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What characterizes targets acquired by private equity firms compared to strategic buyers, and how does this affect takeover premiums? Evidence from European transactions.

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Abstract

This master thesis investigates differences in target characteristics and takeover premiums in acquisitions performed by private equity firms and strategic buyers. We use a dataset of 67 takeovers of listed European companies where the target was acquired by a private equity firm, which we match with 67 comparable transactions performed by strategic buyers. The acquisitions in our sample were announced between 2008 and 2017. In contrast to previous research, we find that there seems to be few statistically significant differences in the characteristics of the targets acquired by the two types of buyers when we control for differences in timing, deal size and target industry. Additionally, we do not find any statistically significant difference in the takeover premiums the two types of buyers pay. This is contrary to most previous research, but in line with the work of Fidrmuc. et. al. (2012). We argue that these findings could be the result of higher competition for targets following an increasing amount of capital under private equity management. Previous research has shown that increased inflow of capital to private equity funds result in increased target valuations, which we argue is likely to have narrowed the gap in takeover premiums between the two buyer types as the private equity industry has matured.

Lastly, we look at how target characteristics are related to takeover premiums. Our results show that the target's margins and profitability are negatively related to takeover premiums, while R&D expenditures are positively related to takeover premiums. Therefore, both acquirers seem to be willing to pay a higher takeover premium for targets with a potential for higher cash flows in the future, than for targets that already are generating positive cash flow today.

1.0 Introduction and motivation

In 2017, the global volume of all Mergers and Acquisitions (M&A) amounted to USD 3.15 trillion, exceeding USD 3 trillion for the fourth year in a row (Mergermarket, 2018). Berk and Demarzo (2017, p. 994) argues that due to the money at stake and the complexity of the deals, decisions concerning M&A are some of the most important decisions financial managers make.

Although some acquisitions unfold as a negotiation between the target and a single potential buyer, many takeovers include several competing bidders. The bidders can belong to one of two groups, strategic or financial buyers (Gorbenko & Malenko, 2014). Strategic buyers usually operate in a related business, being competitors, suppliers or customers. They are long-term owners acquiring targets that can be integrated into their own business to realize operational synergies. Financial buyers, primarily private equity firms, treat the target as part of a financial portfolio and exits the investment once the opportunity is sufficiently attractive.

Historically, private equity deal activity has tended to occur in waves (Martos-Vila et. al., 2014). Since the beginning of the 2000s, private equity firms have been a major driver of M&A globally. Even larger listed companies have come within their reach (Cumming et al., 2007). In Europe this was illustrated by the 2007 acquisition of the British pharmacy chain, Alliance Boots. The deal value amounted to USD 24.8 billion, which made it the largest European private equity buyout at the time (McEnery, 2011).

Managers and shareholders should know that selling to a private equity fund is in many aspects different than selling to a strategic buyer. Private equity funds have shorter investment horizons and often incentivize target management by allowing them to take an ownership stake (Dittmar, 2012). Strategic acquirers are also known to pay higher takeover premiums than private equity firms (Bargeron et. al., 2008). Selecting the right buyer or the approach that enables the company to end up with the preferred buyer could therefore result in very different outcomes for the company, its managers and shareholders.

Despite the importance of M&A in global finance, and the recognized importance of strategic and private equity bidders (Gorbenko & Malenko, 2014) there has, to

our best knowledge, not been any research on the difference between the two types of acquirers in the European market before. As existing research primarily has focused on US acquisitions, while our study focuses on European deals. Fidrmuc et. al. (2012) studied different types of targets strategic and private equity buyers bid for, while other papers have focused on bidding behaviour and differences in takeover premiums (Bargeron et. al., 2008; Dittmar et. al., 2012). We think that the high level of M&A activity in Europe, and its effect on shareholder returns, makes it important to understand the market dynamics and the players involved.

The overall objective of this thesis is to develop a deeper understanding of what kind of targets that is usually acquired by strategic buyers compared to private equity firms and whether there is a difference in the takeover premiums that the two types of buyers pay. We will also investigate whether differences in takeover premiums between targets could be explained by their characteristics. There is a widespread view that strategic acquirers on average have a higher willingness to pay than private equity firms. However, recent studies have challenged this view and instead points to target characteristics as being, at least, just as important determinants of takeover premiums (Gorbenko & Malenko, 2014; Fidrmuc et. al., 2012).

We argue that our thesis is highly relevant and could provide meaningful insights for the participants of the European M&A market. Our motivation is to obtain useful insights that will enable financial managers, investors and policy makers to make more informed decisions.

We aim to answer the following research questions:

- 1) *What characterizes targets acquired by private equity firms compared to strategic acquirers?*
- 2) *Is the takeover premium different if the target is acquired by a private equity firm or a strategic buyer?*
- 3) *Can differences in takeover premiums be explained by target characteristics?*

2.0 Literature review

In this section, we will start by reviewing the literature regarding the rationale behind why private equity firms and strategic buyers undertake acquisitions and whether this results in different target preferences. Secondly, we will look at whether strategic acquirers have a higher willingness-to-pay than private equity firms and as a result pay a higher takeover premium. Lastly, we will discuss whether differences in takeover premiums can be explained by target characteristics.

2.1 Why do strategic buyers and private equity firms perform acquisitions and what characterizes targets acquired by private equity firms compared to strategic buyers?

Acquisitions are often considered an alternative investment form. One of the most general reasons that corporations engage in M&A activity is that the buying firm considers the acquisition to be an attractive investment (Pautler, 2001). They will undertake acquisitions when it is the most efficient way of entering new geographical markets, expanding capacity or acquiring new knowledge or skills. Strategic buyers operate within the same industry as the target and are looking to purchase assets they can redeploy to its best use in their own operations. Since most assets are quite specialized, strategic buyers can often redeploy the assets in a more efficient way than outside industry buyers and exploit operational synergies other buyers cannot (Shleifer and Vishny, 1992; Gorbenko & Malenko, 2014). Compared to this, targets pursued by private equity firms are typically undervalued companies with the potential to generate strong cash flows. These buyouts are often also accompanied by a major reorganisation of the target's business (Gorbenko & Malenko, 2014).

According to Walker (2000), early studies of corporate takeovers identified five broad motivations for how corporate acquisitions could create value: 1.) Increase efficiency by exploiting economies of scale or disciplining inefficient managers (Bradley et. al., 1983; Martin & McConnell, 1991); 2.) Reduce agency problems associated with managers' access to the firm's free cash flow (Jensen, 1986; Lang et. al., 1991); 3.) Exploit asymmetric information between the managers of the acquiring firm and the shareholders of the target (Myers & Majluf, 1984); 4.)

Enable the acquiring firm to utilize the target firm's tax credits; 5.) Increase the combined firm's market power.

Several of these views have since been challenged. Amongst others, Eckbo (1992) used data on merger-induced abnormal stock returns of non-merging industry rivals to study whether horizontal mergers can lead to increased market power. His research reveals evidence against the hypothesis that horizontal mergers usually has anticompetitive effects.

Another contribution was made by Bradley et. al. (1983) who studied the information and synergy hypothesis on 697 US tender offers between 1958 and 1980. According to the information hypothesis, the rationale behind an acquisition is the discovery of undervalued assets owned by the target firm, while the synergy hypothesis assumes that the rationale is to exploit specific assets to achieve synergy gains, which is only possible if control of the target firm's assets is transferred to the bidding firm. The key finding of the paper was that the abnormal return to target shareholders in the case of an unsuccessful tender offer tend to dissipate within two years of the initial bid. According to the authors, this could indicate that the synergy hypothesis better describes the nature of acquisitions than the information hypothesis.

One of the earliest theories about what motivates private equity buyouts is known as the free cash flow hypothesis, which was proposed by Jensen (1986). Jensen argued that firms with substantial undistributed free cash flow and limited growth opportunities are prone to severe agency problems. Leveraged buyouts could be a way to mitigate this issue by increasing companies leverage and thereby forcing the organizations to pay down debt instead of investing in negative NPV projects. As a result, firms acquired by private equity are likely to have higher undistributed cash flows and fewer investment opportunities than firms acquired by strategic buyers. Several researchers have since found evidence in favour of the free cash flow hypothesis while studying leveraged buyout activity, particularly in the 1980s. Examples of such scholars are Opler & Titman (1993), who found that firms acquired by private equity firms tended to have a combination of unfavourable investment opportunities, illustrated by a low Tobin's Q (market to book value of equity) and high cash flows.

Bargeron, et. al. (2008) studied a sample of 1,214 takeovers by public bidders and 453 takeovers by private bidders in the US between 1980 and 2005. Firstly, the authors discovered that private equity firms tended to acquire targets with more leverage and lower Tobin's Q than those acquired by public acquirers (strategic buyers). They also found that private equity firms tended to acquire targets with lower sales growth the last three years than strategic buyers. Lastly, they found that private equity firms tended to acquire companies with significantly higher operating cash flow to total assets ratio. This finding is in line with the theory that private equity firms can create value by distributing excess cash flow as dividends to shareholders. When the authors looked at the difference between private equity and private operating firms (strategic buyers) they found that the targets acquired by private equity firms have more business segments than targets acquired by private operating firms. This is consistent with the view that acquiring companies with more segments reduces potential synergy gains and that targets with several operating segments therefore would be relatively less attractive for a strategic buyer compared to a private equity firm. Interestingly they also found several similarities between takeovers by private equity firms and private operating companies and that they were more similar than takeovers performed by private and public operating companies.

Fidrmuc et. al. (2012) conducted an extensive study on a sample of 205 private equity transactions which they matched with an equal number of comparable acquisitions by strategic acquirers in the US between 1997 and 2006. The authors found that the two types of buyers typically acquire targets with different characteristics, even when they control for target industry, deal size and timing of the transaction. Targets acquired by private equity firms more often tend to be characterized by strong cash flow and low market-to-book ratios, consistent with Jensen (1986). While targets with high R&D expenses, more intangible assets and higher market-to-book ratios more often end up being acquired by strategic buyers.

Kaplan (1989) studied post-buyout operating improvements in 48 large management buyouts (MBO's) carried out in the period from 1980 to 1986. He found that firms on average experienced an improved operating performance and cash flow after the takeover. The most interesting contribution however, is that the study provides clues to the reasons behind the increased operating performance.

The evidence presented by the author confirms that reduced agency cost seems to be the reason behind the operational improvements, and not asymmetric information between the management and the shareholders.

2.2 Do strategic acquirers have a higher willingness-to-pay than financial acquirers? And how does this affect takeover premiums

It has become an established view in the literature that strategic acquirers have a higher willingness to pay than private equity firms (Gorbenko & Malenko, 2014). Since strategic buyers operate within the same industry as the target firm, they can utilize the asset better and thereby realize synergy gains between their own operations and that of the target firm (Shleifer and Vishny, 1992; Gorbenko and Malenko, 2009). Private equity firms on the other hand, are industry outsiders that would not know how to properly manage industry specific assets such as oil rigs, pharmaceutical patents, or steel plants. As a result, they must hire specialist to run the assets for them, thereby facing agency costs. Additionally, they fear overpaying for the asset since they lack the necessary knowledge to value the asset properly. This could result in assets being sold for prices below their value in their best use, i.e. when the assets are valued and bought by industry specialists.

Several studies have presented evidence for this view. Barger et. al. (2008) found that takeovers by private equity firms on average resulted in a 28.5% takeover premium. This was significantly below acquisitions by strategic firms, where the premium was 46.5% for public acquirers and 40.9% for acquisitions by private operating firms.

Another contribution was made by Gorbenko and Malenko (2014) when they discovered that while strategic bidders have higher target valuations than financial bidders on average, there are other important differences between the two. Firstly, financial acquirers systematically value targets with poor performance and lack of investment opportunities higher. Secondly, the spread between the valuations of different strategic bidders is significantly larger than the spread between the valuation of financial bidders. Lastly, valuations of financial bidders show higher correlation with economic factors such as cost of debt and stock market performance compared to strategic bidders. The results indicate that different

targets are attractive to different bidders and therefore support the market segmentation view.

Contrary to popular belief however, Fidrmuc et. al. (2012) found that there were no significant differences in premiums when they control for target industry, deal size and announcement year. This implies that differences in takeover premiums usually observed, could be attributed to other factors such as timing of the acquisitions, size of the target company, liquidity of its stock or differences in valuations across industries.

2.3 Can differences in takeover premiums be explained by target characteristics?

Several scholars have studied and identified differences in target and deal characteristics that could help explain differences in target premiums (Bargeron et. al., 2008).

Fidrmuc et. al. (2012) found that takeover premiums were impacted by target characteristics. Firms that were more profitable, were the deal were buyer initiated and the target had a higher Tobin's Q tended to get higher premiums on average. Other factors that impacted premiums positively were poor recent stock performance, analyst coverage and smaller firm size.

Lehn & Poulsen (1989) were among the earliest scholars to test the implications of the free cash flow hypothesis. In addition to explaining what determines whether firms go private, the authors argue that the free cash flow hypothesis could also help explain cross-sectional variances in the premiums paid in such takeovers. If the acquirer gains in public-to-private transactions are directly related to the level of the target firm's residual free cash, then the same should be true for the takeover premiums. The authors analysed a sample of 263 successful public-to-private deals between 1980 and 1987 and found that the premiums paid were positively and significantly related to the targets residual cash flows.

As previously mentioned, Bargeron et. al. (2008) discovered large differences in takeover premiums paid by different groups of acquirers. To explain some of these

differences the authors investigated whether any of these differences could be explained by target characteristics. They found that takeover premiums in general were negatively related to target firm size, industry-adjusted Tobin's Q ratio and stock market performance over the past year. On the other hand, they found that takeover premiums were higher when the target firm had more leverage.

Since private equity firms would not be able to exploit potential synergy gains in acquired targets, one could argue that targets with potential operational synergies are more likely to be acquired by strategic buyers. Companies without potential synergies would likewise be of less interest for strategic buyers and instead be acquired by private equity. To check if synergies could help explain the difference in takeover premiums between strategic and private equity buyers, Barger et al. (2008) also studied the premiums for targets acquired by firms with the same two digits SIC code (industry code), and targets acquired by firms that do not have the same two digits SIC code. They found that takeover premiums for acquisitions within the same industry are not significantly different from acquisitions made by companies outside the target's industry.

Another interesting contribution was made by Simonyan (2014). In his analysis of 2116 takeovers between 1985 and 2005, he identifies four factors that affect takeover premiums. Firstly, the takeover premiums seemed to be affected by market misvaluation as they were higher during periods of investor pessimism and lower during periods of investor optimism. In addition, prior stock market returns affected the premiums negatively, while the premiums were positively related to stock market volatility. He also found that premiums were affected by momentum, indicated by being positively related to premiums in earlier transactions. Finally, takeover premiums were impacted by industry factors such as regulation (lower premiums) and consolidation (higher premiums).

3.0 Theory

3.1 Agency theory and the free cash flow hypothesis

A corporate manager is the agent of a shareholder, and differing views between the two parties could give rise to agency problems (Jensen, 1986). Scholars as early as Smith (1776) have raised this concern, arguing that one cannot expect managers of

other people's assets, to watch over it as anxiously as they do with their own. Berle and Means (1932) stated that "self-interest has long been regarded as the best guarantee of economic efficiency". However, after the separation of ownership and control, this relationship has weakened, as the agent controls the wealth of investors and have the possibility to make sub-optimal decisions.

The base case in original agency cost theory is that managers own 100% of the firm's equity (Jensen & Meckling, 1976). However, with ownership of less than 100% combined with diverging interest between managers and shareholders, it gives managers incentives not to act purely in the best interest of the shareholders. Hence, with diverging interest, it simultaneously gives rise to additional agency costs (increased monitoring and reporting) because of managements shirking and perquisites consumption (Ang, Cole & Lin, 2000). Grossmann and Hart (1983) and the incentive compatibility literature, have expressed their concern about asymmetric information, moral hazards and conflict of interest that have risen between dispersed ownership. Jensen and Meckling (1976) suggests that asymmetric information and conflict of interest arise because of managements unwillingness to make unpopular choices as wage reductions, shutting down negative NPV projects, firing employees, negotiation with suppliers or contractors etc. Managers that makes suboptimal choices, ultimately affects shareholder returns negatively.

According to Lehn and Poulsen (1989), acquisitions by private equity buyers offer a solution to the agency cost problem. Private equity firms tend to pay out excess cash not needed to fund NPV positive projects or day-to-day operations. This leaves less cash for management to waste on non-profitable projects and an inefficient organization. Targets with high cash flow reserves are therefore seen as attractive investment objects for private equity firms, which could lead to higher willingness to pay (Lehn & Poulsen, 1989; Jensen 1986). Another study conducted by Lang et. al. (1991) supports the free cash flow hypothesis, that managers make suboptimal decisions when they are endowed with free cash flow.

3.2 Winners curse

Winner`s curse is a situation when the highest bidder ends up with the asset but is likely to have overestimated the value of the asset (Capen et. al., 1971). The economic rationale behind corporate takeovers is that bidders expect the assets to generate positive cash flows in the future. If we assume that the bidders are able to estimate the true value of these cash flows on average, the winning bid, which is higher than the average bid, will be higher than the fundamental value of the target. Hence, the “winner`s curse” hypothesis suggests that the winning bidder, is the one that overestimates the value of the target the most (Varaiya & Ferris, 1987). In that case, the following returns may no longer be justified by the price paid for the target.

All corporate bidders have access to publicly available information at the time of the bidding competition. Hence, with no asymmetric information, the rational bidders should all have the same valuations of the targets future cash flows, and the winners curse is no longer a problem (Cox & Isaac, 1984). With imperfect information, the bidder`s valuation will deviate from the true value of the target. If the highest bid is lower than the true valuation, there is no deal, but if the bid is higher, the winner will incur a winner`s curse. The winner is said to be “cursed” because the actual value they received is less than what they paid for it, or what they expected it to generate (Thaler, 1988).

3.3 Efficient market hypothesis

In an efficient capital market, security prices would instantly and fully reflect all available information about all securities and thus result in unbiased estimates of the value of the securities underlying assets (Basu, 1977). The efficient market hypothesis is a fundamental theory in finance explaining how financial markets accomplish its primary task, namely the efficient allocation of ownership of economic resources. An efficient capital market enables firms to make production-investment decisions, while investors can invest in securities that give them ownership of cash flows from economic activities under the assumption that the security prices reflect all available information about those economic activities (Fama, 1970).

Academic researchers have presented substantial empirical evidence in support of the efficient market hypothesis (Fama, 1970). There are however, trading strategies that have been documented to generate superior return at least over shorter time periods. A notable example of such a trading strategy is the value investing strategy, whereby investors buy stocks with a low price relative to its book value, earnings or other measure of fundamental value (Lakonishok et. al., 1994).

4.0 Methodology

In this chapter we will outline the methodology used to investigate our research questions. First, we will address the extensive target matching procedure used to pair private equity transactions with comparable strategic deals. Thereafter, we will explain the methodology used to address each research question separately. The data used in our research questions are cross-sectional data which gives us data for multiple entities at a single time period (Stock & Watson, 2015, p. 54).

4.1 Target matching procedure

To construct our sample, we needed to identify comparable pairs of acquisitions made by private equity and strategic buyers. To identify these pairs, we employ a rigid matching procedure, first employed by Fidrmuc et. al. (2012). In our view, the matching procedure is one of the key features of our research design. The matching procedure takes three different variables into account; 1.) which year the deal was announced; 2.) target industry; 3.) deal size. Matching on these variables helps reduce potential omitted variable bias in our results. We start with a list of 172 private equity deals and compare them to 937 strategic deals in order to find a suitable match. Every acquisition made by a strategic buyer can only be matched to a private equity transaction once.

Industries are often characterised by differences in capital structure, profitability, growth rates, cyclicalities, etc. At the same time private equity firms and strategic buyers could be more prone to acquire companies in certain industries. Lerner, et. al. (2010) reports that the distribution of private equity investments across industries are uneven, with private equity investments being overrepresented in mature and traditional industries like the textiles, pulp & paper, machinery & equipment, electrical and chemical industries. This pattern was confirmed by Boone

and Mulherin (2001) which report that more than half of all private equity transactions occur in only four industries. Therefore, matching on industry is important to reduce the effect of potential omitted variable bias introduced by industry differences across our sample.

Strategic buyers generally acquire significantly larger companies than private companies (Bargeron et al., 2008). Hence, matching transactions based on deal size is also paramount in order not to introduce bias into our data. We have however, made some changes to the original matching procedure. Instead of using the transaction value as a measure for deal size, we use enterprise value. Since the target's enterprise value is independent of its capital structure, this enables us to mitigate potential bias arising from differences in capital structure across targets.

Private equity deals tend to occur in waves (Martos-Vila, et. al., 2011; Kaplan & Strömberg, 2009). In addition, there have been observations of variations in competitive pressure between bidding acquirers in different periods. For example (Officer et al., 2010) discovered that deal competition was substantially higher in the period from 2006-2007 compared to the years prior. Findings like this highlights the importance of matching targets based on the timing of the transactions.

The matching procedure follows a series of steps: 1.) For each private equity transaction in our sample we identify a set of acquisitions by a strategic buyer where the target company is in the same industry as the private equity target, having the same first three SIC code digits. Among this list we search for a takeover with the same announcement year and that lies within +/- 25% range in terms of enterprise value; 2.) If no similar transaction could be found, we widen the search horizon to include the year after and the year before the announcement date; 3.) If no match is found in step (2) either, we apply the same search criteria to two years before and after the announcement date; 4.) If this still yields no results, we will repeat step (1) but search for acquisitions where the target is within the first two SIC code digits as the target of the private equity transaction; 5) If this process still leaves us without a matching pair, we will repeat step (1), but search for acquisitions within a +/- 50% deal range; (6) The last resort is to repeat step (1) but look for a transaction where only the first SIC code digit matches.

The resulting dataset consisted of 67 private equity takeovers that have been exclusively matched with 67 strategic acquisitions. As can be seen in the table below, the majority of the transactions were either matched on the first two steps or on the last step in the procedure.

Table 1

Overview of transaction pair by which step in the matching procedure the transactions matched on. The matching procedure follows a series of steps: 1.) For each private equity transaction in our sample we search for target acquired by a strategic buyer with the same first three SIC code digits, the same announcement year and that lies within +/- 25% range in terms of enterprise value. 2.) If no similar transaction could be found, we widen the search horizon to include the year after and the year before the announcement date; 3.) If no match is found in step (2) either, we apply the same search criteria to two years before and after the announcement date. 4.) If this still yields no results, we will repeat step (1) but search for acquisitions where the target is within the first two SIC code digits as the target of the private equity transaction; 5) If this process still leaves us without a matching pair, we will repeat step (1), but search for acquisitions within a +/- 50% deal range; (6) The last resort is to repeat step (1) but look for a transaction where only the first SIC code digit matches.

Stage	(1)	(2)	(3)	(4)	(5)	(6)
Matches	17	19	3	6	0	22

4.2 Measuring difference in target characteristics between private equity and strategic buyers

To test whether the two acquirers buy targets with different characteristics, we will employ two different methods. The two methods are standard t-tests for difference in means and logistic regressions, popularly called logit regressions.

The main reason for applying a standard t-test for the difference in mean, is the simplicity of the test, as well as the straight forward interpretation of the output. The t-test assumes that the distribution of the variables is known, if not, they need to be estimated. However, if the sample size is large enough, the central limit theorem imply that the distribution is approximately normally distributed (Stock & Watson, 2015, p. 129). As the sample size for each test is approximately 130 observations, we argue that the sample is large enough to make the sample size

assumption valid, while the distribution of the variables is approximately normally distributed. Another assumption is that variables must be independently and identically distributed. Because most of the transactions are performed by different acquirers, at different time periods and in different industries, we argue that the assumption of identically and independently distributed random variables holds.

Because we want to test how different target characteristics affect the likelihood of being acquired by either a private equity firm or a strategic buyer we need a binary variable as the dependent variable. We use a binary variable which takes the value of 1 if the acquirer is a private equity (PE) firm and 0 if the acquirer is strategic. To perform a regression with a binary variable as the dependent variable, we employ a logistic regression model. Because we model the probability that our dependent variable, the PE-dummy, is equal to 1, it makes sense to adopt a model formulation which forces the predicted variables to be between 0 and 1, and that catches the non-linear nature of probabilities with a binary outcome (Stock & Watson, 2015, p. 437).

The setup for performing a logit regression is done by choosing the target characteristics at question as the explanatory variable, plus a constant, while keeping the dependent variable binary (see equation 1 below). Given the explanatory variables, and a binary dependent variable, the logistic regression can determine whether the probability of the target characteristic is most likely to be preferred by a private equity or strategic acquirer. The coefficients are calculated using the maximum likelihood method. The maximum likelihood method estimates the values “most likely” explaining the data observed, and therefore maximizes the probability given the observed data (Stock & Watson, 2015, p. 446). This means that given the input in the regression model, the logit model determines the most likely acquirer of the target. Because the estimates from a maximum likelihood model is normally distributed and consistent, the t-statistics and confidence interval can be calculated the normal way in large sample sizes. Because the dependent variable in a logit model is binary, the error term is binary as well, and follows a binomial distribution. However, the binary distribution approaches the normal distribution as the sample size increases. A drawback from the logistic regression model, is that the coefficients are difficult to interpret before computing the probabilities (Stock & Watson, 2015, p. 444).

Logit equation model:

$$(1) PE_i = \alpha + \beta_1 Characteristic_i + \varepsilon_i$$

Where PE is a dummy variable and $Characteristic$ denotes the different target characteristics indicated with $i = 1, 2, 3$, etc.

4.3 Measuring difference in takeover premiums between private equity and strategic buyers

To test whether there is a statistically significant difference between the takeover premiums paid by private equity firms and strategic buyers we run cross-sectional regressions with the takeover premium as the dependent variable and a private equity dummy as the explanatory variable. Control variables are also included in the regressions. The takeover premium is measured as the percentage difference between the equity value paid in the acquisition and the market value of equity prior to the deal announcement. The private equity dummy takes the value of one if the buyer is indeed private equity, and zero otherwise.

We argue that the difference in takeover premium cannot be correctly addressed by naive simple cross-sectional regressions due to possible endogeneity issues. Endogeneity issues arise when the error term is correlated with the explanatory variable (Brooks, 2015, p. 91). Endogeneity can bias the estimates we get from a basic regression, leading to wrong and imprecise results. In our case, biased results could lead to a wrong conclusion that strategic buyers pay a higher takeover premium than private equity firms or vice versa. To wrongly conclude that there exists a difference between the strategic and financial takeover premiums, when there's not, would constitute a type 1 error. A type 1 error is to wrongly reject the null hypothesis when it is true (Stock & Watson, 2015, p. 124). Going forward, we will discuss the most relevant sources of endogeneity issues in our study: measurement errors and omitted variables.

Measurement errors occur when the data under assessment has been revised, changed or altered without taking the right precautions to deal with it (Brooks, 2015, p. 3 and p. 236). In our case, measurement error could be a problem if

takeover premiums or other target characteristics are not measured in the same way across firms, or the measurement method has been altered without any adjustments. The calculation method used for takeover premiums and other variables has not been changed or altered along the way, and the data used has been retrieved from the same two sources (SDC Platinum and Compustat) for the whole sample period (2008-2017). To further mitigate possible measurement error, every single transaction in our data sample has been researched thoroughly to see who's ultimately controlling the buying entity, either private equity or strategic. This is further explained in section 5. Based on our fixed calculation methods, the same source of information and our extensive background check of each transaction, we believe that measurement error is minimized to the best of our knowledge.

Omitted variable bias occurs when one or more variables are excluded in the estimated regression compared to the true model (Stock & Watson, 2015, p. 229). Hence, if the omitted variable is a determinant of Y and is correlated to an explanatory variable X_i , then a single OLS estimator is inconsistent. Consequently, the error terms would also be correlated to the estimator, violating the first OLS assumption that the expected mean of the error term is zero, leading to biased results (Stock & Watson, 2015, p. 231). In our case, omitted variable bias could be problematic when trying to estimate differences in takeover premium if the buyer type is correlated to a factor that has not been included in the model, while the omitted factor is also a determinant of the takeover premium. Examples of factors that could be correlated to the buyer type and also be determinants of the takeover premium are target characteristics, capital structure, market characteristics or timing. Potential omitted variable bias will be mitigated by including control variables in our model specifications. Additionally, our extensive target matching procedure is a core element of our research design which will address potential bias arising from omitted factors related to differences in timing, target size or industry.

We formulate the following regression models:

$$(2) \text{Premium}_{1DPrior,i} = \alpha + \beta_1 PE_i + \beta_2 \frac{Debt}{TA}_i + \beta_3 \text{Tobin's } Q_i + \varepsilon_i$$

$$(3) \text{Premium}_{1WPrior,i} = \alpha + \beta_1 PE_i + \beta_2 \frac{Debt}{TA}_i + \beta_3 \text{Tobin's } Q_i + \varepsilon_i$$

$$(4) \text{Premium}_{4WPrior,i} = \alpha + \beta_1 PE_i + \beta_2 \frac{Debt}{TA}_i + \beta_3 \text{Tobin's } Q_i + \varepsilon_i$$

$$(5) \text{ Premium}_{Average,i} = \alpha + \beta_1 PE_i + \beta_2 \frac{Debt}{TA}_i + \beta_3 \text{Tobin's } Q_i + \varepsilon_i$$

Where Premium denotes the takeover premium, PE is a dummy variable that is equal to one if the acquirer is a private equity firm and zero if the acquirer is a strategic buyer. In addition, i denotes the specific observations ranging from 1 to 134, and ε_i is the uncorrelated normal distributed error term.

As control variables we include the book value of debt to total assets, Debt/TA, and market to book value of equity, Tobin's Q. According to previous research, targets acquired by private equity usually have more leverage than targets acquired by strategic buyers (Bargeron et al., 2008). Other researchers on the other hand, have argued that private equity firms create value by increasing the target's leverage ratio (Jensen, 1986) and would therefore be likely to acquire targets with a limited amount of leverage relative to their cash flow. More leverage could make targets more vulnerable to hostile takeovers or weaken their bargaining position and could therefore bias our results. Other researchers have argued that an increased degree of leverage could give a higher concentration of ownership and introduce financial covenants which would strengthen the bargaining position of the incumbent management forcing the acquirer to pay a higher premium (Stulz, 1988).

Previous studies have also found that private equity firms tend to acquire targets with lower Tobin's Q than targets acquired by strategic buyers (Fidrmuc et. al. 2012). At the same time a lower Tobin's Q could result in a higher takeover premium.

Taking it one step further, we will also test whether the takeover premium changes in the weeks prior to the announcement of the acquisition. A significant share price runup in the weeks prior to the announcement could implicate that there has been some information leakage prior to the deal announcement. According to Jarrell and Poulsen (1989), information about the takeover bid prior to announcement could come from several sources such as toehold bidding, anticipation or insider trading. We also here test whether the difference in takeover premiums vary between the two buyer types. Hence, we will use the previously explained dummy variable, PE, as an explanatory variable. This gives the following model specifications:

$$(6) \quad R_{4W \text{ vs. } 1W_i} = \alpha + \beta_1 PE_i + \varepsilon_i \quad i = 1, \dots, 134$$

$$(7) \quad R_{4W \text{ vs. } 1D_i} = \alpha + \beta_1 PE_i + \varepsilon_i \quad i = 1, \dots, 134$$

Where $R_{4W \text{ vs. } 1W_i}$ and $R_{4W \text{ vs. } 1D_i}$ are the differences in premiums paid four weeks and one week prior to announcement, and four weeks and one day prior to announcement, as can be seen below:

$$(8) \quad R_{4W \text{ vs. } 1W_i} = \text{Premium}_{4WPrior,i} - \text{Premium}_{1WPrior,i} \quad i = 1, \dots, 134$$

$$(9) \quad R_{4W \text{ vs. } 1D_i} = \text{Premium}_{4WPrior,i} - \text{Premium}_{1DPrior,i} \quad i = 1, \dots, 134$$

4.4 Measuring whether target characteristics affect takeover premiums

In this part, we will investigate whether there are some target characteristics that could help explain differences in takeover premiums across targets and buyer types. To do so, we use simple OLS regressions with takeover premium as the dependent variable and different target characteristics as explanatory variables.

First, we run OLS regressions on the pooled sample of both strategic and private equity deals to check whether there is a statistically significant relationship between some target characteristics and the takeover premiums paid by both acquirers. The premium used in this equation is the average of the premiums four weeks, one week and one day prior to announcement. The following setup shows the regression for the pooled sample:

$$(10) \quad \text{Premium}_{Average,i}^{Pooled} = \alpha + \beta_1 \text{Characteristic}_i + \varepsilon_i \quad i = 1, \dots, 134$$

Secondly, we run the same regression on the sample of private equity takeovers and strategic takeovers separately. This enables us to test whether one acquirer usually pays a higher takeover premium for some specific characteristics than the other. This gives us the following model specifications:

$$(11) \quad \text{Premium}_{Average,i}^{Priv.eq} = \alpha + \beta_1 \text{Characteristic}_i + \varepsilon_i \quad i = 1, \dots, 67$$

$$(12) \quad \text{Premium}_{Average,i}^{Strategic} = \alpha + \beta_1 \text{Characteristic}_i + \varepsilon_i \quad i = 1, \dots, 67$$

Where $Premium_{Average,i}^{Priv.eq}$ and $Premium_{Average,i}^{Strategic}$ are the average of the takeover premium four weeks, one week and one day prior to the deal announcement for the sample of private equity and strategic takeovers respectively.

5.0 Data

As the basis for constructing our dataset we extracted a list of 16,832 takeovers of listed European companies carried out between 01.01.2008 and 31.12.2017 from the Securities Data Corporation (SDC) Platinum database. To be included in our dataset the acquisitions needed to fulfil certain strict requirements. The deal value and the resulting enterprise and equity valuations had to be known. We also required that the target firms had available accounting data on Compustat.

Thereafter, we investigated each transaction to verify whether the transactions were carried out by a private equity fund, a strategic buyer or neither. To do this, we checked each transaction to see who controlled the ultimate entity of each buyer. This resulted in a list of 172 targets acquired by private equity funds and 937 targets acquired by companies operating in the same industry as the target.

To find matching pairs of transactions carried out by strategic and private equity buyers we followed the rigid matching procedure further described under the methodology section. This resulted in a sample consisting of 134 takeovers or 67 pairs of transactions, between 2008 and 2017.

Table 2

Sample by year. This table reports the number of deals in our sample by acquirer type and the year of announcement. The table shows a total of 67 acquisitions performed by private equity and 67 acquisitions performed by strategic acquirers. The total sample consists of 134 transactions. Sample period covers the years 2008 to 2017.

YEAR	Private equity buyer	Strategic buyer
2008	15	14
2009	10	10
2010	6	10
2011	12	8
2012	5	7
2013	2	4
2014	6	4
2015	3	4
2016	4	4
2017	4	2
Total	67	67

In order to perform our study, we needed to supplement the acquisition and price data from SDC with company and accounting data. The company and accounting data was extracted from Compustat.

In the table below, we display all the variables contained in our dataset. The mean deal size for the strategic acquisitions is USD 279 million, while it is USD 248 million for the private equity deals. The difference is however, not statistically significant. We deem this to be a natural result of our target matching procedure.

Table 3

Summary statistics table. This table reports a summary of all the fundamental variables in our dataset for the transactions carried out by private equity and strategic acquirers respectively. The statistics included are mean, standard deviation, median and the result of a simple test-statistic on the difference in mean between private equity and strategic buyers. N is the reported number of observations used in the t-tests.

	Private equity buyer			Strategic buyer			Diff. in means	N
	Mean	St.dev.	Median	Mean	St.dev.	Median		
Shares Acquired	78 %	29 %	98 %	91 %	18 %	100 %	-13%***	134
Owned after transaction	85 %	25 %	100 %	96 %	9 %	100 %	-11%***	134
Sought	82 %	27 %	100 %	94 %	17 %	100 %	-12%***	134
Equity value pre-takeover	277	458	115	193	314	88	83	128
Equity value	295	517	106	298	471	135	-3	134
Enterprise value	367	625	151	359	633	152	8	134
Transaction value	248	499	97	279	455	109	-31	134
Share premium	46 %	74 %	30 %	55 %	49 %	44 %	-10 %	124
Debt	20 %	17 %	16 %	17 %	16 %	12 %	3 %	132
Tobins Q	2.62	5.05	1.93	4.28	13.67	2.08	-1.66	126
CAPEX	0.83	3.16	0.31	0.42	0.45	0.34	0.40	132
Cash	0.12	0.11	0.08	0.18	0.19	0.09	-0.06**	133
EBIT margin	-0.34	3.12	0.06	-0.43	2.01	0.04	0.09	131
EBITDA margin	-0.26	2.99	0.12	-0.35	1.93	0.07	0.09	131
Equity ratio	0.45	0.19	0.46	0.49	0.23	0.49	-0.04	134
FCF yield	-0.01	0.94	0.03	0.07	1.35	0.00	-0.08	126
Goodwill	0.24	0.21	0.21	0.21	0.21	0.16	0.03	134
Gross margin	0.21	2.57	0.52	0.44	0.32	0.46	-0.23	131
Intangible assets	0.33	0.23	0.31	0.28	0.23	0.33	0.04	134
Tangible assets	0.17	0.22	0.08	0.15	0.22	0.05	0.01	134
Net debt	72.4	234.9	3.6	61.2	253.8	4.2	11.2	134
R&D	0.69	3.72	0.04	0.55	1.67	0.09	0.14	80
ROIC	0.02	0.29	0.07	0.00	0.21	0.06	0.02	131
Std.dev og ROIC	0.19	0.69	0.05	0.10	0.15	0.04	0.09	131
Sales CAGR 3Y	0.26	0.65	0.08	0.15	0.35	0.08	0.11	123

*** Significant at the 0.01 level

** Significant at the 0.05 level

* Significant at the 0.10 level

As we can see from table 3, there is a statistically significant difference between the private equity and strategic buyers in the ownership share sought, acquired and owned following the transaction. This is unsurprising given that private equity funds usually require the management team to take an ownership position in the target post-acquisition (Kaplan & Strömberg, 2009). Strategic buyers on the other hand, prefer to acquire all of the target's shares so that they can integrate the company into their own operations.

On average, targets acquired by private equity have a ratio of cash to total assets of 0.12, compared to 0.18 for strategic buyers. This difference is statistically significant on the 5% level. This could indicate that strategic buyers tend to acquire targets with higher cash reserves than private equity firms.

To measure the takeover premium, we use the equity value paid in the transaction compared to the weighted share price one day, one week and four weeks prior to the deal announcement. The takeover premium paid to the target's shareholders is 46% on average for private equity, compared to 55% for strategic buyers. The difference between the medians is even larger, with a median premium for private equity of 30% versus 44% for strategic buyers. Even though the difference in means is rather large in economic terms, the result is not statistically significant on any conventional significance level.

In table 4, we have tabulated the correlations between each variable in our dataset. As testing for two different variables that are highly correlated will provide limited additional value, we will only include one of them in our studies. Examples of highly correlated variables are EBIT, EBITDA and Gross margin which all are correlated in excess of 80% with each other. Including these variables going forward, would yield approximately the same results and economic interpretation for each variable. Because of that, we will exclude EBITDA and Gross margin, and instead focus only on the EBIT margin.

Table 4

Correlation matrix. This table reports the correlation of each target characteristic variable against other variables obtained from each acquisition. Each entry reports the corresponding correlation between the two variables. Correlation measures to what extent the variables move in tandem, where 1 indicates perfect positive correlation between the variables and -1 indicates perfect negative correlation. The table shows correlation coefficients of 25 variables and covers the time period of 2008 to 2017.

	Shares Acquired	Owned after transaction	Sought	Equity value pre-acquisition	Equity value	Enterprise value	Transaction value	Takeover premium	Debt	Tobins Q	CAPEX	Cash	EBIT margin	EBITDA margin	Equity ratio	FCF yield	Goodwill	Gross margin	Intangible assets	Tangible assets	Net debt	R&D	ROIC	Stdev of ROIC	Sales CAGR 3Y	
Shares Acquired	1.000																									
Owned after transaction	0.869	1.000																								
Sought	0.893	0.766	1.000																							
Equity value pre-acquisition	0.074	0.020	0.047	1.000																						
Equity value	0.110	0.058	0.092	0.954	1.000																					
Enterprise value	0.097	0.047	0.075	0.944	0.989	1.000																				
Transaction value	0.205	0.163	0.193	0.940	0.988	0.977	1.000																			
Takeover premium	0.157	0.106	0.091	-0.144	-0.027	-0.024	-0.006	1.000																		
Debt	-0.170	-0.224	-0.179	0.364	0.368	0.410	0.331	-0.110	1.000																	
Tobins Q	0.132	0.112	0.108	0.319	0.300	0.278	0.305	-0.050	-0.203	1.000																
CAPEX	-0.135	-0.020	-0.013	-0.171	-0.189	-0.186	-0.174	-0.052	-0.055	-0.049	1.000															
Cash	0.097	0.066	0.109	-0.128	-0.101	-0.145	-0.088	0.311	-0.421	0.453	0.319	1.000														
EBIT margin	0.272	0.344	0.330	0.077	0.056	0.054	0.065	-0.531	0.017	0.005	0.115	-0.134	1.000													
EBITDA margin	0.271	0.344	0.329	0.080	0.058	0.057	0.068	-0.535	0.018	0.006	0.114	-0.137	1.000	1.000												
Equity ratio	0.155	0.200	0.186	-0.193	-0.167	-0.184	-0.131	0.179	-0.587	-0.054	0.126	0.329	0.136	0.134	1.000											
FCF yield	0.070	0.061	0.060	-0.003	-0.001	-0.027	0.018	0.005	0.244	-0.064	-0.122	-0.160	0.078	0.079	-0.084	1.000										
Goodwill	0.039	0.110	-0.014	-0.025	-0.049	-0.014	-0.050	-0.019	0.109	-0.246	-0.046	-0.444	0.141	0.142	-0.035	-0.017	1.000									
Gross margin	0.317	0.389	0.378	0.040	0.027	0.020	0.041	-0.433	0.018	0.006	0.105	-0.078	0.943	0.938	0.211	0.065	0.099	1.000								
Intangible assets	0.048	0.107	-0.005	0.076	0.029	0.072	0.035	0.051	0.167	-0.237	-0.077	-0.455	-0.041	-0.040	-0.023	-0.028	0.907	-0.035	1.000							
Tangible assets	-0.120	-0.138	-0.065	0.150	0.196	0.207	0.182	-0.227	0.244	-0.114	-0.248	-0.264	0.015	0.019	-0.170	-0.061	-0.364	-0.014	-0.394	1.000						
Net debt	-0.026	-0.040	-0.059	0.414	0.434	0.560	0.425	0.003	0.443	0.013	-0.079	-0.325	0.015	0.019	-0.188	-0.163	0.191	-0.029	0.285	0.164	1.000					
R&D	-0.271	-0.344	-0.332	-0.070	-0.050	-0.049	-0.059	0.523	-0.018	0.010	-0.121	0.128	-0.997	-0.997	-0.137	-0.070	-0.133	-0.942	0.053	-0.028	-0.016	1.000				
ROIC	0.205	0.257	0.263	0.134	0.100	0.090	0.099	-0.547	0.083	-0.024	0.061	-0.269	0.829	0.827	0.047	0.158	0.139	0.807	0.028	-0.104	-0.013	-0.818	1.000			
Stdev of ROIC	-0.126	-0.163	-0.159	-0.176	-0.167	-0.164	-0.165	0.350	-0.109	0.105	0.107	0.315	-0.615	-0.613	-0.205	-0.165	-0.212	-0.611	-0.140	0.011	-0.064	0.609	-0.702	1.000		
Sales CAGR 3Y	0.076	0.033	0.001	-0.098	-0.058	-0.033	-0.041	0.135	0.022	0.018	-0.058	0.127	-0.323	-0.318	0.071	-0.002	0.099	-0.353	0.199	-0.169	0.130	0.339	-0.360	0.253	1.000	

6.0 Results and analysis

In this chapter, we discuss the results obtained from running regressions on our dataset and discuss our findings. We start by analysing the results from the logistics regression on target characteristics. Thereafter we investigate the difference in takeover premiums paid by private equity and strategic buyers. Finally, we look at whether target characteristics can help explain some of the variation in takeover premiums.

6.1 What characterizes targets acquired by private equity firms compared to strategic acquirers?

In table 5, we provide the estimation results from our logit model. Contrary to what we had expected, we find few of the differences in target characteristics between strategic and private equity takeovers that other researchers have found. Earlier researchers have found statistically significant differences when it comes to characteristics such as Tobin's Q, Free Cash Flow, intangible assets and R&D expenditures, none of which are statistically significant in our data. Aside from one variable, cash, none of the variables are statistically significant even at the 15% level. These results are however, in line with what we found when we simply looked at the differences in means between the two buyer types.

The only target characteristic that is statistically significant is cash, which is statistically significant at the 5% level. The coefficient on private equity is negative indicating that strategic buyers on average acquire targets with larger cash reserves than targets acquired by private equity funds. This result is rather surprising to us as we would expect private equity funds to target companies with higher undistributed cash flows, in line with the free cash flow hypothesis (Jensen, 1986). This result is also contrary to the findings made by Fidrmuc. et. al. (2012). It could be argued however, that the cash reserves of a company are a rather poor approximation for its ability to generate high free cash flows. Researchers that have tested this hypothesis earlier have instead measured the firm's actual cash flows (Lehn & Poulsen, 1989; Lang et. al., 1991). If we instead look at the median free cash flow yield, we see that this is higher for private equity firms than for strategic buyers, indicating that private equity firms still target companies with higher cash flows.

Table 5

Results summary table. This table presents the estimation results of simple logit regressions on target characteristics, with a dummy variable for the buyer type as the dependent variable, and different target characteristics as explanatory variables (see equation 1). The dummy variable takes on the value of one if the acquirer is private equity firm, and zero if the acquirer is a strategic buyer. Included are also robust standard errors in brackets, the p-value and the number of observations from each logistic test.

Characteristic	Coefficient	S.e.	P-value	N
Debt	0.968	(1.055)	0.359	132
Tobins Q	-0.021	(0.020)	0.310	126
CAPEX	0.147	(0.120)	0.220	132
Cash	-2.623**	(1.154)	0.023	133
EBIT margin	0.013	(0.075)	0.859	131
Equity ratio	-1.003	(0.823)	0.223	134
FCF yield	-0.061	(0.140)	0.663	126
Intangible assets	0.804	(0.750)	0.284	134
Tangible assets	0.314	(0.802)	0.696	134
Net debt	0.001	(0.001)	0.795	134
R&D	0.019	(0.075)	0.803	80
ROIC	0.328	(0.853)	0.701	131
Std.dev of ROIC	0.569	(0.415)	0.170	131
Sales CAGR 3Y	0.509	(0.385)	0.186	123

*** Significant at the 0.01 level

** Significant at the 0.05 level

* Significant at the 0.1 level

To control for large deviations across industries, we also ran regressions on the differences from the industry average on each variable. As there were no significant deviations in the estimation results from the results shown above, we concluded that it would not add any value to investigate these results further.

One potential explanation for the lack of differences between the two buyer types could be increased competition among private equity firms in the takeover market. As the private equity industry has matured, typical transaction characteristics have changed (Kaplan & Strömberg, 2009). The amount of capital under management by private equity firms has grown over time, resulting in increased competition for targets. This has driven private equity firms to bid for companies that they would not be interested in earlier. While private equity deals in the 1980's were dominated by public-to-private takeover of large companies in mature industries, private equity firms in the following decades has shifted its focus to non-publicly traded firms in a wider variety of industries (Kaplan & Strömberg, 2009).

6.2 Is the takeover premium different if the target is acquired by a private equity or strategic buyer?

Table 6 shows that private equity firms pay a lower takeover premium than strategic acquirers. This result is however, not statistically significant, in contrast to previous research (Bargeron et al., 2008; Gorbenco and Malenko, 2014). It is however, in line with Fidrmuc et. al. (2012). As such, our research seems to confirm the notion put forth in their study, that matching deals on size, timing and industry results in a more comparable set of transactions with a statistically insignificant difference in takeover premium. This indicates that the difference in takeover premiums between private equity and strategic buyouts at least to some degree, can be explained by differences in deal size, timing or target industry.

Table 6

Takeover premium. The difference in takeover premium paid by private equity and strategic acquirers are tested using cross-sectional OLS regressions with control variables (see equations 2-5). The takeover premiums are calculated as the price paid above (below) the market value of equity four weeks, one week and one day prior to the deal announcement. 'Average' is the simple average of the premiums four weeks, one week and one day prior to announcement. PE is a dummy variable that takes the value of one if the acquirer is a private equity firm and zero if the acquirer is a strategic buyer. Two control variables Debt/TA and Tobin's Q are also included in the regressions, where Debt/TA is the ratio of book value of debt to total assets and Tobin's Q is the market to book value of equity.

	Takeover premium			
	1 Day prior	1 Week prior	4 Weeks prior	Average
PE dummy	-0.026	-0.067	-0.149	-0.109
S.E.	(0.129)	(0.109)	(0.107)	(0.116)
P-value	0.843	0.541	0.167	0.350
Debt/TA	-0.197	-0.097	-0.080	-0.068
S.E.	(0.260)	(0.263)	(0.297)	(0.278)
P-value	0.451	0.713	0.789	0.808
Tobin's Q	-0.003	-0.003	-0.004**	-0.004
S.E.	(0.003)	(0.002)	(0.002)	(0.002)
P-value	0.278	0.189	0.025	0.130
<i>N</i>	<i>121</i>	<i>122</i>	<i>122</i>	<i>122</i>

*** Significant at the 0.01 level

** Significant at the 0.05 level

* Significant at the 0.1 level

It seems that the difference in the takeover premium decreases as the announcement date approaches. The difference is on average 14.9% four weeks prior to the announcement, while it decreases to only 2.6% the day before the announcement. From table 7, we see that the difference in the difference between private equity and strategic takeover premiums from four weeks before to one week before is statistically significant at the 5% level. This difference is driven by a reduction in takeover premiums for the strategic acquisitions, caused by share price run-ups in the weeks leading up to the announcements.

Table 7

Difference in takeover premiums over time. The tests are performed on the difference between the takeover premium four weeks and one week prior to announcement, and the difference between takeover premium four weeks and one day prior to announcement. The differences are tested using simple OLS regressions with an acquirer dummy, PE, which takes the value of one if the acquirer is private equity firm and zero if the acquirer is a strategic buyer. The full regressions used are outlined in equation 6 and 7, while the differences are shown in equation 8 and 9.

	Difference in takeover premium	
	Diff 4 weeks vs. 1 week	Diff 4 weeks vs. 1 day
PE dummy	-0.081** (0.041)	-0.105* (0.061)
P-value	0.048	0.086
N	124	124

*** Significant at the 0.01 level
 ** Significant at the 0.05 level
 * Significant at the 0.1 level

This result could have a couple of different interpretations. It could indicate that there is a higher chance of information leakage when the target is sold to a strategic buyer than when it is sold to private equity. This interpretation is however, contrary to earlier research on private equity which has found a significant amount of information leakage prior to the official deal announcement (Lehn & Poulsen, 1989; Boone & Mulherin, 2011; Fidrmuc et. al., 2012). However, it could also indicate that given information leakage about a potential acquisition, investors would rather invest in targets that were rumoured to be acquired by strategic buyers as they would expect the takeover premium to be higher.

The lack of difference in takeover premiums between private equity firms and strategic buyers discovered both in the US (Fidrmuc et. al., 2012), and now in Europe could be the result of increased bidding competition among private equity firms. Gompers and Lerner (2000), argue that because venture capital and private equity funds are different from other asset classes, capital inflow to these funds should eventually increase the takeover premium due to increased competition. The authors found that there was a strong and positive relationship between capital inflows and target valuations. This implication is also supported by more recent evidence from Boone and Mulherin (2011), which found that private equity bidding is in fact associated with significantly higher bidding competition compared to other bidder types. As there is a limited number of potential targets, an increase in the amount of capital under management by private equity firms could result in increased bidding competition for targets as the industry matures, which would raise takeover premiums. As a result, the difference in takeover premiums between the two buyer types would narrow. This implication will however, require further research in order to be properly verified.

This result complements our findings in chapter 6.1. If there are no significant differences in the characteristics among the targets that the two types of buyers typically acquire, nor in the takeover premiums they pay, a given company seems to be equally attractive to either buyer type. At the same time, shareholders would on average be equally well off with either acquiror type, as there are no statistically significant differences in the takeover premiums the acquirors pay. Consequently, this implies that managers and shareholders would be able to choose the buyer type that fits their current situation based on other factors than valuation alone.

There are several practical differences for the company and its management between being acquired by a private equity firm or a strategic buyer. For example, being acquired by a private equity firm would in many instances allow the incumbent management to continue in their positions and even become owners in the company (Kaplan & Strömberg, 2009). This could be a preferable solution for managers that consider their company's equity to be undervalued. If there is an asymmetric distribution of information, company insiders with access to more favourable information of their company's prospects, would want to own the rights to the company's residual cash flows, which they believe will increase in value

(Lehn et. al., 1990). In contrast, strategic buyers usually aim to take full ownership of the target and integrate it into their existing operations. As a result, this solution could be more preferable to founders who would like to fully terminate their ownership and quit any positions in the target's management.

This finding could also have some practical implications from a policy perspective. As previously mentioned, the established view is that strategic buyers have a higher willingness-to-pay than private equity firms as they could realize synergy gains by redeploying productive assets to their best use in their own operations. If this is not true however, and those assets could be utilised just as well by an industry outsider it could be an argument against industry consolidation. Horizontal mergers tend to be viewed with suspicion due to its potential negative effects on consumer surplus. Critics of antitrust policies however, argue that this could be more than made up by improvements in the producer surplus. They argue that companies tend to be large because it is more efficient due to economies of scale (Farrell & Shapiro, 1990). Therefore, mergers that enable the merging companies to realise synergies and enjoy increased economies of scale would enhance total economic welfare. On the other hand, empirical research has found that mergers also tend to raise product prices for consumers, while they would need to result in substantial economies of scale for product prices to be reduced (Farrell & Shapiro, 1990).

If private equity firms have the same willingness to pay as strategic acquirers for the same productive assets, it could indicate that the private equity firms are able to utilise the assets just as profitably as the strategic buyers. Authors like Demsetz (1973) and Stillman (1983) have argued that horizontal acquisitions of less efficient firms by more efficient firms could create economic welfare. We argue however, that selling to private equity firms could give the same improvements in efficiency, but without the risk of negative effects on consumer welfare. This is however, an area that needs further research in order to be fully understood.

6.3 Is the take-over premium affected by the target characteristics?

In table 8, we show the results from our regressions of takeover premium on target characteristics. As we can see, several target characteristics are statistically significantly related to the takeover premiums. We compare the results from

regressions on our entire sample with results from regressions on the private equity deals and the strategic deals in our sample.

Table 8

Results summary table. This table presents the estimation results of regression 10-12, which tests whether target characteristics can explain all or some of the differences in takeover premiums across targets and buyer types. The tests are performed using simple OLS regressions with takeover premium as the dependent variable and different target characteristics as explanatory variables. The Pooled sample is the total sample consisting of both private equity and strategic deals (see equation 10), while the Private Equity and Strategic are test performed on the samples of private equity and strategic takeovers respectively, as shown in equations 11 and 12. Robust standard errors are reported in brackets, while sample size in shown below the reported standard errors.

Characteristic	Pooled sample	Private Equity	Strategic
Tobins Q	-0.003	-0.101	-0.002*
S.e.	(0.002)	(0.063)	(0.001)
N	124	61	63
CAPEX	-0.016***	-0.014***	-0.012
S.e.	(0.004)	(0.004)	(0.081)
N	122	59	63
Cash	0.311	-0.840	0.631**
S.e.	(0.366)	(0.856)	(0.306)
N	123	60	63
EBIT margin	-0.062***	-0.059***	-0.069**
S.e.	(0.011)	(0.004)	(0.029)
N	121	60	61
Tangible assets	0.017	0.721	-0.620***
S.e.	(0.441)	(0.881)	(0.183)
N	124	61	63
R&D	0.080***	0.070***	0.125***
S.e.	(0.015)	(0.002)	(0.017)
N	76	34	42
ROIC	-0.875***	-1.037**	-0.514*
S.e.	(0.274)	(0.448)	(0.296)
N	123	61	62
Std.dev of ROIC	1.061***	1.442**	0.681*
S.e.	(0.349)	(0.557)	(0.407)
N	122	61	61

*** Significant at the 0.01 level

** Significant at the 0.05 level

* Significant at the 0.1 level

We would expect a low Tobin's Q to result in a higher takeover premium as shareholders would demand a higher compensation for a lower ratio of the market to book value of equity. In addition, previous research has shown that targets with

a low Tobin's Q would benefit more than targets with high Tobin's Q (Lang et. al., 1989). However, we find that this relationship is not statistically significant. We only find that there is a statistically significant difference in the takeover premiums paid by strategic buyers at the 10% level. A logical interpretation would be that differences in Tobin's Q reflect fundamental differences between targets that warrant differences in market valuation regardless of the book value of equity.

CAPEX is negatively related to the takeover premium in the private equity sample, a result that is statistically significant on the 1% level. This characteristic is not statistically significant for the strategic buyers however. As capex reduces the free cash flows, this result seems to fit well with the free cash flow hypothesis and earlier empirical evidence which shows that private equity firms prefer to acquire companies with high residual cash flows (Lehn & Poulsen, 1989).

From table 8, we can also see that the target's EBIT margin is negatively related to the takeover premium. This result is statistically significant at the 1% level for both the combined sample and for the private equity sample. For the sample of strategic acquirers, it is statistically significant at the 5% level. Another profitability measure, ROIC, is also negatively related to the takeover premium and statistically significant on the 1% level for the combined sample. This result surprised us at first as we would assume that acquirers, at least private equity firms, would be willing to pay a higher premium for companies with high cash flows, in line with the free cash flow hypothesis (Jensen, 1986). Instead, it seems that acquirers are willing to pay a higher premium for targets with a potential for higher cash flows in the future, than for targets that already have high cash flows today. Another indication of this is the relationship between takeover premium and the target's R&D expenditure which is statistically significant at the 1% level for both acquirer types. Higher R&D expenditures today could result in increased profitability in the future.

These findings could have some practical implications from a market efficiency perspective. A common assumption among academic researchers is that capital markets are efficient, and that investors considers all available information about future changes in profitability so that share prices reflect unbiased estimates of future earnings (Basu, 1977). However, several researchers have shown that investors seem to make expectational errors about future earnings prospects which

lead to systematic errors in pricing (Porta et. al., 1997; Lakonishok et. al., 1994). Lakonishok et. al. (1994) argue that investors tend to extrapolate past results such as growth in sales or earnings into the future, which can result in systematic overpricing of companies with strong past performance, but with weaker future prospects, and vice versa. This explanation seems to fit well with our results. If investors extrapolate companies present profitability margins into the future, it could create an opportunity for an opportunistic buyer with a contrarian view to acquire undervalued companies with better prospects than the market expects and realize these improvements. In line with previous research, most of this gain is then paid out to shareholders of the target in the form of a higher takeover premium (Jarrell et. al., 1988).

The topic of whether mergers and acquisitions actually create value for society have been a subject of much debate (Jarrell et. al., 1988). Critics of takeovers have argued that takeovers simply redistribute value from one party to someone else, divert attention away from more productive efforts or lead to concentration of monopoly power. We argue however, that a strong market for corporate control could be a disciplinary factor that adjusts deviations from correct asset prices. This implication will however, require further research.

7.0 Conclusion

In this master thesis we have investigated differences in target characteristics and takeover premiums in acquisitions performed by private equity firms and strategic buyers. We find that, in contrast to earlier research, there seems to be few differences in characteristics between the targets usually acquired by the two buyer types. We also find that the difference in takeover premiums is not statistically significantly different from zero when we control for industry, deal size and timing. A result that is in line with the findings of Fidrmuc et. al. (2012). We argue that these findings could be a natural result of a maturing private equity industry and increased competition among private equity firms. As there are a limited number of targets, an increase in the amount of capital under management by private equity firms would drive up takeover premiums, resulting in a narrowing of the gap in premiums between the two buyer types. These findings implicate that managers and shareholders can choose the buyer type that is best suited for their situation based on other factors than valuation alone. Lastly, we look at the impact of target

characteristics on takeover premiums and discover that both acquirers seem to be willing to pay a higher premium for targets with a potential for higher cash flows in the future, than for targets that already have a high cash flow today.

8.0 Limitations and further research

There are several limitations in our thesis. As we needed data on the market valuations of the targets in our sample we had to base our study on a sample of listed targets only. This resulted in a relatively small sample size, which might have resulted in increased standard errors, subsequently making it more difficult to obtain significant test results. In addition, listed companies only make up one share of all the companies that are involved in M&A activities. Therefore, we might not have been able to get the full picture across all targets.

Some of our findings contradict results from previous research. As most of these studies have been performed on US data from before the financial crises, it could be useful to test whether these findings are specific to European transactions or if some things has changed in the US after the financial crisis. Hence, a potential for further research could be to investigate whether private equity and strategic acquirers in the US still acquire targets with different characteristics, when controlling for factors such as industry, timing and deal size.

In our study of the differences in takeover premium we found that targets acquired by strategic firms experience larger share price run-ups compared to targets acquired by private equity firms prior to announcement. We propose that future researchers look into this and test whether there seems to be a higher degree of information leakage prior to announcements of strategic acquisitions than prior to announcements of takeovers by private equity firms.

Compared to some earlier research we find no statistically significant differences in the takeover premiums paid by different buyer types. We argue that this could be the result of an increasing amount of capital under private equity management which has resulted in increased competition for targets. We would propose that future researchers test this further to see whether this could help explain the

reduction in the difference in takeover premiums compared to studies done in earlier periods.

Another avenue that warrants further research is the why companies with low profitability today, but potential for higher profitability in the future have higher takeover premiums. We propose that future researchers could test if this is the result of factors such as market misvaluation, information-asymmetry or that professional acquirers like private equity firms are better at utilising the information that they have available.

Appendix A: Variable definitions

Acquirer dummy (PE) is a dummy that takes the value one if the acquire is a private equity buyer, while it will take zero if the acquire is a strategic buyer.

Tobins Q is the market value of equity divided by the book value of equity assuming that market value and book value of debt is equal.

Takeover premium is a variable that measures the premium paid above (below) the market value of equity prior to the announcement in percent. The value of equity prior to the announcement is an equal weighted average of the share prices four weeks, one week and one day prior to announcement.

CAPEX is a variable that measures the targets capital expenditures to property, plant and equipment.

Debt is the targets book value of debt to total assets the last fiscal year prior to announcement.

Cash is defined as cash and short-term investments to total assets the last fiscal year prior to announcement.

EBIT margin is defined as the targets operating profit to total revenues.

EBIDTA margin is defined as the earnings before interest, tax, depreciation and amortization to revenues the last fiscal year prior to announcement.

Gross margin is defined as gross profit to revenues

Equity ratio is defined as the value of stockholder's equity to total liabilities and stockholder's equity.

Goodwill is defined as the book value of goodwill to total asset the last fiscal year prior to announcement.

FCF yield is defined as the targets free cash flow divided by the targets pre-acquisition enterprise value.

Intangible assets is defined as the targets intangible assets to total asset

Tangible assets is defined as the targets tangible assets to total asset

Net debt is the difference between the targets enterprise value and the market value of stockholder's equity.

ROIC is the return on invested capital, which is defined as NOPAT divided by invested capital.

Std. dev of ROIC is the standard deviation of the targets ROIC and is aimed to capture the risk of the targets return on invested capital.

Sales CAGR 3Y is the compounded annual growth rate of the targets sales the past three years.

Additional takeover premium definitions

4 Weeks prior is a share premium variable defined as the equity value paid above (below) the targets equity value four weeks prior to announcement.

1 Week prior is a share premium variable defined as the equity value paid above (below) the targets equity value one week prior to announcement.

1 Day Prior is a share premium variable defined as the equity value paid above (below) the targets equity value one day prior to announcement.

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