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Financial and strategic acquirers on takeover premiums: a universal and time independent relationship?

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Abstract

Using data from US and European takeover deals in the period 1997-2006 and 2009-2018, this paper tested the unspoken assumption present in the existing literature that differences in takeover premiums between financial and strategic buyers are consistent over time and geographical location. By comparing the takeover data of the two time periods this paper shows that the difference in takeover premiums between US financial and strategic buyers decreased after the financial crisis of 2008, due to a reduction in the mean premium paid by strategic buyers. This result suggests that the crisis and the reforms that followed reduced the agency costs within a strategic buyer. At the same time, it has not been proven that the difference in level of investor protection, which is a result of the applied law system, led to a higher difference in takeover premiums between the buyers groups in Europe compared to the US.

Keywords: mergers & acquisitions, takeover premium, financial acquirer, strategic acquirer, private equity firms.

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1. Introduction

Right after a firm's management made the big decisions to offer the business for sale, the next big decision arises: to who should the company be sold to? Generally, sellers have the option to sell to either a financial buyer or a strategic buyer. Both type of buyers have their own objective of taking over a company. Financial buyers, primarily represented by private equity firms, generally hold a 'buy, improve and sell-strategy', while strategic buyers are often looking for synergies with the selling firm and therefore hold a 'buy and hold-strategy'. The main objective of the selling firm is most often to obtain a high takeover price. In the existing literature on the relation between buyer type and takeover premium, there seems to be an unspoken assumption that the outcomes of the research are universally valid and time independent. But what about the effect of having either a market- or bank-based economy? Being either a common law or a civil law country? And what about monumental events like crises or regulatory reforms?

For a long time, strategic buyers were considered to have a significant advantage over financial buyers. Argued was that strategic buyers could pay significantly higher prices due to their ability to share with the sellers a portion of the synergy value created by the acquisition (Martos-Vila et al., 2013). However, in the first decade of the 21st century the tide has changed and private equity firms have become increasingly important M&A players. They have increased in numbers, average fund size as well as deal number and deal size (Cumming et al., 2007). As of 2020, private equity firms have acquired a permanent position in the M&A market. Given their ample level of equity and debt capital available the expectation is that they will remain active in the market (Global M&A outlook, 2020). Selling your firm to a financial bidder thus became a serious alternative to selling to a strategic bidder. For a selling firm it becomes more interesting to know the differences between financial buyers and strategic buyers in terms of deal characteristics like takeover premiums, futures prospects of the firm and management retainment.

A number of researches have been conducted in which the relation between the type of buyer and the takeover premiums are investigated. Bargeron et al. (2008) used a sample of completed cash-only deals during the period 1998-2005 consisting of 453 deals by US private bidders and 1,214 deals by US public bidders and found that a sizable difference in premiums exists between the two types of bidders. Gorbenko and Malenko (2014), who used data on US company auctions in the period 2000-2008, found that a typical target is valued higher by strategic buyers compared to financial buyers. Another research done by Fidrmuc et al. (2012), who used a sample of 205 private equity deals of listed US targets that were matched to comparable deals with strategic buyers over the period from 1997 to 2006, shows that takeover premiums paid by private equity versus strategic buyers are not significantly different. Furthermore, research is done on the best way to sell a company, these studies focus primarily on the choice between selling the firm in a private negotiation, informal auction or controlled auction (Boone and Mulherin, 2007,2008,2009; Bulow and Klemperer, 2009). Since the chosen selling method largely determines the type of buyer, this research is considered highly relevant.

Looking at all relevant research done in the field, contemporary research seems to be missing. All research done in the field have taken a sample of acquisitions completed before the financial crisis of 2008. According to Rizzi (2009) the private equity industry suffered a setback triggered by the financial crisis; he explains that the 'golden age' of 2003-2007 is gone due to largely self-inflicted wounds. Though the private equity industry has probably scratched up ten years after the crisis, it is reasonable to assume that the industry will look significantly different than before the financial crisis. This paper will test whether the differences in takeover premiums between strategic and financial buyers have changed since the financial crisis.

Furthermore, all researches are focused on acquisitions that took place in the US market. According to Moschieri and Campa (2009), who analysed European M&A activity, takeovers in EU-15 countries still have specific characteristics, different from M&A's in the USA and Asia. These differences mainly arise in their attitude, acquisition techniques, payment methods and premiums. European deals are, for example, more often friendly, there is more concentrated ownership in Europe and European deals are more often cash-deals. All these differences might have an influence on the choice of a selling firm to who to sell the business to. This paper will test whether the difference in takeover premiums between strategic and financial buyers is significantly different in the European market compared to the US market.

The goal of this research is to examine whether differences in takeover premiums between financial and strategic buyers are consistent over time and geographical location. The research done in this paper will supplement previous literature that either looked at the differences in takeover premiums (Bargeron et al., 2008; Fidrmuc et al., 2012) or the difference in target valuations (Gorbenko and Malenko, 2014) between financial and strategic buyers. Aim of this paper is thus to increase the geographical scope as well as the time span of research done in this specific research field.

Another aim of this paper is to give all parties involved in a takeover process a little more insight in the determinants of a takeover premium, and thus the takeover price. Especially for European stakeholders it could be beneficial that they no longer have to rely on US data and assume that there is no significant difference between the two markets.

The remainder of this paper is organized as follows. In section 2, an overview of the relevant literature, leading to the hypotheses, will be given. In section 3, an elaboration will be given regarding the research methodology. In section 4, an overview of the results will be given. Section 5 discusses the findings of this research and proposes ideas for future research. Section 6 concludes.

2. Literature review

The takeover market is one of the largest corporate markets, a market that experienced a significant growth in the beginning of the 21st century (Gorbenko and Malenko, 2014; Dittmar et al., 2012). The takeover market consists of two main parties: buyers and sellers. Sellers are the firms who have decided to go into a selling process. This selling process starts either by a management decision to offer the company for sale, or by a prospective buyer approaching a target. The set of bidders is composed of two groups: strategic buyers and financial buyers (primarily consisting of private equity firms). Strategic buyers are usually companies in a related type of business, such as competitors, customers or suppliers. They tend to look for targets that offer long-term operational synergies and aim to integrate them into their own business (Gorbenko & Malenko, 2014). Financial buyers usually look for undervalued targets with a potential to generate high cash flows, often after reorganization. After acquisition, a financial buyer treats the target as a part of its financial portfolio (Gorbenko & Malenko, 2014). In a nutshell, one can say that strategic buyers apply a 'buy and hold-strategy', while financial buyers are applying a 'buy, improve and sell-strategy'.

For a long time, strategic buyers were dominating the M&A market. It was assumed that strategic buyers had a significant advantage over financial buyers, since they could pay significantly higher prices due to their ability to share with the sellers a portion of the synergy value created by the acquisition (Martos-Vila et al., 2013). However, since the turn of the century the dominance of strategic buyers has decreased and private equity firms have become increasingly important M&A players. They have increased in numbers, average fund size as well as deal number and deal size (Cumming et al., 2007). Following this market trend, the number of scientific articles researching the differences between strategic and financial buyers (Boone and Mulherin, 2009; Dittmar et al., 2012; Fidrmuc et al., 2012; Gorbenko & Malenko, 2014) and their effect on takeover premiums (Bargeron et al., 2008; Fidrmuc et al., 2012) and management incumbent (Qiu et al., 2014) increased as well.

Bargeron et al. (2008) found that public target shareholders receive a 63% higher premium when the acquirer is a public firm (most likely a strategic buyer) rather than a private equity firm. The premium difference holds with the usual controls for deal and target characteristics

In line with the findings of Bargeron et al. (2008), Gorbenko & Malenko (2014), who used data on auctions of companies, find that an average target is valued higher by strategic bidders compared to financial bidders. However, they indicate that this view is far from capturing the whole picture. The difference in average valuations varies widely across targets. While strategic bidders have higher valuations for targets with higher investment opportunities, financial bidders are willing to pay higher premiums for poorly performing targets. These results are thus consistent with the view that the takeover market is segmented, meaning that different targets appeal to different bidders.

Contrary to the findings of Bargeron et al. (2008) and Gorbenko & Malenko (2014), Fidrmuc et al. (2012) show that the takeover premium paid by private equity versus strategic buyers is not significantly different. Their research however emphasizes that the selling mechanism choice is a very important corporate decision that constitutes the beginning of the selling process and consequently also determines whether the firm is sold to a private equity or strategic buyer. Furthermore, their research confirms the findings of Gorbenko & Malenko (2014) that the takeover market is segmented.

Overall, though no consensus is reached on whether selling to a strategic buyer or a financial buyer leads to a more optimal takeover price, the literature hints towards a higher takeover premium paid by strategic buyers. Bargeron et al. (2008) mention some possible explanations. They say that failure is more costly for public firms, leading to higher bidding prices by strategic acquirers. However, it might also reflect greater agency costs in the typical public firm relative to private equity firms, or a greater willingness of private equity firms to make offers that have little chance of success. These explanations

are in the same line of thought as the theory of managerial hubris (Roll, 1986) and the theory of managerial discretion (also known as the free cash flow theory) (Jensen, 1986). Managerial hubris is the unrealistic belief held by managers in bidding firms that they can manage the assets of a target more efficiently than the target's current management, leading to too high bids for their targets (Roll, 1986). Following this theory, managers of strategic bidders would be more infected with hubris than managers of financial bidders. The theory of managerial discretion (Jensen, 1986) describes that in case of too much free cash managerial discretion can become too high, leading to (among others) an incentive for managers to cause their firm to grow beyond the optimal size. Result is that managers invest in targets with negative Net Present Value (NPV) for the acquirer.

Another potential reason why a strategic buyer would pay a higher takeover premium is given by Dittmar et al. (2012), who suggests that private equity buyers are more willing to retain the target CEO in exchange for a lower takeover value. However, Bargaron et al. (2008) and Qiu et al. (2014) studied the effect of CEO retention on the target's cumulative abnormal returns (CAR) and found no prove for the theory of Dittmar et al. (2012). Qiu et al. (2014) does find a significantly negative relation between target CEO retention and takeover premiums received by shareholders, but no difference between private equity and strategic buyers was found.

Looking at all the researches conducted in the discussed literature it is striking that all data collections took place within the United States (US) market. Possible explanations for this are the leading role of the US in the world economy, the strong supply of US M&A data and an overrepresentation of US researchers in the academic literature. Main question that arises is whether the results of research based on the US market can be universally applied. Moschieri and Campa (2009), who analysed the European M&A industry, mention that takeovers in EU-15 countries have specific characteristics, different from M&A's in the US and Asia. Furthermore, most European countries have a civil law system and a more bank-based financial system, opposed to the USA who has a common law system and a more market-based financial system (Alzahrani and Lasfer, 2012; Hernández-Cánovas and Martínez-Solano, 2010)

Next to the exclusive focus in existing literature on the US market, another issue is that the chosen sample periods all seem to overlap and are ending just before the financial crisis of 2008 (e.g. Bargaron et al., 2008; Firdmuc et al., 2012; Gorbenko and Malenko 2014; Dittmar et al., 2012). Contemporary research thus seems to be missing. Rizzi (2009) claims that the private equity industry suffered a setback triggered by the financial crisis and explains that the 'golden age' of 2003-2007 is gone. Though the private equity industry has probably scratched up ten years after the financial crisis, it is reasonable to assume that the industry will look different than before the financial crisis.

Research on the influence of buyer type on deal characteristics thus seems to be lacking for markets outside the USA, as well as for the post-financial crisis period. The aim of this research is to fill in this literature gap by conducting a study like the one of Firdmuc et al. (2012). In order to test whether the relation between buyer type and takeover premium is indeed universally valid and time independent, it is important to first explore the characteristics of this relationship in a single market and time period. The characteristics of this relationship can be used as benchmark for other time periods and regions. The chosen region and time period for this first research is based on the work of Bargaron et al. (2008), Gorbenko and Malenko (2014) and Firdmuc et al. (2012), who all conducted research on the relationship between buyer types and takeover premium/target valuation in the US market in a period between 1997 and 2008. The period chosen for my test is similar to these researches and consists of ten years spanning from January 1997 until December 2006. Notice that this period is ending just before the start of the global financial crisis. The chosen market is the US market. Though no consensus is reached, the above-mentioned literature hints towards a higher takeover premium paid by strategic buyers, leading to my first hypothesis:

Hypothesis 1: *strategic buyers pay (on average) a higher takeover premium than financial buyers for the same target in the US market in the period 1997-2006.*

The next part of this research focuses on the difference in takeover premiums between US strategic and financial bidders, in the period before and after the financial crisis of 2008. Based on the implementation of new reforms shortly after the financial crisis and the implementation of the Sarbanes-Oxley act (SOX) in 2002, the expectation is that agency costs between companies and their shareholders are reduced. Due to this decline of agency costs, the difference in takeover premiums between the two buyer types is expected to decrease over time as well. SOX is a US federal law, passed in 2002 in response to a number of high-profile scandals (e.g. Enron), that set new stricter requirements for all public US firm boards, management and public accounting to enhance corporate governance and thereby restore public confidence (Zhang, 2005). Though the act is passed years before the financial crisis, the years after 2002 are a relatively small part of the total research period of most researches conducted and the effect is thus not fully integrated in the figures. Another argument for the expected increase in investor protection and the associated decline in agency costs are the implementation of stricter financial regulation. Think about all the aspects of the Dodd-Frank Wall Street reform and consumer protection act. The Dodd-Frank act is a US federal law that overhauled financial regulation in the aftermath of the financial crisis and made changes affecting almost every part of the nation's financial services industry. Just like with the SOX, expected is that due to the decline in agency costs, the difference in takeover premiums between the two buyer types has decreased. This leads to the second hypothesis:

Hypothesis 2: *The difference in takeover premiums between US strategic buyers and US financial buyers has decreased after the financial crisis of 2008.*

The last part of this research focuses on the differences between the USA and Europe in terms of takeover premiums differences between financial and strategic buyers. Djankov et al. (2008) and La porta et al. (2008), who both presented a measure of investor protection, state that in common law countries transactions are subject to closer regulation, more legal scrutiny, greater disclosure requirements and more arm's-length approval than civil law countries. Common law countries are thus subject to a higher level of investor protection than civil law countries. The USA is classified as a common law country that is strong in investor protection, while almost all European countries (except the UK, Ireland and Cyprus) are classified as civil law countries (Alzahrani and Lasfer, 2012; The World Factbook, 2020). When applying this information to this paper's research, one can expect that investors in European firms are less protected from managerial hubris and managerial discretion than investors in American firms, potentially leading to more excessive takeover premiums. Expected is thus that the difference in takeover premiums between the two buyer types is higher in Europe compared to the USA. This leads to the third hypothesis:

Hypothesis 3: *The difference in takeover premiums between strategic buyers and financial buyers is higher in Europe compared to the USA.*

3. Research methodology

This chapter will explain the research methodology of the study. Section 3.1 describes the data collection process. Section 3.2 describes the matching process and section 3.3 will outline the set-up of the hypotheses tests.

3.1 Data collection process

To test the hypotheses set in the literature section, a quantitative research method will be used. Before any research can be conducted data has to be collected on acquisitions by financial and strategic buyers in three different sample periods and regions. The three samples are:

Sample 1: *USA acquisitions in the period 1997 - 2006* (US 97-06);

Sample 2: *USA acquisitions in the period 2009 - 2018* (US 09-18);

Sample 3: *European acquisitions in the period 2009 - 2018* (EU 09-18)

The M&A data used to form the three sample selections has been extracted from Factset. Factset is a database that provides descriptions and characteristics of M&A events and of the companies involved. Factset is considered to be a highly reliable source of financial data. To verify the data reliability of Factset, the plan was to crosscheck the Factset data with the data from the Eikon database. However, the database from Eikon generated significantly lower amounts of transactions, which were often incomplete as well. Because of this, the data from Eikon is considered to be unsuitable to use for a proper crosscheck.

To retrieve the data for the first sample (US 97-06) a search is conducted focusing on acquisitions completed between Januari 1, 1997 and December 31, 2006 whereby the target is a public firm located in the US. This resulted in 4,851 M&A transactions. As 'items to display' *announcement date, transaction value, 30 days premium (%)*, *financial buyer, strategic buyer* and *target primary SIC industry code* were added to the standard items displayed. The items financial buyer and strategic buyer show whether the acquirer is making the acquisition for investment purposes or for strategic business purposes. Financial buyers frequently include private equity firms, buyout funds or any other finance related company. Strategic buyers operate in the same business or industry as the target company and are often looking for synergies with the target company (Factset, 2020). Chosen is to look at the 30 days premium, this is considered to be a balance between the short-term premium in which there is a higher chance of information leakage prior to the deal announcement date, and the long-term premium in which the chances of incorporating other biases might increase. All transaction values are in million US Dollars. To end up with a complete list of M&A transactions all cases with a missing value in the aforementioned items are removed from the initial sample. These missing values were almost exclusively found in the *30 days premium* item. Before removal a check was done to test whether the to be removed cases were completely random, this seemed to be the case. Furthermore all *30 days premiums* with a value below -70% and above 500% were removed from the sample, this is done to prevent that the mean *30 days premium* is influenced by an extreme case. Only a few cases were removed because of this restriction. After this data cleaning 3,167 M&A transactions were left, of which 497 transactions were undertaken by a financial buyer and 2,670 transaction were undertaken by a strategic buyer.

To retrieve the data for the second sample (US 09-18) the same search criteria are applied as in sample one, only now the *announcement date* is set to 1 Januari, 2009 until 31 December, 2018. The second search thus focused on acquisitions completed between Januari 1, 2009 and December 31, 2018 whereby the target is a public firm located in the US. This search resulted in 2,512 M&A transactions. After data cleaning 2,362 M&A transactions were left, of which 375 transactions were

undertaken by financial buyers and 1,987 transactions were undertaken by strategic buyers.

To retrieve the data for the third sample (*EU 09-18*) the same search criteria are applied as in sample two, only now the *target location* is set to *Western Europe* and *Eastern Europe*, together capturing all European countries. The third search thus focused on acquisitions completed between Januari 1, 2009 and December 31, 2018 whereby the target is a public firm located in Europe. In 'items to display' *target country* is added to the existing list of items. This search resulted in 1,537 M&A transactions. After data cleaning 1,420 M&A transactions were left, of which 334 were undertaken by financial buyers and 1,086 were undertaken by strategic buyers.

3.2 Matching process

Next task in all three samples is to match each financial buyer acquisition with a strategic buyer acquisition. The matching procedure of this research resembles the matching procedure of Fidrmuc et al. (2012), whose matching was based on the following variables: *transaction value*, *target primary SIC industry code* and *announcement date*. This matching procedure involves the following steps:

- I. For every financial acquisition, a search is conducted for all strategic acquisitions wherein the target company has the same first three SIC code digits as the financial buyer target. Within this list a search is performed to find a matching transaction announced in the same year and comes closest in terms of transaction value, using a +/- 25% error range.
- II. If there is no matching transaction found in the same year and within the transaction value range, the same search is applied for the year before and year after the year of announcement.
- III. If still no match is found, the same research is widened to two years before and after the year of announcement.
- IV. If still no match is found, the search in step (I) is repeated, but now a search is conducted to strategic buyers with a target company that has the same first two SIC code digits as the financial buyer target.
- V. If there is still no match, the searches in step (I)-(IV) are repeated for transactions with a +/- 50% value error range.
- VI. As last option, step (I) is repeated at the first SIC code level.

Since financial and strategic buyers seem to be interested in different kind of targets (Boone and Mulherin, 2008), it is important to match acquisitions based on the described variables. Important to note is that every strategic acquisition can be matched to only one financial acquisition. In case a strategic acquisition is matched to multiple financial acquisitions, the best match will remain in the sample. For the other financial acquisition(s) a new matching process will start. Due to the time constraints of this research it is not possible to start a matching process for every single financial acquisition. Therefore the decision is made to make come up with the same number of matches in all three sample groups, which is 120. Having the same number of matches in all sample groups increases the comparability. However due to the fact that (using the criteria) no match was found for some financial acquisitions, the actual number of matching processes that were executed is higher than 120. The number of matching processes executed to get to 120 matches were respectively 146, 140 and 139 for samples one, two and three. Since reasonably no relation will exist between the first letter of the target's name and quantitative variables like premium or transaction value, the order of the matching process is done on alphabetical order of the *target name*.

3.3 Set-up of the hypotheses tests

3.3.1 Setting up an OLS regression

In order to research the effect of buyer type on the takeover premium, an OLS regression will be run between the (independent) variables *buyer type*, *announcement year*, *industry* and *transaction value*, and the (dependent) variable *30 days premium (%)*. Due to the design of the matching process, the expectation is that for each sample the transaction characteristics of the two groups (financial and strategic buyers) do not significantly deviate from each other.

The independent variable *buyer type*, the key independent variable of this research, is a categorical variable with only two categories (*financial buyer* and *strategic buyer*) and is therefore a dichotomous variable. The independent variable *industry* (determined by SIC code) is a categorical variable with a higher number of categories. Both categorical variables will be included into the model by transforming them into dummy variables. The other two independent variables, *announcement year* (interval level) and *transaction value* (ratio level) will be integrated into the regression without any adjustments. In order to test whether the effect of buyer type on takeover premium differs between industry sectors, for every industry sector an interaction variable is added to the formula. In case the coefficient of the interaction variable is significant, before as well as after removing the insignificant interaction variables, the relevant interaction term will remain in the model. The OLS regression (without interaction variables) will look as follows:

$$\text{Premium} = \beta_0 + \beta_1 * \text{Buyer type} + \beta_2 * \text{Announcement year} + \beta_3 * \text{Transaction value} + \beta_4 * \text{Construction} + \beta_5 * \text{FIR} + \beta_6 * \text{Manufacturing} + \beta_7 * \text{Mining} + \beta_8 * \text{Retail} + \beta_9 * \text{Services} + \beta_{10} * \text{TCU} + \beta_{11} * \text{Wholesale} + \varepsilon_i$$

Buyer type:

0 – Financial buyer
1 – Strategic buyer

Industry – E.g. Construction:

0 – Target is not active in the construction industry
1 – Target is active in the construction industry

* The complete NAICS – SIC Code list, including the full industry sector name, can be found in appendix A.

Before performing a final OLS regression it is important to first check whether any outliers have a significant influence on the estimations. This check will be done by running a Cook's distance D test. In case an observation has a Cook's distance D value larger than $4/n$, the observation is considered to be an influential case and will be removed from the sample. Next, it is important to check whether all relevant OLS assumptions are met. Keeping in mind that this research is dealing with a cross-sectional analysis, the focus of the assumption check will mainly be about the assumptions which are expected to be a potential source of trouble if violated. The following assumptions are considered to be included into this category: *there is homoscedasticity; each independent variable is uncorrelated to the error term; there is no multicollinearity; parameters of the model have for each individual (observation) the same value.*

The assumption *there is homoscedasticity* will be checked by running a Breusch-Pagan test and a Cameron & Trivedi's composition of IM-test. In case of heteroscedasticity, a robust standard error will be used. The assumption *each independent variable is uncorrelated to the error term* will be tested by running a Ramsey Reset Test. In case of violation of this assumption a new look will be given at the functional form and/or the independent variables that are (not) used. The assumption *there is no multicollinearity* will be checked by running a VIF (Variance Inflation Factor) test. To confirm multicollinearity a threshold value of five is used, meaning that if one or more variables have a VIF value higher than five the assumption is violated. To solve the issue of multicollinearity the variable with the highest VIF value will be removed from the regression and a new VIF test will be conducted. This process will continue until all variables have a VIF value lower than five. The assumption *parameters of the model have for each individual (observation) the same value* will be checked by

adding all relevant interaction variables. In case the coefficient of the interaction variable is significant, before as well as after removing the insignificant interaction variables, the relevant interaction term will remain in the model.

By performing the OLS regression on the first sample (US 97-06), the first hypothesis of this research can be tested. In case parameter β_1 is positive and significant the hypothesis that strategic buyers pay (on average) a higher takeover premium than financial buyers for the same target is confirmed. The same regression will be run for the other two samples (US 09-18 and EU 09-18) to test whether the first hypothesis also works for another time period and geographical location. In order to accept a hypothesis a minimum confidence interval of 90% is used.

3.3.2 Setting up a two-sample t test

In order to test the second hypothesis, *the difference in takeover premiums between US financial buyers and US strategic buyers has decreased after the financial crisis of 2008*, the mean premium difference between the buyer types of sample one will be compared to the mean premium difference between buyer types of sample two. This will be done using a *two-sample t test*. Before conducting such a test, it is important to first check whether any outliers are present in the data. This will be done by calculating a Z-score for each individual observation. The threshold to determine whether an observation is an outlier is set at a Z-score of -3.00 and 3.00. This means that every match in which one of the observations have a Z-score lower than -3.00 or higher than 3.00 will be removed from the sample. This threshold is widely used in academic research (Bakker and Wicherts, 2014). In case the samples have unequal variances and/or unequal sample sizes, a *two-sample t test with unequal variances* will be used. In case the mean premium difference of sample two (US 09-18) is significantly lower than the mean premium difference of sample one (US 97-06), the second hypothesis will be confirmed. A minimum confidence interval of 90% is used to accept the hypothesis.

In order to test the third hypothesis, *difference in takeover premiums between financial buyers and strategic buyers is higher in Europe compared to the USA*, the mean premium difference between the buyer types of sample two will be compared to the mean premium difference between buyer types of sample three. This will (again) be done using a *two-sample t test*. The set-up process of this *two-sample t test* is exactly identical to the set-up of the two-sample t test used to test the second hypothesis. In case the mean premium difference of sample three (EU 09-18) is significantly higher than the mean premium difference of sample two (US 09-18), the third hypothesis will be confirmed. Again, a minimum confidence interval of 90% is used to accept the hypothesis.

4. Results

This chapter will show and interpret the results of all analyses and regressions done. Section 4.1 describes and analyzes the characteristics of each of the three samples. Notice that in these samples no outliers or influential cases are yet removed. Since this will be the case in the upcoming regressions and two-sample t tests, the sample composition in section 4.1 will slightly differ from the samples used in section 4.2. Section 4.2 describes and discusses the set-up and the results of the regressions done.

4.1 Sample characteristics

4.1.1 US acquisition 1997 – 2006

Sample one consists of 240 completed M&A transaction that took place between January 1, 1997 and December 31, 2006, whereby the target is located in the United States. These transactions are divided into two equal groups based on the buyer type in each transaction, leading to one group with 120 transactions completed by a financial buyer and another group with 120 transactions completed by a strategic buyer. Due to the setup of the matching procedure these two groups should not significantly deviate from each other in terms of *announcement year*, *industry* and *transaction value*.

In Table 1 the distribution of *announcement years* is shown for both groups. Since the applied matching procedure allows matching transactions to have a maximum deviation of two years, the two distributions of the two groups are not identical. Nevertheless, a trend of an increasing number of transactions over time can be recognized in both group distributions. This finding is in line with Rizzi (2009) who described the period from 2003 to 2007 as the ‘golden age’ of the private equity industry.

Table 1
The distribution of announcement years for both the financial and the strategic buyer group.

Announcement Year	FinancialBuyer		StrategicBuyer	
	Freq.	Percent	Freq.	Percent
1997	7	5.83	5	4.17
1998	6	5.00	7	5.83
1999	8	6.67	10	8.33
2000	14	11.67	11	9.17
2001	11	9.17	16	13.33
2002	11	9.17	9	7.50
2003	13	10.83	13	10.83
2004	10	8.33	12	10.00
2005	15	12.50	20	16.67
2006	25	20.83	17	14.17
Total	120	100.00	120	100.00

Table 2 shows the *industry* distribution of the two groups. The industries are chosen based on the division used by the NAISC (2020) (see appendix A), who are dividing all businesses into ten different industries. The applied matching

procedure guarantees that all matches share (at least) the first SIC-code digit. However, important to notice is that not all businesses who share the same first digit in their SIC-code belong to the same industry. For example, businesses whose SIC-code start with the digit ‘1’ can either belong to the ‘mining’ industry or to the ‘construction’ industry, depending on the second digit of their SIC-code. In the same way businesses whose first SIC-code digit is a ‘5’ can either belong to the ‘wholesale trade’ industry or the ‘retail trade’ industry. Any deviations between the industry distribution of the two groups can be explained by this mechanism.

Table 2

The distribution of businesses over the industries for both the financial and strategic buyer group.

Industry	FinancialBuyer		StrategicBuyer	
	Freq.	Percent	Freq.	Percent
Construction	1	0.83	0	0.00
Finance, Insurance and Real Estate	17	14.17	17	14.17
Manufacturing	39	32.50	39	32.50
Mining	1	0.83	2	1.67
Retail trade	13	10.83	11	9.17
Services	39	32.50	39	32.50
Transport, Communication, Utility	7	5.83	7	5.83
Wholesale trade	3	2.50	5	4.17
Total	120	100.00	120	100.00

Table 3 shows both group's data related

to the *transaction value*. The applied matching procedure allows for a maximum transaction value deviation of 50%. Theoretically the difference in mean transaction value between the two group's could thus be 50%. However, since the deviations could be positive as well as negative and since a search is done for the 'best' match, it is more realistic that the difference between the groups is around the zero percent. Table 3 shows that the mean transaction value of both groups are respectively 791 million USD and 739 million USD, a difference of 52 million USD. This is a difference of -6.62%. The mean transaction values turn out to be not significantly different from each other. In conclusion, no remarkable differences are detected between this sample's group of financial buyers and strategic buyers in terms of *announcement year*, *industry* and *transaction value*, increasing the credibility of results in the next section.

Table 3

Statistics of the transaction values. 'FBTran-e' refers to the transaction value of the financial buyer group. 'SBTran-e' refers to the transaction value of the strategic buyer group.

Two-sample t test with equal variances

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
FBTran~e	120	791.4385	259.25	2839.941	278.0977	1304.779
SBTran~e	120	739.0751	235.3155	2577.752	273.127	1205.023
combined	240	765.2568	174.7015	2706.464	421.1054	1109.408
diff		52.36344	350.1199		-637.3662	742.0931

diff = mean(FBTransactionV~e) - mean(SBTransactionV~e) t = 0.1496
 Ho: diff = 0 degrees of freedom = 238

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 0.5594 Pr(|T| > |t|) = 0.8812 Pr(T > t) = 0.4406

4.1.2 US acquisition 2009 – 2018

Just like the first sample, sample two consists of two groups of 120 transactions. The only difference between the first and the second sample is that the transactions in sample two took place between January 1, 2009 and December 31, 2018, instead of the period 1997-2006. Sample two used the same matching procedure, therefore also in this case the group of financial buyers should not significantly deviate from the group of strategic buyers in terms of *announcement year*, *industry* and *transaction value*.

Table 4 shows the distribution of *announcement years* for both groups. No remarkable differences between the two groups can be detected, nor any clear trend over time.

Table 4

The distribution of announcement years for both the financial and the strategic buyer group

Announcement Year	FinancialBuyer		StrategicBuyer	
	Freq.	Percent	Freq.	Percent
2009	8	6.67	7	5.83
2010	13	10.83	15	12.50
2011	18	15.00	22	18.33
2012	12	10.00	10	8.33
2013	12	10.00	8	6.67
2014	8	6.67	8	6.67
2015	9	7.50	10	8.33
2016	12	10.00	12	10.00
2017	10	8.33	17	14.17
2018	18	15.00	11	9.17
Total	120	100.00	120	100.00

Table 5 shows the industry distribution of both groups. The only deviation is created by the fact that businesses in both the 'retail trade' and 'wholesale trade' industry have a SIC-code starting with the digit '5'.

Table 5

The distribution of businesses over the industries for both the financial and strategic buyer group.

Industry	FinancialBuyer		StrategicBuyer	
	Freq.	Percent	Freq.	Percent
Finance, Insurance and Real Estate	14	11.67	14	11.67
Manufacturing	30	25.00	30	25.00
Retail trade	14	11.67	9	7.50
Services	48	40.00	48	40.00
Transport, Communication, Utility	10	8.33	10	8.33
Wholesale trade	4	3.33	9	7.50
Total	120	100.00	120	100.00

Table 6 displays both group's data related to the *transaction value*. The table shows that the mean transaction value of both groups are respectively 1,666 million USD and 1,566 million USD, a difference of 100 million USD. This is a difference of -5.98%. The mean transaction value turns out to be not significantly different from each other. Again, no remarkable difference are detected between this sample's group of financial buyers and strategic buyers in terms of *announcement year*, *industry* and *transaction value*, increasing the credibility of results in the next section.

Table 6

Statistics of the transaction values. 'FBTran~e' refers to the transaction value of the financial buyer group. 'SBTran~e' refers to the transaction value of the strategic buyer group.

Two-sample t test with equal variances						
Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
FBTran~e	120	1666.253	367.0684	4021.033	939.4214	2393.086
SBTran~e	120	1566.582	346.9423	3800.563	879.6011	2253.562
combined	240	1616.418	252.0329	3904.477	1119.928	2112.907
diff		99.67185	505.0824		-895.3311	1094.675
		diff = mean(FBTransactionV~e) - mean(SBTransactionV~e)		t =	0.1973	
Ho: diff = 0				degrees of freedom =	238	
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr(T < t) = 0.5781		Pr(T > t) = 0.8437		Pr(T > t) = 0.4219		

4.1.1 EU acquisition 2009 – 2018

Like the previous samples, sample three consists of two groups of 120 transactions. The time period of this sample is the same as in sample two: from January 1, 2009 until December 31, 2018. Sample three however focuses on transactions wherein the target is located in Europe. Factset defines Europe in the broadest geographical context possible, this includes countries like Azerbaijan, Kazakhstan and Uzbekistan. Given the applied matching procedure, also in this sample the group of financial buyers should not significantly deviate from the group of strategic buyers in terms of *announcement year*, *industry* and *transaction value*. Different from the other samples is that in this sample a look will be given at the distribution of *countries* as well.

Table 7 shows the distribution of *announcement years* for both groups. Looking at the distributions one can see that there is a slight increase in the number of transactions over time. Respectively 60% and 61.6% of the transaction took place with the first five years of the times period (2009-2013).

Table 7

The distribution of announcement years for both the financial and the strategic buyer group.

Announcement Year	FinancialBuyer		StrategicBuyer	
	Freq.	Percent	Freq.	Percent
2009	15	12.50	9	7.50
2010	15	12.50	16	13.33
2011	20	16.67	22	18.33
2012	16	13.33	16	13.33
2013	6	5.00	11	9.17
2014	10	8.33	6	5.00
2015	15	12.50	9	7.50
2016	9	7.50	11	9.17
2017	7	5.83	11	9.17
2018	7	5.83	9	7.50
Total	120	100.00	120	100.00

Table 8 shows the industry distribution of both groups. Again, the only deviations are in industries that share the same first SIC-code digit.

Table 8

The distribution of businesses over the industries for both the financial and strategic buyer group.

Industry	FinancialBuyer		StrategicBuyer	
	Freq.	Percent	Freq.	Percent
Construction	0	0.00	2	1.67
Finance, Insurance and Real Estate	25	20.83	25	20.83
Manufacturing	33	27.50	33	27.50
Mining	5	4.17	3	2.50
Retail trade	10	8.33	5	4.17
Services	36	30.00	36	30.00
Transport, Communication, Utility	10	8.33	10	8.33
Wholesale trade	1	0.83	6	5.00
Total	120	100.00	120	100.00

Table 9 displays both group's data related to the *transaction value*. The table shows that the mean transaction value of both groups are respectively 304 million USD and 284 million USD, a difference of 20 million USD. This is a difference of -6.65%. The mean transaction value turns out to be not significantly different from each other.

Table 9

Statistics of the transaction values. 'FBTransactionV~e' refers to the transaction value of the financial buyer group. 'SBTransactionV~e' refers to the transaction value of the strategic buyer group.

Two-sample t test with equal variances

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
FBTransactionV~e	120	303.8172	88.13672	965.4894	129.2977	478.3367
SBTransactionV~e	120	283.6032	79.00871	865.497	127.1581	440.0484
combined	240	293.7102	59.06256	914.9933	177.3605	410.0599
diff		20.21396	118.3658		-212.9644	253.3924

diff = mean(FBTransactionV~e) - mean(SBTransactionV~e) t = 0.1708
 Ho: diff = 0 degrees of freedom = 238

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 0.5677 Pr(|T| > |t|) = 0.8645 Pr(T > t) = 0.4323

Table 10 displays the distribution of *target countries* for both groups in the sample. Since the applied matching procedure did not match transactions based on *target country*, the distributions do not necessarily have to resemble each other. However, due to the law of large numbers a certain degree of similarity is expected. Looking at the distributions no major differences are detected. Some minor differences are the frequencies of Sweden in both groups (7 and 14 times in respectively the financial and strategic buyer group) and the number of different countries per group (18 and 22 in respectively the financial and strategic buyer group). In conclusion, no remarkable differences are detected between the group of financial buyers and strategic buyers in terms of *announcement year*, *industry*, *transaction value* and *target country*, increasing the credibility of results in the next section.

Table 10

The distribution of target countries for both the financial and the strategic buyer group.

Target Country	FinancialBuyer		StrategicBuyer	
	Freq.	Percent	Freq.	Percent
Austria	2	1.67	1	0.83
Belgium	4	3.33	3	2.50
Bulgaria	1	0.83	0	0.00
Cyprus	1	0.83	0	0.00
Denmark	3	2.50	2	1.67
Finland	1	0.83	2	1.67
France	16	13.33	16	13.33
Germany	9	7.50	12	10.00
Greece	1	0.83	3	2.50
Ireland	2	1.67	0	0.00
Italy	3	2.50	4	3.33
Kazakhstan	0	0.00	1	0.83
Latvia	0	0.00	1	0.83
Lithuania	0	0.00	3	2.50
Luxembourg	0	0.00	1	0.83
Netherlands	3	2.50	6	5.00
Norway	1	0.83	3	2.50
Poland	4	3.33	6	5.00
Romania	0	0.00	1	0.83
Russian Federation	2	1.67	3	2.50
Serbia	0	0.00	1	0.83
Sweden	14	11.67	7	5.83
Switzerland	2	1.67	1	0.83
Turkey	0	0.00	1	0.83
United Kingdom	51	42.50	42	35.00
Total	120	100.00	120	100.00

However, something that does stand out is the dominant presence of the United Kingdom (UK) in both groups. This is especially interesting since the UK and Ireland are the only European country that are classified as a common law country, just like the USA (Alzahrani and Lasfer, 2012). This unique feature of the UK might very good be the reason that they are so dominantly present in the data. This would simply mean that M&A transactions are more common in common law countries than in civil law countries. The dominant presence of the UK in the samples might also be a threat to the validity of the third hypothesis. This hypothesis is namely grounded by the fact that the USA and Europe are different in

terms of investor protection, created by the type of legal system (common law VS. civil law). Following this theory, the substantial presence of the UK in the samples (respectively 42.5% and 35% for the financial and strategic buyer group) will lower the difference in takeover premiums between financial and strategic buyers. Assumed is thus that the chances that the hypothesis will be accepted are negatively related to the (relative) number of UK targets in the samples.

4.2 Regression analysis

The first part of this section described and analysed the characteristics of all three samples. Aim of this analysis was to confirm that the matching procedure was executed carefully, to check whether any noteworthy differences within and between samples were present and to give a clear overview of the data used in this paper. Whereas the previous section primarily focused on the independent variables, this section's main focus will be on the dependent variable. The dependent variable is the *30 days premium (%)*, henceforth known as '*premium*'. This section compares the premiums of the two groups within a sample (financial and strategic buyer group) and compares this difference with that of the other samples. This way an attempt is made to test the hypotheses grounded in section 2.

4.2.1 US acquisitions 1997-2006

Before running the final OLS regression to test the first hypothesis, it is important to first test whether any outliers are present who have a significant influence on the estimations. By running a *Cook's distance D test* and thereby applying a threshold value of ' $4/n$ ' (n being the number of observations), 18 influential outliers were detected. All these outliers are deleted from the sample. Since the number of influential outliers was quite high with respect to the total sample size, a check was done to control whether the figures and the accompanying conclusions presented in section 4.1 were still representative and valid. This turned out to be the case. Next, it is important to check whether all relevant OLS assumptions are met. An extensive summary of the *OLS assumption check of regression one* can be found in appendix B. In short, to solve the issue of heteroscedasticity *robust standard errors* will be used, to solve the issue of multicollinearity the variable with the highest VIF value (*Services*) will be removed from the regression, as last a test with the incorporation of interaction variables did not lead to the final addition of any interaction variable to the final OLS regression.

After removing the influential outliers a *two-sample t test with unequal variances* was conducted to get a first look at the mean premiums of both buyer groups. The mean premiums of the first sample's financial buyer group and strategic buyer group are respectively 32.50% and 45.28%, an absolute difference of 12.78% and a relative difference of 39.32%. These premiums are slightly lower than the findings of Fidrmuc et al. (2012), who conducted a similar research in the same time period and found an average premium of 42.9% and 47.8% for private equity versus strategic buyers, respectively. Important hereby is to note that Fidrmuc et al. (2012) did not remove any (influential) outliers, which are often associated with (extremely) high premiums and thus increasing the mean premium value. Eckbo (2009), who reviewed empirical research documenting offer premiums in US corporate takeovers in the period 1973-2002, indicates that the true offer premium is about 45-50%. A range that is (again) slightly higher than the premiums of this research's first sample.

To test this paper's first hypothesis, research has to be conducted to discover whether the mean premium of the strategic buyer group is significantly higher than the mean premium of the financial buyer group. The conducted *two-sample t test with unequal variances* shows that the two mean premiums are statistically significant different from each other (using a 99% confidence interval), confirming the first hypothesis. However, in this test the relationship between *buyer type* and *premium* is not controlled for external variables that might influence the test outcome. The factors that might influence the relationship are equal to the variables used in the matching procedure: *announcement year*, *transaction value* and *industry*. To properly test the first hypothesis an OLS regression has been

conducted whereby these control variables are included as independent variables. The key variable, *buyer type*, is a categorical variable with only two categories and will therefore be added to the regression as dummy variable. The *industry* variable is a categorical variable with eight different categories and will also be added to the regression as dummy. All industries with a frequency lower or equal to five are taken together as the category 'other industry sector'. The other two variables (*announcement year* and *transaction value*) are at least 'interval level' and are therefore added to the regression without any further adjustments. As already mentioned earlier, the industry sector *services* will be removed from the regression to solve the issue of heteroscedasticity and no interaction variables were significant enough to be added to the regression. This led to the following regression:

$$\begin{aligned}
 \text{Premium} = & \beta_0 + \beta_1 * \text{Strategic buyer} + \beta_2 * \text{Announcement year} + \beta_3 * \\
 & \text{Transaction value} + \beta_4 * \text{FIR} + \beta_5 * \text{Manufacturing} + \beta_6 * \text{Retail} + \beta_7 * \text{TCU} + \beta_8 * \\
 & \text{Wholesale} + \beta_9 * \text{Other} + \varepsilon_i
 \end{aligned}$$

Strategic buyer: **Industry – E.g. Construction:**
 0 – Financial buyer 0 – Target is not active in the construction industry
 1 – strategic buyer 1 – Target is active in the construction industry

The result of the OLS regression is shown in table 11.

Linear regression		Number of obs	=	222		
		<u>F(8, 212)</u>	=	.		
		Prob > F	=	.		
		R-squared	=	0.0802		
		Root MSE	=	33.976		
Premium	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
Strategicbuyer	12.96906	4.585177	2.83	0.005	3.930675	22.00743
Financialbuyer	0	(omitted)				
Announcementyear	-1.320625	.7436255	-1.78	0.077	-2.786472	.1452221
Transactionvalue	-.0013977	.0004068	-3.44	0.001	-.0021996	-.0005959
FIR	-10.17864	6.158731	-1.65	0.100	-22.31884	1.961553
Manufacturing	.0240323	6.327959	0.00	0.997	-12.44975	12.49781
Retail	-3.374464	6.229001	-0.54	0.589	-15.65318	8.904248
TCU	-7.136402	7.26685	-0.98	0.327	-21.46094	7.188137
Wholesale	10.755	5.213476	2.06	0.040	.4781106	21.03189
Other	-30.65325	5.776937	-5.31	0.000	-42.04084	-19.26565
_cons	2679.962	1489.188	1.80	0.073	-255.5499	5615.475

Table 11 presents the OLS regression testing the first hypothesis of this research.

A significant regression equation was found (F (9,212) = 2.05 , p < 0.05), with a R² of 0.0802. However, to confirm the first hypothesis of this paper the coefficient for the variable 'Strategicbuyer' (represented by β₁ in the regression formula) has to be statistical significantly higher than zero. Looking at table 11 one can see that this coefficient is significantly higher than zero, given a confidence interval of 99%. The average paid takeover premium increase by 12.97 in case the acquisitions was done by a strategic buyer. Due to this result the first hypothesis of this paper, **strategic buyers pay (on average)**

a higher takeover premium than financial buyers for the same target in the US market in the period 1997-2006, is confirmed.

4.2.2 US acquisitions 2009-2018

In order to run the final OLS regression of sample two, the same procedure is conducted as in the OLS regression of sample one. Running a *Cook's distance D test* led to the identification of six influential outliers. All these outliers are deleted from the sample. A check to control whether any significant changes took place in the figures and conclusions of section 4.1 was conducted and its result is negative. Next, it is important to check whether all relevant OLS assumptions are met. An extensive summary of the *OLS assumption check of regression two* can be found in appendix B. In short, to solve the issue of heteroscedasticity *robust standard errors* will be used and a test with the incorporation of interaction variables did not lead to a final addition of any interaction variable to the final OLS regression.

After removing the influential outliers a *two-sample t test with unequal variances* was conducted to get a first look at the mean premiums of both buyer groups. The mean premiums of the second sample's financial buyer group and strategic buyer group are respectively 34.21% and 37.04 %, an absolute difference of 2.83% and a relative difference of 8.27%. Comparing this sample's premiums to the premiums of sample one, one can see that a convergence in mean premiums has taken place between the two buyer groups. This convergence is mainly created by the reduction of the mean premium paid by strategic buyers, indicating that the premiums paid by US strategic buyers have decreased after the global financial crisis of 2008.

Data about the differences in mean premium, using a *two-sample t test with unequal variances*, tells us that the mean premium of the strategic buyer group does not significantly deviate from the financial buyer group's mean premium. This is in contrast to sample one. However, also in this sample a control has to be conducted for external variables that might influence the outcome. The set-up of this OLS regression is almost similar to the regression conducted in sample one. Only difference is that in sample two there was no need to create the category 'other industry sector' and there was no need to remove an industry sector to cope with multicollinearity. This led to the following regression:

$$\text{Premium} = \beta_0 + \beta_1 * \text{Strategic buyer} + \beta_2 * \text{Announcement year} + \beta_3 * \text{Transaction value} + \beta_4 * \text{FIR} + \beta_5 * \text{Manufacturing} + \beta_6 * \text{Retail} + \beta_7 * \text{Services} + \beta_8 * \text{TCU} + \beta_9 * \text{Wholesale} + \varepsilon_i$$

The result of the OLS regression is shown in table 12.

Linear regression		Number of obs	=	234		
		F(8, 225)	=	4.78		
		Prob > F	=	0.0000		
		R-squared	=	0.1268		
		Root MSE	=	31.502		
Premium	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
Strategicbuyer	1.037784	4.173969	0.25	0.804	-7.187287	9.262855
Financialbuyer	0	(omitted)				
Announcementyear	-2.791791	.7830565	-3.57	0.000	-4.334854	-1.248729
Transactionvalue	-.0003162	.0004693	-0.67	0.501	-.0012411	.0006086
FIR	12.72655	6.832438	1.86	0.064	-.7372024	26.1903
Manufacturing	22.58247	7.377273	3.06	0.002	8.045083	37.11985
Retail	12.35195	7.521821	1.64	0.102	-2.470273	27.17418
Services	18.97675	6.416034	2.96	0.003	6.333546	31.61995
TCU	0	(omitted)				
Wholesale	34.3833	9.154067	3.76	0.000	16.34463	52.42197
_cons	5639.373	1577.53	3.57	0.000	2530.749	8747.997

Table 12 presents the OLS regression testing the first hypothesis on the second sample.

A significant regression equation was found ($F(8,225) = 4.78, p < 0.01$), with a R^2 of 0.1268. However, to test whether the mean premium of the strategic buyer group is significantly higher than the mean premium of the financial buyer group, one should look at the variable 'Strategicbuyer' (β_1 in the regression formula). Table 12 shows that the mean premium paid by strategic buyers is not significantly higher than the premium paid by financial buyers. This confirms the findings of the *two-sample t test*. The finding of the first hypothesis that strategic buyers pay a higher takeover premium than financial buyers for the same US target in the period 1997-2006, can thus not be confirmed for the period 2009-2018.

To test hypothesis two, it is however irrelevant whether the mean premiums of the two buyer groups significantly differ from each other or not. Hypothesis two namely proposes that the difference in takeover premiums between US financial buyers and US strategic buyers has decreased after the financial crisis of 2008. Looking at the absolute and relative difference between the mean premiums paid by financial and strategic buyers in both the first sample (US 97-06) and the second sample (US 09-18), one can observe that there is indeed a decreasing trend. While the absolute and relative premium difference in sample one was respectively 12.78% and 39.32%, the absolute and relative premium difference in sample two was respectively 2.83% and 8.27%. On intuition this looks like a significant difference. To test whether this is actually true, a *two-sample t test* will be conducted.

Before running a *two-sample t test* on the difference in takeover premiums between US financial buyers and US strategic buyers before and after the financial crisis of 2008, it is important to first check whether any outliers are present in the data. This is done by calculating a Z-score for each individual observation. In case the Z-score has a value lower than -3.00 or higher than 3.00 the observation is considered an outlier and will, together with its match, be deleted from the sample. This led to the removal of five matches in the first sample and to the removal of three matches in the second sample. Since the samples have unequal variances as well as an unequal sample size a *two-sample t*

test with unequal variances will be used to test the hypothesis. The result of the test can be seen in table 13

Two-sample t test with unequal variances						
Variable	Obs	Mean	Std. Err.	Std. Dev.	[90% Conf. Interval]	
Pre~9706	115	-11.14162	4.767276	51.12334	-19.04734	-3.235903
Pre~0918	117	-1.187472	3.949618	42.72165	-7.736317	5.361373
combined	232	-6.12164	3.101184	47.23583	-11.24317	-1.000107
diff		-9.954147	6.190832		-20.17955	.2712554
diff = mean(Premiumdiff~9706) - mean(Premiumdiff~0918)				t =	-1.6079	
Ho: diff = 0		Welch's degrees of freedom =		223.469		
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr(T < t) = 0.0546		Pr(T > t) = 0.1093		Pr(T > t) = 0.9454		

Table 13 presents the two-sample t test with unequal variances testing the second hypothesis of this research. Pre-9706 refers to premium differences in sample one, Pre-0918 refers to the premium differences in sample two.

To confirm the second hypothesis of this paper the mean premium difference of the second sample should be significantly lower than the mean premium difference of the first sample. In other words, the difference should be significantly lower than zero. Looking at table 13 one can see that this is the case. The second hypothesis of this paper, ***the difference in takeover premiums between US strategic buyers and US financial buyers has decreased after the financial crisis of 2008***, is thus confirmed.

4.2.3 EU acquisitions 2009-2018

Before running the final OLS regression of sample three, the same procedure is conducted as before. Running a Cook's distance D test led to the identification of eighteen influential outliers. All these outliers are deleted from the sample. Since the number of influential outliers was quite high with respect to the total sample size, a check was done to control whether the figures and the accompanying conclusions presented in section 4.1 were still representative and valid. This turned out to be the case. Next, it is important to check whether all relevant OLS assumptions are met. An extensive summary of the *OLS assumption check of regression three* can be found in appendix B. In short, to solve the issue of multicollinearity the variable with the highest VIF value (services) will be removed from the regression and a test with the incorporation of interaction variables did not lead to the final addition of any interaction variable to the final OLS regression.

After removal of the influential outliers a *two-sample t test with unequal variances* was conducted to get a first look at the mean premiums. The mean premiums of the third sample's financial and strategic buyer group are respectively 26.38% and 31.79%, an absolute difference of 5.41% and a relative difference of 20.51%. The height of these mean premiums are quite a bit lower than that of the first and second sample of this research and thus also lower than the findings of Fidrmuc et al. (2012) and Eckbo (2009). While the mean premium of sample two (35.64%) is already somewhat lower than the mean premium of sample one (38.64%), the impression is created that the lower mean premium of sample three (29.06%) is primarily created by the geographical location of the target company. This

suggests that European targets receive (on average) lower premiums than their American counterparts, no matter the acquirer’s buyer type.

Data about the differences in mean premium, using the *two-sample t test with unequal variances*, shows that the mean premium of the strategic buyer group is not significantly higher than that of the financial buyer’s group. But also in this case a control has to be conducted for external variables that might influence the outcome. In this OLS regression the category ‘*other industry sector*’ is added to the regression formula, while the sector ‘*services*’ is deleted from the sample to solve the issue of multicollinearity. This led to the following regression:

$$\begin{aligned}
 \text{Premium} = & \beta_0 + \beta_1 * \text{Strategic buyer} + \beta_2 * \text{Announcement year} + \beta_3 * \\
 & \text{Transaction value} + \beta_4 * \text{FIR} + \beta_5 * \text{Manufacturing} + \beta_6 * \text{Retail} + \beta_7 * \text{TCU} + \beta_8 * \\
 & \text{Wholesale} + \beta_9 * \text{Other} + \varepsilon_i
 \end{aligned}$$

Strategic buyer: **Industry – E.g. Construction:**
 0 – Financial buyer 0 – Target is not active in the construction industry
 1 – strategic buyer 1 – Target is active in the construction industry

The result of the OLS regression is shown in table 14.

Source	SS	df	MS	Number of obs	=	222
Model	31102.683	9	3455.85366	F(9, 212)	=	2.94
Residual	249129.757	212	1175.14036	Prob > F	=	0.0026
				R-squared	=	0.1110
				Adj R-squared	=	0.0732
Total	280232.44	221	1268.02009	Root MSE	=	34.28

Premium	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
Strategicbuyer	3.56721	4.646561	0.77	0.444	-5.59217 12.72659
Financialbuyer	0	(omitted)			
Announcementyear	-.666885	.871337	-0.77	0.445	-2.384479 1.050709
Transactionvalue	.0062805	.0056275	1.12	0.266	-.0048126 .0173736
FIR	-19.22645	6.56023	-2.93	0.004	-32.15809 -6.294817
Manufacturing	-5.860132	6.092585	-0.96	0.337	-17.86994 6.149675
Retail	-22.25821	10.14581	-2.19	0.029	-42.25781 -2.258616
TCU	-6.246934	8.959704	-0.70	0.486	-23.90846 11.41459
Wholesale	83.61925	34.71432	2.41	0.017	15.1898 152.0487
Other	29.96819	18.22418	1.64	0.102	-5.955628 65.89201
_cons	1375.309	1754.555	0.78	0.434	-2083.299 4833.918

Table 14 presents the OLS regression testing the first hypothesis on the third sample.

A significant regression equation was found (F (9,212) = 2.94, p < 0.01), with an R² of 0.1110. However, to test whether the mean premium of the strategic buyer group is significantly higher than the mean premium of the financial buyer group, one should look at the variable ‘Strategicbuyer’ (β₁ in the regression formula). Table 14 shows that the mean premium paid by strategic buyers is not significantly higher than the premium paid by financial buyers, hereby confirming the finding of the *two-sample t test*. The finding of the first hypothesis that strategic buyers pay a higher takeover premium than financial buyers for the same US target in the period 1997-2006, can thus not be confirmed for EU targets in the period 2009-2018.

To test hypothesis three, it is however irrelevant whether the mean premiums of the two buyer groups significantly differ from each other or not. Hypothesis three namely proposes that the difference in takeover premiums between financial buyers and strategic buyers is higher in Europe compared to the USA. Argued is that the main cause of this higher discrepancy in Europe is the lower level of investor protection in European countries, caused by the different type of law systems applied. Transactions in European countries, known for their civil law system, are thus argued to be less subject to investor projection than similar transactions in the USA, known for their common law system. Processing this information one can expect that investors in European firms are less protected from managerial hubris and managerial discretion than investors in American firms, potentially leading to more excessive takeover premiums. Taking a glance at the absolute difference between the mean premiums paid by financial and strategic buyers in both the second sample (US 09-18) and the third sample (EU 09-18), one can indeed see that the premium difference between the buyer groups is higher in Europe (5.41%) than in the USA (2.83%). In order to test whether this difference is significant a *two-sample t test* will be conducted.

Before running a *two-sample t test* on the difference in takeover premiums between financial and strategic buyers in the USA and in Europe, it is important to first check whether any outliers are present in the data. Using a Z-score, this led to the removal of three matches in the second sample and six matches in the third sample. Since the samples have unequal variances as well as an unequal sample size a *two-sample t test with unequal variances* will be used to test the hypothesis. The result of the test can be seen in table 15.

Two-sample t test with unequal variances						
Variable	Obs	Mean	Std. Err.	Std. Dev.	[90% Conf. Interval]	
Pr~S0918	117	-1.187472	3.949618	42.72165	-7.736317	5.361373
Pr~U0918	114	-3.651996	4.643393	49.57787	-11.35283	4.04884
combined	231	-2.40373	3.036316	46.14801	-7.418224	2.610763
diff		2.464524	6.095948		-7.604021	12.53307
diff = mean(Premiumdif~S0918) - mean(Premiumdif~U0918)				t =	0.4043	
Ho: diff = 0				Welch's degrees of freedom =	224.205	
Ha: diff < 0		Ha: diff != 0		Ha: diff > 0		
Pr(T < t) = 0.6568		Pr(T > t) = 0.6864		Pr(T > t) = 0.3432		

Table 15 presents the *two-sample t test with unequal variances* testing the third hypothesis of this research. Pr-S0918 refers to premium differences in sample two, Pr-U0918 refers to the premium differences in sample three.

To confirm the third hypothesis of this paper the mean premium difference of the third sample should be significantly higher than the mean premium difference of the second sample. In other words, the difference should be significantly higher than zero. Looking at table 15 one can see that this is not the case. The third hypothesis of this research, ***the difference in takeover premiums between strategic buyers and financial buyers is higher in Europe compared to the USA***, is thus not confirmed.

5. Discussion of the findings

Due to the rapid economic development at the start of the 21st century, the magnitude of M&A activity started to increase and so did the influence of private equity firms into this industry. Due to this growing influence of private equity firms, a growing body of research started to investigate the relationship between on the one hand *buyer type* and on the other hand M&A characteristics like *takeover premium*, *target valuation* and *management retainment*. Especially the relationship between *buyer type* and *takeover premium* got some attention. However, remarkable was that the existing research was exclusively focused on the US market in the period 1997-2008. There seemed to be an unspoken assumption that the results of these researches were universally valid and time independent. This study challenges this (unspoken) assumption by hypothesizing that the difference in takeover premiums between financial and strategic buyers have decreased after the global financial crisis of 2008 and by hypothesizing that the difference between the premiums of the two buyer types is larger in Europe compared to the USA. Three hypotheses were developed to determine the effect of *buyer type* on *takeover premiums* in different time periods and geographical locations. Section 5.1 discusses the findings of the previous chapter and compares them with prior research. Section 5.2 elaborates on this paper's contributions, limitations and recommendations for future research.

5.1 Discussion and interpretation of results

In the first part of the result section of this paper the characteristics of all three samples are displayed and analysed. Next to giving the reader a clear overview of the data presented in this paper and checking whether the matching procedure was executed carefully, a search was done to see whether any notable trends and/or differences within and between samples were present. This led to some findings. In the first sample (US 97-06) a trend of an increasing number of transactions over time can be recognized. A finding that is in line with Rizzi (2009) who described the period from 2003 to 2007 as the 'golden age' of the private equity industry, mentioning that the industry was over-expanded and over-reached driven by spendthrift investors and careless credit markets. In the third sample there seems to be a decreasing number of transactions over time. This finding is not quite in line with the figures of the IMAA (2020), who show a fairly equal number of transaction over time in the period 2009-2018. This difference in findings could be explained by this research's relatively low sample size. Looking at the differences between samples, two more remarkable findings are found when comparing the average transaction values. The average transaction value of sample two (US 09-18) is 1.616 million USD, more than two times the average transaction value of sample one (US 97-06), which is 765 million USD. This increase in transaction value can only partly be explained by inflation (being 32% in the period 2002 - 2014 (US bureau of labor statistics, 2020)). In the *State of the deal trend* (Deloitte, 2019) is suggested that the ever growing average deal size is a consequence of 'the bigger the companies, the bigger the appetite for larger-size transactions', indicating that the large increase in average transaction value is primarily created by more transactions being executed among the top valued corporates. More research is required to get a better insight into this trend. Furthermore, the difference in transaction value between sample two (US 09-18) and sample three (EU 09-18) is remarkable. The average transaction value of sample two (1.616 million USD) is about 5.5 times larger than sample three (294 million USD). However, this difference can partly be explained by the fact that US public firms have an average market cap that is about 2.56 times the value of the average market cap of a European public firm (Factset, 2020), and partly by the fact that the majority of the transactions in sample two took place in the first half of the time period, associated with lower transactions values.

The second part of the result section of this paper compares the premiums of the two buyer groups within a sample and compares this difference with that of the other samples. This way the three

hypotheses of this paper are tested. To test the first hypothesis, ***strategic buyers pay (on average) a higher takeover premium than financial buyers for the same target in the US market in the period 1997-2006***, only the data of sample one is used. The mean premium of the first sample's financial buyer group and strategic buyer group are respectively 32.5% and 45.28%, an absolute difference of 12.78% and a relative difference of 39.32%. This difference is significant using a 99% confidence interval, hereby confirming hypothesis one. Other researches that were able to confirm a similar hypothesis are the researches of Barger et al. (2008) and Gorbenko and Malenko (2014). Barger et al. (2008) used a sample of completed cash-only deals during the period 1998-2005 consisting of 453 deals by US private bidders and 1,214 deals by US public bidders and found that a sizable difference in premiums exists between the two types of bidders. Gorbenko and Malenko (2014), who used data on US company auctions in the period 2000-2008, found that a typical target is valued higher by strategic buyers compared to financial buyers. Another research that tested a similar hypothesis but did not get a significant result is done by Fidrmuc et al. (2012), who used a sample of 205 private equity deals of listed US targets that were matched to comparable deals with strategic buyers over the period from 1997 to 2006. Though the expected difference was found between the premiums of private equity buyers and strategic buyers (43% and 48% respectively), this difference was not significantly different from zero. Given the fact that all these researches detect a higher premium paid by strategic buyers, of which most turn out to be significant, the cautious conclusion can be drawn that in the period 1997-2006 strategic buyers paid higher premiums for US targets than the financial buyers. Since this research had the available data, the same hypothesis was tested for US targets in the period 2009-2018 (sample two) and European targets in the period 2009-2018 (sample three). In both samples the mean premium paid by the strategic buyer group was higher than the mean premium paid by the financial buyer group, this difference was however not significant. However, important to note is that quite a low number of observations (N) are used in these samples. If this number had been significantly higher the 'margin of error' used to test the hypothesis would have been much lower, increasing the chances of accepting the hypothesis.

To test the second hypothesis of this paper, ***the difference in takeover premiums between US financial buyers and US strategic buyers has decreased after the financial crisis of 2008***, the data of the first and second sample are used. This hypothesis is grounded by the implementation of new reforms shortly after the financial crisis (e.g. the Dodd-Frank Wall Street reform) and by the implementation of the Sarbanes-Oxley act (SOX) already implemented in 2002. Expectation is that these reforms decreased the agency costs between the managers of strategic acquirers and their shareholders, leading to less excessive premiums and a lower premium difference between the two group of buyers. Where the mean premiums of the first sample's financial and strategic buyer group were respectively 32.5% and 45.28%, the mean premiums of the second sample are respectively 34.21% and 37.04%. Comparing these premiums, one can see that a convergence in mean premiums has taken place between the two buyer groups. This convergence is mainly created by the reduction of the mean premium paid by strategic buyers. This is in line with the reasoning used to ground the hypothesis. Testing shows that the convergence in mean premiums is significant, using a confidence level of 90%. Hypothesis two is thus confirmed. The confirmation of this hypothesis validates this paper's belief that the relationship between buyer type and takeover premium is time dependent. This paper suggests that the main cause for the reduction in divergence between the mean premiums of the two buyer types is a result of a decrease in agency costs within firms who act as a strategic buyer, which is primarily caused by structural reforms. Recommendation for future research is to further investigate the underlying cause of this reduction in divergence of takeover premiums between the two buyer groups.

To test the third hypothesis of this paper, ***the difference in takeover premiums between financial buyers and strategic buyers is higher in Europe compared to the USA***, the data of the second and third sample are used. This hypothesis is grounded by the difference in level of investor protection present in the two markets. Literature shows that the level of investor protection present in a country is a consequence of the applied law system, with common law countries being subject to a higher level of investor protection than civil law countries. Applying this knowledge to the case of takeover premiums, it is reasonable to assume that in a common law market (like the US market) investors are better protected from managers who are exposed to managerial hubris and empire-building behaviour than investors in a civil law market (most European countries), resulting in less excessive takeover premiums. Where the mean premiums of the second sample's financial and strategic buyer group were respectively 34.21% and 37.04%, the mean premiums of the third sample are respectively 26.38% and 31.79%. Looking at the mean premium of sample three when including both buyer types (29.06%) and comparing this to the mean premium of sample two (35.64%), the impression is created that the European targets receive (on average) lower premiums than their American counterparts, no matter the acquirer's buyer type. Looking at the premium paid by buyer type, one can see that the difference in mean premiums between the two buyer groups is larger in Europe compared to the USA. Testing however shows that the premium difference between the two buyer groups is not significantly higher in Europe than in the USA, in the applied time period. The increased mean difference is thus insignificant to confirm the third hypothesis.

A serious threat to the validity of the third hypothesis as grounded in this research is the dominant presence of UK targets in the third sample. Grounded was that the hypothesized increase in difference between the mean takeover premiums of the financial and strategic buyer group was caused by the fact that the European market is primarily subject to a civil law system, while the US market is subject to a common law system. Since fifty-two out of the fifty-five European countries used for this research are classified as civil law country and only two countries are classified as common law country (the UK and Ireland), the expectation was that when testing the differences in takeover premiums between Europe and the US one would automatically test the differences in takeover premiums between targets subject to a civil law versus a common law system. Though a substantial amount of acquisitions involving a UK-based target was expected, the dominant presence in sample three was not foreseen. In the financial and strategic buyer group respectively 42.5% and 35% of the targets were located in the UK. To put this in perspective, only 7.5% and 10% of the targets were located in Germany, the biggest European economy (Worldbank, 2020). Following the grounding of the third hypothesis, the substantial presence of the UK in the samples will lower the difference in takeover premiums between financial and strategic buyers. Assumed is thus that the chances that the hypothesis will be accepted are negatively related to the (relative) number of UK targets in the third sample. Recommendation for future research is thus to test two hypothesis, one focusing on the difference between the European market and the US market and the other focusing on the difference between markets subject to a civil law system and markets subject to a common law system.

5.2 Contributions, limitations and recommendations for future research

5.2.1 Contributions

This research contributes to the existing M&A literature by providing more insight into the effect of time and geographical location on the relationship between *buyer type* and *takeover premium*. Aim of this research was to challenge the unspoken assumption present in the existing literature that differences in takeover premiums between financial and strategic buyers are consistent over time and geographical location. Where all previous researches were exclusively focused on the US market in the period 1997-2008, this research expanded this scope. First of all this research confirmed that in the US

market in the period 1997-2006 strategic buyers paid (on average) a higher takeover premium than financial buyers for the same target. This result confirms the findings of similar researches and therefore contributes to the creation of a consensus. This research is however the first to test this same hypothesis for the subsequent period 2009-2018. Though the mean premium paid by strategic buyers was higher than that of financial buyers, in this time period it is not significantly proven that strategic buyers pay on average a higher takeover premium than financial buyers. This is the case for the US as well as the European market. Main finding of this research is that the difference in takeover premiums between US financial and strategic buyers has decreased after the financial crisis of 2008. This finding validates this paper's belief that the relationship between buyer type and takeover premium is time dependent. Theorized is that this convergence in mean premiums is caused by a decline in agency costs between the managers of strategic acquirers and their shareholders created by the implementation of new reforms shortly after the financial crisis and by the earlier implementation of the SOX. The fact that the convergence in mean premiums between the two buyer groups is mainly created by the reduction of the mean premium paid by strategic buyers, is in line with this theory. As last, this paper tested whether the difference in takeover premiums between the two buyer types is higher in Europe compared to the USA. Theorized is that this divergence in mean premiums is caused by the different level of investor protection present in each market, which is a direct consequence of the applied law system. The idea is that the higher the level of investor protection, the better shareholders are protected from managers who are exposed to managerial hubris and empire-building behaviour, resulting in less excessive takeover premiums. Though the difference in mean premiums between the two buyer groups is larger in Europe than in the USA, this difference is not significant. However, important to note is that (due to an assessment error) the conducted *two-sample t test* is not exactly testing the hypothesis as grounded in the literature section. The test shows that the difference in takeover premiums between the two buyer types is not significantly higher in Europe compared to the USA, but does not show whether the difference in takeover premiums between the two buyer types is significantly higher in civil law countries compared to common law countries. More research is needed to test that specific hypothesis.

In conclusion, this paper's theory that the relationship between *buyer type* and *takeover premium* is inconsistent over time is confirmed by discovering that the difference in takeover premiums between US financial and strategic buyers has decreased after the financial crisis. This paper's theory that the relationship between buyer type and takeover premium is inconsistent by geographical location is not confirmed. However, the stimulus for other researches to not limit their M&A research solely to the US market is hopefully given. Another aim of this paper was to give all parties involved in a takeover process a little more insight in the determinants of a takeover premium, and thus the takeover price. This is done by using more contemporary and thus more relevant data, by increasing the geographical scope with Europe and by theorizing the influence of institutional reforms and investor protection on the relationship between buyer type and takeover premium.

5.2.2 Limitations and recommendations for future research

Some limitations were encountered in this research, these can provide a foundation for future research. These limitations are primarily a consequence of the limited amount of funds and/or time available for this research.

Firstly, due to time constraints, the number of observations (N) used in each sample was lower than desired. Chosen was to settle with 120 observations in each sample, before checking for any (influential) outliers. By increasing the number of observations in each sample it is more likely to yield an average value closer to the expected value. Furthermore, increasing the number of observations reduces the margin of error. A lower margin of error could (for example) have accomplished that the second hypothesis would have been accepted with a stricter confidence interval or that the third

hypothesis would have been accepted at all. Advice for future researches is thus to increase the number of observations (N) significantly.

Secondly, a limited number of control variables were included in the regression analysis. Adding a relevant independent variable (like *transaction year*) into the model increases the accuracy of the effect that the main independent variable (*buyer type*) has on the dependent variable (*premium*). In other words, it increases the internal validity. However, the primary pitfall in controlled regressions is that the full set of variables one would want to control for is often not available (e.g. *concentration of ownership*) or the data is far from complete (e.g. *takeover purpose, method of payment*) in the accessible databases. Limit of this research is that there was only access to three relevant databases (Factset, Eikon and Zephyr), which did not quite complement each other. Having access to more (or other) databases could solve this limitation.

The last limitation of this research is solely concerned with the testing of hypothesis three. This hypothesis claimed that the difference in takeover premiums between financial buyers and strategic buyers is higher in Europe compared to the USA. Argued was that this increased discrepancy is created by the fact that the level of investor protection present in a country is determined by the applied law system. Civil law countries would have a lower level of investor protection, leading to higher agency costs and more excessive takeover premiums offered by overconfident and empire-building managers. Since fifty-two out of the fifty-five European countries used for this research were classified as civil law country, while only two countries were classified as common law country (UK and Ireland), the expectation was that when testing the differences in takeover premiums between Europe and the US one would automatically test the differences in takeover premiums between targets subject to a common law versus a civil law system. Though a substantial number of takeovers involving a UK-based target was expected, the dominant presence of UK targets in sample three was not foreseen. In the financial and strategic buyer group respectively 42.5% and 35% of the targets were located in the UK. Since the assumption was made that the chances that the hypothesis will be accepted are negatively related to the (relative) number of UK targets in the third sample, it is not surprising that the third hypothesis was not confirmed. Recommendation for future research is thus to test two hypothesis, one focusing on the difference between the European market and the US market and the other focusing on the difference between markets subject to a civil law system and markets subject to a common law system.

6. Conclusion

In this paper an analysis is done to test the effect of *time* and *geographical location* on the relationship between *buyer type* and *takeover premium*. Aim of this research was to challenge the unspoken assumption present in the existing literature that differences in takeover premiums between financial and strategic buyers are consistent over time and geographical location. This is done by collecting a data set of one hundred twenty public takeover deals made by financial buyers and matching them with comparable deals made by strategic buyers. This is done for three sample groups: 1. US deals in the period 1997-2006; 2. US deals in the period 2009-2018; 3. European deals in the period 2009-2018.

By comparing the data within a sample, this paper confirms earlier findings that in the period 1997-2006 US strategic buyers paid (on average) a higher takeover premium than financial buyers for the same target. This is however not the case for the subsequent period 2009-2018, both in the US and the European market. Main finding of this research is that the difference in takeover premiums between US financial and strategic buyers decreased significantly after the financial crisis of 2008. This validates this paper's belief that the relationship between buyer type and takeover premium is time dependent. The fact that the convergence in mean premiums is mainly created by the reduction of the mean premium paid by strategic buyers is in line with this paper's theory that this convergence is created by a decline in agency costs between the managers of strategic buyers and their shareholders, caused by new reforms. This paper's expectation that the difference in takeover premiums between the two buyer groups is higher in Europe compared the USA is not significantly proven. However, to test the influence of the type of law system applied in a market on the size of takeover premiums, a new (more diligent) research has to be conducted.

This is the first paper who theorized the influence of *institutional reforms* and the influence of the *applied law system* on the relationship between buyer type and takeover premium. This paper successfully challenged the unspoken assumption present in the existing literature that differences in takeover premiums are consistent over time. The prove that the difference in takeover premiums are also inconsistent over geographical location was not significant enough. However, the stimulus for other researches to not limit their M&A research solely to the US market is hopefully given. Furthermore, by using more contemporary data and by increasing the geographical scope, this paper gave all parties involved in a takeover process a little more insight in the determinants of a takeover premium.

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Appendices

Appendix A

<u>NAICS – SIC Code list</u>		
SIC-Code	Industry sector	Alternative name used in this paper
01-09	Agriculture, Forestry and Fishing*	-
10-14	Mining	-
15-17	Construction	-
20-39	Manufacturing	-
40-49	Transportation, Communications and utility	TCU
50-51	Wholesale trade	Wholesale
52-59	Retail trade	Retail
60-67	Finance, Insurance and Real estate	FIR
70-89	Services	-
90-99	Public administration*	-
	Other industry sector**	Other

* No firms used in this research's samples belonged to this industry sector.
 ** For each sample, all industry sectors with a frequency lower or equal to five are bundled in the category 'other industry sector'.

Appendix B

OLS Assumption checks

After removing all influential outliers it is time to check whether all relevant OLS assumptions are met. Going through the list of assumptions and hereby keeping in mind that this research is dealing with a cross-sectional analysis, four assumptions are identified that are a potential source of trouble if violated. These are the following four assumptions:

- *There is homoscedasticity*
- *Each independent variable is uncorrelated to the error term (no specification error)*
- *There is no multicollinearity*
- *Parameters of the model have for each individual (observation) the same value*

These assumptions will be checked in all three sample regressions.

Sample regression one (US 97-06)

The assumption *there is homoscedasticity* is checked by running a Breusch-Pagan test and a Cameron & Trivedi's Composition of IM-test. According to the Breusch-Pagan test (table 16) there is heteroscedasticity and thus a violation of the assumption, the IM-test (table 17) confirms this using 90% confidence interval. To solve this problem of heteroscedasticity a *robust standard error* will be used in the OLS regression.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
Ho: Constant variance	
Variables: fitted values of Premium	
chi2(1)	= 26.66
Prob > chi2	= 0.0000

Table 16 A Breusch-Pagan test testing for heteroscedasticity.

Cameron & Trivedi's decomposition of IM-test			
Source	chi2	df	p
Heteroskedasticity	38.28	28	0.0933
Skewness	5.67	9	0.7725
Kurtosis	13.01	1	0.0003
Total	56.96	38	0.0247

Table 17 A Cameron & Trivedi's decomposition of IM-test testing for heteroscedasticity.

The assumption *each independent variable is uncorrelated to the error term* is checked by running a Ramsey Reset Test. The outcome of the test (table 18) confirms that there is no specification error, the assumptions is thus not violated.

Ramsey RESET test using powers of the fitted values of Premium	
Ho: model has no omitted variables	
F(3, 209)	= 0.49
Prob > F	= 0.6906

Table 18 A Ramsey Reset test testing for a specification error.

The assumption *there is no multicollinearity* is checked by running a VIF (Variance Inflation Factor) test. To confirm multicollinearity a threshold value of five is used, meaning that if one or more variables have a VIF value higher than five the assumption is violated. As can be seen in table 19 there are multiple variables with a VIF higher than five, indicating that there is multicollinearity. To solve this issue the variable with the highest VIF value (*services*) is removed from the regression and a new VIF test is conducted. The new VIF test (table 20) shows that there no longer is any multicollinearity.

Variable	VIF	1/VIF
Services	50.91	0.019643
Manufacturing	50.59	0.019769
FIR	29.87	0.033479
Retail	20.09	0.049781
TCU	12.42	0.080489
Wholesale	3.95	0.252852
Transaction	1.13	0.883596
Announcement	1.08	0.929489
Strategic	1.01	0.991579
Mean VIF	19.01	

Table 19 (left) A VIF test detecting multicollinearity.

Table 20 (right) A second VIF test detecting no multicollinearity after removing the variable *services*.

Variable	VIF	1/VIF
Manufacturing	1.32	0.757730
FIR	1.25	0.802805
Retail	1.19	0.841508
TCU	1.16	0.861890
Transaction	1.13	0.883596
Announcement	1.08	0.929489
Wholesale	1.03	0.973863
Other	1.01	0.986222
Strategic	1.01	0.991579
Mean VIF	1.13	

The assumption *parameters of the model have for each individual (observation) the same value* is checked by adding all relevant interaction variables to the regression. In case the coefficient of the interaction variable was significant, before as well as after removing the insignificant interaction variables, the relevant interaction term would have remained in the model. This was not the case.

Sample regression two (US 09-18)

The assumptions *there is homoscedasticity* is checked by running a Breusch-Pagan test and a Cameron & Trivedi's Composition of IM-test. According to the Breusch-Pagan test (table 21) there is heteroscedasticity and thus a violation of the assumption, while the IM-test (table 22) indicated that there is homoscedasticity. To be sure that there will be no heteroscedasticity a *robust standard error* will be used in the OLS regression.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
Ho: Constant variance	
Variables: fitted values of Premium	
chi2(1)	= 14.28
Prob > chi2	= 0.0002

Table 21 A Breusch-Pagan test testing for heteroscedasticity.

Cameron & Trivedi's decomposition of IM-test			
Source	chi2	df	p
Heteroskedasticity	17.57	28	0.9365
Skewness	13.77	8	0.0880
Kurtosis	7.34	1	0.0067
Total	38.68	37	0.3935

Table 22 A Cameron & Trivedi's decomposition of IM-test testing for heteroscedasticity.

The assumption *each independent variable is uncorrelated to the error term* is checked by running a Ramsey Reset Test. The outcome of the test (table 23) confirms that there is no specification error, the assumptions is thus not violated.

Ramsey RESET test using powers of the fitted values of Premium	
Ho: model has no omitted variables	
F(3, 222)	= 0.27
Prob > F	= 0.8476

Table 23 A Ramsev Reset test testing for a specification error.

The assumption *there is no multicollinearity* is checked by running a VIF (Variance Inflation Factor) test. To confirm multicollinearity a threshold value of five is used, meaning that if one or more variables have a VIF value higher than five the assumption is violated. As can be seen in table 24 all variables have a VIF value lower than five, the assumption is thus not violated.

Variable	VIF	1/VIF
Services	4.12	0.242562
Manufacturing	3.58	0.279615
FIR	2.42	0.413646
Retail	2.21	0.451839
Wholesale	1.71	0.585064
Transaction	1.13	0.884244
Announcement	1.08	0.926640
Strategic	1.02	0.978503
Mean VIF	2.16	

Table 24 (left) A VIF test testing for multicollinearity.

The assumption *parameters of the model have for each individual (observation) the same value* is checked by adding all relevant interaction variables to the regression. In case the coefficient of the interaction variable was significant, before as well as after removing the insignificant interaction variables, the relevant interaction term would have remained in the model. This was not the case.

Sample regression three (EU 09-18)

The assumptions *there is homoscedasticity* is checked by running a Breusch-Pagan test and a Cameron & Trivedi's Composition of IM-test. According to both the Breusch-Pagan test (table 25) and the IM-test (table 26) there is homoscedasticity. The assumption is thus not violated.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
Ho: Constant variance	
Variables: fitted values of Premium	
chi2(1)	= 1.30
Prob > chi2	= 0.2551

Table 25 A Breusch-Pagan test testing for heteroscedasticity.

Cameron & Trivedi's decomposition of IM-test			
Source	chi2	df	p
Heteroskedasticity	20.83	29	0.8653
Skewness	27.73	9	0.0011
Kurtosis	6.58	1	0.0103
Total	55.14	39	0.0449

Table 26 A Cameron & Trivedi's decomposition of IM-test testing for heteroscedasticity.

The assumption *each independent variable is uncorrelated to the error term* is checked by running a Ramsey Reset Test. The outcome of the test (table 27) confirms that there is no specification error, the assumptions is thus not violated.

Ramsey RESET test using powers of the fitted values of Premium	
Ho: model has no omitted variables	
F(3, 209)	= 1.27
Prob > F	= 0.2866

Table 27 A Ramsey Reset test testing for a specification error.

The assumption *there is no multicollinearity* is checked by running a VIF (Variance Inflation Factor) test. To confirm multicollinearity a threshold value of five is used, meaning that if one or more variable(s) have a VIF value higher than five the assumption is violated. As can be seen in table 28 there are multiple variables with a VIF higher than five, indicating that there is multicollinearity. To solve this issue the variable with the highest VIF value (*services*) is removed from the regression and a new VIF test is conducted. The new VIF test (table 29) shows that there no longer is any multicollinearity.

Variable	VIF	1/VIF
Services	49.15	0.020346
Manufactur~g	46.54	0.021487
FIR	39.81	0.025121
TCU	18.48	0.054121
Retail	14.31	0.069905
Other	5.01	0.199776
Transactio~e	1.14	0.880653
Announceme~r	1.10	0.906917
Strategicb~r	1.02	0.980773
Mean VIF	19.62	

Table 28 (left) A VIF test detecting multicollinearity.

Table 29 (right) A second VIF test detecting no multicollinearity after removing the variable services.

Variable	VIF	1/VIF
Manufactur~g	1.44	0.695028
FIR	1.42	0.704865
TCU	1.19	0.842569
Retail	1.15	0.870318
Transactio~e	1.14	0.880653
Other	1.11	0.900804
Announceme~r	1.10	0.906917
Wholesale	1.02	0.979565
Strategicb~r	1.02	0.980773
Mean VIF	1.18	

The assumption *parameters of the model have for each individual (observation) the same value* is checked by adding all relevant interaction variables to the regression. In case the coefficient of the interaction variable was significant, before as well as after removing the insignificant interaction variables, the relevant interaction term would have remained in the model. This was not the case.