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MSc Economics & Business

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Differences in target-firm characteristics and premiums paid by private equity and public acquirers in horizontal mergers

ABSTRACT

This research studies whether private equity firms pay a lower premium to target shareholders than public acquirers in horizontal merger deals over the last 30 years. Results show that public target shareholders receive an 18% higher premium when the acquirer is a public firm over the whole period. The premium difference holds with the usual controls for deal and target characteristics. However, the difference decreases in more recent time periods no longer showing significant differences in the latest 10-years. Further, the premiums paid do not differ whether a firm makes a platform or add-on acquisition, and buy-and-build strategies are not explained by the ex-ante cumulative abnormal returns.

Keywords: Private equity, public companies, horizontal mergers, acquisition premiums

Author: Hylke Sasse

Student number: 366632

Thesis supervisor: M. Q. Mao

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1. INTRODUCTION

The significant participation of private firms in general and private equity (hence "private" or "PE") firms in particular in mergers and acquisitions activities over recent years has drawn much attention in the press. In 2014, 22% of the total deal value of U.S. mergers and acquisitions came from private equity deals and ten of the largest fifteen deals were performed by private equity firms (Fortune, 2015). Though the press has emphasized the relative importance and growing role of PE bidders in the takeover market, academic research has devoted little attention to these bidders. Earlier studies have been performed on all private equity deals in the US market (Bargeron et al. 2008). However, many sub-divisions have not been researched yet to investigate whether private equity firms show consistent results in acquiring targets for a lower premium than public firms within these sub-divisions. This research will focus on horizontal merger deals. These deals are mainly realised in so-called buy-and-build strategy acquisitions. The strategy exists of a platform (which is acquired first, or already exists) and add-on acquisitions to form synergies, i.e. the value and performance of two firms combined is greater than the sum of the separate individual firms. These strategies can be performed both in vertical integration (to get control over the value chain) and in horizontal integration (to get control over the market). However, horizontal merger deals are often questioned in regard to fair market competition and therefore the Federal Trade Commission (FTC) needs to approve the deal before it is completed. These approvals are not in the scope of this research. The focus lays on the characteristics of completed and approved deals and the buy-and-build strategy. This strategy is mostly executed during leveraged buyouts.

Leveraged buyouts (LBO's) first emerged as an important phenomenon in the 1980s. In a LBO, a company is acquired by an investment firm with a relative small proportion of equity and a larger proportion of outside debt financing (Kaplan & Strömberg 2008). These buyouts can be performed by public listed companies and private firms. Private equity firms have the reputation to create more enterprise value compared to public firms. With the phrases "creating value" or "increasing value" is meant the increase in enterprise value in this thesis. As found by Kaplan & Schoar (2003) and Ljunqvist & Richardson (2003), private equity firms outperform the S&P 500 benchmark in the time period 1980-2001. These studies focus on certain aspects of investing in private equity funds, for example in performance persistence

and determinants of the speed at which capital is invested. Phalippou & Gottschalg (2009) on the other hand, investigate whether historical performance of private equity funds surpasses that of public equity. They find that private equity firms do not outperform the S&P 500 but in contrary underperform in the time period 1980-1993. They question whether the private equity asset class is misevaluated in regard to the increase in performance of acquired firms by LBO's. On the other hand, more recent studies have shown that buyouts still do create value, as shown by Bargeron et al. 2008 and Guo, Hotchkiss & Song (2011). The latter finds that large increases in total value are experienced between the time of the buyout and the exit from a private equity firm portfolio.

Over the recent years, private equity firms have gained a reputation of significantly improving the value of their investments (Barber and Goold, 2007). Barber and Goold mention a list of factors that are often related to these value increases: tax advantages through aggressive use of leverage, emphasis on cash flows and operational improvements, not being restricted by public company regulations and the application of a buy-to-sell strategy. Another potential source of value creation is the ability of private equity firms to acquire companies for a lower premium than public firms. Bargeron et al. (2008) perform research on this source of value creation. They find that public target shareholders receive a higher premium from public acquirers (63%) compared to private acquirers (35%). However, the authors stress the need for further research to explain causes of this difference in premiums paid.

This thesis responds to the demand for more research on the difference of premiums paid by private equity and public acquirers. To be more specific, this study focuses on the premiums paid in horizontal mergers. As mentioned before, horizontal mergers by private equity firms are most times related to, but not limited to, a buy-and-build strategy. Such strategies can be executed by using leveraged buyout transactions. Compared to more traditional leveraged buyouts they have some interesting characteristics due to their focus on longer-term industry consolidation. For example, in buy-and-build strategies PE firms often start with buying a top performing company that has a dominant position in the market. Then they combine this "platform" with "add-on" acquisitions to create a large conglomerate, thereby capturing the advantages of economies of scale and/or scope. These benefits make the buy-and-build strategy potentially very valuable. Other ways of reaching a

horizontal merger by private equity firms or public firms are for example by doing a hostile takeover. Horizontal mergers might differ in characteristics and premiums paid by public and private equity firms. Therefore, the research question in this thesis is:

What are the differences in target-firm characteristics and premiums paid by private equity and public acquirers in horizontal mergers?

This study will try to fill the gap in academic literature for horizontal mergers and help the discussion whether private equity firms are able to pay a lower premium gain for target shareholders, based on the characteristics and premiums paid. The existing literature does not find unanimous results regarding the premiums paid for PE targets and the characteristics they have. This deviation in results could be formed by the diversity of deal intentions, without the split between vertical or horizontal integration. Another possibility is the different time periods and private equity waves with different backgrounds. The practical relevance of this study includes further knowledge whether private firms target different kinds of firms than public firms in acquisitions. The characteristics of target firms might help to explain how the economic attractiveness deviates for the two kinds of bidders. Furthermore, this could have a relation to the different strategies performed by the private equity firms and public firms.

Since a private firm does not have publicly traded equity to offer in an acquisition, it is not surprising that most acquisitions by private firms are cash deals. In order to have a good comparison, it is necessary to compare premiums for cash offers by private firms to premiums for cash offers by public firms. Using a sample of completed cash-only deals during the period 1984-2015 consisting of 182 deals by private bidders and 1.256 deals by public bidders, this thesis finds sizable difference in premiums between the two types of acquirers, similar to Bargeron et al. (2008) and Schwert (1996). In the sample of this thesis the average premium around the announcement day for target shareholders when the bidder is a public firm is 25,23% (1 day prior to the bid until 1 day after the announcement). The average premium when the acquirer is a private equity company is 21,42%, so the difference is 3,81%. This difference is statistically significant at the 95% confidence interval. This is in line to the findings of Bargeron et al. (2008).

Bargeron et al. (2008) explain the difference in gains to target shareholders between acquisitions by public firms versus private firms with the explanation that public and private firms take over different types of firms. "With such an explanation, target shareholders do not necessarily receive less if a private firm acquires their firm than they would if a public firm made the acquisition. One might argue that acquisitions by public firms would generate more shareholder wealth because public firms are operating companies, so that such acquisitions would have synergy gains that are shared with the target (Bargeron et al. 2008)". Extensive literature shows that differences in firm and deal characteristics help explain differences in target gains. But controlling for target and deal characteristics does not result in different findings for the difference in target premiums between private acquisitions and public acquisitions. The finding stays in line with previous research that private equity acquirers pay a lower premium than public bidders.

The remainder of this research is organized as follows. In the second chapter, relevant literature is reviewed and hypotheses are formulated. In the third and fourth chapter, the derivation of the data and the research methodology are explained. In the fifth chapter, the results are discussed. Finally, in the sixth chapter a conclusion is drawn by summarizing the findings and suggestions are provided for further research.

2. LITERATURE REVIEW

In this chapter, relevant literature is discussed that has been published on characteristics which are relevant for the research question. First target characteristics will be reviewed followed up by deal characteristics, at the end of this section hypotheses will be formed.

2.1 Target Characteristics

In order to compare mergers and acquisitions with each other on basis of target characteristics, some literature is reviewed to determine which characteristics are most relevant for this study.

2.1.1 Target firm size

Prior research has shown that target shareholder gains are negatively related to target size (Schwert, 1996). The literature describes different possibilities how to measure size, in this study it is assumed that size is measured by the assets of a company. As this study focuses on horizontal mergers, assets give a proper indication for the target firms' size. Earlier research found that acquisition of smaller targets is less complex and although scale effects may be smaller, capturing existing value creation potential may be easier (Beitel, Schiereck, & Wahrenburg, 2004). Thus the acquisition of targets that provide for sufficient synergies but are still of a manageable size should have a positive impact on value creation. The relative size of targets, in relation to the bidders, was studied by Hawawini and Swary (1990). They analyzed 123 US-bank mergers and acquisitions between 1972 and 1987 and found that M&A transactions are more favorable for bidders if the targets are small relative to the bidders.

Overall there is strong evidence that size does play a key role in determining the premium paid for a company during a buyout. Furthermore, there is evidence to suggest that the size of the target firm compared to the acquirer, has a direct effect on the level of potential synergies. This suggests that as firms get larger, also the potential synergies may be larger for a public acquirer, increasing their willingness to pay a higher premium. As such the expectations are that when a firm gets larger, the premiums will also rise. This increase in premium is expected to be more extensively for public acquirers.

2.1.2 Leverage

A next characteristic to compare targets is leverage. Safieddine and Titman (1999) show that targets increasing their leverage seem to act in the interest of shareholders as it reduces the free cash flow problem, increases the tax savings made from the tax shield, and protects current investors from losing value resulting from dilution. Private acquirers prefer targets with low leverage as it gives them an opportunity to set up their own capital structure without any refinancing costs.

Looking from a different perspective, a highly levered target firm could mean it facilitates more concentrated ownership of the target (Bargeron et al., 2008) and hence forces an acquirer to pay a higher premium (Stulz, 1988). Based on this last argument it is expected that highly levered firms are more likely to be acquired by public firms. This is due to the fact that as the premium rises, a buyout becomes less attractive to private acquirers as it eats into their returns. It collaborates with general findings that public firms are more willingly to pay a high premium (Bargeron et al., 2008). Furthermore, private acquirers would be less willing to pay a high premium if the firm is already highly levered, as the potential tax shields they would want to create would already be in place.

2.1.3 Profitability

A measure to quickly view how a firm is performing, is profitability. Previous literature illustrates that the higher the profitability is, the higher the possible gain to shareholders and the more firms will be bidding (Weir et al. 2015). Profitability is measured by the Return on Equity (ROE) and Return on Assets (ROA).

This measure is used in order to control the possibility that the profitability of the target has a dissimilar influence on the premium a private equity firm has to pay in contrast to public equity firms. On the one hand, it is expected that private equity firms are more willing to acquire low-profitability targets due to their expertise on operational improvements and consequent capability to increase target profitability (Vinten, 2007). This would lead to higher premiums being paid by private firms for low-profitability targets in contrast to public players. On the other hand, expectations are that public companies are more likely to acquire high-profitability firms as these increase the potential for synergies creation after the acquisition. Peck and Temple, (2002) showed that there is a higher chance for horizontal

acquisitions to create synergies if entry barriers and profitability are high for public firms. Of these synergies, the public player would be willing to pay a premium that will likely be just above the private player's price.

However, this does not yet imply causality whether private firms pay a lower premium, as it does not take into account the competition between bidders of the same category for a target of a given profitability. In order to capture this possibility, there are two ways to control profitability in the analysis but no explicit predictions on the effects of the potential differences in the premium paid are made.

2.1.4 Operating cash flow

Targets might be attractive takeover firms if they are based on the operating cash flows. Bargeron et al. (2008) provide evidence that targets acquired by private firms have a larger operating cash flow (divided by total asset value) as compared to public firms. They further find that private equity companies are able to create value by returning a 4% higher free cash flow to shareholders than public firms. Finally, they find that the premium for acquisitions paid by private companies is lower because for such acquisitions in comparison to acquisitions by public companies the acquisition premium is included into the stock price to a larger extent.

Guo, Hotchkiss and Song (2011) explain the impact on premium by concluding that cash flow gains are higher for companies with larger increases in leverage as a result of the buyout, consistent with private equity approach. Therefore, it is expected that, based on operating cash flows, private players pay a lower premium to target shareholders.

2.1.5 Industry-adjusted Tobin's Q

Following Martin (1996), the definition of Tobin's Q is formulated as the sum of market value of equity, long-term debt, short-term debt, and preferred stock divided by book value of equity, calculated as of the fiscal year-end preceding the takeover announcement date.

Previous literature establishes a relationship between takeover gains and Q-ratios of both targets and bidders. First, findings by Lang et al. (1989) indicate that bidders with lower Q-ratio have lower pre-announcement period returns, supported by more recent research from Fuller et al (2002) and Moeller et al. (2004). Secondly, Servaes (1991), concludes that

targets with lower Q are found to have higher total returns as well as target and bidder returns. Thirdly, stock bidders tend to have higher Q's (Martin, 1996) and have lower book/market ratios (e.g., Dong et al., 2006).

Finally, Bargeron et al. (2008) find that private equity firms in general acquire targets with lower industry-adjusted Q ratios than publicly traded firms do, which would lead to higher returns as indicated by earlier literature. Therefore, it is expected to find that private equity firms acquire targets with a lower Tobin's Q than public companies. In order to create an industry-adjusted Q, the yearly median Q of firms in the same two-digit SIC code are subtracted. Firms acquired by private bidders have a lower Tobin's Q relative to their industry median than firms acquired by public bidders (Bargeron et al. 2008).

2.2 Deal Characteristics

In the previous sections, target characteristics which affect target shareholders gains and premium paid by acquirer are touched upon. In this section, supporting literature on deal characteristics and evidence is provided, indicating that target shareholders gain less when acquired by private company.

2.2.1 Deal Size

In existing literature no clear relationship between private equity takeovers or public takeovers and the size of the deal is found. Several studies find results contradicting each other over different time periods and industries. Bargeron et al. (2008) found that public acquirers make significantly larger acquisitions. Whereas, Gompers and Kaplan (2015) find that private equity firms acquire higher deals when the takeover strategy is a LBO.

To determine whether the target firm is a platform or an add-on acquisition, deal size is not only used as a floating variable, but also as a binary variable. The split is made at the median deal size. Deals above the median are described as platform acquisitions and deals under the median as add-on acquisitions. With this split, premiums could be better interpreted since the size of a firm has a potential direct effect on the premiums paid for target firms as described in the target characteristics.

2.2.2 Tender offer

Tender offers are connected with substantially higher gains to target shareholders than mergers (Bargeron et al. 2008). By the fundamentals of a tender offer, which is an offering bid to buy the majority or all outstanding shares for a premium over the market price, it is not surprisingly to see tender offers by public firms more often. Bargeron et al. (2008) found that public bidders are more often involved in tender offers than private equity bidders. Furthermore, tender offers are more likely to be associated with a high premium (Huang and Walking, 1987). As such, expected is to see a higher premium from tender offers from public acquirers.

2.2.3 Toeholds

Walkling (1985), Jennings and Mazzeo (1993), and Betton and Eckbo (2000) all found that toehold bidding (pre-bid ownership of target shares) increases the probability of winning the target. Moreover, Betton and Eckbo (2000) also report that toeholds are associated with lower offer premiums in winning bids. Another finding by Bradley et al. (1988) states that toeholds cause target shareholder premiums to be lower as well. They find no clear evidence whether private equity firms or public firms can gain more from toeholds. The expectation is that toeholds decrease the premiums paid equally for both public and private bidders.

2.2.4 Hostile

The type of takeover bids, either friendly or hostile, is included as a dummy variable for a hostile takeover. Research of Schwert (2000) indicates that this variable would be positively related to the premiums paid to target shareholders. However, as Schwert argues, the classification of the nature of a takeover can be doubtful, which is something to take into consideration when interpreting the results. For the sake of consistency, the classification of Thomson One is used in this paper. Expectations are that the premiums paid show the same positive relation as in the research performed by Schwert.

2.2.5 Platform acquisitions

In order to distinguish different acquisition strategies followed in horizontal mergers, a dummy is created for the difference in platform and add-on acquisitions. Platform acquisitions are expected to be more expensive, in other words, the premium to be paid will

be higher. Add-on acquisitions on the other hand, might not be very profitable but could create synergies with the platform, increasing the enterprise value. Since these add-ons might be in a non-efficiently operating state, the premiums are expected to be lower. This difference in premiums is expected to be equally between private equity and public firms.

2.3 Private equity versus public acquirers

The private equity started gaining importance in the global market in the 1980s, the market for takeovers quickly became divided into roughly two main types of buyers, which Martos-Wila et al. (2013) referred to as strategic buyers (public companies) and financial buyers (private equity firms). Kaplan and Strömberg (2008) define the latter as specialized investment firms using a relatively small portion of equity and a relative large portion of outside debt financing to buy a majority control of an existing firm, also known as a leveraged buyout (LBO). Strategic buyers, on the other hand, are more characterized by their buy-and-hold strategy and intention to integrate the acquired business into their own operations according to Barber and Goold (2007). The fundamental differences between a strategic buyer and a financial buyer according to Martos-Vila et al. (2013) are as follows. Firstly, strategic buyers have a current project they are considering combining with the target, i.e. they are performing a building strategy. Financial buyers evaluate the target as a stand-alone project and consider in a second step a building strategy, i.e. they follow first a buy strategy and only later a build strategy. Secondly, financial buyers have a different corporate governance structure than strategic buyers (Acharya et al., 2009). Over the years since the rise of PE there have been made predictions how this market would evolve. One of them was Jensen (1989). In his study he already predicted that eventually private equity firms would become the dominant corporate organizational form as he claims that those structures used in leveraged buyouts are superior to those of the typical public corporation with dispersed shareholders, low leverage and weak corporate governance. Baldwin (2012) confirms this supposed superiority of the private equity firms with respect to public companies as he argues that private equity funds currently constitute the key asset class within global financial market providing higher returns, diversification and actual outperformance. On the other hand, critics of private equity claim this superiority is often overestimated (Phalippou and Gottschalg, 2009).

Fidrmuc et al. (2012) examine to what extent the characteristics of targets and the approach to how targets are sold have an effect on the premiums paid to shareholders. They find that PE firms buy targets with more generally re-deployable assets such as tangible assets and that strategic buyers buy targets with more specific assets characterized by, for example, high R&D expenditures i.e. a PE firm is more likely to acquire a grocery shop than a space shuttle company. After controlling for observable target characteristics they find that the higher profitability and better stock performance over the last year are associated with lower premiums. Market to book, leverage, asset tangibility, cash and R&D have no significant effect in the results of Fidrmuc et al. (2012). This seems a contradiction, since they do show that PE and strategic buyers acquire different targets, the differences between the targets do not explain why PE buyers pay lower prices. Fidrmuc et al. (2012) find that the way how a target is sold has an effect on the premiums. They show that the difference in premiums between PE and strategic buyers accrue only for the case of informal auctions. In these auctions, strategic buyers tend to pay higher premiums for low profitable targets with many intangible assets, high cash level and R&D expenditures. They find no statistically significant difference in premiums paid in the case of controlled auctions and negotiations. This paper however does not check for different auctions types.

In addition to how PE buyers manage to pay a lower premium, Hutson and Mahony's (2008) study results in an interesting view of how the likelihood of the success of a takeover bid that is reflected in the premium (abnormal return 1 day prior to the announcement), can affect the eventual premium paid. Their study finds that PE buyers pay less for their targets than public buyers. They find that by applying the simple model of Samuelson and Rosenthal (1986) the announcement day abnormal return has no reflection towards the full premium. It also reflects the market's assessment of the likelihood of success of the takeover bid- that private equity takeover bids are generally assessed to have a greater likelihood of success than bids by public companies. This implies that the market learns from past successes of takeovers. This could be used to PE bidders' advantage to negotiate for a lower premium. As PE buyers are more known for their success in creating value for shareholders than public buyers after a takeover, the target is willing to accept the lower premium knowing that a high premium, otherwise, decreases the maximum gain that can be generated after the takeover.

2.4 Hypotheses

Some research has been conducted on whether there is a difference between public and private acquirers on the target shareholders' gains and the premiums paid. Little is known whether in horizontal mergers the premiums paid by private equity firms are in line with the previous findings described at the characteristic variables above. The idea of horizontal mergers and the buy-and-build strategy is to try to create synergies between a large top performing company and smaller add-on firms which might be undervalued. Economies of scale and scope can be captured because of these synergies between the platform and add-ons and create value. "Synergy exists in an acquisition when the value of the combined entity exceeds the sum of the values of the two combining firm (Seth, 1990)." Assumed is hereby that the CAR of the acquirer is large enough not to create trivial results of the combined CAR from the target and acquirer. To test whether in horizontal mergers the premiums paid are in line with previous research, the first hypothesis being tested in this thesis is:

H1: *Premiums paid by private equity takeovers in horizontal mergers are lower than premiums from public takeovers.*

The synergies might be a source of value creation. However, the literature tells us that synergies only create value when target firms are of a manageable size. When acquisitions are described as a platform acquisitions this potential for value creation decreases. Therefore, the second hypothesis is:

H2: *Premiums paid by private equity and public takeovers are lower for add-on acquisitions.*

As stated in the introduction this study is performed with a sample over the years 1984 to 2015. Within this 31- years several merger waves occurred as shown by Andrade et al. (2001). The first wave occurred in the period 1984-1994, with its peak around 1990. A second wave occurred in the period 1995-2004, with the peak around 1999. A third wave is present but still under investigation by several studies. This wave is in this study captured in the time period 2005-2015, with the peak around 2008. To show that over the different time periods, private equity bidders consistently pay a lower premium, robustness checks are performed. Next to the time consistency, also checks are performed for different industries and different time intervals for the cumulative abnormal returns.

3. DATA

The sample is derived from the SDC Mergers and Acquisitions database accessed via Thomson One. All acquisitions in the United States of America over the period from 1984 to 2015 are taken into consideration. The selected acquirers and targets are companies from the United States of America. Transactions with non-operating targets, without disclosed deal value, labelled as spinoffs, recaps, self-tenders, exchange offers, repurchases, minority stake purchases or privatizations are excluded. The focus is on private equity bidders. It requires this study to retrieve a sample existing of cash offers. Since a private firm does not have publicly traded equity to offer in an acquisition, most acquisitions made by private firms are cash deals. Therefore, to make an apples-to-apples comparison, it is necessary to compare premiums for cash offers by private firms to premiums for cash offers by public firms. Acquisitions are filtered for horizontal integration before other databases are used. The way how these filters have been applied will be explained in the methodology section.

Since the aim is to investigate whether private equity firms are able to take over other firms for a relatively lower premium, measures are needed that compare takeover bids and target firm characteristics. Only deals where the target is a public firm are considered in this study. This restricts the database from 4230 to 1579 deals. Many private firms have no detailed financial information available in the databases. Private firms, in contrast to public firms, are not required to provide publicly available financial information. To make a good comparison the private target firms are therefore completely excluded, this exclusion is similar to Bargeron et al. (2008).

In order to retrieve the right information for the other measures for target firms' characteristics and the premiums, Compustat and Eventus are used. From Compustat data regarding for the firms' characteristic measures is derived. Eventus is used to retrieve the CAR's for different time periods around the deal announcement. The integration of these databases resulted in the loss of some of the initial observations from the SDC database. Reasons for this loss are the transformation from CUSIP-6 to CUSIP-8 identification codes, missing data for the event requested and accounts not properly filled from target firms in the Compustat databse. In the end the sample exists of 1438 observations, of which 182 are

private deals and 1256 public over the time period 1984-2015. The number of deals and ratio public-private acquirers is similar to earlier studies, for example, Bargeron et al. (2008) and Kaplan & Schoar (2003). Analyses and regressions on the complete sample are performed with these observations. The sample is further split into the periods 1984-1994, 1995-2004 and 2005-2015.

In table 1, an overview of the sample is given. The number of deals and the deal value per year are provided. From table 1 it becomes clear that there are no significant wave patterns in the horizontal merger deals. The year 1999 has the highest amount of deals with a total of 91 deals, however only 5 of these are private equity bidder deals. The peak for private equity bidders are the years 1998 and 2000 with both 14 deals. When looking to the different industries the Finance, Insurance industry have most horizontal merger deals. Followed by the manufacturing industry and the services industry as third. The private equity bidders close between 10-20% of all deals in all industries except in the wholesale trade, agriculture and construction industry.

4. METHODOLOGY

Due to the focus on the ability of private equity firms to pay a lower premium compared to public firms, the structure of the research design is similar to the methodology and structure presented in the existing literature (e.g. Bargeron et al., 2008). They argue that estimations of premiums over a long period of time are sensitive to misspecification of the benchmark return (Kothari and Warner, 2007). To overcome this problem, target shareholder gains over a short event window are estimated, using standard event study methods (Brown and Warner, 1995). As described by Kothari and Warner (2007), event studies are a widely used methodology in the field of financial economics. According to practices from previous research in the field of mergers and acquisitions performing an event study, such as Bargeron et al. (2008), Officer (2010) and Andrade et al. (2004). Cumulative abnormal return (CAR) measures the return in excess of the expected return, based on market parameters. These cumulative abnormal returns are calculated through the following formula (Kothari and Warner, 2007):

$$CAR_{iK,L} = \sum_{t=K}^{L} AR_{it}$$

In which i is the stock of interest, and (K, L) is the period that is measured. Abnormal returns are measured by taking the excess return above the predictions (normal returns) of the Capital Asset Pricing Model (CAPM) of Sharpe (1964), which results in the following formula:

$$AR_{it} = R_{it} - (a + B_i * R_{Market\ Index})$$

The Eventus-tool on Wharton Data Research Services, allows to make a cross-sectional daily analysis of the stock returns of the companies in the sample. Following this way, cumulative abnormal returns of the target firms are determined around the announcement date of the takeover. To calculate the abnormal returns of the market as prescribed by Schwert (1996), the market model parameters are estimated over the period -379 to -127 days before the announcement date of the takeover, using a value-weighted index. The event windows (K, L) around the announcement date that are used in this research, are CARRUNUP, CAR11, CAR5 and CAR3. The timeframes used are respectively, -42 to -5, -5 to 5, -2 to 2 and -1 to +1, 0 is in this case the announcement date.

To test if there is a difference in means of premium paid between private equity acquirers and public acquirers in the sample of takeover for the different time-periods, Welch's t-tests are conducted. The Welch's t-test is an interpretation of the Student t-test, but in the case of unequal sample sizes and variations the results of the Welch's t-test give a more reliable outcome (Welch, 1947). Because the dataset consists of relatively more public acquirers, the Welch's t-test is most appropriate to compare the mean premiums. The Welch's t-test is calculated by the following formula:

$$Welch's\ t-test = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{N_1} + \frac{s_2^2}{N_2}}}$$

In this formula $\bar{X}_1$ is the average of the private equity bidders on the related variable, $\bar{X}_2$ is the average of the public bidder on the related variable. s_1^2 and s_2^2 are the standard errors of the private and public bidders on the related variables. N_1 and N_2 are the private and public acquirers sample sizes. The hypotheses will be tested with Welch's tests. These tests give an intuition about the differences in means between the different groups of interest, private equity and public acquirers. However, these tests do not control for deal-specific, target-

specific and time-specific effects. Therefore, multiple regressions are performed to analyse the hypotheses more comprehensively.

The regressions are based on the principle of Ordinary Least Squares (OLS) of Stock and Watson (2012). The estimators are measured by the dataset of 1438 deals, covering the period 1984-2015. This regression is the interpretation of models used in previous event studies in the field of mergers and acquisitions, related to the difference in premium paid by private equity and public acquirers, and merger waves such as Andrade et al. (2001), Bargeron et al. (2008), Officer (2011) and Alexandridis et al. (2013). To be sure that the p-values of the coefficients of this regression do not suffer from heteroskedasticity in the standard errors, heteroskedastic robust standard errors are used, as prescribed by White (1980). H1 will be tested using the following formula:

$$CAR_{RUNUP}, CAR_{11}, CAR_5, CAR_3 = a + \beta_1 Private + \beta_2 Platform + \beta_3 Hostile + \beta_4 Toehold + \beta_5 Tender + \beta_6 Leverage + \beta_7 IAQ + \beta_8 ROA + \beta_9 ROE + \beta_{10} OCF + \beta_{11} LnAssets$$

4.1 Independent variables

The first core estimator of interest that is linked to the central theme of this research and that will test H1, is a dummy variable (Private). This dummy variable classifies the nature of the acquirer, either a private equity acquirer of a public acquirer, which is qualified as such by the retrieved dataset from SDC. As previous research suggests, such as Bargeron et al. (2008), expected is that private equity acquirers pay a lower premium than public acquirers and therefore expected is that this estimator will have a negative coefficient.

The second core estimator is a dummy variable for platform acquisitions (Platform), which indicates if a target is a platform acquisition or an add-on acquisition. The indication whether an acquisition is a platform or add-on type is based on the deal value of the deal. If the deal value is +10 million above the median of all deal values, the acquisition is labelled as a platform acquisition in this study. No earlier studies have performed a similar split in their databases yet, since this is the first study which looks at horizontal mergers only.

As described earlier in this research several target and deal characteristics have proven in earlier performed studies to have an influence on the premiums paid. Therefore, the

following target characteristics will be included as control variables: LnAssets, ROA, ROE, Leverage, Operating Cash Flow (OCF) and Industry-adjusted Tobin's Q (IAQ).

The leverage ratio is calculated using the following formula:

$$Leverage = \frac{Total\ Assets}{Total\ Liabilities}$$

The amount of growth opportunities is often defined as an important factor in acquisition prices. To proxy for growth opportunities available, this study uses an industry-adjusted measure to capture industry fixed effects for growth opportunities. The Industry-adjusted Q is calculated from the Tobin's Q at the quarter before the acquisition announcement:

$$Tobin's\ Q = \frac{Enterprise\ Value}{Total\ Assets}$$

After the Tobin's Q is calculated, the yearly median q of firms in the same two-digit SIC code is subtracted from the firm specific Tobin's Q.

$$IAQ_i = Q_i - \bar{Q}_{Industry}$$

Profitability of a firm is, as described earlier, split into the Return on Assets (ROA) and Return on Equity (ROE) proxy. ROA is calculated using the following formula:

$$ROA = \frac{Net\ Income}{Total\ Assets}$$

For the ROE the following formula is used:

$$ROE = \frac{Net\ Income}{Shareholders\ Equity}$$

Because the Net Income of some target firms is highly negative in the fiscal year before the deal announcement date this might result in extreme values and possible outliers influencing the database. To exclude the spurious effects of outliers 90% winsorization is performed on these variables. This means that all data below the 5th percentile is set to the 5th percentile and data above the 95th percentile is set to the 95th percentile.

The next two variables are size and OCF. The logarithm of assets is taken to get a proper proxy for the size of the target. Lastly the operating cash flow (OCF) is calculated:

$$OCF = \frac{(Sales - (costs\ of\ goods\ sold + sales\ expenses + general\ administrative\ expenses + \Delta\ net\ working\ capital))}{Total\ Assets}$$

The deal characteristics to control for the premiums paid are Hostile, Tender and Toehold. These characteristics are all dummy variables equal to 1 when the type of the takeover is hostile, when a tender and when a toehold is present. As described in the literature a tender is present when an offering to buy the majority or all outstanding shares for a premium over the market price. A toehold is present when there was pre-bid ownership of target shares before the deal.

Table 2 shows the descriptive statistics of the total sample without the differentiation between public and private bidders. These differences will come forward in the next section, where a univariate analysis is performed on the differences. From table 2 comes forward that the CAR's are similar to the amounts found by Bargeron et al. (2008) and Officer (2003). For the run-up period the CAR is lowest, in the case of horizontal mergers the mean lays at 0.06, where Bargeron et al. (2008) found a result of 0.09. Also the CAR11, CAR5 and CAR3 are in the same range as previous studies, showing a declining trend when the number of days around the announcement day is shorter. Panel A of table 2 presents the means of the independent variables. 13% of all deals are executed by private equity bidders. And 47% are described as Platform acquisition in this study, i.e. the deal size is significant larger as the median of all deal values.

5. RESULTS

In this chapter, the results obtained from multiple analyses are presented. In the first section univariate analyses are performed. The univariate analysis is done in order to test if means for premiums paid between private and public firms are significantly different. In the second section, multiple regression analyses are presented. The multiple regressions examine if the findings from the first section are statistically significant against control variables.

5.1. Univariate analysis

In this section, differences in premiums paid by private equity and public acquirers to the target shareholders are tested for their significance. Moreover, differences in the target and deal characteristics of the acquisitions made by private and public companies are tested at the univariate level. These tests are performed both for the full dataset and to sub-sets for different time periods to check for the robustness of the results from the whole sample. The univariate analysis for the full dataset, i.e. horizontal merger deals in the period 1984-2015, is illustrated in Table 3. Panel A of table 3 shows the different cumulative abnormal

return (CAR) windows. The p-values of the differences between the CAR's show that only the CAR3, 1 day before until 1 day after the announcement date, is significant at the 5% confidence level and tells us that private equity acquirers pay a significant lower premium than public acquirers. A visual interpretation of the difference in average premium paid between private equity and public acquirers can be seen in Figure 1. For the other event windows around the announcement date the private bidders also pay a lower premium to the target shareholders, but the difference is not statistically significant. For the Runup period however, the private equity acquirers tend to pay more than public bidders. However, also this difference is not statistically significant which implies that there can no conclusions be drawn on this difference. It does on the other hand show a light that in the case of horizontal mergers, the premiums difference between private equity and public bidders tend to be less significant as found by earlier studies researching a wider set of deals (Bargeron et al. 2008).

Panel B of table 3 shows the differences at univariate level for the target and deal characteristics. For the full dataset only the size, measured as lnassets, Industry-adjusted Tobin's Q (IAQ) and the Platform dummy have a statistically significant difference between private equity and public acquirers. The fact that only these characteristics show a significant difference is partly in line with results found by previous studies. Bargeron et al. (2008) also found significant difference between the size of the targets from private and public bidders. The negative difference tells us that private bidders acquire smaller targets than public bidders. Also the IAQ measure is statistically different. The result is the reverse from Bargeron et al. (2008) in their study they found a negative difference, implying that private firms acquire less profitable firms. This is a contradiction to the expectation formed in the literature review. However, this study specified at horizontal mergers shows a positive result, implying that private acquirers acquire more profitable targets.

The horizontal merger deals could mean public companies purely aim for synergies, where current profitability and growth options of the target itself do not play a key role. When synergies are created, the profitability of the target firm could increase making the ex ante profitability of the target otiose. For other characteristics of the target firms Bargeron et al. (2008) found no significant results. The OCF and Leverage variables are both in their study as in this thesis not showing significant interpretable results. However, a difference between
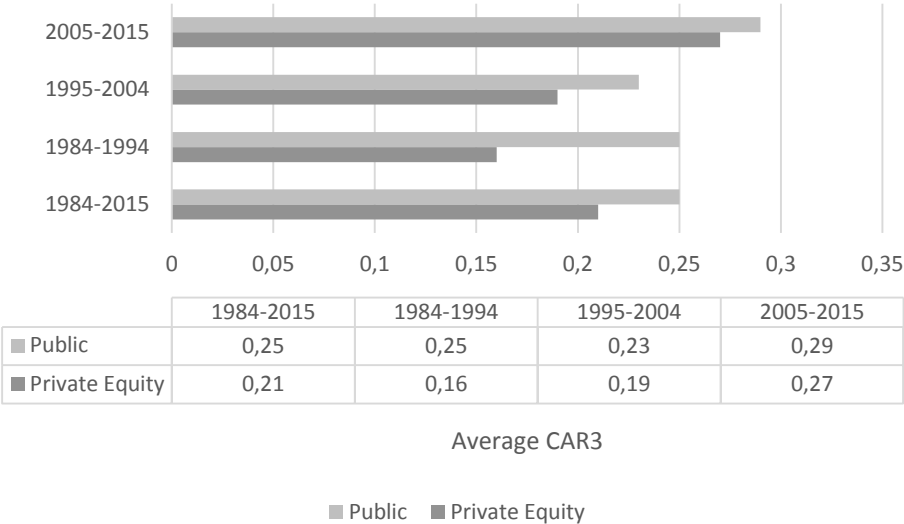
the findings of this thesis and their results is that the difference for Toeholds and Hostile bids were significantly different between private equity and public acquirers. The newly introduced Platform indicator variable has a significant difference between private and public acquirers. The difference is significantly negative indicating that public bidders take over more platform targets than private acquirers. This is in line with the significant difference for the size of a target. Private bidders have smaller targets in their acquisition profile for the full dataset. They are more likely to acquire add-on acquisitions and not platform acquisitions when they possibly follow a buy-and-build strategy.

5.1.1. Robustness checks univariate analysis

In order to check for the robustness of the univariate analysis as previously described, the full dataset is split into different sub-sets based on different time periods. The time periods that will be used are from 1984-1994, 1995-2004 and 2005-2015. There are significant differences between the time periods tested as can be seen in table 4. Figure 1 provides an overview for the premiums paid over the complete sample against the different sub-periods.

Figure 1

Average CAR3 for the complete sample and sub-periods

	1984-2015	1984-1994	1995-2004	2005-2015
■ Public	0,25	0,25	0,23	0,29
■ Private Equity	0,21	0,16	0,19	0,27

Average CAR3

■ Public ■ Private Equity

For the first time period, 1984-1994, all the CAR's around the announcement date show statistical significant differences between private and public bidders. This deviates from the total time period, since there only the CAR3 had a significant difference. Moreover, the difference at CAR3 is -0,09 (0,25 against 0,16) in the first sub period against a difference of -0,04 (0,25 against 0,21) for the complete sample, so the difference is double in size. The

difference in premiums paid to target shareholders equals 56% between private and public acquirers for this time period. This difference might be explained from the difference in size of the target or the operating cash flow (OCF). Private bidders acquire smaller firms as can be seen by the negative difference. Expected was that when firms get larger also the premiums paid would rise. The result for the first time period is in line with this expectation. Also the expectation for the operating cash flow is fulfilled. The expectation was that private equity acquirers acquire targets with a better operating cash flow. This is found, as can be derived from the positive difference between private and public bidders.

Other characteristics do not show significant differences between private equity and public acquirers. This is not in line with the expectation, where differences were expected towards for example the profitability indicators ROE and ROA. Only the Platform dummy shows a significant difference. Public bidders tend to acquire more platform acquisitions. This indicates that public acquirers aim for more platform acquisitions with possible synergies.

The second and third sub-period, from 1995 until 2004 and 2005 until 2015, show different results in the univariate analysis than the first period. The CAR's have no longer a significant difference between private equity and public bidders for any time period. This implies that the differences are similar to each other and the hypothesis that private equity firms pay a lower premium has to be rejected. From Figure 1 it becomes clear that the premiums paid by private equity acquirers increase at a higher level as the premiums paid by public acquirers, decreasing their difference. The premiums are still in line with earlier studies, only private equity acquirers no longer pay a significantly lower premium compared to public acquirers. A surprising finding is the Runup period premium for private equity bidders in the sub-period 2005-2015, equalling 0,13. This is a relatively high premium compared to previous studies and the other sub-periods, where the Runup premium mostly lay around 0,05.

For the target characteristics in both the sub-periods, the size of the target shows a significant difference. In all cases the difference is negative, this tells us that private equity bidders acquire smaller targets. Related to the size also the platform proxy shows significant differences, public firms target more for platform acquisitions. This is just as in the first sub-period in line with the expectation. Which other target characteristic has significant differences, differs between the time periods. In the second time period, only the Industry-

adjusted Tobin's Q has a statistically significant difference. The difference has a negative sign, indicating that private equity bidder acquire firms with higher growth opportunities. This is, as in the first sub-period, in contradiction to previous studies and the expectation. Other characteristics, both for target and deal, show differences in line with expectations formed. However, the significance is not high enough to lay in a reliable confidence level. Therefore, these differences will not be explained in more detail.

The third sub-period has significant differences for Toehold and Hostile deals. These are two deal characteristics. Toeholds indicate pre-bid ownership of target shares. The expectation was that toeholds decrease the premiums paid equally for public and private bidders. The difference has a negative sign, indicating that toeholds are more present at public bidders. Whether the expectation is fulfilled can not be derived from this analysis, since the CAR's do not show significant differences. If toeholds explain the difference in premiums paid will be explained in more detail in the multiple regression section. For Hostile bids the sign is negative, there are more hostile takeovers related to public acquirers. That in the period 2005-2015 the hostile takeovers are significant different between private and public bidders and indicating that public acquirers in this case have more hostile takeovers, can be named surprising. The crisis could have an influence on this result. It would imply that public firms more often target a hostile bid for possible synergies and horizontal integration than private equity bidders.

5.2. Multiple regression

In this section multiple regression analyses are performed in order to examine whether the target and deal characteristics, as suggested in the literature, do indeed have a dissimilar impact on the premiums paid between private and public acquirers. The cumulative abnormal return (CAR) is the dependent variable in all regressions. The period under investigation runs from 1984 until 2015. All completed only cash merger and acquisition deals between a U.S. bidder and a U.S. public target are taken into consideration. This study investigates only deals with a horizontal integration character. The dependent variable for the main test is the CAR3, which has a time frame running from 1 day before the announcement date until 1 day after. Figure 2 provides a graphical presentation of how the different variables relate to each other in the tests. Based on the Predictive Validity Framework by Libby et al. (2002), this figure presents a summary of our research in a single

figure. The conceptual level shows the variables that were presented in the literature review and the relation that came forward for the association between the concepts. The operational level shows how these variables from literature were transformed into measurable variables, so that regression can be performed. As can be examined from the figure, the company type can be measured by taking a private or public structure. The acquisition premium is measured by CAR.

Figure 2

Predictive Validity Framework
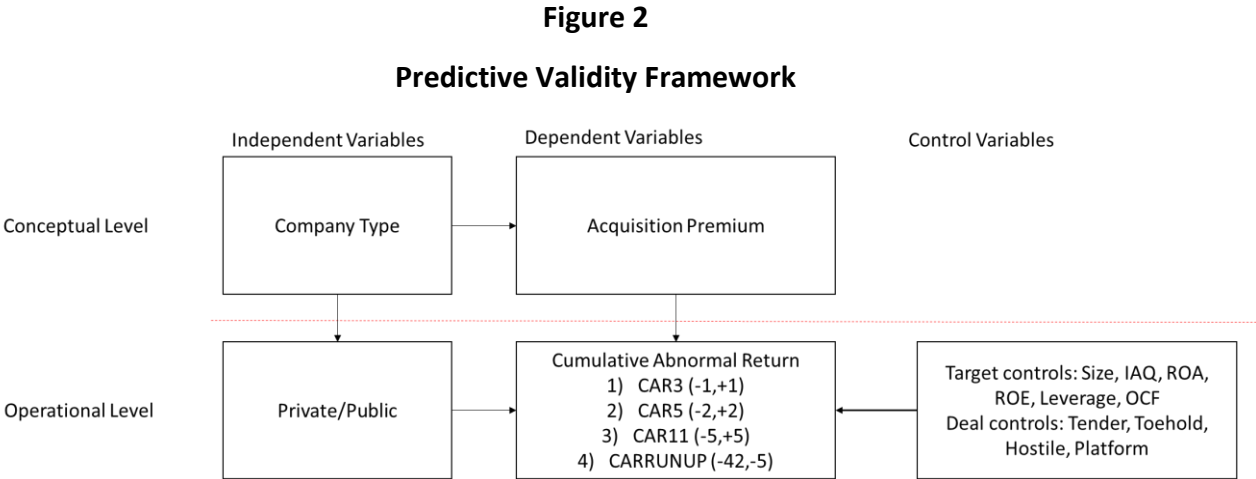
Furthermore, control variables are added to the regression in order to strengthen the robustness of the outcomes of the model. The calculation of multiple control variables has been explained in detail in the methodology section.

Now that a clear overview is provided how the model is constructed, the next step is to run the regressions and interpret the results. This is done by using the statistical software package Stata. Stata is widely used in economic research and provides the advantage of having a large tool set of statistical analyses. If target and deal characteristics explain the difference in abnormal returns, these indicator variables should be insignificantly different from zero in our multiple regressions. Table 5 shows the regressions estimates for the full dataset under investigation.

The indicator variable in table 5 for a private acquirer is significantly negative, showing that acquisitions by private firms have significantly lower premiums than acquisitions by public firms. The indicator variable is -0,04 for acquisitions by private equity firms, significant at the 5% level. Everything else constant, private equity firms pay a lower premium by 4% of firm equity value than public companies. The estimated indicator variable is of the same magnitude as the premium difference shown in table 3. Consequently, controlling for firm

and deal characteristics does not seem to reduce the average premium difference between acquisitions by private firms versus public firms. The negative coefficient tests the first hypothesis whether private equity acquirers pay a lower premium to target shareholders than public acquirers. This hypothesis can not be rejected, since both the univariate analysis and the multiple regression on the full dataset provides a significantly negative sign.

Another finding from the multiple regression on the full dataset with the CAR as dependent variable is the negative coefficient lnassets. As a short recap, the size of a target is measured by the lnassets variable. The negative variable shows that when a firm is larger, the CAR will be lower. This coefficient is significant at the 10%-confidence level. This finding is in line with the theory that higher target shareholder gains are to be expected at smaller firms.

Next to the significant size proxy, also the coefficient for the proxy whether the deal is a Tender offer is significant. The theory was that tender offers are connected with substantially higher gains to target shareholders than other merger deals (Bargeron et al. 2008). The significant positive sign of the coefficient from the Tender variable explains that higher CAR are realised when the deal was a tender offer. The univariate analysis did not show a significant difference between public and private acquirers for the tender deal attitude, so no direct conclusion can be drawn whether private or public acquirers have a higher or lower CAR when the deal was a tender offer. Also the coefficient of the ROA is significant. The negative coefficient of -0,28 indicates that firms with a lower return on assets, i.e. a lower profitability, are acquired for a lower premium paid to target shareholders.

The other variables in the regression on the full dataset are not statistically significant. This implies that these target and deal characteristics do not help to explain the lower target shareholder gains of acquisitions by private firms. The variable IAQ is however close to be significant at the 10% level. The coefficient of -0,05 implies that when the growth opportunities of a target compared to its industry average are better, the lower the premium paid to target shareholders. Surprisingly, the indicator variable for add-on or platform acquisitions is not significant, this means that the CAR3 can not be explained by the character of a buy-and-build strategy. There is no statistical relation between the cumulative abnormal return and the buy-and-build strategy whether a target is a platform or add-on

acquisition for the acquirer. To check whether the results found on the full dataset are robust both different time periods as different industries are regressed independently.

5.2.1 Robustness check on different time periods

The first robustness check discussed is the split into different time periods. The 30-year full dataset is split into three sub-divisions of 10 years each, this is done for the same year-intervals as at the univariate analysis. Recall from the univariate analysis that for the timeslot from 1995-2004 no significant difference in CAR was found between private and public bidders. The multiple regression results for the three different periods can be found in table 6 and a visual overview is given by figure 3.

Figure 3

Private dummy indicator values over the different sub-periods
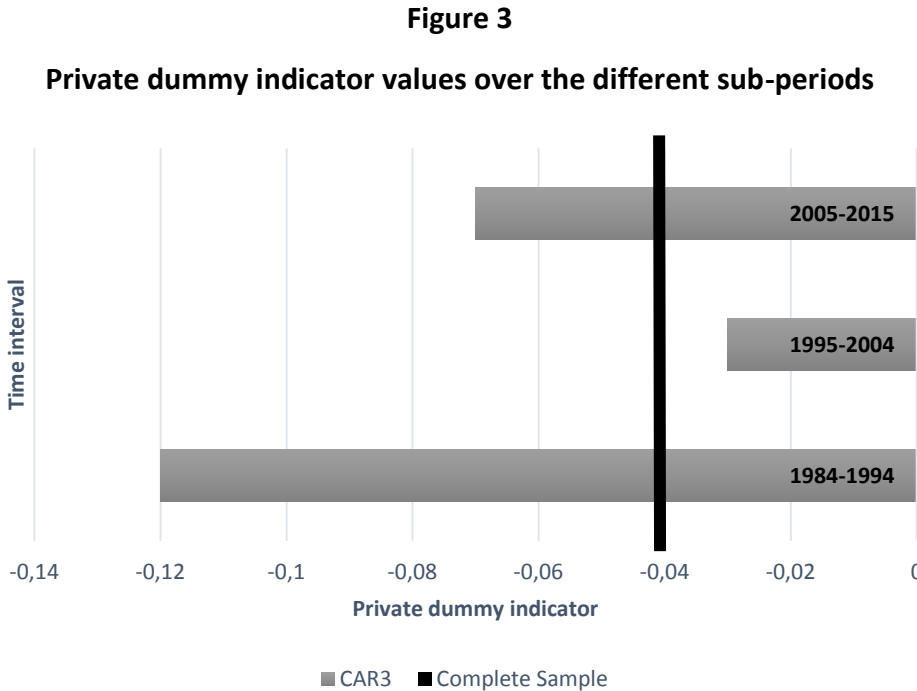
The results show similar results as at the univariate analysis. For the time period 1984-1994 and 2005-2015 the coefficient for private firms is significantly negative, whereas for the period 1995-2004 no significant coefficient is found. The significant coefficient for private firms in 2005-2015, deviates from the univariate analysis. At the univariate analysis the difference between private equity and public acquirers was not significant, in the multiple regression however there is a significant coefficient. This shows that controlling for target and deal characteristics increase the difference significantly for acquisition premiums paid to

target shareholders by public firms versus private firms. In all cases the coefficient has a negative sign, indicating that private equity acquirers pay a lower premium to target shareholders. This is in line with the literature and other findings.

In the regression for the full dataset the size and tender proxies had a significant coefficient. In the sub-periods the significant coefficients deviate per period. In the first and second period the Industry-adjusted Tobin's Q (IAQ) has a significant negative coefficient. The negative coefficient indicates that firms with a lower IAQ results in a lower CAR. The theory explained that firms with a low Q have higher total returns. This finding is not supported by the results, since the coefficient has a negative sign and is not consistent over the different periods.

Other variables with a significant coefficient are Tender in the second period, Leverage in the second and third period and lastly lnassets in the third period. For the Leverage variable surprisingly the sign changes between the second and third period, from a negative to a positive relationship between the leverage of a target and the CAR.

The split into three different time periods led to similar results as for the full dataset. The indicator whether the acquirer was a private equity firm or public firm had in two out of three sub-periods a similar significant coefficient as for the full dataset. For the control variables some had significant coefficients whereas this was not the case in the full dataset regression. However, the coefficients could not tell a consistent relationship over the three different periods to undermine the regression on the full dataset.

5.2.2. Robustness check on different industries

After checking for differences between time periods, the sample is also split into different industries. The dataset is split into the industries Finance, Manufacturing, Services and a group of the Rest of the industries present in the dataset, these studies can be seen in Table 1 panel B. By splitting the dataset in these four groups, the groups consist of relatively similar sizes. The regressions are performed on the different groups to check whether the results are similar over the different industries or that there exist significant differences between the industries. The results can be seen in table 7 and a visual overview is given by figure 4.

Figure 4

Private dummy indicator values over different industries
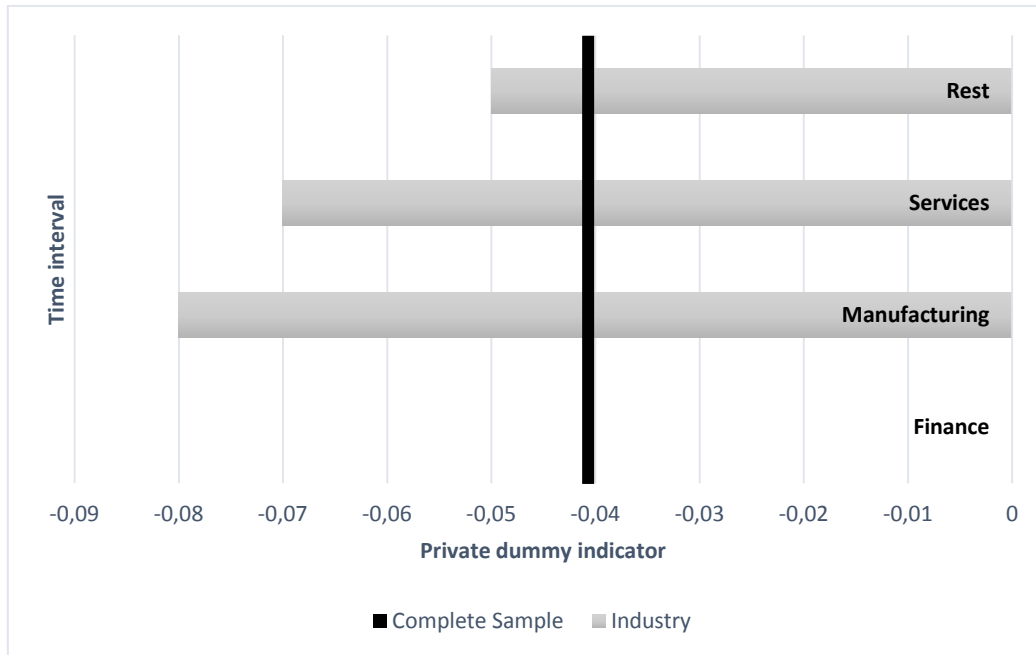
The results can be called surprising since the Private bidder indicator is only significant for the Manufacturing industry. The coefficients for all industries are again negative, similar like the full dataset and the different sub-periods. However, the significance of the coefficients has decreased over the different industries. There seems to be industry specific effects. The Manufacturing industry seems to have most explaining control variables for the CAR. Next to the Private bidder indicator also the Leverage, ROA, OCF and lnassets have significant coefficients. In the manufacturing industry a highly levered firm has a positive relationship with the CAR. A 1% increase in the leverage of the target, increases the CAR by 15%. For the Return on Assets however, the relationship is negative. This implies that the CAR decreases when the ROA increases. This is in line with the literature that there can't be earned high abnormal returns when the target has a very high ROA. This comes partly through the market knowledge that the target is very profitable and the abnormal returns can not be earned in a takeover.

Different results are found in the Services industry. In this industry the following variables have significant coefficients: Tender, Leverage and IAQ. However, where the manufacturing industry had a positive relation between the Leverage and CAR, in the Services industry the relation is negative. This is the only industry with a negative relation between the leverage of

the target and the CAR. It also deviates from the coefficient found in the full dataset, this coefficient indicates also a positive relation between the Leverage and CAR.

The coefficients change between the different industries. However, since many coefficients of the variables are not significant, no conclusions can be drawn from these. Only the Leverage has a changing sign between the manufacturing and services industry. This might indicate that those two industries behave different and have different characteristics. The other coefficients are in line with the full dataset and show consistent results. Since only one exception for one variable is present this does not change the coefficients found in the regression of the full dataset. The full dataset is robust for industry effects.

5.2.3. Robustness check on different dependent variables

Lastly the regressions are run for different dependent variables, to check whether similar results are found by different time intervals of the dependent variable or that the time interval under investigation has deviating findings. The control periods consist of a run-up period, starting 42 days before the announcement date until 5 days before, CARRUNUP. This period is included since the market might already expect the deal between the target and acquirer, i.e. there might be information regarding the target revealed in the run-up period before the announcement. The second control period starts 5 days before and ends 5 days after the announcement date, CAR11. With this period a longer time span is taken to spread possible shocks in the premium around the announcement date. The same counts for the last control period starting 2 days before until 2 days after the announcement date, CAR5. The results of this robustness check can be found in table 8.

The two dependent variables which extend the timespan around the announcement date have similar coefficients to the CAR3. The significance of the coefficient decreases however when the timespan increases. For the 5 days around the announcement date (CAR5) the private indicator is still significant at the 10% level with a coefficient of -0,03, this is quite similar to the CAR3 coefficient of -0,04. Also for the 11-day period the coefficient is similar, only this coefficient is no longer significant. For the run-up period it is a different story. Here the coefficient is also insignificant, but it has a positive sign, indicating that private acquirers on average pay a higher premium in the run-up period.

Like at the original regression the control variables are not all significant. Only the IAQ has a

significant coefficient in all regressions with different dependent variables. It shows a negative sign in all regressions, this means that when the growth chances are better for the target than the industry Q the premium paid to target shareholders is smaller. Another variable with strong significant coefficients is the tender offer. Like at the CAR3 regression the sign is positive indicating that tender offers pay a higher premium to target shareholders than non-tender offers. Overall the results do not deviate significantly from the CAR3 regression, this indicates that the original regression is a robust one.

6. CONCLUSION

This thesis studies premiums paid to target shareholders in public takeovers executed by private equity and public acquirers in the United States of America over the last 30 years. This study is one of the first with the focus on horizontal takeovers solely. These takeovers are often part of a buy-and-build strategy and have a potentially high value creation between the acquirer and target because of synergies and more control over the market.

The general finding of this study is that the target shareholders gain more, both statistically and economically, if a public firm makes the acquisition than when the acquisition is made by a private equity firm. The latter pay a lower premium to target shareholders. In this case the acquisition is a horizontal integration type, a firm merges or acquires another firm within the same industry. Using a premium measure that captures the period one day before until one day after the announcement date, the premiums paid to target shareholders are 18% higher if a public firm makes the acquisition rather than a private firm. In absolute numbers, the average premium paid to target shareholders when the acquirer is a public firm is 25,23% against when the acquirer is a private firm 21,42%. This difference is tested both on a univariate level, testing means, as well as on a multiple regression level, controlling for target and deal characteristics. The timespan of the complete sample runs from 1984 until 2015. In this period, several merger waves occurred which possibly influence the strategies performed by private and public acquirers. Also different industries can have industry fixed effects and longer premium periods could tell a different story, for this reason several checks are performed to strengthen the regression on the complete sample.

The hypotheses have been tested in the results section. Conclusions drawn from these tests are as follows. For the first hypothesis *"Premiums paid by private equity takeovers in horizontal mergers are lower than premiums from public takeovers"* the tests showed results

that support this statement. The premiums paid are both statistically as economically lower when the acquirer is a private equity firm than a public firm. This difference might come from a different strategy performed by the acquiring firm. A strategy that is often performed in the horizontal merger deals is the so-called Buy-and-Build strategy. The literature tells us that synergies only create value when target firms are of a manageable size. When acquisitions are described as a platform acquisitions this potential for value creation decreases. To test this theory, the second hypothesis of this study is that *"premiums paid by private equity and public takeovers are lower for add-on acquisitions"*. This hypothesis was rejected: the results indicate that the premiums paid to target shareholders is not explained by the difference whether the acquisition is platform or an add-on acquisition. At the univariate level the results show that private acquirers on average acquire more add-on acquisitions. Platform acquisitions seem more attractive for public firms.

6.1. Relevance, limitations and future studies

The contribution to the academic and economic discussion whether private equity firms target different firms is that at horizontal M&A deals on average private equity firms acquire smaller targets. Another characteristic is the growth opportunities measure that shows that on average PE firms acquire targets with higher growth opportunities relative to the industry the target is in. For the premiums paid and possible abnormal returns to be earned, this study shows that private equity bidders pay a lower premium to target shareholders considering the full sample period. However, the results also show that the climate is changing resulting in a decreasing difference between private and public bidders in the latest period running from 2005 until 2015. The industry robustness checks show that there might be different strategies followed per industry, however the differences between industries are not statistically significant.

Some limitations of this study are the relatively small number of private equity deals. For the private sector there is a lack of publicly available data. Because the private sector does not have to report so many numbers as publicly listed companies, data-points are lost in the buildup of the database. Another limitation is the assumption that markets are efficient. In the calculation of the cumulative abnormal return the expected return is found by multiplying the systemic risk of the stock by the realized market return. However, in reality markets exhibit inefficiencies, especially in time of bubbles such as the Dot-com bubble and

the mortgage bubble. Furthermore, the adjusted R^2 of the model stayed relatively low in all regression, in future studies different variables should be introduced to be able to explain more of the variation in the period under investigation. Future studies are recommended to further investigate the different target characters for each industry and to expand the research towards different countries and/or regions worldwide. Another recommendation for future investigation is the value creation after the deal is executed and whether the potential synergies effects are present and can be seen in the increased enterprise value after the deal. Furthermore studies which investigate not only the CAR of the target firm but also research into the CAR of the acquirer and third party involved could help explain possible differences in premiums paid by public and private equity acquirers. It could be that public firms are better able to create synergies and therefore premiums are higher, future research should help resolve this issue.

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8. APPENDIX

Table 1
Descriptive Statistics

In this table, Panel A shows the number of deals per year and the accumulated deal value. Panel B shows the number of deals per Industry and the accumulated deal value. The sample includes all SDC completed cash-only merger and acquisition deals between a U.S. bidder and a U.S. public target acquisition announced between 1984 and 2015 that result in 100% ownership by the bidder and the takeover is a horizontal merger.

PANEL A

Year	All		Public		Private	
	N	Deal value	N	Deal value	N	Deal value
1984	3	579	2	431	1	148
1985	18	14.201	16	14.110	2	91
1986	32	11.259	28	10.978	4	281
1987	28	8.105	24	6.963	4	1.142
1988	31	9.526	25	7.903	6	1.623
1989	17	7.283	15	7.246	2	37
1990	17	2.431	15	2.384	2	47
1991	14	1.645	13	1.623	1	23
1992	17	3.445	15	3.424	2	21
1993	36	3.675	35	3.655	1	20
1994	50	16.895	46	16.648	4	247
1995	56	22.186	51	20.666	5	1.520
1996	67	17.548	57	16.613	10	934
1997	74	66.478	67	65.465	7	1.013
1998	78	150.986	64	147.122	14	3.864
1999	91	159.368	86	159.096	5	272
2001	77	94.780	68	93.880	9	901
2002	52	17.957	42	16.750	10	1.207
2003	75	40.854	67	39.934	8	920
2004	72	102.690	69	101.490	3	1.199
2005	60	200.025	48	192.978	12	7.047
2006	58	83.233	46	73.362	12	9.870
2007	61	85.066	53	82.833	8	2.233
2008	41	69.804	32	44.444	9	25.360
2009	28	130.796	25	130.722	3	73
2010	47	35.051	39	33.631	8	1.420
2011	27	38.914	22	36.908	5	2.006
2012	35	47.793	30	47.425	5	367
2013	42	55.427	40	55.380	2	46
2014	38	131.597	34	131.461	4	135
2015	8	52.726	8	52.726	0	0
Total	1.438	1.793.064	1.256	1.726.349	182	66.715

PANEL B

Industry	All		Public		Private	
	N	Deal value	N	Deal value	N	Deal value
Manufacturing	426	720.775	389	693.223	37	27.552
Transportation	133	368.739	120	364.005	13	4.734
Wholesale Trade	21	8.547	20	8.297	1	250
Finance, Insurance and Real Estate	479	343.951	412	319.919	67	24.032
Services	251	189.249	214	182.946	37	6.302
Retail Trade	65	64.304	49	61.595	16	2.709
Mining	56	86.042	45	84.907	11	1.135
Agriculture, Forestry and Fishing	2	7.899	2	7.899	0	0
Construction	5	3.559	5	3.559	0	0
Total	1.438	1.793.064	1.256	1.726.349	182	66.715

Table 2
Descriptive Statistics Variables & Correlation Matrix

This table shows the descriptive statistics for the variables used in this study and the correlation matrix between the independent variables. The sample includes all SDC completed cash-only merger and acquisition deals between a U.S. bidder and a U.S. public target acquisition announced between 1984 and 2015 that result in 100% ownership by the bidder and the takeover is a horizontal merger. Panel A shows the independent variables lnassets (the natural logarithm of total assets), Operating Cash Flows (OCF), Leverage, Return on Equity (ROE), Return on Assets (ROA), Industry-adjusted Tobin's Q (IAQ), and dummies for whether the bid is a Toehold, Tender offer, Hostile, Private or a Platform bid. Panel B shows the Cumulative abnormal returns for a Runup period, starting 42 days until 5 days before the announcement, CAR11 from 5 days before until 5 days after, CAR5 from 2 days before until 2 days after and the period of interest CAR3, 1 day before until 1 day after the announcement of the bid. Panel C shows the correlations between the dependent variables.

PANEL A

Variable	Obs	Mean	Std. Dev.	Min	Max
lnassets	1,438	5,51	1,99	0,00	11,88
OCF	1,438	0,01	0,17	-0,90	0,75
Leverage	1,438	0,58	0,34	0,00	5,00
ROE	1,438	0,07	0,76	-0,67	0,50
ROA	1,438	0,02	0,30	-0,32	0,19
IAQ	1,438	0,00	0,27	-2,06	1,31
Toehold	1,438	0,02	0,15	0,00	1,00
Tender	1,438	0,27	0,45	0,00	1,00
Hostile	1,438	0,05	0,23	0,00	1,00
Private	1,438	0,13	0,33	0,00	1,00
Platform	1,438	0,47	0,50	0,00	1,00

PANEL B

Variable	Obs	Mean	Std. Dev.	Min	Max
CARRUNUP	1,438	0,06	0,22	-1,11	3,02
CAR11	1,438	0,27	0,27	-1,14	2,64
CAR5	1,438	0,26	0,26	-0,98	2,58
CAR3	1,438	0,25	0,25	-0,91	2,60

PANEL C

	lnassets	OCF	Leverage	ROE	ROA	IAQ	Toehold	Tender	Hostile	Private	Platform
lnassets	1										
OCF	0,17	1									
Leverage	0,41	-0,07	1								
ROE	0,14	0,25	0,07	1							
ROA	0,15	0,47	-0,02	0,53	1						
IAQ	-0,01	0,08	-0,54	-0,02	0,14	1					
Toehold	0,01	0,00	-0,01	-0,04	-0,01	0,01	1				
Tender	-0,11	0,00	-0,14	-0,03	0,02	0,00	0,00	1			
Hostile	0,05	0,03	-0,01	0,00	0,05	-0,04	0,00	0,26	1		
Private	-0,11	0,00	-0,03	-0,02	0,00	0,05	-0,02	-0,03	0,01	1	
Platform	0,77	0,11	0,32	0,14	0,14	-0,07	-0,01	-0,12	0,02	-0,11	1

Table 3
Univariate analysis

In this table, univariate analysis is performed between private and public acquisitions for the period 1984-2015. The sample includes all SDC completed cash-only merger and acquisition deals between a U.S. bidder and a U.S. public target acquisition announced between 1984 and 2015 that result in 100% ownership by the bidder and the takeover is a horizontal merger. The analysis is executed by performing Welch's t-tests. For each variable the mean is calculated for the given group and then the difference between the two is taken and tested with the before mentioned t-test. Panel A shows the dependent variables CARRUNUP, CAR11, CAR5 and CAR3 (respectively -42 to -5, -5 to +5, -2 to +2 and -1 to +1, where 0 is the announcement date). Panel B shows the independent variables lnassets, OCF, Leverage, ROE, ROA, IAQ, Toehold, Tender, Hostile, Private and Platform. P-values marked with *, ** and *** are significant at the 10%, 5% and 1% level respectively.

1984-2015	Variables	All	Private	Public	Difference	t-statistic	P-value
	CARRUNUP	0,06	0,07	0,05	0,01	0,64	0,33
Panel A	CAR11	0,27	0,25	0,28	-0,03	-1,39	0,15
	CAR5	0,26	0,23	0,26	-0,03	-1,56	0,12
	CAR3	0,25	0,21	0,25	-0,04	-2,02	0,05**
	lnassets	5,51	4,91	5,60	-0,69	-4,52	0,00***
	OCF	0,01	0,01	0,01	0,00	0,09	0,40
	Leverage	0,58	0,56	0,59	-0,03	-1,34	0,16
	ROE	0,07	0,01	0,05	-0,05	-0,78	0,29
	ROA	0,02	0,00	0,02	-0,02	-0,18	0,35
Panel B	IAQ	0,00	0,04	-0,01	0,04	2,04	0,049**
	Toehold	0,02	0,02	0,03	-0,01	-0,86	0,28
	Tender	0,27	0,24	0,28	-0,03	-1,01	0,24
	Hostile	0,05	0,06	0,05	0,01	0,33	0,38
	Private	0,13	1,00	0,00	1,00	-	-
	Platform	0,47	0,34	0,49	-0,16	-4,17	0,00***

Table 4
Sub-periods univariate analysis

In this table, univariate analysis is performed between private and public acquisitions for different time periods, from 1985-1994, 1995-2004 and 2005-2015 respectively. The sample includes all SDC completed cash-only merger and acquisition deals between a U.S. bidder and a U.S. public target acquisition announced between 1984 and 2015 that result in 100% ownership by the bidder and the takeover is a horizontal merger. The analysis is executed by performing Welch's t-tests. For each variable the mean is calculated for the given group and then the difference between the two is taken and tested with the before mentioned t-test. Panel A1, B1 and C1 show the dependent variables CARRUNUP, CAR11, CAR5 and CAR3 (respectively -42 to -5, -5 to +5, -2 to +2 and -1 to +1, where 0 is the announcement date). Panel A2, B2 and C2 show the independent variables lnassets, OCF, Leverage, ROE, ROA, IAQ, Toehold, Tender, Hostile, Private and Platform. P-values marked with *, ** and *** are significant at the 10%, 5% and 1% level respectively.

1984-1994	Variables	All	Private	Public	Difference	t-statistic	P-value
	CARRUNUP	0,04	0,04	0,04	-0,01	-0,18	0,39
Panel A1	CAR11	0,27	0,18	0,28	-0,10	-2,74	0,01***
	CAR5	0,25	0,19	0,26	-0,07	-1,99	0,06**
	CAR3	0,24	0,16	0,25	-0,09	-2,68	0,01***
	lnassets	4,65	3,94	4,74	-0,80	-1,82	0,08*
	OCF	0,01	0,05	0,01	0,04	1,80	0,08*
	Leverage	0,55	0,47	0,56	-0,09	-1,40	0,15
	ROE	0,12	0,21	0,11	0,11	0,55	0,34
	ROA	0,04	0,05	0,04	0,01	0,37	0,37
Panel A2	IAQ	-0,04	-0,05	-0,04	-0,01	-0,16	0,39
	Toehold	0,02	0,03	0,02	0,01	0,37	0,37
	Tender	0,38	0,28	0,39	-0,11	-1,25	0,18
	Hostile	0,13	0,14	0,12	0,01	0,20	0,39
	Private	0,11	1,00	0,00	1,00	-	-
	Platform	0,33	0,17	0,35	-0,17	-2,23	0,03**
1995-2004	Variables	All	Private	Public	Difference	t-statistic	P-value
	CARRUNUP	0,05	0,03	0,06	-0,03	-1,05	0,23
Panel B1	CAR11	0,26	0,25	0,26	-0,01	-0,25	0,39
	CAR5	0,24	0,22	0,25	-0,02	-0,82	0,28
	CAR3	0,23	0,19	0,23	-0,04	-1,58	0,11
	lnassets	5,41	4,84	5,49	-0,65	-3,31	0,00***
	OCF	0,00	0,00	0,00	-0,01	-0,13	0,40
	Leverage	0,60	0,55	0,60	-0,06	-1,59	0,11
	ROE	0,01	0,00	0,01	-0,02	-0,35	0,37
	ROA	-0,02	-0,01	-0,02	0,00	0,12	0,40
Panel B2	IAQ	0,00	0,09	-0,01	0,10	3,55	0,00***
	Toehold	0,02	0,02	0,02	0,00	0,10	0,40
	Tender	0,27	0,26	0,27	-0,01	-0,25	0,39
	Hostile	0,05	0,08	0,05	0,03	1,05	0,23
	Private	0,12	1,00	0,00	1,00	-	-
	Platform	0,44	0,31	0,46	-0,15	-2,86	0,01***
2005-2015	Variables	All	Private	Public	Difference	t-statistic	P-value
	CARRUNUP	0,06	0,13	0,05	0,07	1,44	0,14
Panel C1	CAR11	0,30	0,28	0,31	-0,03	-0,94	0,26
	CAR5	0,29	0,27	0,30	-0,03	-0,94	0,26
	CAR3	0,29	0,27	0,29	-0,02	-0,62	0,33
	lnassets	6,17	5,41	6,31	-0,90	-3,67	0,00***
	OCF	0,01	0,01	0,01	-0,01	-0,47	0,36
	Leverage	0,59	0,61	0,58	0,02	0,64	0,32
	ROE	0,07	-0,07	0,09	-0,16	-1,29	0,17
	ROA	-0,01	-0,02	0,00	-0,01	-0,44	0,36
Panel C2	IAQ	0,02	0,00	0,03	-0,03	-0,90	0,27
	Toehold	0,03	0,00	0,03	-0,03	-3,66	0,00***
	Tender	0,21	0,21	0,21	-0,01	-0,17	0,39
	Hostile	0,02	0,00	0,02	-0,02	-2,67	0,01**
	Private	0,15	1,00	0,00	1,00	-	-
	Platform	0,61	0,44	0,64	-0,20	-3,02	0,00***

Table 5
Multiple regression full dataset

The sample includes all SDC completed cash-only merger and acquisition deals between a U.S. bidder and a U.S. public target acquisition announced between 1984 and 2015 that result in 100% ownership by the bidder and the takeover is a horizontal merger. The dependent variable is the 3-day abnormal announcement return (CAR3). The interval for the abnormal return starts 1 day before the announcement date until 1 day thereafter. Independent variables include the following: Private is an indicator variable equal to one if the bidder is a private equity firm. All remaining variables are defined in the header of table 4. P-values are based on heteroskedaticity-consistent standard errors. P-values denoted with *, **, *** are significant at the 10%, 5% and 1 % level, respectively.

1984-2015	Coef.	P-value
Private	-0,04	0,04**
Platform	-0,01	0,81
Hostile	-0,03	0,40
Toehold	0,04	0,36
Tender	0,06	0,00***
Leverage	0,01	0,68
IAQ	-0,05	0,14
ROA	-0,28	0,00***
ROE	0,01	0,80
OCF	0,09	0,19
lnassets	-0,01	0,07*
Constant	0,28	0,00***
Obs.	1438	
R²	0,04	

Table 6
Multiple regression sub-periods

The sample includes all SDC completed cash-only merger and acquisition deals between a U.S. bidder and a U.S. public target acquisition announced between 1984 and 2015, split into three different sub-periods, that result in 100% ownership by the bidder and the takeover is a horizontal merger. The three different sub-periods are from 1984-1994, 1995-2004 and 2005-2015. The dependent variable is the 3-day abnormal announcement return (CAR3), 1 day before the announcement date until 1 day after. Private is an indicator variable equal to one if the bidder is a private equity firm. All remaining variables are defined in the header of table 4. P-values are based on heteroskedaticity-consistent standard errors. P-values denoted with *, **, *** are significant at the 10%, 5% and 1 % level, respectively.

Variable	1984-1994		1995-2004		2005-2015	
	Coef.	P-value	Coef.	P-value	Coef.	P-value
Private	-0,12	0,02**	-0,03	0,25	-0,07	0,04**
Platform	-0,04	0,41	0,01	0,58	-0,05	0,20
Hostile	0,01	0,88	-0,01	0,76	-0,01	0,95
Toehold	0,01	0,92	0,06	0,38	0,03	0,62
Tender	0,01	0,66	0,10	0,00***	0,01	0,68
Leverage	-0,05	0,57	-0,07	0,07*	0,15	0,00***
IAQ	-0,13	0,08*	-0,08	0,06*	0,04	0,50
ROA	-0,37	0,19	-0,41	0,00***	-0,03	0,83
ROE	0,02	0,88	0,10	0,10	-0,06	0,29
OCF	0,37	0,08	0,14	0,10*	-0,10	0,48
lnassets	-0,00	0,78	0,00	0,93	-0,03	0,00***
Constant	0,30	0,00***	0,24	0,00***	0,45	0,00***
Obs.	263		730		445	
R²	0,08		0,06		0,12	

Table 7
Multiple regression different industries

The sample includes all SDC completed cash-only merger and acquisition deals between a U.S. bidder and a U.S. public target acquisition announced between 1984 and 2015, split into different industries, that result in 100% ownership by the bidder and the takeover is a horizontal merger. The different industries analysed are Finance, Manufacturing, Services and Rest. The dependent variable is the 3-day abnormal announcement return (CAR3), 1 day before the announcement date until 1 day after. Private is an indicator variable equal to one if the bidder is a private equity firm. All remaining variables are defined in the header of table 4. P-values are based on heteroskedaticity-consistent standard errors. P-values denoted with *, **, *** are significant at the 10%, 5% and 1 % level, respectively.

Variable	Finance		Manufacturing		Services		Rest	
	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value
Private	0,00	1,00	-0,08	0,09*	-0,07	0,24	-0,05	0,18
Platform	0,05	0,07*	0,03	0,52	-0,07	0,30	-0,06	0,18
Hostile	0,07	0,41	-0,04	0,31	-0,03	0,83	0,02	0,75
Toehold	0,03	0,54	-0,01	0,92	0,26	0,11	-0,02	0,76
Tender	0,02	0,68	0,02	0,50	0,12	0,00***	0,04	0,19
Leverage	0,10	0,12	0,15	0,00***	-0,20	0,02**	0,10	0,15
IAQ	-0,03	0,60	0,07	0,18	-0,21	0,02**	-0,02	0,70
ROA	0,03	0,68	-0,17	0,00***	-0,01	0,89	0,01	0,90
ROE	-0,05	0,16	0,02	0,30	0,03	0,24	-0,02	0,36
OCF	-0,07	0,47	0,21	0,01**	0,03	0,74	-0,10	0,51
lnassets	-0,03	0,00***	-0,03	0,02**	0,02	0,42	0,00	0,97
Constant	0,27	0,00***	0,34	0,00***	0,28	0,00**	0,20	0,00***
Obs.	479		426		251		282	
R²	0,04		0,06		0,09		0,05	

Table 8
Multiple regression different dependent variables

The sample includes all SDC completed cash-only merger and acquisition deals between a U.S. bidder and a U.S. public target acquisition announced between 1984 and 2015 that result in 100% ownership by the bidder and the takeover is a horizontal merger. The dependent variables are the 5-day abnormal announcement return (CAR5), CAR11 and a run-up period from 42 days until 5 days before the announcement date (RUNUP). Private is an indicator variable equal to one if the bidder is a private equity firm. All remaining variables are defined in the header of table 4. P-values are based on heteroskedaticity-consistent standard errors. P-values denoted with *, **, *** are significant at the 10%, 5% and 1 % level, respectively.

Variable	CAR5		CAR11		CARRUNUP	
	Coef.	P-value	Coef.	P-value	Coef.	P-value
Private	-0,03	0,10*	-0,03	0,12	0,02	0,37
Platform	-0,01	0,68	-0,02	0,35	0,00	0,90
Hostile	-0,01	0,79	-0,02	0,59	-0,03	0,24
Toehold	0,05	0,30	0,03	0,56	-0,01	0,78
Tender	0,06	0,00***	0,07	0,00***	0,01	0,28
Leverage	0,01	0,66	0,01	0,64	-0,01	0,83
IAQ	-0,05	0,10	-0,06	0,07*	-0,06	0,02**
ROA	-0,30	0,00***	-0,32	0,00***	-0,11	0,20
ROE	0,03	0,52	0,03	0,56	-0,01	0,80
OCF	0,07	0,33	0,07	0,36	-0,02	0,76
lnassets	-0,01	0,12	-0,01	0,19	-0,00	0,87
Constant	0,30	0,00***	0,31	0,00***	0,06	0,01***
Obs.	1,438		1,438		1,438	
R²	0,04		0,04		0,01	