

Premiums offered by private equity firms post 2008

An analysis of premiums paid by private equity acquirers compared to private operating acquirers in US PTP transactions

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Abstract

In this thesis, we investigate the difference in premiums paid by private equity firms compared to private operating firms in US PTP transactions over the period 1999 to 2016. Our study focuses on how private equity firms have evolved after the financial crisis in 2008 with regard to premiums paid. Using a dataset consisting of 758 transactions, we show that private equity firms on average pay a higher premium in US PTP transactions after 2008 compared to before. Furthermore, private operating firms are still on average paying a higher premium when compared to private equity firms after 2008, without taking target and deal characteristics into account. However, when accounting for target and deal characteristics, private equity firms are paying a higher premium compared to private operating firms. All our results are statistically significant.

Key words: Private equity, acquisition premium, public-to-private transactions

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1 Introduction

In the years leading up to the financial crisis of 2008, private equity firms were experiencing a peak in global capital raised and number of buyout transactions. A more developed financial system created an advantageous playground for the leveraged buyout firms, allowing for easier debt financing and better debt instruments. The financial crisis of 2008 left the private equity industry with unfamiliarly low amounts of capital raised compared to the booming years of 2006 and 2007. The amount of public-to-private (PTP) transactions decreased severely. However, the private equity industry seems to have witnessed a come-back since then, as investments into the buyout funds continue to increase. Accessing large amounts of capital at ease in combination with accommodating debt market conditions, has led to a surge in capital raised for buyout funds. However, the private equity industry continues to show a declining performance. More competition from industry peers and other cash-rich acquirers are said to be the reason behind this.

In line with the private equity business model, acquiring target firms becomes a vital component for their performance. Previous literature has shown that private equity firms are able to acquire targets at a lower premium compared to operating firms. We therefore find a new premium analysis, focusing on private equity firms, to be highly relevant. In this thesis, we will examine the differences in premiums paid by private equity firms versus private operating firms in the US public-to-private market over the time period 1999 to 2016. Our study focuses on the years after the financial crisis in 2008 and how the private equity industry has evolved with regards to premiums paid in PTP transactions.

We show that private equity firms on average pay a higher premium in US PTP transactions after 2008 compared to before. Furthermore, private operating firms are still on average paying a higher premium when compared to private equity firms after 2008, without taking target and deal characteristics into account. However, when accounting for target and deal characteristics, private equity firms are paying a higher premium compared to private operating firms. All our results are statistically significant.

Our contribution to the current literature is a more recent time frame on the US PTP market and relevant results concerning increased premiums paid by private firms.

The thesis is structured as follows: We start by providing definitions of words and concepts that will be used extensively throughout the text. Section 2 presents an overview of the previous literature and the theoretical framework that works as the basis for the remaining paper. Section 3 presents the data collection process and the final sample. In section 4 we present our hypotheses and the methods used for testing them. The results are presented in section 5. Finally, in section 6 we provide our conclusions.

1.1 Definitions

1.1.1 Acquirer types

A private equity acquirer is defined as a private equity firm or an investor group consisting of one or more private equity firms. No difference in results are found by Barger et al. (2008), hence we have selected to include these observations in order to receive a larger sample.¹ A private operating acquirer is defined as a firm that is not a private equity acquirer. Thus, it is not mandatory for an operating acquirer to purchase the target firm within the same strategic field. By allowing for this broader definition of operating acquirers, we are able to include other acquirer groups such as conglomerates.

There exist several differences between the two acquirer groups. Operating acquirers oftentimes purchase an organization within the same industry, thus they are able to find additional value from target's assets by deploying them within (or by extending) pre-acquisition operations. Unlike private equity acquirers, they are usually able to benefit from synergy gains between the acquired company and their own organization. Private equity acquirers are usually not interested in managing the day-to-day operations of the target themselves and the acquired firm is rather

¹ To be noted, we will conduct several robustness tests to adjust for the private equity acquirer definition.

seen as a portfolio company among others. Hence, a distinction between the two acquirer groups are often made when analyzing buyout transactions.

1.1.2 Private equity firm structure: GPs and LPs

The private equity business model is based on capital inflows. A private equity firm, also known as the General Partner (GP), will raise funds to pursue future investments. The capital providers for these funds are known as Limited Partners (LP) and include pension funds, insurance companies and high net worth individuals/families. The GP will manage the fund and use the committed capital in line with the fund's communicated strategy and agreements. When the fund is later realized, usually after eight to ten years, the returns are paid out to the investors (less potential management fees and carried interest).

1.1.3 Public-to-private (PTP) transaction

A public-to-private (PTP) transaction occurs when a privately held company acquires a publicly listed company and delists it by taking it private. However, when examining previous literature there exists several different definitions of PTP-transactions (Ehn, 2015). It is common for PTP transactions to be mistaken for leveraged buyouts (LBO), as PTP transactions are usually financed to a large extent with debt (Weir et al., 2008). Additional complexity is added to this definition as private equity firms are by far the largest private acquirers on the financial markets and usually perform buyouts using high amounts of leverage (Kaplan and Strömberg, 2009). Hence, a PTP transaction can sometimes be used when describing a LBO backed by a financial sponsor. A large part of the PTP transactions are in fact exactly this, but certainly not all.

It is by no means necessary for a PTP transaction to include debt financing or financial sponsor involvement. Private operating firms also take part in the PTP market. We will therefore define PTP transactions as transactions where a private firm acquires a public firm and delists it. Acquirer type or transaction characteristics are not excluding factors in our definition. This broader definition of PTP transactions is in line with Geranio and Zanotti (2012).

2 Previous literature and Theoretical framework

2.1 Previous literature

In this section, we will give an overview of the previous literature within our thesis subject. We will start by providing a historic background of PTP transactions in the US and a short overview of the main empirical body as summarized by Renneboog and Simons (2005) and Renneboog and Vansteenkiste (2017). Afterwards, we will present the recent trends and literature regarding private equity activity. This includes fund performance, capital committed and capital inflows. Papers concerning premiums and transaction characteristics, as well as differences between the two, will be presented thirdly. Finally, an overview of PTP specific variables and their potential value creating hypotheses will be presented.

2.1.1 History of PTP transactions & the main empirical body

The market for mergers and acquisitions has been shown to come in waves, this is also the case for the subgroup of PTP transactions (Maksimovic et al., 2013; Renneboog and Vansteenkiste, 2017). The first PTP wave occurred during the second half of the 1980's and started in the US (Jensen, 1989). The reasons behind this wave has been studied to a large extent. Shleifer and Vishny (1990) suggest that the wave occurred because of a willingness to create more specialized organizations and split up the existing large conglomerates. Holmstrom and Kaplan (2001) mention the reduction of excess capacity as a potential reason. The PTP activity almost perished completely in the beginning of the 1990's and remained at low levels until later years in the same decade.

The second wave started in late 1990's and continued until the financial crisis in 2008. One of the main reasons behind this wave was the development of the financial system which allowed for better funding alternatives, for example through collateralized debt obligations according to Shivdasani and Wang (2011). According to calculations made by Renneboog and Vansteenkiste (2017), the periods 1996 - 2000 and 2005 - 2007 were characterized by high numbers of PTP

transactions. The financial crisis in 2008 and the immediate recession that followed, decreased the number of PTP transactions substantially.

The literature on PTP transactions is exhaustive and has been documented at several time periods (e.g. Renneboog and Simons, 2005; and Renneboog and Vansteenkiste, 2017)). Renneboog and Vansteenkiste (2017) divide the literature into four strands: “Intent”, “Impact”, “Process” and “Duration”. Our thesis focuses on the “Impact” strand, which measures the premium paid and the factors constituting the wealth gains for target shareholders. The authors also present several incentives for a publicly listed company to go private as they summarize evidence from previous literature. Companies taken private may find an increase in value from changes in capital structure, management equity stakes and corporate governance amongst others.

Guo et al. (2011) find that the average debt-to-assets ratio changes from 25.2% (pre-buyout) to 70.5% (post-buyout) for public targets between 1980 and 2005. This may establish important wealth gains from tax deductions on interest payments, also noted as interest tax shields. According to Kaplan (1989b), the value of these tax shields may amount to an interval of 21% to 72% of the premium paid in PTP transactions.

Jensen (1986) argues that increased debt levels may also help to reduce the agency cost of free cash flow because of commitment to future debt payments. Meaning, the control function of debt may offer excess value in firms with substantial free cash flows.

A publicly listed corporation taken private will experience large changes in equity ownership as the company’s shares are spread among less investors. In cases of improved equity incentives, a general reduction of agency costs within the company may occur and result in value creation. For a period between 1980 and 1986, Kaplan (1989a) finds that all post-buyout managers’ (for managers which also worked at the firm prior to the buyout) average equity holdings increased from 9.30% to 30.99% of total shares.

2.1.2 Recent trends in private equity activity

The private equity industry has developed substantially during the past decades. Sensoy et al. (2014) describe the current private equity setting as tough and argues that the industry has entered a maturity phase. The authors note an increase in competition over the years from surging amounts of capital inflows as well as a higher number of firms and funds. Previously, the value creation process of private equity firms was less demanding as more undervalued targets were available for acquisition and operational optimization - reaping the benefits of “low-hanging fruit”. This process is not as apparent as it once was, due to changes in competitive landscape and economic environment in which fewer valuable acquisition targets are available (Sensoy et al., 2014).

The authors divide their data into two time spans; 1991 - 1998 and 1999 - 2006. They find a general decline in internal rate of returns (IRRs), money multiples and public market equivalents (PMEs) from the first to the second period.² This decline in performance is mainly driven by a large drop in venture capital firms’ performance. The performance of buyout funds is rather constant over the two time periods.

Harris et al. (2015) find that the average IRR and money multiple for private equity firms has decreased over the last three decades (1980’s – 2000’s). However, there exist large differences in performance from year to year. Buyout funds have generated higher returns than the public market, measured in PME, up until vintage year of 2006.³ After 2006, the performance of the buyout funds have been close to market returns. The authors find that the performance of a buyout fund has a negative correlation with the fund’s committed capital.

² The IRR is the annual return on the invested capital, the measure takes into account all capital distributions as well as residual values, net of all payments to the GP. The money multiple is the returns, including residual values, over the invested capital net of all payments to the GP. The PME measures the return for the private equity fund against the return for the public market over the same investment horizon (See British Private Equity & Venture Capital Association for further information and other ways to calculate these measures).

³ The vintage year is the year in which the initial influx of investment capital is deposited to a private equity fund.

They find this result to be significant for the money multiple and the PME measure, but not for IRR.

Appelbaum and Batt (2016) state that the private equity industry displayed a great activity increase, in terms of deal value, between 2011 and 2015. In line with this, fundraising surged during the period 2013 to 2015, reaching over \$300 billion per year on a global level. Furthermore, the authors also show increasing numbers of mega buyout funds.⁴ According to Appelbaum and Batt (2016), the high amounts of dry powder for the private equity firms in combination with the increased competition from cash-rich public operating acquirers has led to inflated acquisition prices during the 2010's. Another trend mentioned by the authors is the new regulations within the financial markets, suppressing financial leverage ratios during buyouts and forcing higher levels of equity financing.

All recent trends mentioned in previous literature are confirmed in Bain & Company's Global Private Equity Report 2017 (Bain & Company, 2017). They present increasing amounts of capital inflows, dry powder and mega buyout funds in line with findings of Appelbaum and Batt (2016). Considering the historical high performance of private equity firms and the industry's ability to present excess return on a yearly basis, it is not odd that the industry has experienced surging levels of committed capital. Furthermore, the amount of dry powder has been steadily rising during the 2000's and reached \$1.47 trillion in 2016. At the same time the net IRR for private equity firms have started to decrease during the past years, mainly due to increased competition.

2.1.3 Differences in acquirer types and characteristics

There exist a vast amount of literature describing the difference between private equity and operating acquirers. Operating acquirers normally acquirer targets in the same industry as themselves. Most often they are interested in combining the target company with their existing business in order to create synergy gains. Private equity acquirers differ from operating acquirers as they do not incorporate the firm in their main operations, rather treat them as one portfolio company

⁴ Mega buyout funds are defined as funds that raise over \$5 billion in capital.

among others. Thus, private equity firms often find other potential value creating factors compared to operating acquirers. Berg and Gottschalg (2005) distinguish between three different phases of potential value creation: the acquisition phase, the holding period and the divestment phase. The early stages of the acquisition phase involve negotiation and due diligence, while the later stages break down the structure of the deal into factors such as level of financial leverage, management stake after transaction, etc. Baker and Montgomery (2009) argues that much of the total value creation by leveraged buyout firms are determined in the acquisition phase rather than later phases. The authors refer to this as “front-loaded” value creation. The holding period consists of operational and organizational changes. The divestment phase consists of an exit and this is when the portfolio company is realized.

In line with the differences in value creation, operating and private equity acquirers often opt for different buyout targets. The research area that tries to quantify and explain the difference in premiums paid by private equity versus operating acquirers is rather new, dating back to the recent 00's, according to Fidrmuc et al. (2012).

Bargeron et al. (2008) analyzes differences in premiums paid as well as target and deal characteristics in acquisitions made by public and private acquirers between 1980 and 2005. The authors are ones among few which also present a comprehensive distinction between different private acquirer groups. To our knowledge, previous studies (e.g. Fidrmuc et al., 2012) cluster private operating and private equity acquirers (alternatively, public operating and private operating acquirers) into one acquirer group. Bargeron et al. (2008) find that private acquirers offer a significantly lower premium compared to public acquirers, when acquiring public targets. The authors argue that private equity firms are more conscious in their bidding process as well as managers of public acquiring firms not being equally affected by the acquisition price (which could lead to agency costs such as empire-building). The results become more difficult to interpret when comparing differences in premium paid between private equity acquirers and private operating acquirers. Bargeron et al. (2008) find that the latter offers a higher premium, but this is only significant for certain premium measures. The

authors suggest their findings are explained by operating companies expecting larger synergy benefits from acquisitions.

Fidrmuc et al. (2012) also find evidence for private equity firms paying lower average premiums to target shareholders when compared to operating acquirers. Using a matched set of observations⁵ between 1997 and 2006 the authors show that private equity firms and operating firms are interested in different types of target firms. They find that operating acquirers opt for targets with higher expenses for research and development (R&D), more intangible assets and higher market-to-book ratios when compared to private equity acquirers. However, the difference in target characteristics cannot explain the differences in premium paid between the two acquirer groups, which is in line with previous literature.

The authors show that the private sale process design have a high explanatory value for the premium offered. They raise the argument that target management designs the sales process in terms of buyer type, pool of potential bidders, assets for sale and deal initiation in favor of target firm, as they possess advantageous company insight. However, they do not find significant evidence for effects on the premium when modeling for the phases and decisions made during the takeover process.

To summarize, previous literature finds private equity firms to pay a lower premium to target shareholders when compared to operating acquirers. Studies have found clear evidence for differences in target and deal characteristics between these two groups, but are yet unable to solve the puzzle of why the premium is lower.⁶

⁵ Meaning, for each private equity firm acquisition they match a "similar" acquisition conducted by an operating acquirer.

⁶ Operating acquirers involves both public and private firms.

2.2 Theoretical framework

Finally, we will present the theoretical framework used for this thesis. First, there will be a discussion regarding different ways to measure the target shareholder premium. Second, an overview of target and deal characteristics.

2.2.1 The measurement of the premium

There exists a vast amount of empirical studies on buyout transactions. Previous papers have focused on different aspects of the previously mentioned “Impact” strand. The probability of a firm being a takeover target, the specific target and deal characteristics and the potential shareholder wealth gains are some of the discussed subjects. Our focus lies on the two latter. Previous research has generally analyzed the potential shareholder wealth gains (the premium) through two different methodologies, event studies or premium analyses. Both methods present their own advantages and disadvantages.

Event studies are conducted through the calculation of cumulative abnormal returns (often noted CAR) and aims to measure premium offered to target shareholders. Problems may arise when using CAR calculations due to non-uniformity in the information releases during deal announcements. In some cases, the announcement of a transaction occurs before other relevant deal specifics are presented. Hence, the stock returns may be affected by higher amounts of uncertainty (Wright et al., 2007).

An alternative to event studies using abnormal returns, is to calculate target shareholder wealth effects through a premium analysis. The premium is calculated as the difference between final transaction price and market value of equity prior to announcement (Fidrmuc et al., 2012). Authors often calculate target premiums based on trading prices several days prior to announcement to adjust for potential pre-bid runner ups in line with findings of Schwert (1996). This is often noted as the anticipation window. Wright et al. (2007) and Renneboog and Vansteenkiste (2017) list premium studies which have chosen an anticipation windows between 1 and 40 trading days.

2.2.2 Target and deal characteristics

Today's literature divides the factors affecting the premium into many groups when studying buyout transactions. We have selected to divide these into two segments, target and deal characteristics, in line with Barger et al (2008) and Fidrmuc et al. (2012), to further study potential explanations to premiums offered target shareholders. Both studies find significance in the differences between target and deal characteristics for operating and private equity acquirers.

Target characteristics includes measures of financial position and operational profitability, among others. For example, Fidrmuc et al. (2012) show evidence that the average target of a private equity acquirer has lower market-to-book ratios and higher financial leverage when compared to strategic acquirers on 1% significance level.

Deal characteristics include details about the specific transactions. For example, the existence of multiple bidders and if the first bid also was the final bid. Barger et al. (2008) find that buyout transactions by private equity acquirers have a larger toehold prior to the deal compared to private operating acquirers.

3 Data

All data has been collected from the database Thomson Reuters SDC Platinum. We have gathered data for US acquisitions for the time period of 1999 to 2016. The following criteria has been used;

- Deal value to be over \$1 million
- Deal status is completed
- Acquirer is a private company
- Target is a public company
- Percent of shares owned after transaction equals 100%
- Percent of shares held at buyout announcement is between 0% and 50%

As described previously, the recent period of PTP transactions between 2008 and 2016 will be compared to historical PTP transactions from 1999 to 2007 in the US. The period between 1999 and 2007 has been chosen for similarity reasons: (1) The two periods both consist of nine years and (2) include a couple of years of lower PTP activity. To assure uniformity in our transactions, we have decided to only include completed deals.

Many of the benefits from a PTP transaction are experienced as the acquirer takes full control over the target firm. Thus, it is a necessary criterion for the transactions to involve a buyout of more than 50% of the company to finally result in 100% of shareholder votes. Finally, in line with the nature of our study, acquirer and target needs to be private respectively public. This data collection process resulted in a total of 968 observations.⁷

3.1 Extreme values and missing values

In order to achieve the correct dataset for testing our hypotheses, a few adjustments have been made manually. First, since the thesis' main subject is regarding premiums offered in PTP transactions, we have decided to exclude all

⁷ When collected from the SDC database 19/04/2017.

observations with missing premium figures over our time period. A total of 208 observations were excluded in this action.

Secondly, we observe two transactions with extremely high premium numbers. The first transaction is between CLC Healthcare Inc. and Center Health Care Inc., and presented a premium of 9 900 percent to target shareholders. No press releases were found for this transaction and therefore it has been excluded from our dataset. The second transaction is between Trico Marine Services Inc. and its creditors, and has presented a premium of 8 900 percent as the company filed for bankruptcy. As we do not find the acquirer type to be fitting for this thesis, we have excluded this transaction from our dataset. This results in a total number of 758 transactions.

3.2 Sample description

As can be seen in Table 1 in Appendix, there are a total of 758 transactions. 434 acquisitions made by private operating firms and 324 made by private equity firms. A fraction of 57.26% and 42.74% respectively. The highest amount of PTP transactions occurred in 2006. This high amount is mainly due to the increase in transactions conducted by private equity firms, a total of 41 transactions announced, which represents 55.41% of total transactions that year. The following year, the total number of PTP transactions announced amounted to 63. In 2008 the total number of transactions announced decreased to 29.

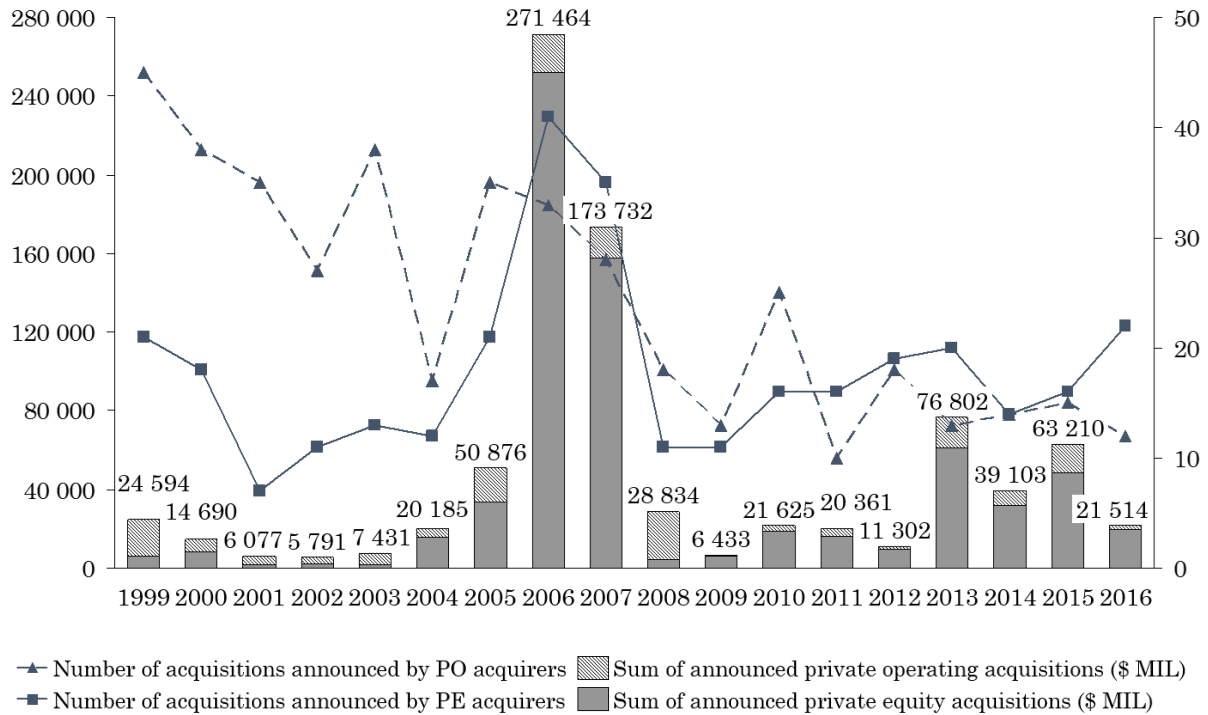
The largest transaction in our dataset was announced during 2006⁸, see table 2 in Appendix. The private equity acquirer, Blackstone Group, purchased Equity Office Properties Trust for a total of \$40 657 million. 2006 is also the year in which the highest total transaction value announced occurred for private equity firms, amounting to \$252 081 million in total (see Figure 1).

⁸ This transaction took place during 2007.

For private operating acquirers, the largest sum of transaction value was announced in 2008 and this is highly due to the buyout of William Wrigley Jr Co. by Mars Inc. for \$22 361 million.

Figure 1: Announced transactions

This figure shows the number of announced transaction by private equity and private operating acquirers as well as total transaction value of announced transactions (per annum).



3.3 Data description

In line with previous literature, differences in premiums paid will be evaluated with target and deal characteristics taken into account. Data for both of these categories have been gathered from the database Thomson Reuters SDC Platinum. All variables are from the financial report the latest twelve month (LTM) prior to announcement, if not otherwise stated. The specific variables will be introduced in Section 4.

4 Hypotheses and Methodology

In the following section, we present our dependent and independent variables in more detail. The methods used for testing our hypothesis will also be explained. The section starts with a presentation of our hypothesis.

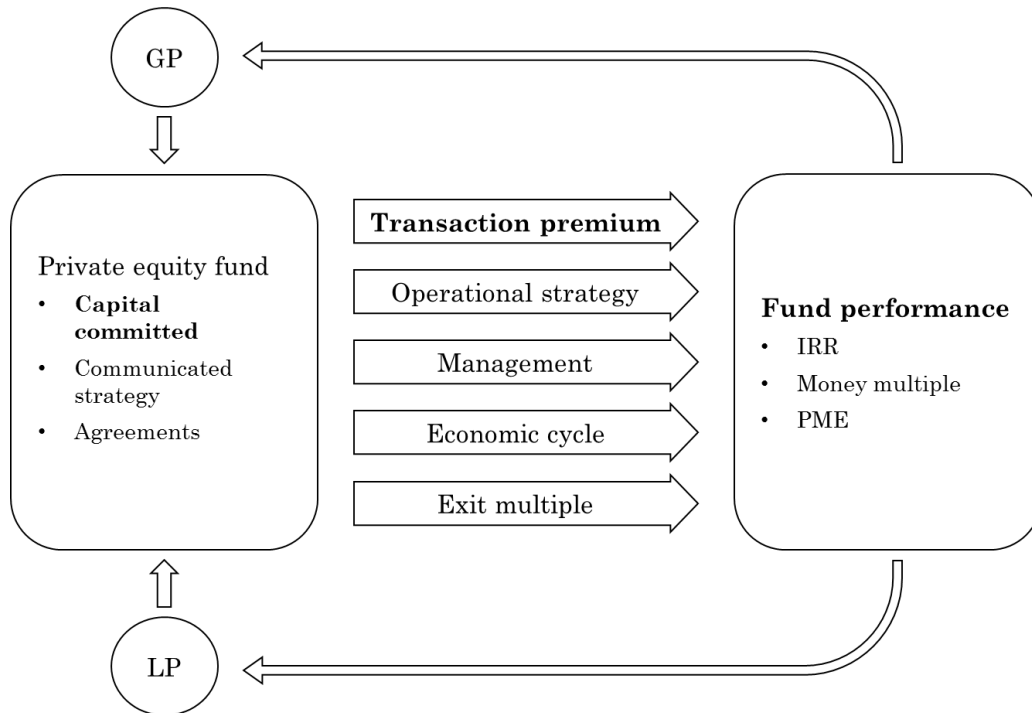
4.1 Hypotheses

As described in Section 2, the private equity industry has undergone huge structural changes during recent years. The industry is said to have reached a phase of maturity, characterized by increased competition, large amounts of capital and decreasing performance. Recent studies (e.g. Harris et al., 2015) have shown that the capital committed has a negative correlation with fund performance and Appelbaum and Batt (2016) describes a funding climate in which private equity acquirers experience large amounts of capital inflows and high levels of capital committed. From this, we believe that part of the industry's decreasing performance, can be attributed to higher premiums offered in PTP transactions by private equity acquirers. In line with findings of Baker and Montgomery (2009), we argue that much of the front-loaded value creation is dispersed as private equity firms need to hunt for valuable targets whilst competing with industry peers and other acquirer types. Although there exist several complex dimensions of a limited partnership, we have tried to illustrate the relationship between a private equity fund and its performance through a simple model (as seen in Figure 2). We want to highlight that the transaction premium is one among many factors affecting the fund's performance.

Bargeron et al (2008) are able to find evidence that private operating firms offer higher premiums to target shareholders than private equity firms. However, the authors are not able to find consistent evidence for this when taking target and deal characteristics into account.

Figure 2: Private equity business model

This figure shows the number of announced transaction by private equity and private operating acquirers as well as total transaction value of announced transactions (per annum).



Therefore, based on previous literature and recent private equity trends we build our hypotheses on the underlying belief of higher premiums paid by private equity firms in more recent years. To conclude, these are our hypotheses:

- *Hypothesis 1:* Private equity firms on average pay a higher premium during the period 2008 – 2016 compared to 1999 – 2007 in US PTP transactions, without taking into account target and deal characteristics.
- *Hypothesis 2:* Private operating firms on average pay higher premiums than private equity firms in US PTP transactions during the period 2008 to 2016, without taking into account target and deal characteristics.
- *Hypothesis 3:* Private equity firms pay a higher premium compared to private operating firms during the period 2008 to 2016, when taking into account target and deal characteristics.

4.2 Premium as the dependent variable

The premium is defined as the final offer price divided by the share price four weeks prior to announcement. The period of four weeks (20 trading days) is used to adjust for potential pre-bid runner ups, in line with previous literature. All of the transactions are composed of winning bids to ensure uniformity among the premium sample, as described in Section 3.

4.3 Target and deal characteristics as the independent variables

Target and deal characteristics are included in the multiple regression in order to evaluate the difference in premiums paid between private equity firms and private operating firms. The selection of these independent variables is based on previous research (e.g. Bargaron et al., 2008; Fidrmuc et al., 2012). Previous authors have chosen different target and deal characteristics to include in their studies. Hence, we have chosen to include quite a large set of variables in order to minimize the risk of a systematic error.

The variables regarding target characteristics include market capitalization, sales, EBITDA to sales, return on assets, debt to assets, cash flow from operations to assets, intangible assets to assets, sales growth over the last two years, Tobin's Q and cash over transaction value. These are factors that describe the underlying business of the target firm, hence they may affect the premium offered.

Market capitalization, in million US dollars four weeks prior to announcement is used to assess the size of the firm. The net sales figure is from the financial report, the latest twelve months (LTM) prior to announcement. The natural logarithm will be used on both market capitalization and sales. This is due to an easier interpretation of the results as the observations become more normally distributed. EBITDA to sales and return on assets are measures describing the profitability of the firm. EBITDA to sales is calculated as earnings before interest, taxes, depreciation and amortization over net sales. Return on assets is calculated as net income over book value of total assets. Both profitability measures are from the financial report, the latest twelve months (LTM) prior to announcement. Debt

to assets is a measure of the firm's financial position and is defined as the ratio of book value of debt to book value of assets, also the LTM report prior to announcement. The cash flow from operations to assets is also based on book value of assets and from the LTM report prior to announcement. This variable shows the cash generating capabilities of the firm. The variable intangible assets divided by assets also comes from the financial report LTM, prior to announcement. The variable sales growth is calculated as the compounded annual growth rate of net sales during the last two years. The variable Tobin's Q is calculated as the market capitalization four weeks prior to announcement over the book value of equity. Cash over transaction value is the cash from the LTM report prior to announcement divided by the transaction value.

The variables regarding deal characteristics include private equity dummy, management participation dummy, initial dummy, multiple bidders dummy, toehold dummy and defensive dummy. The private equity dummy takes the value of one if the acquirer is a private equity firm (as defined in Section 1) and zero otherwise. The management participation dummy takes into account if the target management participated in the acquisition as a part of the acquirers, takes a value of one if this is the case and zero otherwise. The initial dummy variable, describes if this winning bid presented is also the initial bid in the selling process. The multiple bidders variable is defined as the existence of two or more bidders for the same target, takes the value of one if this is true and zero otherwise. The toehold dummy shows whether or not the acquirer owned 0.5% of target's outstanding shares prior to announcement (in line with Barger et al. (2008)). The defensive dummy takes the value of one if the target was unwilling to be acquired in the beginning and tried some sort defensive strategy in order to prohibit this, takes the value of zero if this is not true.

4.4 Univariate analysis

A univariate analysis of the average premium will be conducted in order to test hypotheses 1; Private equity firms on average pay a higher premium during the period 2008 – 2016 compared to 1999 – 2007 in US PTP transactions, without taking into account target and deal characteristics, and 2; Private operating firms

on average pay higher premiums than private equity firms in US PTP transactions during the period 2008 to 2016, without taking into account target and deal characteristics. The premium, as defined above, is the variable of interest when testing these hypotheses. The difference in means will be tested through a one-tailed independent group t-test. The independent group t-test will be used since the variance for the population is unknown. This t-test is commonly used to assess whether two independent groups have a significant difference in means for a specific variable.

4.4.1 Univariate analysis of target and deal characteristics

In line with Barger et al. (2008), we will perform a univariate analysis of our independent variables to find which target and deal characteristics present a significant difference between the two different acquirer groups. These variables will later be used in our regressions and are discussed in the Section 4.5.

4.5 Regression analysis

An ordinary least squares regression (OLS) will be used to test hypothesis 3; Private equity firms pay a higher premium compared to private operating firms during the period 2008 to 2016, when taking into account target and deal characteristics. The premium (as defined above in the beginning of this section) will be used as the dependent variable. Target and deal characteristics will be used as independent variables.

The OLS regression requires that several assumptions about the data hold. These include the following; (1) A linear relationship between the dependent and the independent variables, (2) the residuals to be normally distributed, (3) the variance of the residuals to be homoscedastic and (4) no multicollinearity. The follow tests have been conducted:

1. The data is tested through different sort of plots. We conclude that there exist differences between the degrees of linearity for the independent variables against the dependent one.
2. The data is tested through a Kernel density estimation. The test shows that our data is not normally distributed, it is skewed upwards.

3. The data is tested with both the Breusch-Pagan test and the White's test. Both test show that the data is heteroscedastic.
4. The data is tested using a vif test. There is no sign of multicollinearity.

We conclude that our data do not fulfil all of these assumptions. Should be noted that this is often the case for economic research.

In order to mitigate the effect of these OLS regression assumption violations we will use robust standard errors in our regressions. In addition to this, the application of robust standard errors is suitable for our data due to the fact that a small amount of highly positive and highly negative premiums (the dependent variable) can be observed. Since the OLS regression model is highly sensitive to extreme dependent observations, these observations will affect the results to a disproportionately large extent. Standard robust errors will reduce the effect on the results of these extreme observations by giving them less weight, but still allow us to take them into consideration.

4.6 Robustness tests

We will conduct the univariate and multiple regression analysis described above with three adjustments in order to test how robust and plausible our results are. White and Lu (2014) argue for the importance of conducting these kinds of robustness tests.

Firstly, we will use a broader definition of private equity acquirers and consider all transactions with financial sponsor involvement to be included in our private equity acquirer dummy variable. This is based on the assumption that private equity acquirers, which could be a major shareholder in the acquiring company, might have reasonable effect on the acquisition process. Secondly, we will use a narrow definition of private equity acquirers and only include those transactions in which a sole private equity firm is the acquirer in our private equity acquirer dummy variable. The excluded observations will not be included in our calculations as we do consider private equity influences to be too substantial. Thirdly, we will do our main analyses with a premium calculated as offer share

price over the share price one week prior to announcement, instead of the base case with the share price four weeks prior to announcement.

5 Results

In this section the results will be presented. We begin with a general overview of the data through descriptive statistics. The main results are thereafter presented where our hypotheses are tested. The section ends with robustness tests.

5.1 Descriptive statistics

5.1.1 Dependent variable

As can be seen in Table 3, private operating firms have paid higher premiums compared to private equity firms during the entire time period (55.34% for private operating firms compared to 36.01% for private equity firms). The average premium has increased from 30.91% in the period 1999 to 2007, to 42.31% in 2008 to 2016, for private equity firms.

For private operating firms the average premium has increased from 52.50% in the first period, to 61.43% in the second period. This means that the average premium has increased more for the private equity firms compared to the private operating firms. Both the min and the max value is lower respectively higher for private operating firms compared to private equity firms, for both time periods.

Table 3: Dependent variable

The table shows the mean, standard deviation, min, max and number of observations for the dependent variable per private operating acquirers and private equity acquirers over the time period 1999 - 2016. The premium is defined as the final offer price divided by the share price four weeks prior to announcement.

Timeperiod	Private operating acquirers					Private equity acquirers				
	Mean	Std. Dev.	Min.	Max.	N	Mean	Std. Dev.	Min.	Max.	N
<i>4 Week Premium</i>										
Premium, 1999 - 2007	0.5250	0.8025	-0.9513	8.1514	296	0.3091	0.2765	-0.3068	1.6962	179
Premium, 2008 - 2016	0.6143	0.9347	-0.6640	6.5000	138	0.4231	0.5484	-0.3902	4.5000	145
Total	0.5534	0.8467	-0.9513	8.1514	434	0.3601	0.4236	-0.3902	4.5000	324

5.1.2 Independent variables

As can be seen in Table 4 in Appendix, there exist several differences in both average target and average deal characteristics between private equity firms and private operating firms. Private equity firms are acquiring larger targets, both in

terms of market capitalization and sales. The profitability, as measured by EBITDA over sales and return on assets, is higher for targets acquired by private equity firms. Private equity firms also seem to acquire firms with a somewhat lower leverage ratio as measured by debt to assets. Operating firms have a toehold to a larger extent than private equity firms.

5.2 Main results

5.2.1 Hypothesis 1

A one-tailed independent group t-test is used to test hypothesis 1; Private equity firms on average pay a higher premium during the period 2008 – 2016 compared to 1999 – 2007 in US PTP transactions, without taking into account target and deal characteristics. As can be seen in Table 5, private equity firms are paying a higher premium for the period 2008 to 2016 (an average premium of 42.31%) compared to the period 1999 to 2007 (an average premium of 30.91%). The difference, -11.40%, is significant at the 5% level. The result show that hypothesis 1 holds true; Private equity firms are in fact paying a higher premium after 2008 compared to before, without taking into account target and deal characteristics.

Table 5: Univariate analysis of the average premium paid by private equity acquirers

The table shows the mean and standard deviation for the average premium paid by private equity acquirers over the time periods 1999 - 2007 and 2008 - 2016. The difference between the means, p-value and t-value are presented. These are based on a one-sided independent group t-test. The premium is defined as the final offer price divided by the share price four weeks prior to announcement.

	Private equity acquirers 1999 - 2007		Private equity acquirers 2008 - 2016		Difference between time periods		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
4 Week Premium	0.3091	0.2765	0.4231	0.5484	-0.1140**	0.0118	(-2.2793)
N	179		145		324		

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

The same analysis has been conducted on private operating firms (see Table 6 in Appendix). Private operating firms have paid an 8.9% higher premium in average from the first (1999 – 2007) to the second period (2008 – 2016). However, the result is not significant.

5.2.2 Hypothesis 2

A one-tailed independent group t-test is also used to test hypothesis 2; Private operating firms on average pay higher premiums than private equity firms in US PTP transactions during the period 2008 to 2016, without taking into account target and deal characteristics. As can be seen in Table 7, private operating firms are paying a higher premium (an average of 61.43%) compared to private equity firms (an average of 42.31%) during the period between 2008 and 2016. The difference, 19.13%, is significant at the 5% level. The results show that hypothesis 2 holds true; Private operating firms are in fact paying a higher premium compared to private equity firms after 2008, without taking into account target and deal characteristics.

Table 7: Univariate analysis of the average premium paid by private operating acquirers compared to private equity acquirers

The table shows the mean and standard deviation for the average premium paid by private operating acquirers and private equity acquirers during 2008 - 2016. The difference between the means, p-value and t-value are presented. These are based on a one-sided independent group t-test. The premium is defined as the final offer price divided by the share price four weeks prior to announcement.

	Private operating acquirers 2008 - 2016		Private equity acquirers 2008 - 2016		Difference between acquirer types		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
4 Week Premium	0.6143	0.9347	0.4231	0.5484	0.1913**	0.0190	(2.0864)
N	138		145		283		

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

5.2.3 Hypothesis 3

To be able to understand differences in target and deal characteristics between the two acquirer groups, we have conducted a univariate analysis for each of our independent variables. The analysis is conducted for the second time period (2008 - 2016), as this time period is our main focus. The result is presented in Table 8 in Appendix.

Several differences in target characteristics can be seen between the two acquirer groups. Private equity firms have acquired larger firms than operating firms as measured by market capitalization and sales. The difference is significant at the 1% level. Private equity firms have also acquired more profitable targets compared to private operating firms. This holds true both for EBITDA over sales and return on assets. Both profitability measures are significant at the 1% level. Private equity firms have acquired less leveraged firms compared to private operating firms as measured by debt to assets. However, the difference is not significant. Private equity firms have also acquired firms with a higher cash flow from operations to assets, the difference is significant at the 1% level. Higher fraction of intangible assets to total assets also characterizes the targets acquired by private equity firms compared to private operating firms, the difference is significant at the 1% level. Private equity firms also seem to acquire firms with a lower market-to-book value as measured by Tobin's Q and lower sales growth, however the results are not significant. Private operating firms seems to acquire firms with a higher ratio of cash to transaction value, the difference is significant at the 5% level.

Deal characteristics are rather similar between the acquirer groups. However, some important differences still exist. Private operating firms more often acquire targets together with the target firm's management. The difference is significant at the 10% level. The initial dummy, the multiple bidder dummy and the defensive dummy is close to the same for both acquirer types, however, there seems to be somewhat more competition for the targets acquired by private equity firms (as seen by lower average for the initial dummy, higher average for the multiple bidder dummy and higher average for the defensive dummy). The difference for the initial, the multiple and the defensive dummies are not significant. Private equity firms have had a lower degree of toeholds compared to private operating firms, the difference is significant at the 10% level.

Based on the differences in target and deal characteristics for the two acquirer groups, there are many reasons to why there exist differences in premiums offered target shareholders during buyouts. We have chosen to focus on the significant differences to see if this might explain the reason to why private

equity acquirers are able to acquire targets at a lower average premium than private operating acquirers. However, we will also include target and deal characteristics that were shown not to be significant in order to test that the results hold for a larger set of control variables.

A multiple OLS regression with standard robust errors is used to test hypothesis 3; Private equity firms pay a higher premium compared to private operating firms during the period 2008 to 2016, when taking into account target and deal characteristics. Table 9 presents the results of these regressions.

Table 9: Primary regressions

This table shows different regressions. The time period is 2008-2016. The dependent variable is the premium defined as the final offer price divided by the share price four weeks prior to announcement. "Simple" only includes the main independent dummy variable, the one that shows if acquirer is a private equity firm. "Target" includes all target characteristics that showed a significant difference in the univariate analysis. "Deal" includes all deal characteristics that showed a significant difference in the univariate analysis. "Significant-" includes all target and deal characteristics that showed a significant difference in the univariate analysis, but excluding those that explain similar aspects of target and deal. "Significant+" includes all target and deal characteristics that showed a significant difference in the univariate analysis. "All" includes all independent variables.

	Simple	Target	Deal	Significant-	Significant+	All
Private equity acquirer	-0.1913** (0.038)	0.1661* (0.075)	-0.1934** (0.040)	0.1839* (0.094)	0.1629* (0.084)	0.2015* (0.075)
ln(Market capitalization)		-0.2393*** (0.002)		-0.1480*** (0.000)	-0.2463*** (0.002)	-0.2989*** (0.001)
ln(Sales)		0.1565** (0.018)			0.1655** (0.018)	0.2172*** (0.007)
EBITDA/Sales		0.1444 (0.489)		0.1874 (0.191)	0.1479 (0.473)	0.5787 (0.242)
ROA		-0.2227 (0.526)			-0.2110 (0.541)	-0.4580 (0.332)
CFFO/Assets		0.2879 (0.401)		0.1714 (0.655)	0.2279 (0.489)	-0.1874 (0.774)
Intangible assets/Assets		-0.1982 (0.186)		-0.1841 (0.253)	-0.1935 (0.194)	-0.2391 (0.211)
Cash/Transaction value		0.0153 (0.481)		0.0273 (0.107)	0.0193 (0.250)	-0.0390 (0.785)
Management participation			-0.0674 (0.775)	0.1296 (0.386)	-0.0259 (0.826)	0.0431 (0.829)
Toehold			0.0146 (0.924)	-0.0773 (0.561)	-0.1485 (0.335)	-0.2974 (0.153)
Debt/Assets						-0.1634 (0.339)
Sales growth						-0.0164 (0.884)
Tobin's Q						-0.0034* (0.056)
Initial						0.0823 (0.501)
Multiple bidders						0.2087 (0.122)
Defensive						-0.0754 (0.676)
Constant	0.6143*** (0.000)	0.7296*** (0.000)	0.6169*** (0.000)	1.1143*** (0.000)	0.7349*** (0.000)	0.7081*** (0.005)
N	283	190	283	190	190	140
adj. R-sq	0.012	0.251	0.005	0.165	0.248	0.248

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

As can be seen in the first regression (noted Simple), private equity firms are paying a lower premium compared to private operating firms without taking into account target and deal characteristics (a negative sign for the Private equity variable). Private equity firms have been paying a 19.13% lower premium during the period between 2008 and 2016, significant at the 5% level. This is in line with the result found regarding our second hypothesis. In the following regressions, target and deal characteristics are included. In the second regression (noted Target), all target characteristics that showed a significant difference in the univariate analysis (see Table 8 in Appendix) are included. The same method is used to determine the deal characteristics included in the regression (noted Deal). The fourth regression (noted Significant-) includes all significant target and deal characteristics, excluding independent variables which might explain similar aspects of the target firm. Sales and market capitalization are both measures of size. EBITDA over sales and return on assets are both profitability measures. All significant target and deal characteristics are included in the fifth regression (noted Significant+). Finally, in the last regression (noted All), all independent variables are included. As can be seen from regression four to six, private equity firms have paid higher premiums compared to private operating acquirers, when taking target and deal characteristics into account between 2008 and 2016. All results are significant at the 10% level. The results show that hypothesis 3 holds true; Private equity firms are in fact paying a higher premium compared to private operating firms for the period of 2008 – 2016, when taking into account target and deal characteristics. Important to note is that the size variables, sales and market capitalization, have high explanatory value and are significant at the 1% level in all the regressions in which they are included.

In Table 10, regression Simple and Significant+ are shown for both the first (1999-2007) and the second (2008-2016) period. As can be seen in the two first columns private equity firms have been paying a lower premium compared to private operating firms during the entire period from 1999 to 2016, without taking into account target and deal characteristics. The difference has however become smaller (from -21,59% in the period 1999-2007 to -19,13% in the period 2008-2016). For the last two regression columns, the significantly different target and deal

characteristics are included. In the first period, private equity firms paid slightly lower premiums compared to operating firms, however this difference is not significant. Furthermore, in the second period, private equity firms are shown to have paid higher premiums than private operating firms when taking target and deal characteristics into account.

Table 10: Primary regressions over time

This table shows different regressions over the time periods 1999 - 2007 and 2008 - 2016. The dependent variable is the premium defined as the final offer price divided by the share price four weeks prior to announcement. "Simple" only includes the main independent dummy variable, the one that shows if acquirer is a private equity firm. "Significant+" includes all target and deal characteristics that showed a significant difference in the univariate analysis.

	Simple	Simple	Significant+	Significant+
	1999 - 2007	2008 - 2016	1999 - 2007	2008 - 2016
Private equity acquirer	-0.2159*** (0.000)	-0.1913** (0.038)	-0.0874 (0.143)	0.1629* (0.084)
ln(Market capitalization)			-0.1223*** (0.002)	-0.2463*** (0.002)
ln(Sales)			0.0627 (0.164)	0.1655** (0.018)
EBITDA/Sales			-1.3220** (0.049)	0.1479 (0.473)
ROA			0.9845* (0.057)	-0.2110 (0.541)
CFFO/Assets			-0.0454 (0.928)	0.2279 (0.489)
Intangible assets/Assets			0.3594* (0.085)	-0.1935 (0.194)
Cash/TV			0.0454 (0.896)	0.0193 (0.250)
Management Participation			0.1091 (0.273)	-0.0259 (0.826)
Toehold			0.0979 (0.516)	-0.1485 (0.335)
Constant	0.5250*** (0.000)	0.6143*** (0.000)	0.7360*** (0.000)	0.7349*** (0.000)
N	475	283	275	190
adj. R-sq	0.023	0.012	0.330	0.248

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

5.2.4 Further analysis

We conducted another univariate analysis for our independent variables to see if there exist differences between target and deal characteristics over the two time periods (1999 – 2007 and 2008 – 2016). This analysis is performed both for private equity acquirers over time (see Table 11 in Appendix) and for private operating acquirers over time (see Table 12 in Appendix).

For private equity acquirers, we find that the average fraction of intangibles to assets has increased from the first to the second period at the 1% significance level. They have also acquired smaller firms as measured by sales, the result is significant at the 5% level. Also, less deals announced post 2008 involve management. This is significant at the 1% level.

For private operating acquirers, we find that they have purchased less profitable firms in the period after 2008 as measured by return on assets. Significant at the 5% level. We also find at the 1% significance level that the involvement of target management has increased in recent years.

5.3 Robustness tests

This subsection presents the results from the robustness tests. The same independent group t-tests and multiple OLS regression over time with standard robust errors as above have been used.

In the first test, we will use the broader definition of a private equity acquirer, including all acquirers with financial sponsor involvement under the private equity acquirer dummy variable. The same conclusions can be drawn. Private equity firms have paid a higher average premium in the second period compared to the first. Private operating firms have paid a higher average premium than private equity firms during the second period. Both results are significant at the 5% level (see Tables 13 and 14 in Appendix). When accounting for target and deal characteristics, private equity firms paid a lower premium during the first period (not significant) and a higher premium during the second period (10% significance level) compared to private operating firms (see Table 15 in Appendix).

The second test used a narrower definition of private equity acquirers, only including those transactions in which one single private equity firm was the direct acquirer. The results for the univariate analyses are the same (see Tables 16 and 17 in Appendix). The result for the multiple regression still show that private equity acquirers offered a higher premium compared to private operating firms (during 2008 to 2016), when taking into account target and deal characteristics. However, the result is not significant (see Table 18 in Appendix).

Thirdly, the results using the dependent variable defined as the offer share price over the share price one week prior to announcement, are the same as using the narrower definition of private equity firms (see Tables 19, 20 and 21 in Appendix).

5.4 Summary of hypotheses and results

Hypothesis 1: Private equity firms on average pay a higher premium during the period 2008 – 2016 compared to 1999 – 2007 in US PTP transactions, without taking into account target and deal characteristics.

Result: This hypothesis is supported

Hypothesis 2: Private operating firms on average pay higher premiums than private equity firms in US PTP transactions during the period 2008 to 2016, without taking into account target and deal characteristics.

Result: This hypothesis is supported

Hypothesis 3: Private equity firms pay a higher premium compared to private operating firms during the period 2008 to 2016, when taking into account target and deal characteristics.

Result: This hypothesis is supported

5.5 Limitations

As the robustness tests show, we cannot reject the possibility that our results have been affected by selection bias. Selection bias might be the case due to the limitations of only using one database (in our case Thomson Reuters SDC

Platinum). When gathering data from SDC Platinum, our final data set presented missing observation for several variables. The choice of which specific observations included in the regressions were not made by us, they were based on data availability in SDC Platinum. Our results also rely fully on the correctness of the numbers reported by SDC.

We disregard several of the assumptions needed for using a t-test and an OLS-regression, which may cause problems when interpreting our results from a statistical perspective. It should be noted that this often is the case with economic research.

Another potential problem with our results is not including all possible target and deal characteristics that might have an effect on the premium paid. For example, the selling mechanism has shown to impact the premium. (Fidrmuc et al., 2012). Another factor that has been shown to affect the premium is the fact that private equity firms usually acquire in just a couple of specific industries compared to private operating firms. (Fidrmuc et al., 2012)

6 Conclusion

The purpose of this study has been to investigate differences in premiums paid between acquirer groups. More specifically, the difference in premiums paid by private equity firms compared to private operating firms in US PTP transactions over the period 1999 to 2016. The main focus has been on investigating how private equity firms have evolved after the financial crisis in 2008 with regard to premiums paid.

We show that private equity firms on average pay a higher premium in US PTP transactions after 2008 compared to before. Furthermore, private operating firms are still on average paying a higher premium when compared to private equity firms after 2008, without taking target and deal characteristics into account. However, when accounting for target and deal characteristics, private equity firms are paying a higher premium compared to private operating firms. All our results are statistically significant.

Our findings are relevant in regards to the recent trends within the private equity industry. A phase of maturity has been reached, characterized by falling performance and high amounts of committed capital. Increased competition is assumed to be the underlying reason for the falling performance, which means it has become more difficult to find so called low-hanging fruit. A saturated competitive landscape and larger amounts committed capital creates a situation in which higher premiums are offered in order to acquire target firms. The value creation potential is limited as number of undervalued targets decrease and acquisitions premiums surge. Hence, private equity firms are struggling to maintain their historical high performance. Of course, higher premiums are only one of many factors explaining the recent decrease in performance, but perhaps an important one.

6.1 Further research

For further research, we suggest conducting the same study as we have but to include public operating firms as a third acquirer group. These public operating firms have become more cash-rich during the latest years which might be one

important reason for the higher premiums paid in the PTP market. Also, the relation between the higher amounts of capital committed for private equity firms and the observed higher premiums paid in PTP transactions allows for another paper subject to investigate in further detail.

References

- Appelbaum, E. & Batt, R. 2016, *Are Lower Private Equity Returns the New Normal?*, Center for Economic and Policy Research.
- Bain & Company, 2017, GLOBAL PRIVATE EQUITY REPORT 2017.
[online] Bain & Company. Available at:
<<http://www.bain.com/publications/articles/global-private-equity-report-2017.aspx>> [Accessed 9 April 2017]
- Baker, G.P. & Montgomery, C.A. 2009, "Conglomerates and LBO associations: A comparison of organizational forms", *Harvard Business School Working Paper*, No. 10-024, September 2009.
- Bargeron, L.L., Schlingemann, F.P., Stulz, R.M. & Zutter, C.J. 2008, "Why do private acquirers pay so little compared to public acquirers?", *Journal of Financial Economics*, vol. 89, no. 3, pp. 375-390.
- Berg, A. & Gottschalg, O.F. 2005, "Understanding value generation in buyouts", *Journal of Restructuring Finance*, vol. 2, no. 01, pp. 9-37.
- Ehn, L. 2015, "Leaving the public capital market: A literature survey about the going private decision", *European Scientific Journal*, vol. 11, no. 7.
- Fidrmuc, J.P., Roosenboom, P., Paap, R. & Teunissen, T. 2012, "One size does not fit all: Selling firms to private equity versus strategic acquirers", *Journal of Corporate Finance*, vol. 18, no. 4, pp. 828-848.
- Geranio, M. & Zanotti, G. 2012, "Equity Markets Do Not Fit All: An Analysis of Public-to-Private Deals in Continental Europe", *European Financial Management*, vol. 18, no. 5, pp. 867-895.
- Guo, S., Hotchkiss, E.S. & Song, W. 2011, "Do Buyouts (Still) Create Value?", *Journal of Finance*, vol. 66, no. 2, pp. 479-517.
- Harris, R.S., Jenkinson, T. & Kaplan, S.N. 2015, "How do private equity investments perform compared to public equity?", *Darden Business School Working Paper No. 2597259*.
- Holmstrom, B. & Kaplan, S.N. 2001, "Corporate governance and merger activity in the United States: Making sense of the 1980s and 1990s", *Journal of Economic Perspectives*, vol. 15, no. 2, pp. 121-144.
- Jensen, M.C. 1989, "Eclipse of the public corporation", *Harvard Business Review* 67, 61 – 75.

- Jensen, M.C. 1986, "Agency costs of free cash flow, corporate finance, and takeovers", *The American Economic Review*, vol. 76, no. 2, pp. 323-329.
- Kaplan, S. 1989a, "The effects of management buyouts on operating performance and value", *Journal of Financial Economics*, vol. 24, no. 2, pp. 217-254.
- Kaplan, S. 1989b, "Management Buyouts: Evidence on Taxes as a Source of Value", *The Journal of Finance*, vol. 44, no. 3, pp. 611-632.
- Kaplan, S.N. & Strömberg, P. 2009, "Leveraged buyouts and private equity", *Journal of Economic Perspectives*, vol. 23, no. 1, pp. 121-146.
- Lu, X. & White, H. 2014, "Robustness checks and robustness tests in applied economics", *Journal of Econometrics*, vol. 178, no. PART 1, pp. 194-206.
- Maksimovic, V., Phillips, G. & Yang, L. 2013, "Private and public merger waves", *Journal of Finance*, vol. 68, no. 5, pp. 2177-2217.
- Renneboog, L. & Simons, T. 2005, *Public-to-Private Transactions: LBOs, MBOs, MBIs and IBOs*, Tilburg University.
- Renneboog, L. & Vansteenkiste, C. 2017, "Leveraged Buyouts: A Survey of the Literature", Tilburg University.
- Renneboog, L., Simons, T. & Wright, M. 2007, "Why do public firms go private in the UK? The impact of private equity investors, incentive realignment and undervaluation", *Journal of Corporate Finance*, vol. 13, no. 4, pp. 591-628.
- Schwert, G.W. 1996, "Markup pricing in mergers and acquisitions", *Journal of Financial Economics*, vol. 41, no. 2, pp. 153-192.
- Sensoy, B.A., Wang, Y. & Weisbach, M.S. 2014, "Limited partner performance and the maturing of the private equity industry", *Journal of Financial Economics*, vol. 112, no. 3, pp. 320-343.
- Shivdasani, A. & Wang, Y. 2011, "Did structured credit fuel the LBO boom?", *Journal of Finance*, vol. 66, no. 4, pp. 1291-1328.
- Shleifer, A. & Vishny, R.W. 1990, "The takeover wave of the 1980s", *Science*, vol. 249, no. 4970, pp. 745-749.
- Weir, C., Wright, M. & Scholes, L. 2008, "Public-to-private buy-outs, distress costs and private equity", *Applied Financial Economics*, vol. 18, no. 10, pp. 801-819.

Appendix

Table 1: Number of announced transactions

The table shows the number of PTP transactions announced by private operating acquirers and private equity acquirers over the time period 1999 - 2016. The percentage of total transactions and the percentage of announced transactions per year are also reported. All of the reported transactions have been completed.

Year	Private operating acquirers			Private equity acquirers			All private acquirers	
	Frequency	% of all transactions	% of transactions per annum	Frequency	% of all transactions	% of transactions per annum	Frequency	% of all transactions
1999	45	5.94	68.18	21	2.77	31.82	66	8.71
2000	38	5.01	67.86	18	2.37	32.14	56	7.39
2001	35	4.62	83.33	7	0.92	16.67	42	5.54
2002	27	3.56	71.05	11	1.45	28.95	38	5.01
2003	38	5.01	74.51	13	1.72	25.49	51	6.73
2004	17	2.24	58.62	12	1.58	41.38	29	3.83
2005	35	4.62	62.50	21	2.77	37.50	56	7.39
2006	33	4.35	44.59	41	5.41	55.41	74	9.76
2007	28	3.69	44.44	35	4.62	55.56	63	8.31
2008	18	2.37	62.07	11	1.45	37.93	29	3.83
2009	13	1.72	54.17	11	1.45	45.83	24	3.17
2010	25	3.30	60.98	16	2.11	39.02	41	5.41
2011	10	1.32	38.46	16	2.11	61.54	26	3.43
2012	18	2.37	48.65	19	2.51	51.35	37	4.88
2013	13	1.72	39.39	20	2.64	60.61	33	4.35
2014	14	1.85	50.00	14	1.85	50.00	28	3.69
2015	15	1.98	48.39	16	2.11	51.61	31	4.09
2016	12	1.58	35.29	22	2.90	64.71	34	4.49
Total	434	57.26	57.26	324	42.74	42.74	758	100.00

Table 2: Transaction values

The table shows the min, the max and the sum of transaction values per acquirer group over the time period 1999 - 2016.

	Private operating acquirers			Private equity acquirers			All private acquirers		
Year	Min.	Max.	Sum	Min.	Max.	Sum	Min.	Max.	Sum
1999	1.442	9487.918	18613.174	65.385	945.389	5981.058	1.442	9487.918	24594.232
2000	2.537	2185.846	6757.064	39.647	2175.138	7932.502	2.537	2185.846	14689.566
2001	1.163	2453.423	4626.376	6.509	874.877	1450.578	1.163	2453.423	6076.954
2002	1.548	1720.821	3646.750	9.639	718.358	2143.751	1.548	1720.821	5790.501
2003	2.290	2230.957	6167.277	11.676	409.493	1263.756	2.290	2230.957	7431.033
2004	3.188	1994.201	4303.173	3.347	4281.800	15881.659	3.188	4281.800	20184.832
2005	3.271	2472.725	16896.984	22.390	10964.916	33979.324	3.271	10964.916	50876.308
2006	1.279	4756.885	19383.364	11.690	40656.911	252081.010	1.279	40656.911	271464.374
2007	3.248	6712.996	15701.540	17.966	32105.382	158030.884	3.248	32105.382	173732.424
2008	2.716	22361.200	24272.182	52.455	2037.156	4562.237	2.716	22361.200	28834.419
2009	1.286	113.467	500.427	9.606	4038.011	5933.070	1.286	4038.011	6433.497
2010	3.648	510.608	2934.851	66.402	5157.109	18689.789	3.648	5157.109	21624.640
2011	5.522	3305.906	4041.336	5.544	5139.015	16319.540	5.522	5139.015	20360.876
2012	10.931	591.245	1701.523	17.188	1885.648	9600.196	10.931	1885.648	11301.719
2013	10.567	7068.160	15672.323	82.928	23478.517	61129.223	10.567	23478.517	76801.546
2014	9.397	4642.966	7310.125	118.669	8453.715	31792.613	9.397	8453.715	39102.738
2015	6.212	11875.800	14578.311	48.204	13877.526	48632.072	6.212	13877.526	63210.383
2016	11.861	448.228	1614.776	1.170	4025.767	19899.290	1.170	4025.767	21514.066
Total	1.163	22361.200	168721.556	1.170	40656.911	695302.552	1.163	40656.911	864024.108
N	434			324			758		

Table 4: Independent variables

The table shows the mean, standard deviation, min, max and number of observations for the independent variables for the time period 1999 - 2016. All numbers are from the targets' reports last twelve months (LTM) prior to announcement, if not otherwise stated. Ln(Market capitalization) and Ln(Sales) is the natural logarithm for market capitalization four weeks prior to announcement and sales. EBITDA/Sales is earnings before interest, taxes, depreciation and amortization over sales. ROA is net income over book value of assets. Debt/Assets is the ratio of debt to assets, both book values. CFFO/Assets is the cash flow from operations divided by book value of assets. Intangible assets/Assets is based on book values. Sales growth is the compounded average growth rate of sales during the last two years. Tobin's Q is the market capitalization four weeks prior to announcement over the book value of equity. Cash/Transaction value is cash over the transaction price. Management participation, Initial, Multiple bidders, Toehold and Defensive are dummies that explain if the deal was characterized by management as part of the acquirers, the winning bid was also the initial bid, several bidders existed, the acquirer owned 0.5% of target prior to announcement and a defensive strategy existed.

Independent variables	Private operating acquirers					Private equity acquirers					All private acquirers				
	Mean	Std. Dev.	Min.	Max.	N	Mean	Std. Dev.	Min.	Max.	N	Mean	Std. Dev.	Min.	Max.	N
<i>Target characteristics</i>															
Ln(Market capitalization)	3.8261	1.8062	-0.9365	9.7536	434	5.7290	1.8727	-0.5108	10.1167	324	4.6395	2.0615	-0.9365	10.1167	758
Ln(Sales)	4.4221	1.5755	0.8763	8.9385	405	6.0366	1.5439	-0.0965	10.9783	318	5.1322	1.7546	-0.0965	10.9783	723
EBITDA/Sales	-0.0133	0.6488	-5.8288	0.9262	371	0.1256	0.1673	-1.3822	0.7100	307	0.0496	0.4975	-5.8288	0.9262	678
ROA	-0.0908	0.3679	-2.2925	1.2417	407	0.0160	0.1371	-0.8010	1.0280	318	-0.0440	0.2949	-2.2925	1.2417	725
Debt/Assets	0.3929	0.6376	0.0005	6.4107	322	0.3195	0.2536	0.0001	1.4311	259	0.3602	0.5049	0.0001	6.4107	581
CFFO/Assets	-0.0008	0.3628	-4.0769	1.5069	396	0.0840	0.1067	-0.4934	0.4755	309	0.0364	0.2839	-4.0769	1.5069	705
Intangible assets/Assets	0.1683	0.1843	-0.0006	0.9058	237	0.2801	0.2201	0.0000	0.8224	269	0.2277	0.2114	-0.0006	0.9058	506
Sales growth	0.0493	0.3167	-0.6438	4.0224	382	0.0400	0.1605	-0.6817	1.1924	293	0.0453	0.2605	-0.6817	4.0224	675
Tobin's Q	10.32	189.85	-283.88	3823.39	408	9.24	121.77	-69.34	2181.40	321	9.84	163.31	-283.88	3823.40	729
Cash/Transaction value	0.4214	1.4379	0.0000	18.1442	362	0.1774	0.4148	0.0008	5.3863	318	0.3073	1.0929	0.0000	18.1442	680
<i>Deal characteristics</i>															
Management participation	0.1429	0.3503	0.0000	1.0000	434	0.1358	0.3431	0.0000	1.0000	324	0.1398	0.3471	0.0000	1.0000	758
Initial	0.9078	0.2896	0.0000	1.0000	434	0.8796	0.3259	0.0000	1.0000	324	0.8958	0.3057	0.0000	1.0000	758
Multiple bidders	0.0622	0.2418	0.0000	1.0000	434	0.0617	0.2410	0.0000	1.0000	324	0.0620	0.2413	0.0000	1.0000	758
Toehold	0.1429	0.3503	0.0000	1.0000	434	0.0648	0.2466	0.0000	1.0000	324	0.1095	0.3125	0.0000	1.0000	758
Defensive	0.0092	0.0957	0.0000	1.0000	434	0.0123	0.1106	0.0000	1.0000	324	0.0106	0.1023	0.0000	1.0000	758

Table 6: Univariate analysis of the average premium paid by private operating acquirers

The table shows the mean and standard deviation for the average premium paid by private operating acquirers over the time periods 1999 - 2007 and 2008 - 2016. The difference between the means, p-value and t-value are presented. These are based on a one-sided independent group t-test. The premium is defined as the final offer price divided by the share price four weeks prior to announcement.

	Private operating acquirers 1999 - 2007		Private operating acquirers 2008 - 2016		Difference between time periods		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
4 Week Premium	0.5250	0.8025	0.6143	0.9347	-0.0894	0.1532	(-1.0241)
N	296		138		434		

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Univariate analysis of the independent variables

The table shows the differences in means for the independent variables for the time period 2008 - 2016. A two-sided independent group t-test has been used. All numbers are from the targets' reports last twelve months (LTM) prior to announcement, if not otherwise stated. Ln(Market capitalization) and ln(Sales) is the natural logarithm for market capitalization four weeks prior to announcement and sales. EBITDA/Sales is earnings before interest, taxes, depreciation and amortization over sales. ROA is net income over book value of assets. Debt/Assets is the ratio of debt to assets, both book values. CFFO/Assets is the cash flow from operations divided by book value of assets. Intangible assets/Assets is based on book values. Sales growth is the compounded average growth rate of sales during the last two years. Tobin's Q is the market capitalization four weeks prior to announcement over the book value of equity. Cash/Transaction value is cash over the transaction price. Management participation, Initial, Multiple bidders, Toehold and Defensive are dummies that explain if the deal was characterized by management as part of the acquirers, the winning bid was also the initial bid, several bidders existed, the acquirer owned 0.5% of target prior to announcement and a defensive strategy existed.

Independent variables	Private operating acquirers		Private equity acquirers		Difference between acquirer types		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
<i>Target characteristics</i>							
ln(Market capitalization)	3.8491	1.8453	5.7571	1.7367	-1.9080***	0.0000	(-8.9474)
ln(Sales)	4.4238	1.6068	5.8350	1.5267	-1.4112***	0.0000	(-7.2407)
EBITDA/Sales	-0.1064	0.8550	0.1158	0.1508	-0.2222***	0.0064	(-2.7746)
ROA	-0.1548	0.4495	0.0095	0.1706	-0.1643***	0.0002	(-3.8195)
Debt/Assets	0.4630	0.9141	0.3188	0.2831	0.1442	0.1319	(1.5172)
CFFO/Assets	-0.0428	0.5376	0.0929	0.1031	-0.1357***	0.0069	(-2.7442)
Intangible assets/Assets	0.1960	0.2034	0.3246	0.2277	-0.1286***	0.0000	(-4.1603)
Sales growth	0.0695	0.4731	0.0257	0.1370	0.0438	0.3358	(0.9661)
Tobin's Q	32.6002	341.8632	2.7637	8.3400	29.8364	0.3312	(0.9755)
Cash/Transaction value	0.5178	1.4509	0.2100	0.4829	0.3078**	0.0354	(2.1260)
<i>Deal characteristics</i>							
Management participation	0.0652	0.2478	0.0207	0.1428	0.0445*	0.0672	(1.8399)
Initial	0.9203	0.2718	0.8621	0.3460	0.0582	0.1157	(1.5780)
Multiple bidders	0.0507	0.2202	0.0552	0.2291	-0.0044	0.8679	(-0.1665)
Toehold	0.1232	0.3299	0.0621	0.2421	0.0611*	0.0780	(1.7698)
Defensive	0.0072	0.0851	0.0207	0.1428	-0.0134	0.3345	(-0.9671)

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 11: Univariate analysis of the independent variables: Private equity acquirers over time

The table shows the differences in means for the independent variables for the time periods 1999 - 2007 and 2008 - 2016. A two-sided independent group t-test has been used. All numbers are from the targets' reports last twelve months (LTM) prior to announcement, if not otherwise stated. Ln(Market capitalization) and ln(Sales) is the natural logarithm for market capitalization four weeks prior to announcement and sales. EBITDA/Sales is earnings before interest, taxes, depreciation and amortization over sales. ROA is net income over book value of assets. Debt/Assets is the ratio of debt to assets, both book values. CFFO/Assets is the cash flow from operations divided by book value of assets. Intangible assets/Assets is based on book values. Sales growth is the compounded average growth rate of sales during the last two years. Tobin's Q is the market capitalization four weeks prior to announcement over the book value of equity. Cash/Transaction value is cash over the transaction price. Management participation, Initial, Multiple bidders, Toehold and Defensive are dummies that explain if the deal was characterized by management as part of the acquirers, the winning bid was also the initial bid, several bidders existed, the acquirer owned 0.5% of target prior to announcement and a defensive strategy existed

Independent variables	Private equity acquirers 1999 - 2007		Private equity acquirers 2008 - 2016		Difference in time for private equity acquirers		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
<i>Target characteristics</i>							
ln(Market capitalization)	5.7063	1.9806	5.7571	1.7367	-0.0508	0.8059	(-0.2459)
ln(Sales)	6.1952	1.5431	5.8350	1.5267	0.3602**	0.0385	(2.0788)
EBITDA/Sales	0.1335	0.1795	0.1158	0.1508	0.0176	0.3503	(0.9354)
ROA	0.0210	0.1037	0.0095	0.1706	0.0115	0.4822	(0.7040)
Debt/Assets	0.3201	0.2322	0.3188	0.2831	0.0013	0.9697	(0.0380)
CFFO/Assets	0.0768	0.1093	0.0929	0.1031	-0.0161	0.1844	(-1.3303)
Intangible assets/Assets	0.2431	0.2072	0.3246	0.2277	-0.0814***	0.0026	(-3.0414)
Sales growth	0.0521	0.1774	0.0257	0.1370	0.0264	0.1523	(1.4353)
Tobin's Q	14.4439	163.3733	2.7637	8.3400	11.6802	0.3422	(0.9523)
Cash/Transaction value	0.1512	0.3496	0.2100	0.4829	-0.0589	0.2244	(-1.2180)
<i>Deal characteristics</i>							
Management participation	0.2291	0.4214	0.0207	0.1428	0.2084***	0.0000	(6.1908)
Initial	0.8939	0.3089	0.8621	0.3460	0.0318	0.3892	(0.8623)
Multiple bidders	0.0670	0.2508	0.0552	0.2291	0.0119	0.6571	(0.4443)
Toehold	0.0670	0.2508	0.0621	0.2421	0.0050	0.8566	(0.1808)
Defensive	0.0056	0.0747	0.0207	0.1428	-0.0151	0.2507	(-1.1519)

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 12: Univariate analysis of the independent variables: Private operating acquirers over time

The table shows the differences in means for the independent variables for the time periods 1999 - 2007 and 2008 - 2016. A two-sided independent group t-test has been used. All numbers are from the targets' reports last twelve months (LTM) prior to announcement, if not otherwise stated. Ln(Market capitalization) and ln(Sales) is the natural logarithm for market capitalization 4 weeks prior to announcement and sales. EBITDA/Sales is earnings before interest, taxes, depreciation and amortization over sales. ROA is net income over book value of assets. Debt/Assets is the ratio of debt to assets, both book values. CFFO/Assets is the cash flow from operations divided by book value of assets. Intangible assets/Assets is based on book values. Sales growth is the compounded average growth rate of sales during the last two years. Tobin's Q is the market capitalization 4 weeks prior to announcement over the book value of equity. Cash/Transaction value is cash over the transaction price. Management participation, Initial, Multiple bidders, Toehold and Defensive are dummies that explain if the deal was characterized by management as part of the acquirers, the winning bid was also the initial bid, several bidders existed, the acquirer owned 0.5% of target prior to announcement and a defensive strategy existed.

Independent variables	Private operating acquirers 1999 - 2007		Private operating acquirers 2008 - 2016		Difference in time for private operating acquirers		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
<i>Target characteristics</i>							
ln(Market capitalization)	3.8155	1.7908	3.8491	1.8453	-0.0336	0.8586	(-0.1783)
ln(Sales)	4.4214	1.5648	4.4238	1.6068	-0.0024	0.9891	(-0.0136)
EBITDA/Sales	0.0296	0.5240	-0.1064	0.8550	0.1360	0.1143	(1.5882)
ROA	-0.0631	0.3234	-0.1548	0.4495	0.0917**	0.0423	(2.0450)
Debt/Assets	0.3608	0.4584	0.4630	0.9141	-0.1022	0.2895	(-1.0638)
CFFO/Assets	0.0179	0.2474	-0.0428	0.5376	0.0608	0.2347	(1.1934)
Intangible assets/Assets	0.1547	0.1732	0.1960	0.2034	-0.0413	0.1262	(-1.5390)
Sales growth	0.0404	0.2148	0.0695	0.4731	-0.0291	0.5256	(-0.6363)
Tobin's Q	0.4790	17.7104	32.6002	341.8632	-32.1211	0.2958	(-1.0499)
Cash/Transaction value	0.3799	1.4331	0.5178	1.4509	-0.1379	0.4060	(-0.8327)
<i>Deal characteristics</i>							
Management participation	0.1791	0.3840	0.0652	0.2478	0.1138***	0.0002	(3.7065)
Initial	0.9020	0.2978	0.9203	0.2718	-0.0183	0.5279	(-0.6320)
Multiple bidders	0.0676	0.2514	0.0507	0.2202	0.0168	0.4791	(0.7086)
Toehold	0.1520	0.3597	0.1232	0.3299	0.0288	0.4107	(0.8238)
Defensive	0.0101	0.1003	0.0072	0.0851	0.0029	0.7563	(0.3106)

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 13: Univariate analysis of the average premium paid by private equity acquirers:
Broader definition of private equity firms

The table shows the mean and standard deviation for the average premium paid by private equity acquirers over the time periods 1999 - 2007 and 2008 - 2016. The difference between the means, p-value and t-value are presented. These are based on a one-sided independent group t-test. The premium is defined as the final offer price divided by the share price four weeks prior to announcement.

	Private equity acquirers 1999 - 2007		Private equity acquirers 2008 - 2016		Difference between time periods		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
4 Week Premium	0.3205	0.2800	0.4279	0.5337	-0.1074**	0.0116	(-2.2856)
N	199		157		356		

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 14: Univariate analysis of the average premium paid by private operating acquirers compared to private equity acquirers: Broader definition of private equity firms

The table shows the mean and standard deviation for the average premium paid by private operating acquirers and private equity acquirers during 2008 - 2016. The difference between the means, p-value and t-value are presented. These are based on a one-sided independent group t-test. The premium is defined as the final offer price divided by the share price four weeks prior to announcement.

	Private operating acquirers 2008 - 2016		Private equity acquirers 2008 - 2016		Difference between acquirer types		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
4 Week Premium	0.6143	0.9347	0.4231	0.5484	0.1913**	0.0190	(2.0864)
N	138		145		283		

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 15: Regressions over time: Broader definition of private equity firms

This table shows different regressions over the time periods 1999 - 2007 and 2008 - 2016. The dependent variable is the premium defined as the final offer price divided by the share price four weeks prior to announcement. "Simple" only includes the main independent dummy variable, the one that shows if acquirer is a private equity firm. "Significant+" includes all target and deal characteristics that showed a significant difference in the univariate analysis.

	Simple	Simple	Significant+	Significant+
	1999 - 2007	2008 - 2016	1999 - 2007	2008 - 2016
Private equity acquirer (Broad)	-0.2118*** (0.000)	-0.1985** (0.041)	-0.0843 (0.184)	0.1593* (0.094)
ln(Market capitalization)			-0.1223*** (0.002)	-0.2444*** (0.002)
ln(Sales)			0.0632 (0.167)	0.1660** (0.018)
EBITDA/Sales			-1.3226** (0.049)	0.1559 (0.451)
ROA			0.9826* (0.057)	-0.2275 (0.510)
CFFO/Assets			-0.0459 (0.928)	0.2146 (0.513)
Intangible assets/Assets			0.3506* (0.092)	-0.1901 (0.197)
Cash/Transaction value			0.0464 (0.893)	0.0202 (0.234)
Management participation			0.1144 (0.247)	-0.0274 (0.817)
Toehold			0.0947 (0.532)	-0.1433 (0.352)
Constant	0.5323*** (0.000)	0.6265*** (0.000)	0.7368*** (0.000)	0.7173*** (0.000)
N	475	283	275	190
adj. R-sq	0.023	0.013	0.329	0.247

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 16: Univariate analysis of the average premium paid by private equity acquirers:
Narrower definition of private equity firms

The table shows the mean and standard deviation for the average premium paid by private equity acquirers over the time periods 1999 - 2007 and 2008 - 2016. The difference between the means, p-value and t-value are presented. These are based on a one-sided independent group t-test. The premium is defined as the final offer price divided by the share price four weeks prior to announcement.

	Private equity acquirers 1999 - 2007		Private equity acquirers 2008 - 2016		Difference between time periods		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
4 Week Premium	0.2819	0.2796	0.4341	0.6103	-0.1522**	0.0127	(-2.2563)
N	78		105		183		

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 17: Univariate analysis of the average premium paid by private operating acquirers compared to private equity acquirers: Narrower definition of private equity firms

The table shows the mean and standard deviation for the average premium paid by private operating acquirers and private equity acquirers during 2008 - 2016. The difference between the means, p-value and t-value are presented. These are based on a one-sided independent group t-test. The premium is defined as the final offer price divided by the share price four weeks prior to announcement.

	Private operating acquirers 2008 - 2016		Private equity acquirers 2008 - 2016		Difference between acquirer types		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
4 Week Premium	0.6265	0.9732	0.4341	0.6103	0.1924**	0.0344	(1.8295)
N	126		105		231		

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 18: Regressions over time: Narrower definition of private equity firms

This table shows different regressions over the time periods 1999 - 2007 and 2008 - 2016. The dependent variable is the premium defined as the final offer price divided by the share price four weeks prior to announcement. "Simple" only includes the main independent dummy variable, the one that shows if acquirer is a private equity firm. "Significant+" includes all target and deal characteristics that showed a significant difference in the univariate analysis.

	Simple	Simple	Significant+	Significant+
	1999 - 2007	2008 - 2016	1999 - 2007	2008 - 2016
Private equity acquirer (Narrow)	-0.2505*** (0.000)	-0.1924* (0.069)	-0.0772 (0.382)	0.1586 (0.145)
ln(Market capitalization)			-0.1893*** (0.000)	-0.2554*** (0.004)
ln(Sales)			0.0814 (0.138)	0.1602** (0.049)
EBITDA/Sales			-1.4416** (0.029)	0.1675 (0.485)
ROA			1.1810** (0.024)	-0.2311 (0.526)
CFFO/Assets			-0.2045 (0.703)	0.1645 (0.639)
Intangible assets/Assets			0.4245 (0.143)	-0.2913* (0.086)
Cash/Transaction value			-0.0825 (0.823)	0.0276* (0.074)
Management participation			0.1820 (0.391)	0.0023 (0.987)
Toehold			0.0459 (0.827)	-0.1422 (0.417)
Constant	0.5323*** (0.000)	0.6265*** (0.000)	0.9392*** (0.000)	0.8115*** (0.000)
N	354	231	179	153
adj. R-sq	0.016	0.009	0.369	0.245

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 19: Univariate analysis of the average premium paid by private equity acquirers: 1 week premium

The table shows the mean and standard deviation for the average premium paid by private equity acquirers over the time periods 1999 - 2007 and 2008 - 2016. The difference between the means, p-value and t-value are presented. These are based on a one-sided independent group t-test. The premium is defined as the final offer price divided by the share price one week prior to announcement.

	Private equity acquirers 1999 - 2007		Private equity acquirers 2008 - 2016		Difference between time periods		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
1 Week Premium	0.2821	0.2569	0.3535	0.3941	-0.0714**	0.0314	(-1.8692)
N	178		143		321		

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01

Table 20: Univariate analysis of the average premium paid by private operating acquirers compared to private equity acquirers: 1 week premium

The table shows the mean and standard deviation for the average premium paid by private operating acquirers and private equity acquirers during 2008 - 2016. The difference between the means, p-value and t-value are presented. These are based on a one-sided independent group t-test. The premium is defined as the final offer price divided by the share price one week prior to announcement.

	Private operating acquirers 1999 - 2007		Private equity acquirers 2008 - 2016		Difference between acquirer types		
	Mean	Std. Dev.	Mean	Std. Dev.	Diff.	P-value	T-value
1 Week Premium	0.4993	0.6991	0.3535	0.3941	0.1459**	0.0171	(2.1322)
N	136		143		279		

p-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 21: Regressions over time: 1 week premium

This table shows different regressions over the time periods 1999 - 2007 and 2008 - 2016. The dependent variable is the premium defined as the final offer price divided by the share price one week prior to announcement. "Simple" only includes the main independent dummy variable, the one that shows if acquirer is a private equity firm. "Significant+" includes all target and deal characteristics that showed a significant difference in the univariate analysis.

	Simple	Simple	Significant+	Significant+
	1999 - 2007	2008 - 2016	1999 - 2007	2008 - 2016
Private equity acquirer	-0.1616*** (0.000)	-0.1459** (0.034)	-0.0597 (0.269)	0.0849 (0.262)
ln(Market capitalization)			-0.0923*** (0.008)	-0.1564*** (0.001)
ln(Sales)			0.0519 (0.197)	0.0976** (0.025)
EBITDA/Sales			-1.2912** (0.044)	0.1809 (0.255)
ROA			0.9756** (0.042)	-0.0878 (0.744)
CFFO/Assets			-0.2099 (0.635)	-0.1217 (0.682)
Intangible assets/Assets			0.3032 (0.139)	-0.0618 (0.584)
Cash/Transaction value			-0.0585 (0.791)	-0.0277*** (0.004)
Management participation			0.0937 (0.165)	0.0726 (0.469)
Toehold			0.1596 (0.189)	-0.0494 (0.649)
Constant	0.4437*** (0.000)	0.4993*** (0.000)	0.6083*** (0.000)	0.6204*** (0.000)
N	474	279	274	187
adj. R-sq	0.018	0.013	0.366	0.153

p-values in parentheses

* p < 0.10, ** p < 0.05, *** p < 0.01