and follow-on companies should be of sufficient size and is therefore positively related to the probability of being a target in a buy-and-build strategy.

Acquisition experience is essential in the buy-and-build strategy as it involves a chain of acquisitions. Servaes and Zenner (1996) argue that transactions costs are lower for frequent acquirers emphasizing the importance of acquisition experience. Moreover, Aktas, De Bodt and Roll (2013) discuss the learning benefits of frequent acquirers and this study expects these learning benefits to be essential in the integration of the follow-on company with the platform company since this has to be completed in a relatively short period of time. Without this acquisition experience, integrating the follow-on companies with the platform company would be more challenging. This is of particular interest for the private equity firm due to the holding constraints of the received funding of the private equity firm (Cumming et al., 2005). From an empirical perspective, Brigl et al. (2016) find that acquisition experience results in higher buy-and-build returns. The previous discussion results in the following hypothesis

Hypothesis 7: acquisition experience is positively related to the likelihood a company in the form of a platform will be part of a buy-and-build strategy.

2.3.3 Buy-and-build financial market determinants

The private equity industry has always been acknowledged for the high levels of debt financing in buyouts and this is no different in the acquisition of the platform and follow-on companies (Smit, 2001). Therefore, low interest rates are expected to facilitate buy-and-build transaction activity due to the lower financing costs. Empirically, Hammer et al. (2017) find that add-on acquisitions activity is higher if debt market conditions are favourable. Another study that examines the relation between debt market conditions and private equity activity is the paper of Axelson et al. (2013) who find that the variation in the amount of leverage in buyouts is primarily driven by debt market conditions. The lower the interest rates the higher the amount of debt private equity firms use in order to finance buyouts. Furthermore, the high yield spread captures the risk premium in debt markets and influences the cost of capital in the acquisition financing. Low debt spreads indicate liquid debt markets for high-yield debt and favourable debt market conditions in general (Axelson et al., 2013). The amount of leverages therefore increases if debt spreads become smaller amplifying buy-and-build transaction activity.

The role of equity markets in the determination of buy-and-build activity is also regarded as relevant. The paper of Bouwman, Fuller and Nain (2009) find that mergers and acquisitions activity is higher in periods of high stock market valuations. Rhodes-Kropf, Robinson and Viswanathan (2005) find similar evidence and suggest that high market valuations positively affect mergers and acquisitions activity. This positive relationship between mergers and acquisitions activity and high public market valuations is due to optimism in the stock market and the attractiveness of acquisition financing through stocks of the acquiring company. From the perspective of the buy-and-build strategy, the acquiring company does not involve a publicly traded company generally speaking. However, high public market valuations indicate profitable exit opportunities enabling the private equity firm to generate high returns (Bansraj and Smit, 2017). It is therefore expected that optimistic equity markets facilitate buy-and-build transactions. The previous discussion with regard to debt- and equity markets results in the following hypothesis

Hypothesis 8: Favourable debt market conditions and high stock market valuations positively relate to the number of completed buy-and-build deals.

3 Methodology

3.1 Introduction regression models

This section introduces and elaborates on the statistical regression models that have been applied in this study to assess the determinants of the buy-and-build strategy at the industry-, company- and financial market level. Widely practiced regression models in which the dependent variable comprises a binary variable are the linear probability model (LPM), logistic and probit model. The subsequent sections will introduce and elaborates these regression models individually.

3.1.1 Linear probability model

The LPM is a linear multiple regression model in which the regression equation predicts the probability (Pr) that Y equals 1 conditional on X and comes according to Stock and Watson (2012) in the subsequent binary form

$$Pr(Y = 1|X_1, X_2, ..., X_n) = \alpha + \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_n + \epsilon_i \tag{3.1}$$

where α comprises the intercept, β the regression coefficient of the explanatory variable X and ϵ the disturbance term. The disturbance term would be equal to zero if the independent variable X perfectly explains the dependent variable Y. The regression coefficients of the LPM are estimated using ordinary least squares (OLS) and the practical idea behind this statistical estimation method is to minimize the sum of squared residuals between the regression line and the observed data points (Dismuke and Lindrooth, 2006). Dismuke and Lindrooth (2006) express the concept of OLS mathematically as follows

$$\sum_{i=1}^{n} \epsilon_i^2 \tag{3.2}$$

where n is the number of observed data point and i the observed data point. Clearly and Angel (1984) regard the regression coefficient to be the best linear unbiased estimator if the disturbance term has a mean of zero and are independent between each other, commonly referred to as homoskedasticity, and the independent and the dependent vari-

able are independently randomized across the population. However, if the dependent variable comprises a dichotomous dependent variable as is the case in this study, the LPM provides less robust empirical results compared to continuous dependent variables (Clearly and Angel, 1984). More in particular, Clearly and Angel (1984) argue that the disturbance term no longer has a uniform variance if the dependent variable is binary. Nerlove and Press (1973) also argue that the estimated coefficients are no longer the most efficient. As stated previously, homoskedasticity is an important assumption of the OLS regression coefficients. This study uses the Breusch-Pagan test introduced by Breusch and Pagan (1979) and finds that heteroskedasticity is present in the data for the industry, company and financial market regressions. Note that heteroskedasticity does not result in biased and inconsistent regression coefficients (White, 1980). However, the standard errors are affected by heteroskedasticity potentially resulting in wrong conclusions with regard to the statistical significance of the regression coefficients. This study therefore tackles heteroskedasticity by using Huber-White robust standard errors resulting in more reliable empirical results. Despite the potential statistical problems that arise with the LPM, this study will nevertheless report the empirical results of the LPM since Stock and Watson (2012) argue that a sample that is subject to relatively few extremes properly describes the population. The independent variables are therefore truncated at the 1% and 99% level. Another statistical shortcoming of the LPM, although less prevalent, is its ability to potentially predict nonsensical probabilities, that is, a probability that falls outside the interval [0,1] (Stock and Watson, 2012). The presence of multicollinearity is another potential problem that might arise with regression models and according to Dowson, Marsh and Walker (2004), multicollinearity might result in invalid coefficient interpretation. As a result, this study examines the correlations between the independent variables and finds that no multicollinearity is present between the independent variables as shown in table 13 in the appendix.

An attractive feature of the LPM is its ability to generate easily interpretable and intuitive regression coefficients causing it to be a widely adopted regression model in the academic literature. The intuitive interpretation is the direct result of the linearity of the model where the coefficient β should be interpreted as the change in the probability associated with a unit change in X given that the dependent variable Y equals 1 (Stock and Watson, 2012). The statistical significance of the individual regression coefficients is based on the p-value approach based on the t-statistic.

This study additionally runs nonlinear models as statistical robustness checks to address the previously discussed statistical problems that arise with the LPM if the dependent variable is binary.

3.1.2 Logistic model

The first nonlinear regression model this study applies is the logistic model and addresses the statistical problems of the LPM since the relation between the dependent and independent variable is assumed to be logistic (Clearly and Angel, 1984). This model is particularly suited in estimating independent variables of which the dependent variable is dichotomous since the logistic model transforms the dependent variable to a logit value (Peng, Lee and Ingersoll, 2010). The logistic model comes according to Stock and Watson (2012) in the subsequent form

$$Pr(Y = 1|X_1, X_2, ...X_n) = \varpi(\alpha + \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_x + \epsilon_i) \tag{3.3}$$

where Pr comprises the probability that Y equals 1 conditional on X and where ϖ is the cumulative standard logistic distribution. The regression coefficient are estimated differently compared to the LPM and the method of use is maximum likelihood (ML). Fitzmaurice and Laird (2015) describe the conceptual idea behind ML in which the regression coefficients are chosen in such a way that most likely predicts the observed data points. Fitzmaurice and Laird (2015) define the maximum likelihood function and express it mathematically as follows

$$\Pi_{i=1}^{n} \pi_i^{y_i} (1 - \pi_i)^{1-y_i} \tag{3.4}$$

with n defined as the number of dichotomous variable reponses $Y_i (i = 1, ..., N)$ and π_i defined as

$$\pi_i = E(Y_i) = \frac{exp(\beta_0 + \beta 1 X_1 + \beta_2 X_2 + ... + \beta_n X_n)}{1 + exp(\beta_0 + \beta 1 X_1 + \beta_2 X_2 + ... + \beta_n X_n)} \tag{3.5}$$

where $E(Y_i)$ is the expected outcome of the dependent variable Y and where π_i is to be substituted in the maximum likelihood function. The regression coefficients in the definition of π_i should be estimated that maximizes the likelihood function, that is, the highest possible outcome (Fitzmaurice and Laird, 2015).

The interpretation of the logistic regression coefficients are difficult to interpret since the regression coefficient does not represent the marginal effect of the independent vari-

able on the dependent variable. Recall that the marginal effect defined as the regression coefficient β of the LPM regression is equal to the slope of the regression line. The marginal effect of the LPM can be expressed mathematically as follows

$$\frac{\partial Y_i}{\partial X_i} = \beta_i \tag{3.6}$$

where Y is the dependent variable, X the independent variable and β the regression coefficient of X. This does not hold for the logistic model since the function is nonlinear implying that the slope of regression changes continuously for every value of X. Therefore, the logistic model has difficult to interpret coefficients. In particular, Peng, Lee and Ingersoll (2010) define the logistic regression coefficients as the natural logarithm of an odds ratio that is defined as the probability ratio of Y equals to 1 to the probability ratio of Y equal to 0.

The difficulties that arise between the comparison of the regression coefficients of the LPM and logistic model are overcome by considering marginal effects. This study will consider marginal effects at mean of X and the average marginal effects, that is, the average of all marginal effects for all unit changes in X. The interpretation of marginal effects is similar to the regression coefficients in the LPM. The statistical significance of the logistic regression coefficients is determined with the Wald chi-square statistic. This statistic test is appropriate in assessing the statistical significance of regression coefficients that have been estimated with ML (Peng, Lee and Ingersoll, 2010).

3.1.3 Probit model

The probit model is the second nonlinear model this study applies and is closely related to the logistic model. The only difference between the logistic and probit model is the distribution assumption. The probit model assumes a cumulative standard distribution where the logistic model assumes a standard logistic distribution. The distributions are almost similar besides the tails of distribution (Peng, Leen and Ingersoll, 2010). The probit model comes according to Stock and Watson (2012) in the subsequent statistical form

$$Pr(Y = 1|X_1, X_2, ..., X_n = \phi(\alpha + \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_n + \epsilon_i) \tag{3.7}$$

where ϕ is the cumulative standard normal distribution and Pr the probability that Y is equal to 1 conditional on X. The difficulties with the interpretation of the coefficients are also applicable to the probit model since the regression coefficient do not represent marginal effects as is the case with the LPM. Similarly to the logistic model, the coefficients are estimated using ML and its statistical significance is also determined with the Wald chi-square statistic as suggested by Peng, Lee and Ingersoll (2010). In order to compare the effects of the independent variables on the dependent variable this study will compute the marginal effect at the mean and the average marginal effect. This enables this study to compare the empirical results of the LPM with the probit model.

3.2 Industry determinants of the buy-and-build strategy

This study will examine the differences in characteristics between buy-and-build industries and regular industries. Buy-and-build industries are defined as industries in which a platform and/or follow-on transaction was completed at one point in time in the transaction sample of this study. Regular industries are defined as industries which have not seen any buy-and-build transaction activity at one point in time. The industry regression model is built upon the industry variables of Bansraj and Smit (2017). Moreover, this study adds three binary variables ($HHI\ 0-500$, $HHI\ 500-1000$, $HHI\ 1000-1500$ and $HHI > 2500$) to assess what degree of concentration has the most influence on the decision whether to execute a buy-and-build strategy in a particular industry. Additionally, this study supplements the statistical results of Bansraj and Smit (2017) by running logistic and probit regressions as a statistical robustness check. The probability a buy-and-build strategy will be executed is regressed on industry conditions and will have the following model specification

$$\begin{aligned} BB_i = \alpha &+ \beta_1\, HHI_{i,t} + \beta_2\, Top10_{i,t} + \beta_3\, Bottom50_{i,t} + \beta_4\, HHITop_{i,t} \\ &+ \beta_5 HHIBottom_{i,t} + \beta_6\, HHI\,0-500_{i,t} + \beta_7\, HHI\,500-1000_{i,t} \\ &+ \beta_8\, HHI\,1000-1500_{i,t} + \beta_9\, HHI>2500_{i,t} + \beta_{10}\, Uncertainty_{i,t} \\ &+ \beta_{11}\, Industry\ growth_{i,t} + \beta_{12}\, Industry\ size_{i,t} + Year\ dummy_t + \epsilon_{i,t} \end{aligned} \tag{3.8}$$

where BB_i is binary indicator that equals one if in industry i in our sample set at one point in time a buy-and-build transaction, that is, a platform and/or follow-on

acquisition is completed, and zero otherwise. The dependent variable is not conditional on time as this study assumes that industry characteristics do not vary significantly over time (Bansraj and Smit, 2017). This implies that the binary indicator is equal to 1 for other year observations as well if at one point in time a buy-and-build transaction is completed in industry i. As a statistical robustness check, this study will rerun equation (3.8) only that the dependent variable now comprises the natural logarithm of the total number of deals in industry i in year t. The independent variables will be lagged by one period to account for decision-making.

α is the intercept of the regression model and ϵ comprises the disturbance term which are the result of a panel data regression. The intercept α is the point at which the regression line intersects with the Y axis conditional that X equals zero. The intercept has no intuitive interpretation in this particular regression application and has therefore only a mathematical function, that is, the intercept comprises the level of the regression line (Stock and Watson, 2012). The disturbance term ϵ captures other explanatory factors causing for the difference between the individual observations and the predicted regression line (Stock and Watson, 2012).

The explanatory variable *HHI* refers to the Herfindahl-Hirschman Index (HHI) and measures the degree of concentration within industry i and is computed as follows

$$Herfindahl - Hirschman\ Index(HHI) = \sum_{c=1}^{n} s_c^2 \tag{3.9}$$

where s_c is the market share s of company c ($c = 1, 2, ..., n$) and n the number of firms. The index ranges between 0 and $10,000$ and involves the cumulative market shares of all companies that are active within industry i. This regressions analysis examines the differences between buy-and-build and regular industries and therefore includes not only platform and follow-on companies, but also all other companies that are active in the UK in order to provide an appropriate picture of the industry structure.

Two additional variables are created in line with Bansraj and Smit (2017) to provide a more comprehensive representation of the concentration within industry i. The industry variables $Top10$ and $Bottom50$ comprise the cumulative market share in percentages of the biggest ten and smallest fifty companies. Moreover, the variable *HHI Top* is defined as the natural logarithm of the cumulative HHI score of the 10 largest firms in industry i. The variables proxies for exit opportunities and measures how equal the market share is divided among the ten largest companies (Bansraj and Smit, 2017). The explanatory variable *HHI Bottom* accounts for available follow-on opportunities and measures the

level of concentration among the fifty smallest companies (Bansraj and Smit, 2017). It is defined as the natural logarithm of the cumulative HHI score of the fifty smallest companies in industry i. The variables *HHI Top* and *HHI Bottom* are expected to be negatively related to the probability since a higher concentration in the top and bottom of industry i indicates less available exit opportunities and potential follow-on acquisitions.

Compared to Bansraj and Smit (2017), this study adds the binary variables *HHI* $0-500$, *HHI* $500-1000$, *HHI* $1000-1500$ and *HHI* >2500. One of these variable is equal to 1 if industry i has a concentration level that falls within the range 0-500, 500-1000, 1000-1500 or >2500. These variables are added to the study in other to determine what degree of concentration in industry i impacts the probability a buy-and-build strategy will be executed the most.

The variable *Uncertainty* proxies for market uncertainty and is calculated as the standard deviation of the natural logarithm of industry i sales (2-year moving window). The 2-year moving window is used to correct for significant fluctuations between consecutive years. The variable is expected to be negatively related to the probability a buy-and-build transaction will be completed in industry i. This stems from the discussion in the literature review suggesting that higher uncertainty decreases acquisition appetite in general.

The variables *Industry growth* and *Industry size* involve the control variables that account for other factors potentially influencing the decision whether to execute a buy-and-build strategy. *Industry growth* is defined as the yearly growth of industry i and is relevant as Huyghebaert and Luypaert (2013) argue that growth prospects are an important determinant of mergers and acquisitions activity. In particular, horizontal acquisitions are more interesting in industries with low growth prospects in order to realize synergistic value through cost reduction and secure of survival. However, horizontal acquisitions might also be beneficial in high-growth industries in order to exploit the valuable growth options (Schoenberg and Reeves, 1999; Maksimovic and Phillips, 2008). Although growth prospects are forward-looking whereas *Industry growth* is backward looking, this study assumes that industry sales do not fluctuate significantly between consecutive years and therefore proxy growth prospects sufficiently. The variable is expected to be negatively related to the probability a buy-and-build transaction will be completed in industry i. This is the result that private equity firms primarily target low growth industries for their buy-and-build strategy as suggested in the literature review. The control variable *Industry size* is used to control for market size and is measured as the natural logarithm of total sales of the industry i.

The categorical variable *Year dummy* involves time fixed effects and captures aggregate time-series trends across the different industries. One year observation is omitted in the regression analysis to prevent the dummy variable trap.

3.3 Platform and follow-on company determinants of the buy-and-build strategy

The differences in company characteristics between buy-and-build companies is not only compared with firms that have been the target in a private equity transaction other than buy-and-build deals. The control sample also comprises active regular companies in the UK since private equity firms do not randomly select targets (Borell and Heger, 2013). Thus, the control group exists of traditional private equity targets and all other companies that are active in the UK. The independent variables in the LPM regression of Bansraj and Smit (2017) are used in order to examine company specific differences. Moreover, this study adds the variable $AcqExp$, defined as the natural logarithm of the number of deals of the target company prior to the private equity buyout. This enables this study to draw a conclusion about whether acquisition experience is a significant determinant of the buy-and-build strategy at the platform company level. The company age of the target company is also added compared to the regression model of Bansraj and Smit (2017) in order to control for differences in maturity among the companies. Furthermore, as a statistical check of robustness this study performs logistic and probit regressions. The regression comes in the subsequent equation

$$\begin{aligned} BB\,Target_{c,t} = \alpha &+ \beta_1\, Size_{c,t} + \beta_2\, ROS_{c,t} + \beta_3\, ROA_{c,t} + \beta_4\, ATR_{i,t} \\ &+ \beta_5\, Margin_{c,t} + \beta_6\, AcqExp_{c,t} + \beta_7\, Company\,age_{i,t} \\ &+ Year\,dummy_t + Industry\,dummy_i + \epsilon_{i,t} \end{aligned} \tag{3.10}$$

where $BB\,Target_{c,t}$ is a binary variable equal to one if company c in year t is part of a buy-and-build transaction, either as a platform deal or follow-on deal, and zero otherwise. α is the intercept of the regression model and ϵ comprises the disturbance term which are the results of a panel data regression. The intercept α is the point at which the regression line intersects with the Y axis conditional that X equals zero. The intercept has no intuitive interpretation in this particular regression application and has therefore only a mathematical function, that is, the intercept comprises the level of the

regression line (Stock and Watson, 2012). The error term ϵ captures other explanatory factors causing for the difference between the individual observations and the predicted regression line (Stock and Watson, 2012). all variables are lagged by one year in order to control for decision-making.

The variable return on sales (ROS) proxies for the performance of company c and measures how efficiently the company generates operational profit from its sales. This study departs from Bansraj and Smit (2017) and follows Smit and Volosovych (2013) instead. The accounting-based performance measure ROS is calculated as the earnings before interest, taxes, depreciation and amortization (EBITDA) divided by total operating sales. This definition is different from Bansraj and Smit (2017) who calculate the ROS as net income divided by total operating sales. This study prefers the EBITDA since it is closer related to the operational cash flow and therefore to the operational performance of company c. Moreover, this study uses industry-adjusted ROS in order determine how the company is performing relative to other industry players. The industry-adjusted ROS is the difference between the ROS of company c and the industry mean of industry i. Bansraj and Smit (2017) argue that underperforming follow-on companies are attractive takeover targets. The operational underperformance unlocks value creation potential for the private equity firm through operating improvements. Therefore, this study expects the probability to be acquired during a buy-and-build program to be higher for follow-ons with lower ROS.

The asset turnover (ATR) is the second independent variable and is another commonly accepted accounting-based performance measure. The ATR is calculated as total operating revenue divided by total assets and measures how efficiently a company deploys its assets in generating revenue. Moreover, this study applies an industry-adjusted ATR computed similarly to the industry-adjusted ROS. Healy et al. (1992) conclude that the ATR is an important metric in assessing the operating performance and show that operating returns after a buyout improve due to enhancements in the capacity utilization measured as the ATR. Companies with a low ATR exhibit significant value creation potential through enhancing operating performance (Bansraj and Smit, 2017). This study therefore expects that follow-on companies with a relatively low ATR are attractive and suitable targets in a buy-and-build strategy.

The third explanatory variable is $Size$ and is calculated using the natural logarithm of total operating revenue. It is expected that the firm size of both platform and follow-on companies is positively related to the probability of being a target in a buy-and-build strategy. This stems from the fact that larger companies have a larger impact on the size premium increasing the return of the private equity firm (Bansraj and Smit, 2017).

Total operating revenue is preferred over total assets in assessing the size of the target company since the focus of the buy-and-build strategy is to consolidate industries and increase market share (Bansraj and Smit, 2017).

The explanatory variable *AcqExp* comprises the natural logarithm of the number of acquisitions prior the buyout and measures the acquisition experience of the target company. The independent variable *AcqExp* is only relevant for the platform company since this firm acts as an acquirer in the buy-and-build strategy. However, this study also collects the acquisition experience of regular and follow-on companies in order to examine cross-sectional variations. This study expects a positive relation between the likelihood a platform company will be part of a buy-and-build strategy and its acquisition experience. Companies with acquisition experience are assumed to have better skills in deal negotiation, follow-on identification and firm integration between the platform and follow-on company. These capabilities of the platform company smoothen the buy-and-build process.

The variables return on assets (ROA), gross margin ($Margin$) and age of the company ($Company\,age$) are included in the regression model and fill in the role of control variables. This study follows Smit and Volosovych (2013) rather than Bansraj and Smit (2017) and calculates the ROA as earnings EBIT divided by total assets. Moreover, this study applies an industry-adjusted ROA computed as the difference between the ROA of company c and the industry i mean of ROA. The ROA measures how efficiently the company deploys its assets in order to generate revenue. The variable $Margin$ involves the gross margin of company c in year t and is defined as the sales minus costs of goods sold divided by sales. $Margin$ measures the relationship between production costs and sales and is commonly used in analysing performance of leveraged buyouts (Boucly et al., 2009; Gaspar, 2012; Wilson et al., 2012). The variable $Company\,age$ is the natural logarithm of the number of years the company is active and proxies for the maturity of company. In particular, Bracker and Pearson (1986) find that more mature companies have more sophisticated strategical planning.

The categorical variables *Year dummy* and *Industry dummy* are applied in the regression to control for fixed effects. $Year\,dummy$ involves time fixed effects and captures aggregate time-series trends. The categorical variable $Industry\,dummy$ accounts for industry fixed effects addressing not defined systematic industry variations that do not vary over time across the different industries (Hammer et al., 2018). One year observation and one industry classification are omitted to prevent the dummy variable trap.

3.4 Financial market determinants of the buy-and-build strategy

The determinants of the buy-and-build strategy at the financial market level are determined examining the variation between the natural logarithm of the number of deals in industry y and financial market conditions. Note that the definition of industry y is different compared to the definition of industry i in the buy-and-build industry regression. The definition of industry i in section 3.2 is based upon the NACE Rev. 2 four-digit codes whilst this section classifies industry y based on ICB sector codes. This difference is important to stress out since the independent variable Hot elaborated later on is based upon ICB codes rather than NACE Rev. 2 four-digit codes. The natural logarithm of the number of buy-and-build deals in industry i (that are based on NACE Rev. 2 four-digit codes) are matched to ICB codes in order to account for these industry classification differences. These differences in industry classification are overcome since the FTSE 350 Sector Indices are classified based on ICB industry codes rather than NACE Rev. 2 four-digit codes. The FTSE 350 Sector Indices are of particular interest in this study as this allows this study to differentiate between the public market valuations of the different industries. Also note that the independent variables Hot and $HighIPOvolume$ introduced later on are conditional on industry y due to the industry-specific data associated with these variables. This does not hold for the debt market and macroeconomic indicators since these do not vary between the different industries. Hence, the interest rate, spread, GDP growth, exchange rate and inflationary rate is similar across the ICB sector industries.

The variations between the natural logarithm of the number of buy-and-build deals and financial market conditions are examined accounting for debt- and equity market conditions whilst controlling for macroeconomic conditions. Favourable debt market conditions determine the decision whether to implement a buy-and-build strategy since the platform acquisition and follow-on acquisitions are financed with a high level of debt (Smit, 2001). Additionally, equity markets conditions are expected to influence the number of buy-and-build transactions since periods of high public market valuations offer attractive exit opportunities for the private equity firm (Bansraj and Smit, 2017). The macroeconomic indicators primarily serve as a controlling component due to the pro-cyclical characteristic of mergers and acquisitions documented in the literature (Nelson, 1966; Reid, 1968; Melicher et al., 1983). A more recent study of Komlenovic et al. (2011) finds that, controlling for industry-level determinants, mergers and acquisitions activity is indeed pro-cyclical. The financial market regression equation comes in the subsequent form

$$
\begin{aligned}
ln\,(no.\,of\,BB_{y,t}\,deals + 1) = \alpha &+ \beta_1\,Interest\,rate_t + \beta_2\,Spread_t + \beta_3\,Hot_{y,t} \\
&+ \beta_4\,GDP\,growth_t + \beta_5\,High\,IPO\,volume_{y,t} \\
&+ \beta_6\,Exchange\,rate_t + \beta_7\,Inflation_t \\
&+ Industry\,dummy_y + \epsilon_{y,t}
\end{aligned}
\tag{3.11}
$$

where $no.of\,BB_{y,t}\ deals$ is the natural logarithm of the number of buy-and-build deals completed in industry y in a quarterly varying time period t. This study additionally reruns equation 3.11 with the dependent variable now comprising the natural logarithm of the number of platform and the number of follow-on deals. α is the intercept of the regression model and ϵ comprises the error term which are the results of a panel data regression. The intercept α is the point at which the regression line intersects with the Y axis conditional that X equals zero. The intercept has no intuitive interpretation in this particular regression application and has therefore only a mathematical function, that is, the intercept comprises the level of the regression line (Stock and Watson, 2012). The error term ϵ captures other explanatory factors causing for the difference between the individual observations and the predicted regression line (Stock and Watson, 2012).

I follow Axelson et al. (2013) and use the $Interest\,rate$ measured as the 6-month LIBOR rate and the *Spread* defined as the difference between the Bank of America Merrill Lynch Euro High-yield and the 6-month LIBOR to proxy for debt market conditions. $Interest\,rate$ is expected to be negatively related to the $number\,of\,BB_{y,t}\,deals$ since financing costs are higher if the $Interest\,rate$ is higher. This is particularly relevant for the buy-and-build strategy since this strategy comprises follow-on acquisitions financed with a high levels of debt (Smit, 2001). The *Spread* is expected to be negatively related as a higher spread indicates higher debt risk premiums, less liquid debt market and worse debt market conditions in general (Axelson et al., 2013).

The variables Hot and $High\,IPO\,volume$ are used to proxy for the equity market conditions. This study follows Bansraj and Smit (2017) and use the FTSE 350 Sector Indices to measure industry specific market valuations relevant for the independent variable Hot. The FTSE 350 Sector Indices consists of 41 industry sector indices based on ICB industry codes and enables this study to distinguish between the different industry-specific public market valuations. Differently compared to Bansraj and Smit (2017), this study follows Wang (2012) and sets the binary variable Hot equal to 1 if the market index of industry y in period t (quarterly varying time period) is higher than its

corresponding median market index over the entire sample period. The variable Hot is expected to be positively related to the dependent variable since hot equity markets are associated with higher public valuations resulting in a more profitable exit for the private equity firm. Moreover, this study adds the binary variable $High\ IPO\ volume$ and is set equal to 1 if the IPO volume in industry y in period t (quarterly varying time period) in the UK is higher than the median IPO volume over the entire sample period. Higher IPO volumes are associated with better equity market conditions and therefore expected to be positively related to the number of buy-and-build deals (Wang, 2012).

The macroeconomic environment in the UK is taken into consideration by adding the variables $GDP\ growth$, $Exchange\ rate$ and $Inflation$ to the regression. The use of macroeconomic variables in examining the private equity sector based on financial market conditions is adopted in the literature shown in the papers of Wang (2012) and Axelson et al. (2013). The macroeconomic indicators purely serve as control variables since mergers and acquisitions activity depends on the state of the economy as stated previously. It is expected that this also holds for buy-and-build activity since this strategy involves a serial acquisition strategy (Smit, 2001). Therefore, this study adds the control variable $GDP\ growth$ and is defined as the real quarter on quarter $GDP\ growth$ of the UK.

The second macroeconomic control variable is the $Exchange\ rate$ and is included in the regression equation to account for cross-border buy-and-build deals. The $Exchangerate$ is a relevant control variable since Brigl et al. (2016) find that buy-and-build strategies with cross-border follow-on acquisitions exhibit higher returns compared to buy-and-build strategies with only domestic follow-on acquisitions. Current literature documents about the relationship between exchange rate movements and foreign direct investments and concludes that a depreciation in a currency is expected to the increase the total value of foreign direct investments. Note that cross-border mergers and acquisitions are an example of foreign direct investments. The variable $Exchange\ rate$ is defined as GBP to USD exchange rate since the vast majority of the cross-border deals involve an acquirer of the US.

The third macroeconomic control variable is $Inflation$ and is related to the yearly inflationary rate in the UK. Existing literature on the relation between inflation and cross-border mergers and acquisitions is less conclusive and mostly shows ambiguous results. The return from investments is expected to be lower if inflation rates increases since cash is more expensive to hold (McKinnon, 1973). Moreover, Boateng et al. (2014) argue that inflation rates affect both the investment return as well as the cost of capital influencing the acquisition appetite of firms. This reasoning is related to the paper of Gugler et al. (2012) who argue that if a firm's return on its capital stock exceeds its

cost of capital, the company will enter into acquisitions in order to expand its asset base profitably. Since inflationary rates influence the mergers and acquisition decision and therefore the buy-and-build decision, this study controls for inflation by adding the variable $Inflation$ to the regression. All variables are lagged by one quarter in order to control for decision making.

The categorical variable *Industry dummy* accounts for industry fixed effects addressing not defined systematic industry variations that do not vary over time across the different industries (Hammer et al., 2018). One industry classification is omitted in order to prevent the dummy variable trap.

4 Data

4.1 Sample construction

This study draws upon Bureau van Dijk's Zephyr database in order to construct a sample of buyouts. According to Hammer et al. (2017), the use of Zephyr as a source of transaction data is becoming increasingly popular among private equity and mergers and acquisition researchers due to the high coverage and reliability. In the first step all deals are collected with a sub-deal type 'build-up' that have been completed between 1/1/2008 and 31/12/2016 in the United Kingdom. Zephyr refers to a build-up if 'a private equity company builds up the company it owns by acquiring other companies to amalgamate into the larger firm, thus increasing the total value of its investments through synergies between the acquired companies'. This study will restrict the area of interest to the UK because the coverage of financial information of non-listed companies is better compared to other countries due to strict disclosure requirements (Bansraj and Smit, 2017). Following these steps will result in a number of build-up transactions and are in the remainder of this study referred to as follow-on acquisitions with an initial total of 951 transactions. These transactions only involve majority stake acquisitions.

In the next step transactions with missing NACE Rev. 2 codes, BvD ID numbers and completion dates are removed from the data sample. The NACE Rev. 2 code is essential in assigning a target company to a specific industry which is relevant in the industry regressions analysis elaborated on in the methodology. The BvD ID number is relevant in obtaining company financials explained later on in this section. Furthermore, to control for previous private equity ownership, transactions of which the previous owner was a private equity firm are excluded from the data set as well. Bansraj and Smit (2017) document about potential biasedness in these type of transactions because the private equity investor has already affected company performance. These transactions will be categorized in the sub-deal type of Zephyr as secondary buyouts, tertiary buyouts and exits and are removed from the data set as well. Following the previous steps will eventually results in a follow-on transaction sample with 739 deals.

The vast majority of these transactions the business description of the acquiring company did not refer to a private equity firm but to a strategic buyer. These strategic buyers are considered to be platform companies and following the transaction history of the platform company results in the finding that a significant amount of these strategic buyers has been the target of a private equity firm in an initial buyout in the past. Therefore, this study considers these strategic buyers to be platform companies. Fol-

lowing the same criteria steps in the collection of the follow-on sample, this study finds a total of 225 platform deals. The total sample of buy-and-build transactions therefore exists of 964 deals.

Furthermore, this study also adds regular leveraged buyout targets to the transaction sample. These transactions are the typical leveraged buyouts that are common in the private equity sector. The transaction should be categorized under deal type as 'institutional buy-out', 'management buy-in', 'management buy-out' or 'MBO/MBI'. Moreover, following the same criteria as under the buy-and-build sample results in a total of 1,129 deals. Additionally, transactions categorized as an acquisition of which the financing is labelled as 'private equity' and/or 'leveraged buyout' are included as well. This results in 272 additional deals which are added to the control sample. The control PE sample amounts 1,401 deals and combing the buy-and-build sample with the control sample will results in data set of 2,365 transactions.

This study uses Orbis to collect industry data by obtaining company financials of all companies that are active in the UK between 2009 and 2016. This results in a total of 1,793,014 company year observations which are next aggregated based on the NACE Rev. 2 codes provided by Orbis. This results in 3,141 industry year observations.

The next step is retrieving the financials of the target companies, that is, companies that have been a target in the buyout sample. This study uses Bureau van Dijk's Orbis to obtain these financials due to the availability of financials of non-listed companies. Nex the BvD ID numbers are used to find the corresponding financials of the target companies. Out of the 2,365 unique BvD ID numbers, Orbis is able to retrieve 1,869 companies with corresponding financials. Matching the company financials with the transaction (buy-and-build) sample results in a complete pre-deal information of 459 (146) deals. This study will additional obtain available financial information of other companies in the UK as well, that is, companies that are not in the transaction sample (2,365 companies). This group of companies is an important control sample since private equity investors do not acquire target companies randomly (Borell and Heger, 2013). This results in a total of 110,672 company year observations.

In the construction of a data set considering macroeconomic, debt market and equity market indicators, this study uses Datastream. This is considered to be a reliable dataset which is also used by Bansraj and Smit (2017) and Hammer et al. (2017). The data is retrieved quarterly as of 2008 Q1 till 2016 Q4.

4.2 Descriptive statistics

Panel A of table 1 depicts the distribution of the transaction sample by year of completion. The deal volume has been steadily growing between 2008 and 2016 with the number of transactions being the lowest in the beginning of the financial crisis. Accordingly, buy-and-build deals have also experienced a steady increase with 2015 exhibiting the highest amount in our transaction sample. Interestingly, the number of platform acquisitions between 2014 and 2016 decreased significantly whereas the follow-on acquisitions experienced a tremendous growth.

Panel B of table 1 depicts the distribution of the transaction sample by industry. The industry 'support services' (14.74%), 'general retailers' (11.26%) and 'software services' (13.05%) show the highest buy-and-build transaction activity. The data shows that industries which are regarded to be asset-heavy such as 'oil gas producers', 'forestry paper' and 'electricity' show significantly lower buy-and-build transaction activity compared to asset-light industries such as 'health care services'.

Panel C of table 1 indicates that the fast majority of the buy-and-build transactions are domestic since 70.17% of the buy-and-build deals have an acquiring company that is seated in the UK. Cross-border buy-and-build transactions are primarily driven by companies that are located in the United States (19.53%). Companies that are located in Germany (1.72%) and France (2.25%) also exhibit some cross-border buy-and-build transaction activity in the UK.

Table 1: Sample distribution of deals

Table 1 represents the sample distribution by year, industry and country. The industry distribution is based on NACE Rev. 2 codes (four digits). The total number of deals (2,342) is 23 deals lower compared to the number of deals (2,635) mentioned in the beginning of this section because these deals did not qualify with one of the ICB sector industries. Panel C depicts the country of origin of the acquiring company in the deal sample.

Panel A: Distribution by year of completion								
	All deals		Buy-and-build		Platform		Follow-on	
Year	N	%	N	%	N	%	N	%
2008	273	11.54	93	9.65	18	8.00	75	10.15
2009	135	5.71	49	5.08	8	3.56	41	5.55
2010	214	9.05	81	8.40	25	11.11	56	7.58

2011	215	9.09	89	9.23	35	15.56	54	7.31
2012	234	9.89	106	11.00	38	16.89	68	9.20
2013	256	10.82	109	11.31	25	11.11	84	11.37
2014	297	12.56	121	12.55	34	15.11	87	11.77
2015	323	13.66	160	16.60	31	13.78	129	17.46
2016	418	17.67	156	16.18	11	4.89	145	19.62
Total	**2,365**	**100**	**964**	**100**	**225**	**100**	**739**	**100**

Panel B: Distribution by industry

	All deals		Buy-and-build		Platform		Follow-on	
ICB-sector	N	%	N	%	N	%	N	%
Oil & gas producers	3	0.13	0	0.00	0	0.00	0	0.00
Oil equipment & services	14	0.60	5	0.53	1	0.45	4	0.55
Alternative energy	0	0.00	0	0.00	0	0.00	0	0.00
Chemicals	60	2.56	26	2.74	8	3.62	18	2.47
Forestry & paper	13	0.56	1	0.11	1	0.45	0	0.00
Industrial metals & mining	64	2.73	18	1.89	4	1.81	14	1.92
Mining	0	0.00	0	0.00	0	0.00	0	0.00
Construction & materials	189	8.07	55	5.79	12	5.43	43	5.90
Aerospace & defense	1	0.04	0	0.00	0	0.00	0	0.00
General industrials	0	0.00	0	0.00	0	0.00	0	0.00
Electronic equipment	65	2.78	22	2.32	5	2.26	17	2.33
Industrial engineering	93	3.97	33	3.47	8	3.62	25	3.43
Industrial transportation	54	2.31	25	2.63	8	3.62	17	2.33
Support services	334	14.26	140	14.74	36	16.29	104	14.27
Auto & parts	68	2.90	32	3.37	8	3.62	24	3.29
Beverages	6	0.26	3	0.32	1	0.45	2	0.27
Food producers	48	2.05	11	1.16	2	0.90	9	1.23
Household goods	43	1.84	15	1.58	8	3.62	7	0.96
Personal goods	37	1.58	8	0.84	3	1.36	5	0.69
Tobacco	0	0.00	0	0.00	0	0.00	0	0.00
Health care services	133	5.68	99	10.42	11	4.98	88	12.07
Pharmaceuticals & biotech	35	1.49	13	1.37	3	1.36	10	1.37
Food & drug retailers	15	0.64	5	0.53	0	0.00	5	0.69

General retailers	260	11.10	107	11.26	19	8.60	88	12.07
Media	116	4.95	47	4.95	17	7.69	30	4.12
Travel & leisure	156	6.66	48	5.05	10	4.52	38	5.21
Fixed line telecommunications	11	0.47	5	0.53	2	0.90	3	0.41
Mobile telecommunications	28	1.20	12	1.26	4	1.81	8	1.10
Electricity	16	0.68	1	0.11	1	0.45	0	0.00
Gas, water & multi-utilities	0	0.00	0	0.00	0	0.00	0	0.00
Nonlife insurance	15	0.64	4	0.42	0	0.00	4	0.55
Life insurance	5	0.21	0	0.00	0	0.00	0	0.00
Real estate services	21	0.90	5	0.53	1	0.45	4	0.55
Real estate investment trusts	0	0.00	0	0.00	0	0.00	0	0.00
Financial services	178	7.60	84	8.84	19	8.60	65	8.92
Equity investment instruments	0	0.00	0	0.00	0	0.00	0	0.00
Software services	255	10.89	124	13.05	28	12.67	96	13.17
Technology hardware	6	0.26	2	0.21	1	0.45	1	0.14
Total	**2,342**	**100**	**950**	**100**	**221**	**100**	**729**	**100**

Panel C: Distribution by country

	All deals		Buy-and-build		Platform		Follow-on	
Country of origin (acquirer)	N	%	N	%	N	%	N	%
Germany	29	1.51	16	1.72	5	2.58	11	1.49
Canada	11	0.57	5	0.54	3	1.55	2	0.27
United States	289	15.08	182	19.53	68	35.05	114	15.45
Hong Kong	3	0.16	1	0.11	0	0.00	1	0.14
France	27	1.41	21	2.25	17	2.30	4	2.06
Cayman Islands	13	0.68	6	0.64	4	2.06	2	0.27
Australia	6	0.31	0	0.00	0	0.00	0	0.00
Singapore	2	0.10	1	0.11	0	0.00	1	0.14
United Arab Emirates	3	0.16	1	0.11	0	0.00	1	0.14
Ireland	5	0.26	3	0.32	0	0.00	3	0.41
Bahrain	4	0.21	1	0.11	1	0.52	0	0.00
The Netherlands	12	0.63	5	0.54	1	0.52	4	0.54
Luxembourg	6	0.31	2	0.21	0	0.00	2	0.27
Bermuda	7	0.37	1	0.11	1	0.52	0	0.00

Norway	9	0.47	7	0.75	3	1.55	4	0.54
Italy	4	0.21	2	0.21	1	0.52	1	0.14
British Virgin Islands	4	0.21	1	0.11	0	0.00	1	0.14
Spain	5	0.26	3	0.32	0	0.00	3	0.41
Japan	3	0.16	0	0.00	0	0.00	0	0.00
Austria	1	0.05	0	0.00	0	0.00	0	0.00
China	1	0.05	0	0.00	0	0.00	0	0.00
Belgium	4	0.21	4	0.43	2	1.03	2	0.27
Sweden	8	0.42	8	0.86	1	0.52	7	0.95
India	1	0.05	1	0.11	0	0.00	1	0.14
Portugal	1	0.05	1	0.11	0	0.00	1	0.14
Gilbraltar	1	0.05	1	0.11	0	0.00	1	0.14
Israel	1	0.05	1	0.11	0	0.00	1	0.14
Finland	1	0.05	1	0.11	0	0.00	1	0.14
Thailand	1	0.05	1	0.11	0	0.00	1	0.14
Switzerland	1	0.05	1	0.11	0	0.00	1	0.14
Denmark	1	0.05	1	0.11	0	0.00	1	0.14
United Kingdom	1453	75.80	654	70.17	100	51.55	554	75.07
Total	**1917**	**100**	**932**	**100**	**194**	**100**	**738**	**100**

Table 2 depicts the descriptive statistics of the independent variables used in the industry regression in order to determine the industry determinants of the buy-and-build strategy. The variable *HHI* shows that the level of concentration (3,000 versus 1,406) is significantly lower of buy-and-build industries compared to regular industries. Accordingly, the cumulative market share of the Top 10 industry firms is significantly lower (85.28% versus 68.49%). This implies that buy-and-build strategies occur on average in more fragmented industries. Interestingly, the industry size of buy-and-build industries on average seems to be larger ($10,136m versus $21,213m) compared to regular industries. Uncertainty measured as market volatility and industry growth of buy-and-build industries is on average not substantially different from regular industries.

Table 2: Summary statistics industry characteristics

Table 2 represents the summary statistics of regular industries and buy-and-build industries. The dependent variable BB_i is a dummy variable equal to one if at one point in time a buy-and-build deal was completed industry i whereas $ln\,(no.\,of\,deals + 1)$ is the natural logarithm of the number of deals in industry i in year t. The variable *HHI* measures the level of concentration (varies between 0 and 10,000) of industry i, *HHI Top* measures the level concentration among the biggest 10 industry i firms and *HHI Bottom* the level of concentration among the smallest 50 industry i firms. Uncertainty measures the level of market volatilty, $Top\,10$ is the cumulative market share of the biggest 10 industry i firms and $Bottom50$ of the smallest 50 firms.$Industrysize$ involves the sum of all industry i firms expressed in $millions. The variable $Industrygrowth$ is truncated at the 1% and 99% level in order to account for outliers..

Panel A: Dependent variables

	N	Mean	S.D.	Q1	Median	Q3
BB_i	3,141	0.38	0.49	0.00	0.00	1.00
$ln\,(no.\,of\,deals + 1)_{i,t}$	3,141	0.11	0.33	0.00	0.00	0.00

Panel B: Independent variables

Regular industries

	N	Mean	S.D.	Q1	Median	Q3
HHI	1,941	3,003	2,673	948	2,191	4,221
HHI Top	1,941	2,987	2,686	913	2,184	4,218
HHI Bottom	1,941	10.54	19.96	0.00	0.29	11.63
Uncertainty	1,941	0.068	0.076	0.027	0.052	0.088
Top 10 (%)	1,941	85.28	19.15	74.79	94.72	100
Bottom 50 (%)	1,941	7.65	10.95	0.00	2.07	12.40
Industry size ($m)	1,941	10,136	44,851	293	975	4,177
Industry growth (%)	1,941	7.53	11.94	-0.51	6.00	13.89

Buy-and-build industries

	N	Mean	S.D.	Q1	Median	Q3
HHI	1,200	1,406	1,359	463	964	1,889
HHI Top	1,200	1,380	1,371	419	931	1,878
HHI Bottom	1,200	10.33	18.86	0.01	0.43	13.95
Uncertainty	1,200	0.071	0.069	0.028	0.056	0.094
Top 10 (%)	1,200	68.49	21.10	53.47	70.95	85.57

Bottom 50 (%)	1,200	8.87	11.22	0.61	3.23	14.57
Industry size ($m)	1,200	21,213	54,136	1,764	6,373	18,462
Industry growth (%)	1,200	7.53	13.57	-0.21	6.61	14.14

Table 3 depicts the summary statistics of the independent variables applied in the company regression. Platform acquisitions are on average considerably larger compared to follow-on acquisitions ($278.38m versus $41.93m). The return on sales as a measure for the operational performance of the target company, on average, seems to be higher for platform companies (14.83% versus 12.39%). However, the asset turnover and return on assets are on average higher compared to platform companies. Platform companies have significantly more acquisition experience compared to follow-on companies suggesting that acquisition experience is more important for platform companies compared to follow-on companies.

Table 3: Summary statistics company characteristics

Table 3 represents the summary statistics of the company characteristics categorized as regular, platform targets and follow-on targets. The dependent variable $BB\,target_{c,t}$ is equal to 1 if compancy c has been the target in a buy-and-build transaction. The dependent variable $Platform\,target_{c,t}$ is equal to 1 if compancy c has been the target in a platform transaction. The dependent variable $Follow-on\,target_{c,t}$ is equal to 1 if compancy c has been the target in a follow-on transaction The data underlying the independent variables have been truncated at the 1% and 99% level.

Panel A: Dependent variables						
	N	Mean	S.D.	Q1	Median	Q3
$BB\,target_{c,t}$	110,672	0.00	0.04	0.00	0.00	1.00
$Platform\,target_{c,t}$	110,672	0.00	0.02	0.00	0.00	0.00
$Follow-on\,target_{c,t}$	110,672	0.00	0.03	0.00	0.00	0.00
Panel B: Independent variables						
Regular						
	N	Mean	S.D.	Q1	Median	Q3
Operating revenue ($m)	110,672	88.03	212.11	14.00	27.00	65.00
Gross margin (%)	110,672	36.70	24.40	18.46	31.67	49.92

Return on sales (%)	110,672	12.45	17.11	4.35	9.52	18.56
Asset turnover (x)	110,672	1.72	1.76	0.79	1.46	2.29
Return on assets (%)	110,672	10.76	16.67	4.55	9.52	16.67
Acquisition experience	110,672	0.32	1.74	0.00	0.00	0.00
Company age	110,672	20.51	18.57	9.00	15.00	26.00

Platforms

	N	Mean	S.D.	Q1	Median	Q3
Operating revenue ($m)	39	278.38	601.13	19.00	42.00	200.00
Gross margin (%)	39	38.35	15.30	28.56	36.89	49.75
Return on sales (%)	39	14.83	14.96	7.69	14.12	24.00
Asset turnover (x)	39	1.59	1.20	0.81	1.36	2.18
Return on assets (%)	39	10.16	20.64	6.70	11.11	20.00
Acquisition experience	39	2.44	3.96	0.00	1.00	2.00
Company age	39	22.50	25.23	9.50	12.50	25.50

Follow-ons

	N	Mean	S.D.	Q1	Median	Q3
Operating revenue ($m)	107	41.93	112.86	9.00	15.00	29.00
Gross margin (%)	107	39.17	21.88	25.12	34.05	49.35
Return on sales (%)	107	12.39	12.45	3.67	9.99	18.18
Asset turnover (x)	107	2.13	2.10	1.13	1.60	2.33
Return on assets (%)	107	16.26	18.50	0.00	14.29	26.32
Acquisition experience	107	0.16	0.91	0.00	0.00	0.00
Company age	39	16.89	11.56	9.00	13.00	19.00

Table 4 depicts the summary statistics of the independent variables applied in the financial market regressions.

Table 4: Summary statistics financial-market characteristics

Table 4 represents the summary statistics of the regression data of the financial market regressions. The index values are derived from the FTSE 350 Sector Indices which are categorized on ICB sector codes. Therefore, the NACE Rev. 2 codes have been assigned to the ICB sector codes based on industry descriptions. The variable *Interest rate* is the mid-price of the Bank of England 6-months LIBOR / LIBID rate. The *Spread* is the difference between the Bank of America Merrill Lynch Euro High Yield rate and the mid-price of the Bank of England 6-months LIBOR / LIBID rate. The *Exchange rate* comprises the rate from GBP (ú) to USD ($). $Inflation$ and *GDP growth* refer to rates in the United Kingdom. .

Panel A: Dependent variable						
	N	Mean	S.D.	Q1	Median	Q3
$ln\,(no.\,of\,deals+1)_{i,t}$	1,295	0.41	0.78	0.00	0.00	0.00
Panel B: Independent variables						
	N	Mean	S.D.	Q1	Median	Q3
Interest rate (%)	1,295	0.88	1.36	0.39	0.43	0.52
Spread (%)	1,295	7.51	4.71	4.28	6.29	8.60
Hot	1,295	0.44	0.50	0.00	0.00	1.00
High IPO volume	1,295	0.21	0.41	0.00	0.00	1.00
Exchange rate (x)	1,295	0.63	0.05	0.62	0.63	0.66
Inflation (%)	1,295	2.38	1.42	1.40	2.70	3.40
GDP growth (%)	1,295	2.73	2.35	2.30	3.30	4.10

5 Results

5.1 Empirical results industry determinants

Table 5 reports the empirical results of the industry regressions between buy-and-build and none buy-and-build industries. Buy-and-build industries are classified based on NACE Rev. 2 codes and are defined as industries in which a buy-and-build deal, that is, a platform acquisition and/or follow-on acquisition, has been completed at one point in time in the deal sample. The empirical results of specifications (1) - (6) provide evidence to suggest that the empirics are in line with hypothesis 1

Hypothesis 1: the likelihood of implementing a buy-and-build strategy is higher in fragmented markets with the presence of an adequate number of follow-on targets.

In particular, the variable *HHI* in specifications (1) and (2) depicts a significantly negative relation between the degree of concentration and the probability a buy-and-build strategy will be executed. This negative relation suggests that buy-and-build strategies are more likely to appear in fragmented industries. Moreover, the empirical results of specification (6) suggest that buy-and-build activity is far less likely to appear in industries that a have a HHI score above 2,500. This is the direct result of the low consolidation potential associated with concentrated industries. Fragmented markets, that is, industries that have a HHI score between 0 - 500 have the highest probability of experiencing buy-and-build activity as shown by the positive and significant regression coefficient in specification (6). Overall, these findings suggest that buy-and-build strategies are indeed more likely to appear in fragmented markets. With regard to follow-on targets, the variable *HHI Bottom* that proxies for the availability of follow-on opportunities is negatively related to the probability a buy-and-build deal will be completed in a particular industry as shown in specifications (3) and (5). This negative relation is expected since the higher the degree of concentration among the fifty smallest firms in industry i, the less available follow-on targets the platform company has to integrate with. This empirical result is also in line with hypothesis (1) suggesting that the availability of follow-on targets is an important determinant of the buy-and-build strategy. The empirical results of the logistic and probit regressions depicted in tables 9 and 10 in the appendix indicate similar results to those of the LPM regressions.

The empirical results of this paper are line with those of Bansraj and Smit (2017) and Hammer et al. (2017) who conclude that buy-and-build strategies are more likely to appear in fragmented markets. Bansraj and Smit (2017) moreover find that industries

with a sufficient amount of follow-on targets are more likely to encounter buy-and-build activity which is line with the empirical results of this paper.

The explanatory variable *HHI Top* present in specifications (3) and (4) accounts for the availability of exit opportunities and the coefficient parameters provide evidence to suggest that the empirical results are in line with hypothesis 2

Hypothesis 2: the availability of an attractive amount of exit options in the form of sufficiently sized companies increases the likelihood of executing a buy-and-build strategy.

The negative relation between the variable *HHI Top* and the dependent variable indicate that buy-and-build strategies are more likely to appear if the industry is subject to an attractive amount of exit options. Recall that the variable *HHI Top* measures "how equal the market shares are divided among the 10 largest firms" within an industry (Bansraj and Smit, 2017). A higher *HHI Top* would imply that the market share is increasing towards one or a handful of companies. As a result, the number of available exit opportunities decreases since less firms are sufficiently sized. Moreover, since less firms are equally sized, the competition in the bidding setting is less fierce resulting in lower bids and therefore lowering the returns for the private equity firm. The empirical results with regard to the variable *HHI Top* of the logistic and probit regression shown in table 9 and 10 are line with those of the LPM regressions in table 5. The empirical results of this study are in line with Bansraj and Smit (2017) who also find that the availability of exit opportunities in the form of a trade sale is considered to be an important determinant of the buy-and-build strategy.

The variables *Uncertainty* and *Industry growth* proxy for the uncertainty and growth rates of an industry and are relevant in assessing hypothesis 3:

Hypothesis 3: the higher the level of uncertainty and the higher the industry growth rate the less likely a buy-and-build strategy will be executed.

The empirical results are not statistically significant and should therefore be interpreted with caution. The direction of the coefficient of variable *Industry growth* in specification (3) - (5) is in line with hypothesis 3 since this study expects that buy-and-build strategies are more likely to appear in low-growth industries. This suggests that the buy-and-build strategy is an attrative way to realize growth through the acquisition of smaller sized firms. With regard to the uncertainty of a particular industry, this study does not find evidence to suggest that buy-and-build strategies are more likely to appear in less volatile industries since the direction of this variable is positive as shown in the specifications (3) - (6). The empirical results of the LPM regression do not differ

from the logistic and probit regressions found in table 9 and 10 in the appendix and provide empirical evidence that is not in line with the literature. In particular, Borell and Heger (2013) find evidence that private equity firms targets fast-growing industries whereas the study of Brigl et al. (2016) finds a negatively significant relation between the probability buy-and-build strategies are implemented and the industry growth rate. Moreover, Bansraj and Smit (2017) find that buy-and-build strategies are more likely to appear in less uncertain industries.

Table 5: Regression results industry determinants

The table represents the regression results of equation 3.8. The dependent variable is equal to 1 if at one point in time in the deal sample a platform and/or follow-on deal is completed in industry i and zero otherwise. Specifications (1) and (2) involve regressions with one industry concentration measure (*HHI*). This industry concentration measure stands for the natural logarithm of the HHI score that varies between 0 and 10,000. Specifications (3) - (6) depict the empirical results with additional concentration measures, in particular, *HHI Top* and *HHI Bottom*. These additional industry measures proxy for the available exit and follow-on opportunities from the perspective of the private equity firm. All explanatory variables are lagged by one period. All regression specifications include time fixed effects. The adjusted (Adj.) r-squared measures the descriptive power of the regression model and increases only if an additional explanatory variable improves the descriptive power of the model than is expected by chance. The parentheses below the coefficient parameters indicate the OLS robust standard errors. *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Panel A: Standard HHI		
	Dependent variable: b&b yes/no	
	(1)	(2)
	LPM	LPM
HHI	-0.0976***	-0.0539***
	(0.0172)	(0.0171)
Uncertainty		0.1426
		(0.1251)
Top 10	-0.2023***	-0.1360**
	(0.0604)	(0.0570)
Bottom 50	-0.0133**	0.0095*
	(0.0056)	(0.0055)
Industry growth		-0.0007
		(0.0068)
Industry size		0.0714***

		(0.0040)
Constant	1.9779***	0.7969***
	(0.1564)	(0.1659)
Timed fixed effects	Yes	Yes
No. of observations	3,141	3,141
No. of b&b observations	1,200	1,200
Adj. r-squared	0.121	0.196

Panel B: Additional HH indices

	Dependent variables: b&b yes/no			
	(3) LPM	(4) LPM	(5) LPM	(6) LPM
HHI Bottom	-0.1684***		-0.1676***	
	(0.0107)		(0.0107)	
HHI Top		-0.0174	-0.0334**	
		(0.0170)	(0.0164)	
Uncertainty	0.1250	0.1449	0.1229	0.1231
	(0.1225)	(0.1241)	(0.1233)	(0.1306)
Top 10	0.0367	-0.1837**	0.0870	
	(0.0365)	(0.0599)	(0.0598)	
Bottom 50	0.3025***	0.0120**	0.2989***	
	(0.0184)	(0.0056)	(0.0189)	
HHI 0 - 500				0.1085***
				(0.0284)
HHI 500 - 1000				0.0755**
				(0.0277)
HHI 1000 - 1500				0.0397
				(0.0304)
HHI > 2500				-0.1457***
				(0.0222)
Industry growth	-0.0012	-0.0004	-0.0014	0.0012
	(0.0066)	(0.0068)	(0.0066)	(0.0068)

Industry size	0.0063	0.0724***	0.0062	0.0738***
	(0.0052)	(0.0040)	(0.0052)	(0.0039)
Constant	-0.1830	0.8416***	-0.2690	-0.1774***
	(0.1663)	(0.1750)	(0.1833)	(0.0385)
Time fixed effects	Yes	Yes	Yes	Yes
No. of observations	3,141	3,141	3,141	3,141
No. of b&b observations	1,200	1,200	1,200	1,200
Adj. r-squared	0.245	0.194	0.245	0.186

As an additional analysis and check of statistical robustness, the binary dependent variable in the previous regression analyses will now comprise the natural logarithm of the total number of buy-and-build deals (both platform and follow-on) in industry i in year t. The coefficients of the explanatory variables *HHI Bottom* and *HHI Top* depicted in table 6 and relevant in assessing hypothesis 1 and 2 are similar to those of table 5. Noticeable, the direction of the independent variables *Uncertainty* and *Industry growth* have switched signs although not statistically significant. This suggests that buy-and-build strategies are more likely to appear in uncertain industries and exhibit industry growth. This empirical result is partially in line with hypothesis 3 since it was expected that uncertainty negatively influences the probability a buy-and-build strategy will be implemented.

Table 6: Regression results industry determinants

The table represents the regression results of equation 3.8. The dependent variable is the natural logarithm of the number of buy-and-build deals plus 1 in industry i. Specifications (1) ÔÇô (4) include the additional concentration measures Bottom and *HHI Top* compared to specification (1) and (2) in table 5. All explanatory variables are lagged by one period. All regression specifications include time fixed effects and a regression constant. The adjusted (Adj.) r-squared measures the descriptive power of the regression model and increases only if an additional explanatory variable improves the descriptive power of the model than is expected by chance. The parentheses below the coefficient parameters indicate the OLS robust standard errors. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	ln (no. deals +1)			
	(1) OLS	(2) OLS	(3) OLS	(4) OLS
HHI Bottom	-0.0732***		-0.0724***	
	(0.0089)		(0.0090)	
HHI Top		-0.0265***	-0.0196*	
		(0.0101)	(0.0100)	
Uncertainty	-0.0792	-0.0720	-0.0815	-0.0411
	(0.0635)	(0.0800)	(0.0641)	(0.0650)
Top 10	-0.0512	-0.1116***	0.0054	
	(0.0342)	(0.0381)	(0.0410)	
Bottom 50	0.1083***	-0.0197***	0.1043***	

	(0.0153)	(0.0041)	(0.0157)	
HHI 0 - 500				0.1424***
				(0.0260)
HHI 500 - 1000				0.0141
				(0.0178)
HHI 1000 - 1500				0.0078
				(0.0193)
HHI >2500				-0.0358***
				(0.0137)
Industry growth	0.0103**	0.0105**	0.0100**	0.0112**
	(0.0047)	(0.0047)	(0.0047)	(0.0047)
Industry size	-0.0110***	0.0175***	-0.0111**	0.0241***
	(0.0035)	(0.0025)	(0.0035)	(0.0026)
Constant	0.3030*	0.6862***	0.2064	-0.0729***
	(0.1549)	(0.1358)	(0.1538)	(0.0257)
Time fixed effects	Yes	Yes	Yes	Yes
No. of observations	3,141	3,141	3,141	3,141
No. of b&b observations	1,200	1,200	1,200	1,200
Adj. r-squared	0.112	0.089	0.113	0.081

5.2 Empirical results company determinants

Table 7 represents the empirical results of the LPM regressions between firms that have been part of a buy-and-build strategy, either as platform or follow-on, and regular firms that are active in the UK but have not been part of a buy-and-build strategy. Moreover, firms that have been the target of a private equity firm other than buy-and-build deals are included as well. As table 7 depicts, the number of observations involves the number of company year observations and amounts 110,672. This amount exists of company year observations of the buy-and-build companies and the control sample which exists not only of companies that have the target in a regular private equity buyout, but also companies that are active in the UK in order to control for the non-random selection of private equity firms. At first glance, the regression coefficients are notably small which is primarily caused by the large control sample. If company year observations of regular UK firms were excluded from the regression analyses, the regression coefficients would

become sufficiently larger but insignificant for all explanatory variables. Moreover, the small regression coefficients are in line with the studies of Borell and Heger (2013) and Bansraj and Smit (2017) who likewise report small regression coefficients and standard errors. This also applies to the adjusted r-squared which is considerably lower compared to the other regression analyses in this study.

The empirical results of specifications (2) and (3) provide the answer to hypothesis 4

Hypothesis 4: platform companies are better performing companies compared to follow-on companies prior to the transaction.

The variable ROS, which measures the standalone performance of company c, indicates that the probability a company will be part of a buy-and-build strategy as a platform increases with the better operational performance as shown in specification (2). An opposite relation holds for follow-on as the negative coefficient of the variable ROS suggests in specification (3). With regard to the second accounting-based performance measure, ATR, this study finds that the probability a company will be part of a buy-and-build strategy as a platform increases more with a better asset turnover compared to follow-ons. This is based on the regression coefficients of the variable ATR in specification (2) and (3). These empirical results, that are in line with hypothesis 4, are similar to the paper of Borell and Heger (2013) which suggests that there are significant differences between the platform- and follow-on company in the operating performance.

Specification (3) provides some statistical support in which the dependent variable is equal to 1 if company c has been the target in a buy-and-build strategy as a follow-on for hypothesis 5

Hypothesis 5: follow-on companies with potential improvability in operating performance prior to the transaction are more likely to be part of a buy-and-build strategy.

The variable ROS is significantly negative and indicates that the lower the ROS the higher the probability that company c will be part of a buy-and-build strategy as a follow-on. This is in line with hypothesis 5 which suggests that underperforming follow-on companies on a standalone basis are more likely to be part of a buy-and-build strategy. This empirical result is in line with the paper of Bansraj and Smit (2017) who also find statistical support for the notion that operational underperformance increases the likelihood. Another accounting-accounting based performance measure this study applies in order to determine the operational performance of company c is the asset turnover proxied by the variable ATR. This study does not find that a lower asset

turnover results in an increase in the probability a company will be part of a buy-and-build strategy as a follow-on. This result is not in line with the paper of Bansraj and Smit (2017).

Specification (1)-(3) indicate results that are partially in line with hypothesis 6

Hypothesis 6: platform and follow-on companies should be of sufficient size and is therefore positively related to the probability of being a target in a buy-and-build strategy.

The regression coefficients of the variable $Size$ are negative and statistically significant for regression specifications (1) and (3). The negative regression coefficient in specification (3) suggests that the smaller company c, the more likely company c will be part of a buy-and-build strategy as a follow-on. The effect is positive for the platform company since the regression coefficient of $Size$ is positive in specification (2), although not statistically significant. The empirical results of the variable $Size$ in specification (3) are therefore not in line with the literature since size is negatively related to the probability a company will be part of a buy-and-build strategy in the role of follow-on. In particular, Hammer et al. (2016) find that size is an important determinant of follow-on activity and find a significant positive relation. This statistical relation also applies to the empirical results of Bansraj and Smit (2017) who find a positive relation between size and the probability a company will be part of a buy-and-build either as a platform or follow-on.

The variable *Acquisition experience* in table 7 assesses hypothesis 7

Hypothesis 7: acquisition experience is positively related to the likelihood a company in the form of a platform will be part of a buy-and-build strategy.

The variable AcqExp (Acquisition experience) is positively and significantly related to the dependent variable in specification (2) suggesting that experience in mergers and acquisitions activity increases the likelihood company c will be part of a buy-and-build strategy as a platform. The coefficient in specification (3) is negative and statistically insignificant suggesting that acquisition experience is not relevant for the follow-on company. This is as expected since the platform fills in the role of acquirer in the buy-and-build strategy whereas the follow-on companies serve as acquisition target. These empirical results are in line with Hammer et al. (2017) who find that acquisition experience of the target company c increases the likelihood of being part of the buy-and-build strategy as a platform. The empirical results of the logistic and probit regressions depicted in tables 11 and 12 in the appendix do not represent significant differences.

Table 7: Regression results company determinants

The table represents the regression results of equation 3.10. The dependent variable of Specification (1) is equal to 1 if company c has been the target of a buy-and-build strategy, either as a platform or follow-on, in year t. Specification (2) has a dependent variable that is equal to 1 if company c has been the target as a platform in the buy-and-build strategy in year t. The dependent variable of specification (3) equals 1 if company c has been the target of a transaction in buy-and-build strategy as a follow-on in year t. All explanatory variables are lagged by one period. All regression specifications include time and industry fixed effects and a regression constant. The adjusted (Adj.) r-squared measures the descriptive power of the regression model and increases only if an additional explanatory variable improves the descriptive power of the model than is expected by chance. The parentheses below the coefficient parameters indicate the OLS robust standard errors. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively. The statistical significance is based on the Wald test and the corresponding p-value associated with χ^2.

Independent variable:	b&b yes/no	Platform yes/no	Follow-on yes/no
	(1)	(2)	(3)
	LPM	LPM	LPM
Size (ln)	-0.00038***	0.00003	-0.00041***
	(0.00010)	(0.00006)	(0.00008)
Return on sales (%)	-0.00076	0.00055*	-0.00131**
	(0.00062)	(0.00033)	(0.00053)
Return on assets (%)	0.00202**	-0.00006	0.00208***
	(0.00092)	(0.00049)	(0.00078)
Asset turnover (x)	0.00014**	0.00001	0.00014**
	(0.00008)	(0.00003)	(0.00008)
Gross margin (%)	-0.00002	0.00016	0.00014
	(0.00045)	(0.00018)	(0.00041)
Acquisition experience	0.00143***	0.00138***	0.00005
	(0.00043)	(0.00039)	(0.00018)
Company age	-0.00005	-0.0014**	0.00001
	(0.0001)	(0.0001)	(0.0001)
Constant	0.00153***	0.00023**	0.00130***
	(0.00024)	(0.00010)	(0.00022)
Fixed year effets	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Total observations	111,107	111,107	111,107

Y=1 observations	146	39	107
Adj. r-squared	0.001	0.001	0.001

5.3 Empirical results financial market determinants

Table 8 represents the regressions results of the financial market conditions (equity- and debt markets) whilst controlling for the macroeconomic environment. The dependent variable is the natural logarithm of the number of buy-and-build deals plus 1 (both platform and follow-ons). The empirical results are partially in line with hypothesis 8

Hypothesis 8: Favourable debt market conditions and high stock market valuations positively relate to the number of completed buy-and-build deals.

The regression coefficients of the explanatory variables $Interest\,rate$ and $Spread$ are negative in specification (2) suggesting that favourable debt market conditions facilitate platform deals. The opposite holds for specification (3) with regard to the financing of follow-on deals suggesting that debt market conditions might be less relevant. This might indicate that these follow-on deals are potentially financed with relatively more cash compared to platform deals. This result is not in line with the paper of Smit (2001) who suggest that both platform and follow-on activity is negatively related to the interest rate. Specification (1) shows comparable empirical results to specification (3) suggesting a positive relation between the interest rate and buy-and-build activity. These empirical results are not in line with the papers of Bansraj and Smit (2017) and Hammer et al. (2017). However, favourable debt market conditions are still likely to facilitate platform activity and the empirical results are therefore partially in line with hypothesis 8 with respect to debt market conditions.

With respect to the equity markets, empirical results in specifications (1)-(3) with regard to the variable $High\ IPO\ volume$ indicate that more buy-and-build deals are completed in periods of a high amount of IPOs proxying for favourable equity market conditions. However, the variable Hot does not show the expected positive relation since this study expected that high market valuations should results in more buy-and-build activity. This is based on the notion that high market valuations results in higher valuations of the platform company resulting in a more profitable exit for the private equity firm. With respect to equity markets, the empirical results are partially in line with hypothesis 8 since the variable $High\ IPO\ volume$ shows a significantly positive relation in all the three specifications.

Table 8: Regression results financial market determinants

The table represents the regression results of equation 3.11. The first specification involves a dependent variable that is equal to the natural logarithm of the number of buy-and-build deals plus 1 in industry y. The second specification involves a dependent variables that is equal to the natural logarithm of the number of platform deals plus 1 in industry y. The third specification is equal to the natural logarithm of the number of follow-on deals plus in industry y. All explanatory variables are lagged by one period. All regression specifications include industry fixed effects and a regression constant. The adjusted (Adj.) r-squared measures the descriptive power of the regression model and increases only if an additional explanatory variable improves the descriptive power of the model than is expected by chance. The parentheses below the coefficient parameters indicate the OLS robust standard errors. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Dependent variable:	b&b deals	platform deals	follow-on deals
	(1)	(2)	(3)
	OLS	OLS	OLS
Interest rate	0.0119	-0.0217***	0.0242
	(0.0176)	(0.0076)	(0.0163)
Spread	-0.0061	-0.0053	-0.0030
	(0.0075)	(0.0038)	(0.0069)
Hot	-0.0525	-0.0429**	-0.0195
	(0.0332)	(0.0177)	(0.0291)
High IPO volume	0.2662***	0.0934***	0.2130***
	(0.0434)	(0.0236)	(0.0389)
GDP growth	0.0072	-0.0014	0.0078
	(0.0140)	(0.0076)	(0.0123)
Exchange rate	0.5723	-0.3388*	0.7067
	(0.4816)	(0.1931)	(0.4549)
Inflation	-0.0373**	0.0018	-0.0413***
	(0.0151)	(0.0080)	(0.0133)
Constant	-0.0274	0.3647***	-0.1490
	(0.3342)	(0.1424)	(0.3119)
Industry fixed effects	Yes	Yes	Yes
No. of observations	1,295	1,295	1,295
Adj. r-squared	0.055	0.031	0.052

6 Conclusion

This study supplements the financial economics literature by examining the determinants of the buy-and-build strategy. Although the buy-and-build strategy has been applied in practice extensively, the understanding of this value-enhancing strategy is relatively limited compared to the more traditional value creation levers applied by private equity firms. As a result, this study examines the determinants of the buy-and-build strategy at the industry-, company- and financial market level in the United Kingdom. Industries that have experienced completed buy-and-build deals, either in the form of platform and/or follow-on, are classified as buy-and-build industries. The cross-sectional variation between buy-and-build industries and industries which have not seen any buy-and-build activity, classified as regular industries, is examined in order to draw conclusion about the industry determinants of the buy-and-build strategy. At the company level, companies that have been part of a buy-and-build strategy, either as a platform or follow-on, are compared with companies that have been the target in a traditional private equity buyout. Moreover, since private equity do not randomly select their targets, this study adds all other firms that are active in the United Kingdom to the control group. Debt- and equity market conditions are expected to impact the number of completed buy-and-builds as well whilst controlling for the macroeconomic environment in the United Kingdom.

Empirical results of the industry regressions suggest that buy-and-build strategies are more likely to appear in industries that are more fragmented and supply a sufficient amount of exit and follow-on opportunities. Exit opportunities are of particular interest for the private equity firm since this enables the investor to realize its return. Follow-on opportunities are also of significant relevance since the buy-and-build strategy comprises a serial acquisition strategy in which the follow-ons are integrated with the platform company. Fragmented markets are particularly interesting for the buy-and-build strategy due to the consolidation potential associated with these type of industries. This study does not find empirical results to suggest that buy-and-build strategies are more likely to occur in uncertain industries as is expected based on the literature.

Companies with potential in the operating performance, that is, companies that are underperforming relative to other industry firms are ideal follow-on candidates since these companies benefit from the unique resources and capabilities of the platform companies. Empirical results inidcate that follow-on companies are subject to operational underperformance compared to the control group. measured by the return on sales. The opposite holds for the platform company suggesting that companies that have superior

operational performance are more likely to be part of a buy-and-build strategy in the form of a platform compared to the underperforming companies. However, the regression coefficient of the variable asset turnover, another accounting-based performance measure, does not indicate that the probability increases with a lower asset turnover for follow-ons. With regard to the firm size, this study finds a positive relation between firm size and the probability a company will be part of a buy-and-build strategy as a platform and a negative relation for follow-ons. This is not in line with the expectation of this study since it was expected that the relation was positive for follow-ons as well in order to compensate for the high transaction costs associated with mergers and acquisitions. Moreover, larger follow-on companies increase the size of the platform company much faster contributing to a higher size premium. Acquisition experience is also considered to be a relevant determinant of platform companies since these firms fill in the role of acquirer in the buy-and-build strategy. Acquisition experience prior to the buy-and-build deal increases the probability a company will be part of a buy-and-build strategy as a platform. This is relevant since previous acquisition experience helps with negotiations and faster integration with the follow-on company.

Empirical results of the financial market regressions indicate that favourable debt market conditions are of particular relevance for platform acquisitions. This does not hold for follow-on deals since the interest rate is positively related to the number of completed follow-on deals, although not statistically significant. This might suggest that debt is less relevant for the financing of follow-on companies compared to platform companies. With respect to equity market conditions, this study finds some empirical evidence suggesting that during times of a relatively high amount of IPOs as a proxy for optimistic equity markets, the number of completed buy-and-build deals are expected to increase.

The empirical results of this study have further enhanced the understanding of the buy-and-build strategies. Further research could focus on whether private equity firms pay for the synergistic value associated with platform and follow-on deals. It is commonly known that strategic acquirers pay for synergies which is not the case for financial sponsors. However, since the platform company is a strategic player within an industry, it might be the case that private equity firms nowadays do pay for synergistic value.

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Appendix

Table 9: Logistic regression results industry determinants

The table represents the marginal effect at the mean (MEM) and average marginal effect (AME) of the industry explanatory variables which are the result of the logistic (logit) regressions. Variables are lagged by one period. The parentheses below the parameters indicate the standard errors. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Panel A: Logit results marginal effect at mean (MEM)				
	Dependent variable: b&b yes/no			
	(1)	(2)	(3)	(4)
	MEM	MEM	MEM	MEM
	Logit	Logit	Logit	Logit
HHI Bottom	-0.1944***		-0.1929***	
	(0.0152)		(0.0153)	
HHI Top		-0.0723***	-0.0544**	
		(0.0227)	(0.0235)	
Uncertainty	0.1632	0.1552	0.1576	0.1101
	(0.1389)	(0.1389)	(0.1401)	(0.1404)
Top 10	0.0615*	-0.0696	0.2201***	
	(0.0373)	(0.0746)	(0.0782)	
Bottom 50	0.3705***	0.0272***	0.3617***	
	(0.0268)	(0.0064)	(0.0270)	
HHI 0 - 500				0.0740**
				(0.0301)
HHI 500 - 1000				-0.0682**
				(0.0312)
HHI 1000 - 1500				-0.0361
				(0.0303)
HHI >2500				-0.2234***
				(0.0309)
Industry growth	-0.0017	-0.0002	-0.00022	0.0013
	(0.0081)	(0.0080)	(0.0080)	(0.0104)
Industry size	0.0208**	0.1029***	0.0217**	0.0990***
	(0.0086)	(0.0059)	(0.0087)	(0.0100)

Time fixed effects	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
No. of observations	3,141	3,141	3,141	3,141
No. of b&b observations	1,200	1,200	1,200	1,200
Pseudo r-squared	0.212	0.172	0.213	0.174

Panel B: Logit results average marginal effect (AME)

	Dependent variable: b&b yes/no			
	(1) AME Logit	(2) AME Logit	(3) AME Logit	(4) AME Logit
HHI Bottom	-0.1566***		-0.1557***	
	(0.0113)		(0.0114)	
HHI Top		-0.0605***	-0.0439**	
		(0.0190)	(0.0190)	
Uncertainty	0.1315	0.1300	0.1272	0.1115
	(0.1118)	(0.1162)	(0.1130)	(0.1416)
Top 10	0.0496*	-0.0583	0.1776***	
	(0.0299)	(0.0624)	(0.0613)	
Bottom 50	0.2985***	0.0227***	0.2920***	
	(0.0201)	(0.0054)	(0.0204)	
HHI score 0 - 500				0.0734**
				(0.0299)
HHI score 500 - 1000				0.0682**
				(0.0283)
HHI score 1000 - 1500				0.0366
				(0.0318)
HHI score >2500				-0.2229***
				(0.0281)
Industry growth	-0.0014	-0.0002	-0.0018	-0.0012
	(0.0065)	(0.0067)	(0.0065)	(0.0079)
Industry size	0.0168**	0.0862***	0.0175**	0.0992***
	(0.0069)	(0.0045)	(0.0070)	(0.0054)

Time fixed effects	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes
No. of observations	3,141	3,141	3,141	3,141
No. of b&b observations	1,200	1,200	1,200	1,200
Pseudo r-squared	0.212	0.172	0.213	0.174

Table 10: Probit regression results industry determinants

The table represents the marginal effect at the mean (MEM) and average marginal effect (AME) of the industry explanatory variables which are the result of the probit regressions. Variables are lagged by one period. The parentheses below the parameters indicate the standard errors. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Panel A: Probit results marginal effect at mean (MEM)				
	Dependent variable: b&b yes/no			
	(1)	(2)	(3)	(4)
	MEM	MEM	MEM	MEM
	Probit	Probit	Probit	Probit
HHI Bottom	-0.1938***		-0.1921***	
	(0.0148)		(0.0149)	
HHI Top		-0.0737***	-0.0525**	
		(0.0221)	(0.0227)	
Uncertainty	0.1682	0.1548	0.1590	0.1094
	(0.1290)	(0.1284)	(0.1291)	(0.1286)
Top 10	0.0588	-0.0606	0.2113***	
	(0.0375)	(0.0717)	(0.0758)	
Bottom 50	0.3657***	0.0254***	0.3569***	
	(0.0261)	(0.0061)	(0.0264)	
HHI 0 - 500				-0.0806***
				(0.0300)
HHI 500 - 1000				0.0708**
				(0.0284)
HHI 1000 - 1500				0.0369
				(0.0319)
HHI >2500				-0.2098***
				(0.0273)
Industry growth	-0.0028	-0.0012	-0.0031	-0.0007
	(0.0079)	(0.0078)	(0.0079)	(0.0078)
Industry size	0.0168**	0.0988***	0.0174	0.0949***
	(0.0083)	(0.0056)	(0.0084)	(0.0051)
Time fixed effects	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes

No. of observations	3,141	3,141	3,141	3,141
No. of b&b observations	1,200	1,200	1,200	1,200
Pseudo r-squared	0.212	0.172	0.214	0.174

Panel B: Probit results average marginal effect (AME)

	Dependent variable: b&b yes/no			
	(1) AME Probit	(2) AME Probit	(3) AME Probit	(4) AME Probit
HHI Bottom	-0.1573***		-0.1560***	
	(0.0111)		(0.0112)	
HHI Top		-0.0627***	-0.0427**	
		(0.0188)	(0.0184)	
Uncertainty	0.1365	0.1316	0.1291	0.0929
	(0.1046)	(0.1091)	(0.1047)	(0.1091)
Top 10	0.0477	-0.0515	0.1716***	
	(0.0304)	(0.0609)	(0.0615)	
Bottom 50	0.2967***	0.0216***	0.2898***	
	(0.0196)	(0.0052)	(0.0120)	
HHI score 0 - 500				0.0684
				(0.0253)
HHI score 500 - 1000				0.0601
				(0.0240)
HHI score 1000 - 1500				0.0313
				(0.0271)
HHI score >2500				-0.1781***
				(0.0228)
Industry growth	-0.0023	-0.0010	-0.0025	-0.0006
	(0.0064)	(0.0066)	(0.0064)	(0.0066)
Industry size	0.01363**	0.0834***	0.0142**	0.0806***
	(0.0067)	(0.0043)	(0.068)	(0.0037)
Time fixed effects	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes

No. of observations	3,141	3,141	3,141	3,141
No. of b&b observations	1,200	1,200	1,200	1,200
Pseudo r-squared	0.212	0.172	0.214	0.174

Table 11: Logistic regression results company determinants

The table represents the marginal effect at the mean (MEM) and average marginal effect (AME) of the company explanatory variables which are the result of the logistic (logit) regressions. Variables are lagged by one period. The parentheses below the parameters indicate the standard errors. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Panel A: Logit results marginal effect at mean (MEM)			
Dependent variable	b&b yes/no	Platform yes/no	Follow-on yes/no
	(1)	(2)	(3)
	MEM	MEM	MEM
	Logit	Logit	Logit
Size (ln)	-0.00035***	0.00002	-0.00038***
	(0.00009)	(0.00003)	(0.00007)
Return on sales (%)	-0.00100	0.00041	-0.00136**
	(0.00075)	(0.00033)	(0.00054)
Return on assets (%)	0.00198***	-0.00005	0.00172***
	(0.00063)	(0.00033)	(0.00046)
Asset turnover (x)	0.00003*	0.00000	0.00002**
	(0.00001)	(0.00002)	(0.00000)
Gross margin (%)	-0.00023	-0.00015	-0.00014
	(0.00047)	(0.00022)	(0.00035)
Acquisition experience (ln)	0.00094***	0.00031***	-0.00007
	(0.00017)	(0.00006)	(0.00028)
Company age (ln)	-0.00004	-0.00010	0.00008
	(0.00008)	(0.00003)	(0.00012)*
Fixed year effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Constant	Yes	Yes	Yes
No. of observations	111,107	111,107	111,107
Y=1 observations	146	39	107
Pseudo r-squared	0.017	0.059	0.028
Panel B: Logit results average marginal effect (AME)			

Dependent variable	b&b yes/no	Platform yes/no	Follow-on yes/no
	(1)	(2)	(3)
	AME	AME	AME
	Logit	Logit	Logit
Size (ln)	-0.00040***	0.00003	-0.00049***
	(0.00011)	(0.00005)	(0.00011)
Return on sales (%)	-0.00113	0.00054	-0.00171**
	(0.00085)	(0.00043)	(0.00071)
Return on assets (%)	0.00223***	-0.00006	0.00217**
	(0.00075)	(0.00044)	(0.00063)
Asset turnover (x)	0.00003*	0.00000	0.00003
	(0.00002)	(0.00002)	(0.00001)
Gross margin (%)	-0.00026	-0.00020	-0.00018
	(0.00053)	(0.00029)	0.00044
Acquisition experience (ln)	0.00106***	0.00041***	-0.00009
	(0.00022)	(0.00009)	((0.00035)
Company age (ln)	-0.00004	-0.00013**	0.00011
	(0.00001)	(0.00001)	(0.00001)
Fixed year effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Constant	Yes	Yes	Yes
No. of observations	111,107	111,107	111,107
Y=1 observations	146	39	107
Pseudo r-squared	0.017	0.059	0.028

Table 12: Probit regression results company determinants

The table represents the marginal effect at the mean (MEM) and average marginal effect (AME) of the company explanatory variables which are the result of the probit regressions. Variables are lagged by one period. The parentheses below the parameters indicate the standard errors. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Panel A: Probit results marginal effect at mean (MEM)			
Dependent variable	b&b yes/no	Platform yes/no	Follow-on yes/no
	(1)	(2)	(3)
	MEM	MEM	MEM
	Probit	Probit	Probit
Size (ln)	-0.00037***	0.0002	-0.00040***
	(0.00009)	(0.00004)	(0.00007)
Return on sales (%)	-0.00107	0.00039	-0.00146**
	(0.00079)	(0.00034)	(0.00060)
Return on assets (%)	0.00205***	-0.00004	0.00184***
	(0.00066)	(0.00033)	(0.00050)
Asset turnover (x)	0.00004*	0.00000	0.00003**
	(0.00002)	(0.00003)	(0.00001)
Gross margin (%)	-0.00021	-0.00013	-0.00013
	(0.00049)	(0.00023)	(0.00037)
Acquisition experience (ln)	0.00101***	0.00036	-0.00005
	(0.00019)	(0.00007)	(0.00028)
Company age (ln)	-0.00005	-0.00010**	0.00008
	(0.00001)	(0.00001)	(0.00001)
Fixed year effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Constant	Yes	Yes	Yes
No. of observations	111,107	111,107	111,107
Y=1 observations	146	39	107
Pseudo r-squared	0.018	0.061	0.028
Panel B: Probit results average marginal effect (AME)			

Dependent variable	b&b yes/no	Platform yes/no	Follow-on yes/no
	(1)	(2)	(3)
	AME	AME	AME
	Probit	Probit	Probit
Size (ln)	-0.00040***	0.00002	-0.00048***
	(0.00011)	(0.00005)	(0.00011)
Return on sales (%)	-0.00117	0.00049	-0.00176**
	(0.00088)	(0.00044)	(0.00075)
Return on assets (%)	0.00226***	-0.00005	(0.00222)***
	(0.00076)	(0.00042)	(0.00064)
Asset turnover (x)	0.00004*	0.00000	0.00004
	(0.00002)	(0.00004)	0.00002**
Gross margin (%)	-0.00023	-0.00017	-0.00015
	(0.00054)	(0.00029)	(0.00045)
Acquisition experience (ln)	0.00111***	0.00046***	-0.00006
	(0.0023)	(0.00010)	(0.00033)
Company age (ln)	-0.00005	-0.00012	0.00011
	(0.00001)	(0.00001)	(0.00001)
Fixed year effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Constant	Yes	Yes	Yes
No. of observations	111,107	111,107	111,107
Y=1 observations	146	39	107
Pseudo r-squared	0.018	0.061	0.028

Table 13: Correlation matrix

Panel A: financial market regression independent variables							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Interest rate	1.00						
(2) Spread	-0.01	1.00					
(3) Hot	-0.20	-0.48	1.00				
(4) High IPO volume	-0.05	-0.12	0.13	1.00			
(5) GDP growth	0.10	-0.75	0.33	0.14	1.00		
(6) Exchange rate	-0.77	0.05	0.16	-0.02	-0.18	1.00	
(7) Inflation	0.31	0.41	-0.51	-0.04	-0.07	-0.37	1.00

Panel B: industry regression independent variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) HHI	1.00											
(2) Top 10	0.82	1.00										
(3) Bottom 50	-0.17	0.03	1.00									
(4) HHI Top	0.85	0.84	-0.16	1.00								
(5) HHI Bottom	0.14	0.33	0.82	0.15	1.00							
(6) HHI 0 - 500	-0.65	-0.75	-0.16	-0.66	-0.35	1.00						
(7) HHI 500 - 1000	-0.31	-0.16	0.39	-0.29	0.27	-0.22	1.00					
(8) HHI 1000 - 1500	-0.06	0.08	0.18	-0.04	0.14	-0.17	-0.18	1.00				
(9) HHI >2500	0.69	0.52	-0.34	0.74	-0.08	-0.33	-0.34	-0.27	1.00			
(10) Industry growth	-0.07	-0.07	-0.02	-0.08	-0.04	0.08	-0.00	-0.01	-0.04	1.00		
(11) Size	-0.40	-0.44	-0.20	-0.40	-0.51	0.30	0.08	0.04	-0.30	0.01	1.00	
(12) Uncertainty	-0.00	0.01	-0.05	-0.00	-0.05	-0.02	0.01	0.01	-0.00	0.27	0.00	1.00

Panel C: company regression independent variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) ATR	1.00						
(2) ROS	-0.25	1.00					
(3)	0.21	-0.17	1.00				
(4) ROA	0.12	0.53	-0.10	1.00			
(5) Gross margin	-0.30	0.45	-0.32	0.20	1.00		
(6) Acq. experience	-0.05	-0.03	0.26	-0.08	0.06	1.00	
(7) Company age	-0.02	-0.05	0.19	-0.04	-0.07	0.20	1.00