



M&A and acquirer types

Who pays a higher premium? Strategic or financial acquirers?

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Abstract

This paper investigates the difference in deal premium between strategic and financial acquirers and how characteristics of financial acquirers influence this. The US and the UK M&A markets are analysed from 2000 to 2022. This paper finds that financial acquirers pay almost 10 per cent less than strategic acquirers. The size and specialisation of financial acquirers negatively affect the deal premium paid. As a sub-analysis, the M&A auction market is investigated to find out how competition and target types affect the influence financial player characteristics have on the premium. This paper finds a significant positive association between financial acquirers and the deal premium in auctions. A negative impact of acquirer size on the deal premium is found. Contrary to the overall M&A market, industry specialisation positively affects the deal premium. Overall, this paper concludes that there is a statistical association between (characteristics of) financial acquirers and the deal premium paid in M&A transactions.

Contents

1	Introduction	1
2	Theoretical framework	5
2.1	What determines the deal premium?	5
2.2	Strategic acquirers	7
2.3	Financial acquirers	7
2.4	Takeover auctions	9
3	Data	11
3.1	Sample restrictions	11
3.2	Variable selection and definition	13
3.2.1	Deal premium	13
3.3	Acquirer characteristics	13
3.4	Target- and deal characteristics	15
3.5	Preliminary analysis of the deal premium	19
3.6	Dealing with missing values	22
4	Methodology	23
4.1	Cross-sectional multivariate regression models	23
4.2	Auction data	27
4.3	Multivariate binomial logistic regression model	28
5	Results	29
5.1	Complete M&A data set	29
5.2	Auction subset	33
5.3	Robustness tests	37
6	Conclusion	37
7	Discussion	40
	References	42

1 Introduction

Within the Mergers and Acquisitions (M&A) market, the deal value of Private Equity (PE) firms soared to almost 1,000 billion US dollars in 2021, the highest value recorded for any year in the merger market (Brahmst & Laumann, 2022). The growth in deal volume is not limited to PE firms; the global M&A market surpassed pre-pandemic levels in 2021, totalling 5.1 trillion US dollars in transaction value and thereby setting a record (KPMG, 2021). The M&A market is dominated by acquirers that can be classified as either one of two types of buyers, leaving financial institutions and banks out of the research. According to Martos-Vila, Rhodes-Kropf, and Harford (2011), an acquirer is either a strategic or financial player. Strategic buyers are operating firms, while financial buyers are financial sponsors often Private Equity (PE) firms.

The deal premium can be described as the buyer's willingness to pay more than the market value for an interest stake in the target company. A higher willingness to pay comes from a higher strategic or financial advantage an acquirer can obtain if they add the target company to their portfolio. A higher willingness to pay that leads to a higher deal premium increases the probability of deal completion. As a selling firm or owner wants to maximise its gains from selling the company, they are more likely to complete the deal process with a firm that is willing to pay more. Historically, it was thought that strategic acquirers had a higher willingness to pay than financial acquirers, partly because of their synergistic value creation options (Martos-Vila et al., 2011). This is part of the reason they closed relatively more deals than their financial counterparties.

Because of the rise of financial acquirers and their ability to specialise in certain industries, a research with more recent data on the differences in deal premium between strategic and financial acquirers is wanted. Therefore, this study proposes the following research question:

Do financial acquirers still pay lower deal premiums and how does their specialisation and size influence the price paid?

According to PwC (2022), almost 40% of the M&A deals in 2021 involved a private equity fund, while this was just 30% over the last five years. This rise is partly due to the global high levels of dry powder because of fundraising by private equity firms. Dry powder refers to the money that is committed by investors but not yet invested. Dry powder levels rise because PE firms have shortened their fund raising cycles and investors commit more capital to PE fundraising because of their high returns. However, the growth in number of PE firms in the M&A market leads to more competition. More players compete for the same number of lucrative

deals. Due to higher fundraising activity and more competition, committed cash is piling up. Higher dry powder levels provide more capital for PE firms that can be used to increase deal numbers or pay higher deal premiums. Because of the growth financial players have been through, their portfolios grew as well. Nowadays, private equity firms often include multiple firms in the same industry in their portfolio which leads to industry specialisation. Experience in the sector is valuable because replication of strategies or sector knowledge can lead to success. Besides this, PE firms complete follow-on acquisitions for portfolio companies and can therefore enjoy partly the same synergistic value creation that strategic buyers can. However, PE-firms are still relatively new players in the M&A market and do not always specialise in certain industries or use follow-on acquisitions. Therefore, it is probable they can not attain the same synergistic value creation opportunities as strategic acquirers.

There are theories that suggest firms backed by financial sponsors have superior operating performance. The Jensen hypothesis (Jensen, 1999) states that the greater operating performance of PE-backed firms is partly because of their superior governance mechanism. Another theory that explains the relative better performance by PE backed firms is the industry specialisation hypothesis. This hypothesis states that the specialisation of PE-firms increases operating profitability due to synergies (Cressy, Munari, & Malipiero, 2007). It is possible that the greater operating performance of PE-backed firms translates into a higher target firm valuation by financial acquirers in the deal process. This higher valuation can translate into a larger deal premium as the willingness to pay for the target company increases. This paper tries to find out if the modernisation of PE-firms (an increase in superior operating performance, growth of PE-firms, and synergistic value options) increase the willingness to pay of financial players compared to strategic acquirers. If this is true, the deal premium paid by financial acquirers should be higher than that of strategic acquirers in our sample. Historically, strategic acquirers were able to pay higher premiums than financial acquirers according to literature.

The most important finding of this study is that being a financial player has a negative correlation of 10 percentage points with the deal premium in the overall M&A market sample. This finding suggests that financial players pay relatively deal premiums than their strategic counterparts in the sample. The negative correlation is in line with previous literature that states that strategic acquirers pay higher premiums than financial acquirers. A possible explanation for this finding is that strategic acquirers have more possibilities for operational synergies Gorbenko and Malenko (2014) or that managerial hubris in strategic firms leads to overpaying Bargeron, Schlingemann, Stulz, and Zutter (2008). However, this paper can not give a definitive answer.

The difference in deal premium can explain why strategic acquirers still close relatively more deals, even though PE-firms are more active on the market than in earlier years.

The analysis is primarily carried out via cross-sectional multivariate regression models with year-fixed effects and control variables. Year-fixed effects and country-specific effects are used to control for the overall economic and financial environment. Besides fixed-effects, control variables regarding target characteristics are added to the model. Cross-sectional multivariate models are used because of ease of interpretation and high explanatory power. The addition of fixed effects makes the model useful on the sample and this way I can control for the (economic) environment. Robustness of the results is tested via removing possible outliers, looking at interaction effects and using a different method to calculate the deal premium. no major differences are found.

The size of financial acquirers has a negative correlation with the deal premium these players pay in the complete UK and US M&A market. The negative relationship could be because PE-firms gain bargaining power if they are larger in size and therefore able to negotiate lower premiums.

A higher level of industry specialisation by financial acquirers, meaning they have more experience in the sector as they have done multiple investments in the same industry, has a statistical negative relationship with the deal premium in the complete M&A sample. Again, an increase in bargaining power could explain this difference.

This paper studies the M&A markets of the United States (US) and the United Kingdom (UK). The UK and US markets are used in this study for several reasons. First, the UK and the US are the most active countries when looking at deal volume (Statista (2022); Jorge (2022)). Second, data is widely available. Third, the US and UK are a good representative of the M&A market in Western countries, which makes it possible to generalise the results of this study. For these reasons, these two markets will be used to gather this study's data. The data set that includes 2,687 deals, is gathered via the Thomson ONE Banking data base over the years 2000 to 2022.

Besides focusing on the overall M&A market, this paper makes a sub-analysis of auctions. According to Fidrmuc, Roosenboom, Paap, and Teunissen (2012) only 35 per cent of private equity deals and 60 per cent of strategic deals are initiated by bidders. PE buyers are commonly known to participate in auctions to find a new portfolio company. Gorbenko and Malenko (2014) found that strategic players in auctions pay higher premiums than financial bidders and often have fewer competing bids. It is interesting to find out if the difference in deal premium between the two types of players is enlarged due to the (possibility of) competitors and the type

of target firms that opt for selling in an auction. Competition could enlarge the difference in deal premium if the two types of buyers react differently to an increase in competition in terms of wanting to outbid the competition above the value of the firm. This paper also looks at the difference in target characteristics in auctions and the full M&A sample to find out if this can explain the change in how (characteristics of) financial bidders influence the deal premium paid. According to Anilowski Cain, Macias, and Sanchez (2009) auctions are most beneficial for companies with future cash flow uncertainties, can explain the reason for financial players paying higher premiums than strategic players in an auction setting compared to negotiations. The most important finding of this paper for the sub-analysis of auctions is the positive correlation between financial players and the deal premium. This opposite effect could be because of a decrease in bargaining power, as Ahlers, Hack, Kellermanns, and Wright (2016) stated that bargaining power of PE-firms decreases if competition increases. Another explanation could be in the type of firms that opt for selling via auctions, PE-firms tend to pay more for poor performing companies as they can restructure them and make them profitable again (Gorbenko & Malenko, 2014). The relationship between industry specialisation and the deal premium was negative in the full M&A sample, but positive in the subset of auctions. Theoretically this can be explained by the more relatively poor performing firms in the auction sample. Industry specialisation of PE-firms could make it less difficult to transform these poor performing companies into better performing ones.

No study has analysed the influence of acquirer type on the deal premium and looked at acquisition characteristics of financial firms such as size and industry specialisation at the same time. Previous research (Alexandridis, Fuller, Terhaar, and Travlos (2013); Kaplan and Schoar (2005)) states that size and specialisation of strategic acquirers influences deal premium. As Cressy et al. (2007) found that operating profitability of PE-backed firms increases when specialisation increases, it is interesting to find out if this translates to a higher deal premium paid by financial acquirers. If so, these characteristics would have similar influence on the deal premium among the two types of acquirers. A study like this is not known yet, especially focusing on both the total M&A market and the more competitive auction market.

2 Theoretical framework

2.1 What determines the deal premium?

The acquisition price in M&A deals is determined by what the acquirer believes the target is worth. The deal premium can be described as the buyer's willingness to pay more than the market value for an interest stake in the target company. In the acquisition process, acquirers often buy targets for a considerable cost over the market value of the target company. The extra price paid is the deal premium. This deal premium is paid as the acquiring firm believes it can benefit from the takeover by either (1) increasing the value of the firm or by (2) increasing the wealth of the manager (Motis, 2007). The first motive mainly influences the deal premium. A value increase can be because of possible value-creating or cost-reducing synergies; these are often impacted by the characteristics of both the target and acquiring firm. It indicates that this is a required field to do research in.

Another value creation possibility is to place more effective managers at the head of the company to give the existing assets more value, as these managers can extract more value from these assets. This hypothesis is called the market for corporate control hypothesis (Manne, 1965). The premium is based on the characteristics of both the target and the acquirer, but how is this willingness to pay more than market value constructed? To illustrate this, a three-layered structure is used. The overall economic situation will be the bottom layer, the deal and target characteristics will be the middle layer, and the attributes of the acquirer are the top layer.

At the basis of the deal, the premium is the overall economic situation; as observed by scholars such as Shleifer and Vishny (2003), M&A activity happens in waves. These merger waves are caused by market overvaluations, according to Rhodes-Kropf and Viswanathan (2004). There are two common theories for why overvaluation causes merger waves. First, according to neoclassical theory, the most significant driver of merger and acquisition activity is the misvaluation of the stock market and the capacity of managers to exploit this misvaluation. Second, according to Q-theory, there is no misvaluation, but high valuations indicate a better-quality business; these higher valued companies acquire lower quality targets to enhance the performance of these firms and achieve an efficient market equilibrium again. However, for economic shocks to influence M&A activity, enough liquidity needs to be present in the market.

The middle layer is concerned with how the deal- and target characteristics influence the deal premium and is influenced by the bottom layer through overvaluation and capital availability. Rhodes-Kropf, Robinson, and Viswanathan (2005) divided overvaluation into three categories:

long-term overvaluation, sector overvaluation, and firm-specific overvaluation. They discovered that undervalued targets (firm-specific misvaluation) are often bought via cash, as this is cheaper as the equity is overvalued. More overvalued targets with higher Tobin's Q ratios are expected to receive relatively lower deal premiums as the overvaluation is already considered (Weitzel & Kling, 2017).

Other target characteristics that lead to a more significant deal premium are lower leverage and better target performance over the preceding year (Bargeron et al. (2008); Fidrmuc et al. (2012)). According to previous research, the size of the target has a negative influence on the deal premium (Alexandridis et al., 2013). The size of enterprises is positively related to more institutional ownership (O'Brien & Bhushan, 1990). Stulz, Walking, and Song (1990) claim that institutional owners are open to accepting lower premiums cos of their lower capital gains tax rates. The same negative association between premium and target size is found by Betton, Eckbo, and Thorburn (2008), as larger companies may be more challenging to sell and hence have less bargaining leverage than smaller companies. These are all indications as to why the size of the target firm might negatively affect the deal premium. As to deal characteristics, offers in cash are less likely to be declined by the management team and shareholders of the target and often hold higher premiums as the capital gains from cash targets cannot be deferred but must be realised immediately.

The acquirer qualities at the final layer influence the premium provided for the target. The bottom and middle layers interact with the top layer, affecting the likelihood of accepting the offer and compensation scheme. The acquirer characteristics are influenced by the overall economic situation and how they are valued in the market. One of the characteristics that affect the acquisition premium is the level of current leverage the acquirer has. It is doubtful that the acquirer would be able to raise additional financing through debt markets if it is already heavily leveraged. Also, cash mergers are more likely to happen in undervalued markets, and the reaction on the stock market is less adverse for cash offers. But as Rhodes-Kropf and Viswanathan (2004) stated, M&A waves occur during periods of overvaluation, which correlates with a more significant proportion of completed acquisitions utilising stocks. In overvalued markets, managers are often too optimistic about the expected synergy gains, leading to overspending on the deal premium (Rhodes-Kropf et al., 2005).

The deal premium used in this research is based on research by (Jarell & Poulsen, 1989), who suggest measuring the deal premium four weeks before the announcement date of the merger. Four weeks are taken to minimise the inclusion of other long-term effects of fundamental factors

that can impact the share price and exclude information about the merger available shortly before the announcement date.

2.2 Strategic acquirers

Strategic buyers are corporations that want to acquire other companies for strategic business reasons like growth potential and synergies. Historically, strategic buyers dominated the M&A market, not only due to their ability to realise (operational) synergies because of economies of scale that may emerge from integrating operations (Gorbenko & Malenko, 2014) but also because of the absence of financial buyers in the M&A market. Another reason strategic buyers might pay more significant premiums is because of their empire-building mentality, leading them to overpay for the firm to reach their goal of managing a large company (Bargeron et al., 2008). Their possibility to pay hefty premiums might lead them to dominate the acquisition market, which will be investigated in this study. Historically, it is thought that strategic acquirers were able to pay higher premiums due to possible synergies and that way, win auctions or go successfully through the acquisition process; this study will analyse if this claim can be confirmed in the current M&A environment by proposing the first hypothesis:

Hypothesis 1 *Strategic acquirers pay higher deal premiums than financial acquirers.*

The hypothesis will be tested using a cross-sectional multivariate linear regression model with year-fixed effects and control variables for target characteristics.

2.3 Financial acquirers

Financial acquirers such as PE firms have gained market share in the M&A market since the early 2000s. PE buyers are often industry outsiders and face agency costs as they must hire specialists to run the firm. The increased risk due to uncertainty leads to lower valuations and, therefore, lower premiums (Shleifer & Vishny, 1992). Contrary to the findings of Shleifer and Vishny, Fidrmuc et al. (2012) found no significant difference in deal premium between strategic or private equity buyers. Other studies find that private equity buyers pay lower premiums to shareholders (Bargeron et al. (2008); Dittmar, Li, and Nain (2012)). An advantage of selling to a PE acquirer is the possibility of the target firm's management to continue working at the company and profit from future growth via an equity stake (Dittmar et al., 2012), making the PE firm a preferred buyer candidate. The influence of industry and size specialisation of financial buyers on bargaining power has been examined before in management buyout processes by Ahlers

et al. (2016). Their study found that the bargaining power of PE firms is lower for situations with high competition, such as in bidding auctions but increases when industry or size specialisation is high. This study will analyse if this increase in bargaining power due to industry specialisation leads to financial acquirers being able to pay lower premiums and if their dominance is more visible in an auction setting.

As mentioned previously, Jensen (1999) researched the post-deal operating performance of PE-backed firms and found that their greater operational profitability is due to their superior governance mechanism. He predicted that private equity buyers would eventually dominate the market for mergers and acquisitions due to these superior governance mechanisms.

Kaplan and Schoar (2005) found that more extensive and older private equity firms outperform newer firms. They pay lower premiums because of their experience in evaluating the company's value and increased bargaining power. Therefore, it is expected to find a similar negative influence of PE-firm size on deal premium in this research.

Cressy et al. (2007) found that operating performance and deal premium are positively influenced when PE firms operate in industries they have more expertise in. These findings put those of Kaplan and Schoar in contrast. They suggest a positive influence on the deal premium of industry specialisation by financial acquirers and a possible beneficial impact on the probability of winning an auction. Shleifer and Vishny (1992) reported that financial buyers pay lower premiums as they lack industry-specific knowledge to accurately value the target firms' assets and fear overpaying for them. As industry specialisation can make valuations more accurate and buy-and-build strategies can lead to the same synergistic value creations as strategic buyers (Walkling, 1985), it is expected that industry specialisation will positively affect the deal premium paid. The contradictory literature indicates the importance of further research on this topic.

Over the years, financial players have developed in size and the capacity to specialise in specific industries and types of acquisitions. This leads to the possibility that their chances of winning an auction or successfully going through the acquisition process have increased over time due to these specialisation or size components. Based on previous literature, industry specialisation should positively affect the deal premium financial buy are willing to pay to acquire the target firm. At the same time, the size should have a negative impact. To find out if this statement can be confirmed and acquirer characteristics of financial players influence the deal premium. The following multi-layered hypothesis is tested via a cross-sectional multivariate regression model with year-fixed effect:

Hypothesis 2a Industry specialisation positively affects the premium paid.

Hypothesis 2b The size of financial acquirers negatively affects the premium paid.

In general an increase in specialisation or size of both types of acquirers can have an effect on the deal premium (Alexandridis et al. (2013); Kaplan and Schoar (2005)). This study looks at the effects on deal premium of both the size of strategic and financial acquirers. The specialisation is only taken for financial acquirers as strategic acquirers are often firms active in the same industry sector as their target (Gorbenko & Malenko, 2014). For strategic acquirers, this leads to overpayment because of synergies and possible hubris (Bargeron et al., 2008). Based on a study by Kaplan and Schoar (2005) this research expects the increase in deal premium caused by industry specialisation to possibly be larger than that of strategic firms. Financial players have superior governance mechanisms and can possibly exploit the growth options in a better way (Jensen, 1999) and therefore might be willing to pay a higher premium. This could be offset by their lesser presence of overconfidence (Bargeron et al., 2008), the possible counter-effect gives relevance to the research.

2.4 Takeover auctions

The sub-analysis of takeovers through auctions is done for two reasons. First, if a takeover is negotiated with only a single bidder, the outcome is determined by the likelihood of competition if the bidder's offer is declined. This expected competition is not observed in negotiations; including these takeovers in the sub-sample is impossible. Second, transaction histories characterised as negotiations are sometimes of poor quality as they have little information on the takeover process. For example, auctions with missing data on losing bids might be classified as negotiations. Therefore, the sub-analysis of auctions is done to accurately assess the impact of competition on the deal premium.

The takeover auction process has been described by Boone and Mulherin (2007) after examining 400 takeovers of public firms in the United States, of which half can be qualified as takeover auctions. The process starts when the Board of Directors decides to sell the firm to a potential buyer after analysing different strategic alternatives. The decision to sell can be based on the firm wanting to focus on its core business, financial downtime, generating liquidity, or other reasons. Most of the time, the firm hires an investment bank to analyse potential buyers, both financial and strategic, and contacts the selected parties by the target firm. The candidate buyers sign confidentiality contracts to receive non-public information about the target company. After analysing this information, some parties will submit preliminary non-binding bids. The

candidates are not committed to these bids yet, as terms often change in negotiations. In the final round, the candidate buyers are asked for their final offers, and the formal takeover process and agreement are signed between the target and acquiring firm. The auction process leaves room for bidders to compete and for the target firm to select the company they are most willing to sell to, relating to an essential aspect of this study.

This study will make a sub-analysis of auctions to determine if the additional element of competition changes the effects that selected variables have on the deal premium paid in an M&A transaction. The sub-analysis is based on a studies by Gorbenko and Malenko (2014). They focused on the difference in deal premium between strategic and financial players as well as the probability of winning a takeover auction. However, these studies focus more on valuation than deal premium and therefore this study is an extension of earlier research and not a replica. A strategic buyer might be less likely to win the bid at an auction or not successfully go through the acquisition process because it can be undesirable to sell the company to a competitor (Scholes, Wright, Westhead, Burrows, & Bruining, 2007). To find out if this is true in the UK and US auction market, a binomial logistic regression model will be used to predict the probability that an auction is won by a financial player.

To find out if the competencies of strategic players in valuing targets (Gorbenko & Malenko, 2014) and their more favourable position due to synergy possibilities lead to higher deal premiums in a more competitive setting, the following hypothesis is proposed and tested via a cross-sectional year-fixed effects model:

Hypothesis 3 Strategic acquirers pay higher premiums than their financial counterparties in the M&A auction market.

Earlier research, such as by Ahlers et al. (2016) and Kaplan and Schoar (2005), focused on the change in the bargaining power of PE firms when competition increases. Based on their research, bargaining power is expected to increase when PE firms are larger in size or are more specialised. However, based on research by Walkling (1985) it is expected that industry specialisation is positively correlated to deal premium as PE firms can exploit operational and governmental synergies as well as being able to conduct buy-and-build strategies. To find out if this increase in bargaining power and higher synergistic value creation opportunities translate to a significant difference in premium, the following hypothesis is proposed:

Hypothesis 4a Industry specialisation positively affects the premium paid in relation to the M&A auction market.

Hypothesis 4b The size of financial acquirers negatively affects the premium paid in relation to the M&A auction market.

3 Data

The data for this study was collected via the Thomson ONE Banking database. The Thomson database has financial data, news, and company profiles on over 60,000 firms worldwide. This research focuses on transactions that occurred from 2000 to 2022.

3.1 Sample restrictions

The following requirements must be met to be included in the data sample:

- (1) The acquisition is announced between January 1st, 2000, and January 1st, 2022.
- (2) The target is a publicly-traded non-financial company in the UK or US, and the deal is not undisclosed.
- (3) After the acquisition, the bidder holds at least 50% of the target shares.
- (4) The final deal value is at least \$5 million.
- (5) The takeover is entirely cash-based.
- (6) The buyer is either a financial or strategic buyer.
Financial buyers are indicated via a financial sponsor flag or leveraged buyout firm flag.
Strategic buyers are marked via the acquirer is a public firm flag.
- (7) The deal status is completed.
- (8) The deal does not qualify as a spinoff, recapitalisation, self-tender, exchange offer, or repurchase.
- (9) The deal is made with at least two bidders for the sub-analysis of auctions.

The restrictions imposed for this study influence the size of the data set. 7.1 in the Appendix displays how the sample size is influenced by the set of restrictions. Out of the total of 318,645 M&A deals in the time period where the target firm is located in the UK or the US, only 2,687 qualify for this study. Some of the restrictions might bias the sample as they limit the inclusion

of deals. Strategic buyers often acquire a smaller percentage of companies and pay in stock as opposed to cash; especially in times of overvaluation. The majority ownership restrictions is imposed as ownership actually changes and the deal premium might differ from minority acquisitions because of the value of control. It is possible that the deal premium increases when firms buy minority stakes before buying a majority of the equity as the acquirer will receive a premium on their own shares. However, the data set includes a limited number of these type of toehold purchases and no significant difference in deal premium is found between toehold purchases and immediate majority acquisitions. The all cash restriction could bias the results as most strategic firms pay in stock. However, omitting the restriction would make the analysis impossible as financial firms are mostly no public firms and consequently can not pay in shares. Therefore, the possible bias it creates should be taken for granted as it allows for the comparison to be made.

The necessity of targets having a public status has been indicated by Barger et al. (2008). The significance of this can be broken down into two reasons: first, unlike private companies, public companies are required to publish financial information; this information is needed as input via control variables in the models constructed in this research. Second, the target's stock returns are required to compute the premium paid for the target. The majority ownership requirement is needed as financial buyers often purchase a majority share of the target company. Also, the premium for majority ownership of the target company is usually higher than for interests of less than 50 per cent due to funding limits (Gorbenko & Malenko, 2014). Only deals with a deal value of more than £5 million are included in the sample. Penny stock transactions with lower deal values can severely skew the sample as their premiums are not representative of more significant deals. The selection is limited to all cash transactions since private equity companies cannot utilise their shares as a form of currency. Public strategic buyers often use stock as a currency as they feel their shares are overpriced. As a result, they would be able to buy the target for a lower premium, causing a discrepancy between the compensation computed in this study and the actual premium.

Considering deals with a mixture of cash and equity will bias the sample, and the real difference between premiums will be hard to identify. Private equity firms are indicated in the sample by the financial sponsor or LBO flag in the total sample ¹. To correctly quantify the actual premium paid by an acquirer, only completed deals that do not qualify as a spinoff,

¹Capital investment bidders qualify as financial players in the sub-analysis for auctions. It would be incorrect to categorise them under strategic players in the auction process.

recapitalisation, self-tender, exchange offer, or repurchase are selected.

A final restriction that is only imposed on the sample used for the sub-analysis of takeovers through auctions is that the deal has at least two bidders.

3.2 Variable selection and definition

3.2.1 Deal premium

The four-week deal premium is the dependent variable in this study. This premium is measured as the offer price divided by the target stock price four weeks previous to the announcement date and expressed as a percentage. One of the most common definitions of the deal premium. Another measure that is often used in merger research is the cumulative abnormal return to measure the stock price returns for target shareholders via an event study. However the direct measure of the deal premium has two distinct benefits over an abnormal return as a dependent variable (Eckbo, 2009). The first reason is that the deal premium is a direct result of the behaviour of the acquirer in the bidding process, and second, the direct deal premium is less susceptible to rumours as the short-term runup of the target stock price that reflects talks about the takeover is already incorporated in the final deal premium that is paid.

When calculating the deal premium, the date on which this value is taken should be distant enough from the intended announcement date while still being close enough to indicate a fair valuation to minimise the influence of rumours and other events. Therefore, following in the footsteps of Barger et al. (2008), and Jarell and Poulsen (1989), the transaction premium is measured using the target share price four weeks in advance of the original announcement date and calculated in the following way:

$$Deal\ premium_i = \frac{S_0 - S_{4M}}{S_{4M}} \quad (1)$$

Where S_0 stands for the offer price per share and S_{4M} equals the target closing stock price four weeks before the original announcement date.

3.3 Acquirer characteristics

This study tries to explain the premium paid by the acquirer via acquirer characteristics and some control variables for target and deal characteristics. The Financial player dummy variable for private equity transactions equals one if the acquirer is qualified as a financial buyer or a leveraged buyout firm and zero if the acquirer is a strategic buyer. As this study focuses on

financial buyers, no acquirer characteristics of strategic buyers are taken separately into the equation. Interacting strategic acquirer characteristics separately into the model would lead to a different research, measuring these effects are not needed for this specific study. If the coefficient for this financial acquirer dummy is small or insignificant, the difference in premium is not explained by what type of player the acquiring party is. The specialisation of the financial firm will be counted based on similar deals in the same sector or the acquisition phase based upon portfolio information. This specialization variable will be conducted per deal and range from not specialised (value of 1) to very specialised (value of 4). The specialisation levels are measured in the following way:

- (1) The financial player has done no previous deals in this sector or the firm was not part of their portfolio companies anymore at the time of the deal.
- (2) The financial player has done a few deals in this sector, however it is only a small component of their portfolio.
- (3) The financial player has done several deals in this sector and a larger proportion of their portfolio is dedicated to the industry.
- (4) The financial player only does deals in this specific industry sector.

As this research focuses on both specialisation and the size of financial acquirers, the $Size_f$ of the financial player is determined by information found online on assets under management by the financial firm.

Summary statistics of the size of acquirers can be found in Table 3.1. The average size of financial acquirers, determined by the value of the assets under management, is 88,900 million US dollars. However, the distribution is heavily skewed due to some significant private equity funds that did multiple deals, such as the Blackstone Group LP and Apollo Global Management LLC. The median fund size represents the size of financial acquirers better. It indicates that financial acquirers have around a median of \$7,800 million, or just below \$8 billion worth of assets under management. The average size of strategic acquirers, determined by the book value of total assets, equals \$25,500 million. This number is again skewed because of some prodigious acquirers, although there are fewer strategic acquirers that undergo multiple transactions. The median size of strategic acquires is 2,680 million US dollars. As the size of the acquirers are measured in a different way, Table 3.1 only gives an overview and is not meant as a way of comparing the statistics of the sizes of both acquirer types.

Table 3.1: Acquirer characteristics

This table contains the summary statistics of the size of the acquirer types. The Wilcoxon rank sum test indicates the statistical difference between the mean values of the groups.

	Strategic acquirer	Financial acquirer	W-test
<i>Observations</i>	$N = 2,247$	$N = 440$	$N = 2,687$
Acquirer size			
Mean	25,500	88,900	W = 1.138
Median	2,680	7,800	p = 0.8825

3.4 Target- and deal characteristics

To correctly assess the effect of attributes of financial buyers, control variables for target and deal characteristics that influence the premium paid need to be included in the model. The chosen target control variables are based upon earlier research done by Gorbenko and Malenko (2014) and van der Hijden (2016). The descriptive statistics of targets can be found in Table 3.2.

Table 3.2: Target characteristics

This table contains the summary statistics of the target characteristics for both types of acquirers. The *T*-test indicates the statistical difference between the mean values of the groups.

	Strategic acquirer		Financial acquirer		T-test
	<i>N</i> = 2,247		<i>N</i> = 440		<i>N</i> = 2,687
<i>Observations</i>	<i>Mean</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>	p-value
Target size	3,520	134	611	163	p = 0.1366
Relative target size	7.52	0.0482	2.30	0.0327	p = 0.2464
Tobin's Q	1.57	1.26	9.34	1.14	p = 0.2642
Profitability*	-0.076	0.0215	0.00999	0.0563	p = 0***
Operational cash flow*	-0.0351	0.0421	0.0445	0.0650	p = 0***
Cash*	0.204	0.108	0.144	0.0725	p = 0***
R&D expenses*	0.177	0.0985	0.0952	0.0591	p = 0***
Intangible assets*	235	19.9	197	26	p = 0.6472
Leverage*	0.255	0.143	0.276	0.222	p = 0.00171***

* As a ratio to the book value

Note:

*p<0.1; **p<0.05; ***p<0.01

The $Size_t$ variable refers to the firm size of the target, defined as the book value of the total assets based on the most recent financial information available before the announcement date. According to the literature, target size has an influence on the size of the deal premium. Financial acquirers purchase smaller targets than strategic acquirers (Bargeron et al., 2008). In the data set used in this study, the target size is not similar for both types of buyers, as the Wilcoxon rank-sum test indicates that strategic players acquire significantly larger targets than financial players. Although the test shows that the target sizes are comparable in the auction setting, the $Size_t$ variable is transformed to $Relative\ size_t$ to display the size of the target relative to the acquirer. Taking the ratio will make it easier to understand how the relative size increase influences the premium paid. Sizes of strategic and financial acquirers can not easily be compared as they are measured via different accounting values, however taking the ratio makes it possible to find out if a relative size increase influences the deal premium paid. As described in Section 3.2.1 overvaluation is an essential driver of M&A activity and deal premium in the middle layer of the deal premium framework. Therefore, *Tobin's Q-ratio* will be added

as a control variable. *Tobin's Q* is calculated by dividing the market value four weeks before the announcement by the company's book value. Undervalued targets commonly earn a more significant premium, especially in cash-only transactions (Rhodes–Kropf et al., 2005). Financial players prefer underperforming targets, while strategic buyers prefer more profitable firms in general, according to Gorbenko and Malenko (2014). Therefore, *Profitability* measured as EBIT over assets, measured over the last twelve months before the announcement date, is considered in the model.

Furthermore, Operating cash flow (*Cash flow*) in the previous 12 months before the announcement date, *Cash*, *R&D expenses* over the last 12 months before the announcement date, and *Intangible assets* are all used in the model constructed as ratios to the target's book value. *Cash* and *Cash flow* are positively related to the premium paid by financial buyers, according to Fidrmuc et al. (2012). Whereas *R&D expenses* and *Intangible assets* positively correlate to strategic players' premiums (Bargeron et al., 2008). Finally, *Leverage* controls the long-term debt to total assets over the last year.

Strategic acquirers buy targets that are larger in size in both an absolute and relative way. Financial acquirers buy more overvalued firms according to the average values of *Tobin's Q-ratio* but not according to the median values. A Tobin's Q-ratio greater than one indicates that a company's stock is overvalued. However, it should be noted that the average Q-ratio according to the Federal Financial Accounts Z.1 data is predominantly above one and even closer to 1.6 lately (Mislinski, 2022). Therefore, it can be said that strategic acquirers buy relatively less overvalued than financial acquirers when looking at the mean value. Still, this finding is reversed when looking at the median values that better represent the data as it is less biased by outliers. Earlier research done by Bargeron et al. (2008) found similar results for *Tobin's Q-ratio*.

The industry SIC code of the target is transformed to the variable *Industry* into the following categories: agriculture, business, consumer, electronics, financial services, food & drinks, housing, industrial, IT, medical, research, transportation, and vehicles. Merging into a smaller set of meaningful categories is done for interpretability as categories are very similar and some levels would otherwise have a too low frequency to perform analysis on. According to Rhodes–Kropf et al. (2005), overvaluation can differ between sectors and might explain a difference in the premium size between sectors.

Table 3.3 shows the spread of M&A activity among different *Industry sectors*. Most acquisitions of strategic players take place in the IT sector, with many companies that focus on prepackaged software. Firms that operate in the financial services industry, such as providing

mortgages or investment advice, are also in demand. Other sailable industries are the medical industry or the more industrial sector. Financial acquirers focus more on the consumer industry and the IT sector. The results indicate some differences between strategic and financial acquirers for the type of sector the target is in; it is essential to consider when modelling the deal premium. A possible industry premium does not bias the difference in premium between the type of buyers.

Table 3.3: Target primary industry distribution

This table contains the distribution of the primary industry per acquirer type and in the complete data set.

	Strategic acquirer	Financial acquirer	Overall
<i>Observations</i>	$N = 2,247$	$N = 440$	$N = 2,687$
Industry			
<i>Agriculture</i>	10 (0.4%)	2 (0.5%)	12 (0.4%)
<i>Business</i>	167 (7.4%)	32 (7.3%)	199 (7.4%)
<i>Consumer</i>	251 (11.2%)	94 (21.4%)	345 (12.8%)
<i>Electronics</i>	191 (8.5%)	36 (8.2%)	227 (8.4%)
<i>Financial services</i>	370 (16.5%)	17 (3.9%)	387 (14.4%)
<i>Food % Drinks</i>	92 (4.1%)	38 (8.6%)	130 (4.8%)
<i>Housing</i>	181 (8.1%)	44 (10.0%)	225 (8.4%)
<i>Industrial</i>	245 (10.9%)	40 (9.1%)	285 (10.6%)
<i>IT</i>	370 (16.5%)	63 (14.3%)	433 (16.1%)
<i>Medical</i>	277 (12.3%)	40 (9.1%)	317 (11.8%)
<i>Research</i>	20 (0.9%)	5 (1.1%)	25 (0.9%)
<i>Transportation</i>	33 (1.5%)	14 (3.2%)	47 (1.7%)
<i>Vehicles</i>	40 (1.8%)	15 (3.4%)	55 (2.0%)

For the sub-analysis of auctions that only includes deals with at least two bidders, the *Number of bidders* is considered. There are N_i bidders participating in the auction for each target firm i . These firms are classified as auction participants if they have signed confidentiality agreements. A bidder can be classified as either financial ($N_{f,i}$) or strategic ($N_{s,i}$) based on company and financial details.

The bidder characteristics of auctions can be found in Table 3.4. Auctions have been classified as such when at least two firms made an offer, this way of classifying auctions is common (Aktas,

de Bodt, & Roll, 2010). Interestingly, most auctions are predominated by one type of bidder; if strategic (financial) players dominate an auction, it will most likely be won by a strategic (financial) player.

Table 3.4: Bidder characteristics in auctions

This table contains the summary statistics of bidder characteristics per acquirer type.

	Strategic acquirer		Financial acquirer		Overall	
<i>Observations</i>	<i>N = 102</i>		<i>N = 23</i>		<i>N = 125</i>	
	<i>Mean</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>
Number of bidders	2.19	2	2.09	2	2.17	2
Number of financial bidders	0.569	0	1.57	2	0.752	1
Number of strategic bidders	1.62	2	0.522	0	1.42	2

3.5 Preliminary analysis of the deal premium

The data set that includes all deals in the period 2000-2022 has 2,687 observations, while the data set that only contains auctions has 125 observations. Out of the 2,687 deals in the complete M&A data set, almost 84% of companies are acquired by a strategic player. Roughly the same distribution is visible in the auction subset (Table 3.5). A visual representation of the deal distribution per acquirer type is visible in Figure 3.1.

Table 3.5: Deals per acquirer type

This table contains the deal distribution per acquirer type for the complete sample and the subset.

Panel A: Complete data set Observations = 2,687		
	Number of deals	% of total deals
Acquirer type		
Strategic acquirer	2,247	83.6%
Financial acquirer	440	16.4%
Panel B: Auction subset Observations = 125		
	Number of deals	% of total deals
Acquirer type		
Strategic acquirer	102	81.6%
Financial acquirer	23	18.4%

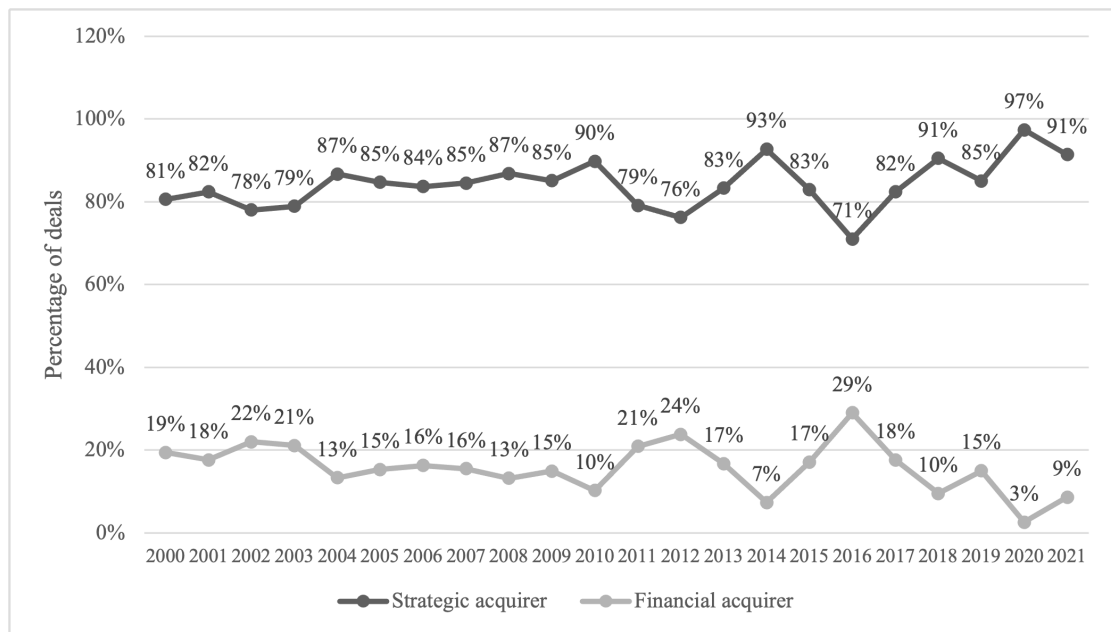


Figure 3.1: Deal distribution over time

To get a better understanding of the M&A development of the number of deals done by the two types of acquirers the deal distribution (over time) is analysed. Table 3.5 and Figure 3.1 show us that strategic players are still more active in the overall M&A market, with over

80% of total firms bought by a strategic acquirer. This is in line with earlier studies such as Gorbenko and Malenko (2014). The higher market share of strategic players could result from the higher premium they are willing to pay due to possible synergies and the fact that globally, most firms qualify as strategic players. Interestingly, PwC (2022) found that almost 40% of deals involved a private equity fund in 2021; However, this study focuses on public targets, while private equity firms predominantly focus on private targets. The dominance on the private market could be more in line with PwC (2022). The data set contains around 270 unique financial buyers, indicating that some financial buyers do multiple deals. Strategic acquirers are relatively less active with only 1,928 unique acquirers and 2,247 deals.

The distribution of deals won by acquirer type is analysed to determine if strategic acquirers are also more active in the more niche M&A market of auctions. Table 3.5 indicates that over the past 22 years, strategic players won 81.6% of auctions and therefore also dominate this subsection of the market when looking at deal numbers, but to a lesser extent than the total M&A market.

Figure 3.1 suggests the ratio of financial firms acting as an acquirer has had a downward sloping trend over the last few years, even though the total deal volume of private equity firms goes up (Brahmst & Laumann, 2022). Strategic acquirers dominate the historical and present M&A market with a higher ratio of completed deals, but are less active in completing multiple deals than financial acquirers.

The mean deal premium, according to Table 3.6 is considerably higher for strategic acquirers (98.2%) than for financial acquirers (39.5%) and above the national averages of the US and the UK (57.97% in 2020 according to An Acuris Company (2021)). But this is slightly offset by the lower mean deal premiums offered by financial acquirers. A simple t-test tells us the average premiums are statistically different from one another ($p = 0.01476$). The mean deal premium for auctions is more evenly distributed among the type of buyer and higher for both types than in the data set dominated by negotiations with a single buyer. A simple t-test tells us the average premiums are not statistically different from one another ($p = 0.5737$).

Table 3.6: Deal premium complete data set vs. auctions

This table contains the summary statistics of the deal premium per acquirer type for the complete sample and the subset.

<i>Panel A: Complete data set</i>					
Deal premium in %	<i>Mean</i>	<i>SD</i>	<i>Minimum</i>	<i>Median</i>	<i>Maximum</i>
<i>Panel A.1: Strategic acquirer</i>	98.2	1.720	-99.9	36.8	71,800
<i>Panel A.2: Financial acquirer</i>	39.5	1.720	-99.4	28.2	1,180
<i>Panel A.3: Overall</i>	88.4	1,570	-99.9	35.1	71,800
<i>Panel B: Auction subset</i>					
Deal premium in %	<i>Mean</i>	<i>SD</i>	<i>Minimum</i>	<i>Median</i>	<i>Maximum</i>
<i>Panel B.1: Strategic acquirer</i>	63	64	-31.6	49.1	400
<i>Panel B.2: Financial acquirer</i>	55.3	52.1	6.1	38	229
<i>Panel B.3: Overall</i>	61.5	61.8	-31.6	48.5	400

3.6 Dealing with missing values

The data contains missing values for multiple predictors; these need to be handled to make better predictions as the models work best on complete cases. First, the observations containing missing data on the deal premium are removed from the data set. This leaves this research with 2,176 observations for the complete M&A data set and 108 observations for the auction subset.

The data that is missing appears to be at random. Missing data on R&D expenses and intangible assets are common as these values are not always mandatory to publish. The book value of strategic acquirers is not always available as some of the acquirers are private firms and do not publish all of their financial data. Using models to impute the missing values lead to the unwanted consequence of not working with real-world data and are therefore not used.

Second, nested versions of the models are run to revise the data because of missing values for some of the variables. Deleting all observations with missing values would make the data set too small. According to previous literature, removing those variables with a more significant proportion of missing values is not in line with the theoretical impact of these variables.

4 Methodology

4.1 Cross-sectional multivariate regression models

The approach of this study is primarily based on a cross-sectional multivariate regression model with fixed effects and, to a lesser extent, a binomial logistic regression. The analysis is divided into two sections: (I) an analysis of the complete set of deals that occurred in the period 2000 till 2022, and (II) an analysis on deals in the more competitive setting of auctions (see Figure 4.1).

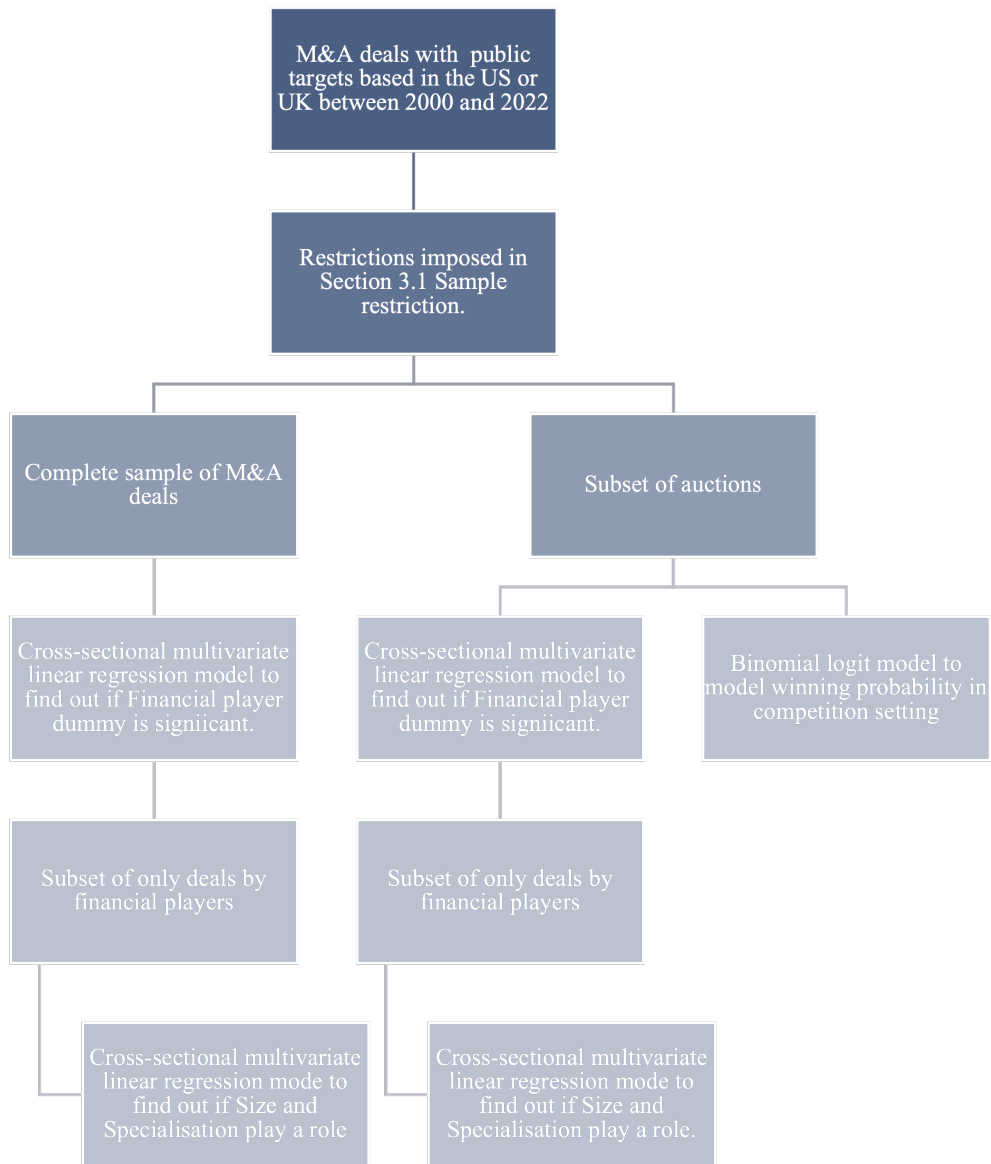


Figure 4.1: Research design

To analyse the difference in deal premium between strategic and financial players and if acquirer characteristics of financial players influence this difference, cross-sectional multivariate regression models with fixed effects are used. This type of regression model is highly versatile and adaptable to various predictors and dependent variables next to producing output that can be easily interpreted.

First, this paper will investigate if strategic players acquire firms by offering a higher deal

premium. The deal premium in percentages is the dependent variable in the first model and calculated following Equation 1. A *Financial player* indicator variable is incorporated into the model to see if there is a difference in the deal premium paid between the types of buyers. If target features and the year-fixed effects explain the difference in compensation, the coefficient for the financial player indicator should be insignificantly different from zero. Target characteristics that can be found in Table 3.2 in Section 3.4, except the target size with absolute values, are added to the model as control factors to account for the influence target characteristics can have on the deal premium. The *Industry* and the *Percentage acquired* are also added to the control variables. Lastly, year-fixed effects and country-specific effects are added to control for the overall economic environment. Accompanying the above follows the first regression model:

$$Deal\ Premium_{i,t} = \alpha + \beta_1 * Financial\ player_{i,t} + \gamma X + \delta BT + \psi C + \mu_{i,t} \quad (2)$$

Where the α indicates the intercept and β_1 measures the influence of being a *Financial player* on the deal premium. The coefficients for the control variable are grouped in vector γ , while X indicates the target characteristics themselves. *Industry* is a dummy variable with $I - 1$ categories in the regression model, as the first category is included in the intercept. The time effects are summarised in vector δ and activated via a dummy variable BT that equals one in the corresponding year and zero otherwise, as the regression has a constant (α), only $T - 1$ dummies are included, and the year-fixed effects for the year 2000 are controlled for via the constant. The country-specific effects are activated via ψ , C equals one indicates that the target firm is based in the UK and zero if the target firm is based in the US. Due to inclusion of a constant, only the country-specific effect of firms in the UK is taken into the model. $\mu_{i,t}$ specifies the error term in the regression.

The fixed effects used in the model relate to the year-fixed impacts and country-specific effects and detain the impact of the overall economic environment. Because of the addition of the year-fixed effects to the model, it is unnecessary to check for changes during a financial crisis or the COVID-19 period as the yearly effects already control for this in the models. The distribution of the deal premium differs per year, as can be seen in Figure 4.2, the additional components of the model that specify the year in which the deal is announced. Year-fixed effects are considered when modelling the deal premium to account for the timing effect of acquisitions and the changing economic environment to control the overall economic situation for that particular year. The country-specific effects relate to the constant difference in deal premium between targets purchased in the US or the UK. As the target countries can have

a dissimilarity in average deal premium, it is important to account for this separately in the models to not bias the results. The Hausman test gives significant results. Therefore, it can be concluded that the preferred model is a fixed effects model. Including the year-fixed effects accounts for possible bias due to different impacts the variables might have during periods of financial crisis, making the analysis more robust. No variable for the high-yield spread is taken into the models as this is an indication for the debt market conditions. However, favourable debt market conditions is a characteristic of PE acquirers. As this paper tries to focus on the effects being a financial player has on the deal premium, I do not want to separate the debt market conditions from the effect being a financial player has. An overview of all variables can be found in Table 7.2 in the Appendix.

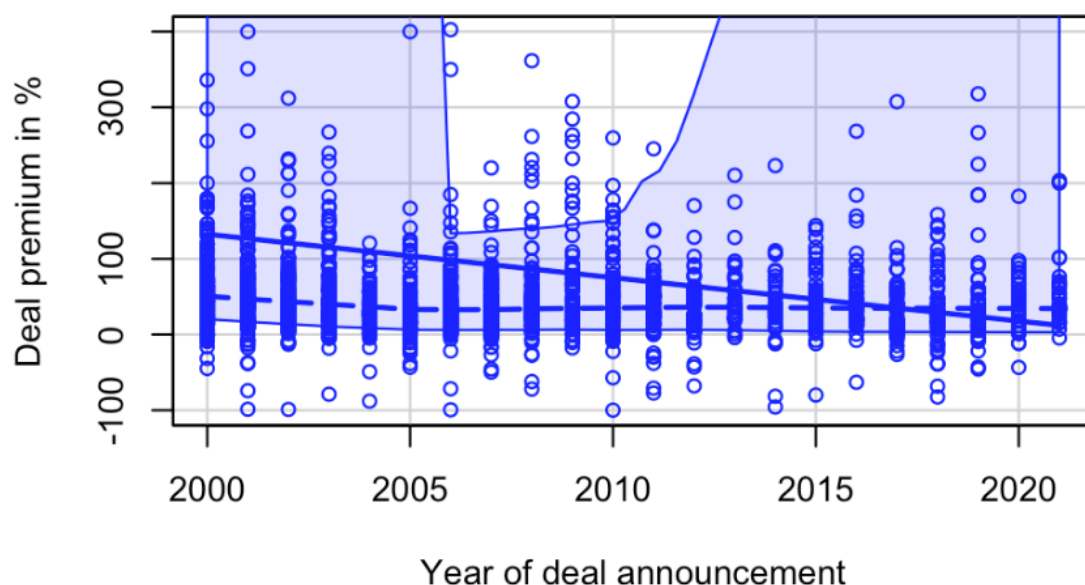


Figure 4.2: Scatterplot of the deal premium over time

Second, a subset of the data containing only the deals where the acquirer is a financial firm is constructed to ascertain if the *Industry specialisation* and *Size* of the financial acquirer positively influence the deal premium paid. Again, a cross-sectional multivariate regression model with year-fixed effects is used with the same control variables as in Equation 2 to control for target characteristics and the overall economic environment. But this time the absolute target size instead of the relative target size is used. If the *Industry specialisation* and *Size* of financial acquirers do not influence the deal premium paid, the variables will be insignificant.

$$Deal\ Premium_{i,t} = \alpha + \beta_1 * Size_{f(i,t)} + \theta Specialisation_{i,t} + Z * Size_{f,i,t} * Specialisation_{i,t} + \gamma X + \delta BT + \psi C + \mu_{i,t} \quad (3)$$

Where the effect of the *Size* of the financial player is captured in β_1 , the categorical variable for *Specialisation* is made into a dummy variable, and θ is a vector of coefficients for each of the $S \sim 1$ *Industry specialisation* scores. The interaction effect of the *Size* and *Industry specialisation* of financial buyers is added to the model to investigate if the impact of these variables becomes more substantial depending on the level of the other via Z , a vector of coefficients for each *Industry specialisation* score. The control variables for target characteristics, the year-fixed effects and the country-specific effects are equal to those of Equation 2, except now the absolute target size $Size_t$ is considered as this study tries to isolate the effect of the size of the financial acquirer.

4.2 Auction data

Finally, for the subset of auctions, Equation 4 is used to assess if the difference in premium between strategic and financial buyers within an auction setting is significant. However, this time only deals that qualify as auctions are being investigated. The equation is similar to the nested model of Equation 2 but has control variable added for the *Total number of bidders* ($N_{i,t}$) and a categorical variable *Bidder types* that indicates if the auction bidders are only strategic firms, financial firms or both. As the *Bidder types* variable is transformed into a dummy, the base line category (both types of bidders) is omitted.

$$Deal\ Premium_{i,t} = \alpha + \beta_1 * Financial\ player_{i,t} + \beta_2 * N_{i,t} + \phi Bidder\ types_{i,t} + \gamma X + \delta BT + \psi C + \mu_{i,t} \quad (4)$$

The deal premium paid by financial players will be further investigated to see the effects of *Size* and *Industry specialisation*. To do this Equation 3 is slightly altered as besides looking at the interaction effect of *Industry specialisation* and *Size* on the deal premium, the *Number of bidders* and both characteristics are considered as well. The model can be expressed in the following way:

$$Deal\ Premium_{i,t} = \alpha + \beta_1 * Size_{f(i,t)} + \theta Specialisation_{i,t} + Z * Size_{f,i,t} * Specialisation_{i,t} + \beta_2 * N_{i,t} + \phi Bidder\ types_{i,t} + \gamma X + \delta BT + \psi C + \mu_{i,t} \quad (5)$$

The control variables for target characteristics and the year-fixed effects and country-fixed effects are equal to those of Equation 4, except now the absolute target size $Size_t$ is considered as this study tries to isolate the impact of the size of the financial acquirer.

4.3 Multivariate binomial logistic regression model

As an additional analysis, a binomial logistic regression model is used to model the probability of winning an auction as a financial player and how this is influenced by an increase in competition, measured via the *Number of bidders* and the acquirer characteristics of *Size* and *Specialisation*. In a binomial logit model, the dependent variable is binary and has a value of either zero or one. In the situation, the model tries to predict the probability that the auction winner is a financial player; the *Financial player* dummy equals one. The model can be written as follows (Agresti, 2007):

$$Financial\ player_{i,t} = \begin{cases} 0=Strategic\ acquirer \\ 1=Financial\ acquirer \end{cases} \quad Logit(\pi_{i,t}) = x'_i\beta \quad (6)$$

Where $\pi_{i,t}$ indicates the probability of the *Financial player* dummy being equal to one and $x'_i\beta$ specifies the vector of regression coefficients, in this case, the *Number of bidders* and the financial acquirer characteristics of *Size* and *Specialisation*. The binomial logistic regression model uses a logistic transformation of the odds (logit); therefore, to calculate the probabilities, a transformation of the odds with an exponential function is necessary. This transformation can be expressed in the following way:

$$\pi_{i,t} = \frac{exp(x'_i\beta)}{1 + exp(x'_i\beta)} \quad (7)$$

5 Results

5.1 Complete M&A data set

The final model for the complete M&A data set is a cross-sectional multivariate model with year-fixed effects. The coefficients can be found in Table 5.1. The significance is based on the robust standard errors (found in column Robust SE (2)). Being a *Financial acquirer* has a negative impact on the deal premium; financial acquirers pay almost 10 per cent points less premium than their strategic counterparts. This is in line with previous research such as Shleifer and Vishny (1992). Other variables that negatively impact the deal premium are *Relative size*, *Tobin's Q*, and economic effects captured in the fixed year effects. That *Size* negatively impacts the deal premium is in line with previous literature, such as Alexandridis et al. (2013). The negative impact of *Tobin's Q ratio* was expected as the offer price already takes the overvaluation into account and the lower acquisition premium, therefore, corrects this difference. The industry effects are not significant in this specific analysis.

The *Percentage acquired* has a positive effect on the deal premium, indicating that for every percentage point above 50 per cent bought, the deal premium increases by 0.27 percentage points. This finding aligns with de La Bruslerie (2010) study and Chaudry and Duveblad (2010). They refer to Shefrin (2005) explanation that the positive effect of buying a more significant stake in a firm is because of hubris of the target firm's management and possibly more extensive use of synergistic opportunities.

Table 5.1: Results full data set

This table contains the results for the full data set. The variables R&D expenses, Profitability, Cash flow, Cash, Intangible assets and Leverage are taken as a ratio to the firms book value. The Relative size is the ratio of the target book value to the acquirer size. Robust SE's are used to correct for possible non-normality and homoskedasticity. Year-fixed, Country and Industry effects are included but their coefficients are not shown. Column (1) shows the coefficient of the Financial player dummy in the model without the control variables, but with the fixed effects. Column (2) gives the results of the full model.

	<i>Dependent variable:</i>	
	Deal premium in %	
	(1)	(2)
Financial player	-70.708*** (4.813)	-9.691** (4.813)
R&D expenses		-7.310 39.129
Percentage acquired		0.270*** (0.087)
Relative size		-0.005* (0.003)
Tobin's Q		-0.458*** (0.165)
Profitability		-17.990 (24.166)
Cash flow		-29.160 (26.782)
Cash		18.488 (20.528)
Intangible assets		-0.0001 (0.001)
Leverage		18.969 (11.552)
Constant	Yes	Yes
Year-fixed effects	Yes	Yes
Industry effects	Yes	Yes
Country-fixed effects	Yes	Yes
Observations	1,705	1,705
Adjusted R ²	0.009	0.208

30

Note: * p<0.1; ** p<0.05; *** p<0.01

Now that it is clear that being a *Financial player* is negatively correlated with the deal premium, it is essential to know if specific characteristics of financial players influence the paid deal premium. The results of the adjusted regression model for the principal variables can be found in Table 5.2. The absolute value of the *Size* of the financial acquirer has a significant adverse effect on the deal premium, and the absolute value of the *Target size* has a significant but small negative correlation with the deal premium. Suppose the *Size* of the financial acquirer increases by one million US dollars, and the deal premium increases by 0.00003%. Kaplan and Schoar (2005) found similar results and concluded that larger firms are often older and more experienced in the valuation and have increased bargaining power.

Interestingly, the more specialised a financial acquirer is, indicated via a higher *Specialisation* level, the lower the deal premium is. A financial buyer with a *Specialisation level* of four, meaning that the firm only operates in that specific industry, can negotiate a deal premium almost 69% lower than a financial buyer who has made no previous investments in that industry (level 1). The negative correlation contradicts Cressy et al. (2007) and, to some extent, Shleifer and Vishny (1992), but this can theoretically be explained by increased bargaining power and valuation experience based on the theory by Kaplan and Schoar (2005). Another possible explanation is that hubris and misvaluation lead to over payment in terms of deal premium for inexperienced buyers, while these biases are moderated by experience. A positive effect of *Industry specialisation* on the deal premium was expected based on higher synergistic possibilities. However, the results indicate that the valuation experience and bargaining power might offset these effects. A significant conclusion that can be taken from this is that specialisation has a different impact on the deal premium based on whether the buyer is a strategic or financial firm. According to literature (Healey, Palepu, & Ruback, 1997), strategic buyers pay higher premiums due to their synergistic value creation options; these come from their industry specialisation. Therefore, specialisation is positively correlated with the deal premium for strategic players, while this effect is negative for financial players.

The interaction effects of the *Size* of the financial acquirer and the different levels of *Specialisation* are highly insignificant and no meaningful conclusions can be drawn from this result.

Table 5.2: Results complete data set financial players

This table contains the results for the subset of financial players. The size of the financial acquirer is expressed as an absolute value. Control variables for the target characteristics, Year-fixed effects and Industry effects are included but their coefficients are not shown. Target size relates to the absolute book value of assets. Robust standard errors are used to correct for possible non-normality and homoskedasticity.

	<i>Dependent variable:</i>
	Deal premium in %
Size financial acquirer	-0.00003* (0.00002)
Specialisation level 2	-57.488* (32.976)
Specialisation level 3	-39.831 (25.760)
Specialisation level 4	-68.709* (36.150)
Target size	-0.003* (0.002)
Interaction effect Size Financial player:Specialisation level 2	-0.001 (0.001)
Interaction effect Size Financial player:Specialisation level 3	-0.001 (0.001)
Interaction effect Size Financial player:Specialisation level 4	-0.001 (0.001)
Constant	Yes
Control variables	Yes
Industry effects	Yes
Year-fixed effects	Yes
Country-fixed effects	Yes
Observations	110
Adjusted R-squared	0.412

Note:

*p<0.1; **p<0.05; ***p<0.01

5.2 Auction subset

For the subset analysis of auctions, an adjustment to Equation 4 is made, and the target control variable *Industry* is left out of the equation due to low explanation levels and to keep the number of variables relative to the number of observations in a more preferable ratio. For auctions, the difference in deal premium between financial and strategic players seems to be reversed as the *Financial player* dummy is highly significant and positive. The coefficients can be found in Table 5.3. Increased competition was expected to positively correlate with deal premium based on earlier research by Aktas et al. (2010), who stated that even latent competition positively affects the deal premium. The *Number of bidders* highly significant and positive effect is in line with their research. If only financial bidders participate in the auction, the bidding war seems to be less heated as the effect on deal premium is negative. A possible explanation for this negative correlation is based on theories by Bargerou et al. (2008), who state that hubris is often a driver of high deal premiums offered by strategic players. Managers of PE firms are, according to theory, less prone to this overoptimism and empire-building mentality. This could be a reason financial players are more indifferent to overbid in order to win an auction and an explanation to the negative correlation between having only financial bidders and the deal premium. Another explanation could be that the type of targets financial and strategic players bid on is different.

A positive correlation between *R&D expenses* and deal premium is cogent as these expenses often relate to growth options and, therefore, possible value creation.

Contrary to the first analysis, the *Percentage acquired* has a minimal but negative effect on the deal premium for the sub-analysis of auctions. The *Tobin's Q* again has a negative impact on the deal premium. The results of an increase in *Cash* or *Cash flow* on the deal premium are adverse. This could suggest that these firms have less growth potential when acquired, and therefore a lower premium is paid. Targets that perform less well are valued higher by financial acquirers, according to Gorbenko and Malenko (2014), because of their experience in fixing poorly managed companies and their access to cheap debt. The effect of *Leverage* is positive; a reason for this could be the earned tax benefits of using debt when acquiring the target firm.

Table 5.3: Results sub-analysis of auctions

This table contains the auction subset results. Robust SE's are used to correct for possible non-normality and homoskedasticity. Column (1) shows the result without the control variables, but with the fixed effects. Column (2) gives the results of the full model.

	<i>Dependent variable:</i>	
	Deal premium in %	
	(1)	(2)
Financial player	78.086*** (7.248)	21.086*** (7.248)
Number of bidders		55.464*** (10.102)
Only financial bidders		-56.923*** (11.470)
Only strategic bidders		-7.596 (7.071)
R&D expenses		426.754*** (24.385)
Percentage acquired		-1.888*** (0.337)
Relative size		0.361 (1.918)
Tobin's Q		-10.615*** (0.632)
Profitability		214.382*** (26.367)
Cash flow		-318.123*** (35.068)
Cash		-131.012*** (15.169)
Intangible assets		-0.021* (0.013)
Leverage		160.870*** (11.693)
Constant	Yes	Yes
Year-fixed effects	Yes	Yes
Country-fixed effects	Yes	Yes
Observations	69	69
Adjusted R-squared	0.005	0.801

Note: *p<0.1; **p<0.05; ***p<0.01

Second, the auction subset is restricted to deals where a financial bidder won the auction to analyse the influence of characteristics of financial players on the deal premium with the use of Equation 5. The year-fixed effects, the *Industry* variable, the interaction effect between the *Size* of the financial acquirer and *Specialisation* and the variables that relate to the *Number of bidders* and *Bidder types* are removed from the model. These variables are omitted as the model on the more minor data set only works with fewer variables, therefore, variables with low explanatory power are removed from the model. A significant positive impact of various *Specialisation* levels is found. Contrary to the regression of the entire model, if a financial firm is more specialised, the deal premium tends to go up. These results must be taken with a grain of salt as the small data set makes it less reliable to generalise the results for the global M&A auction market. Similar to the overall M&A market, the *Size* of the financial acquirer has a significant negative impact on the deal premium in an auction setting.

Table 5.4: Results M&A auction data set financial players

This table contains the results for the subset of financial players in auction. Control variables for the target characteristics are included but their coefficients are not shown. Target size relates to the absolute book value of assets. Robust SE's are used to correct for possible non-normality and homoskedasticity.

<i>Dependent variable:</i>	
Deal premium in %	
Size financial acquirer	-0.0002*** (0.0001)
Specialisation level 2	33.943*** (11.378)
Specialisation level 3	50.885*** (17.489)
Specialisation level 4	29.328 (20.623)
Target size	0.151*** (0.045)
Constant	Yes
Control variables	Yes
Country-fixed effects	Yes
Observations	20
Adjusted R-squared	0.6248
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01

As a final analysis, the chances of winning an auction as a financial player are predicted using a binomial logistic regression model to see if the competition increases or if financial firms are more specialised or larger. The chances of the buyer being a financial firm increase. The binomial logistic regression model (Equation 6 and 7) predicts the logit transformation of the probability of an observation belonging to a specific category of a categorical dependent variable. In the case of this study, I want to find out if the probability that the buyer in an auction setting is a financial firm changes when the competition increases or characteristics of the financial player change. The increase in the *Number of bidders* on the probability of the buyer being a financial firm turns out to be negative but highly insignificant. Therefore, no conclusions can be drawn from this result. The *Size* of the financial acquirer and *Specialisation* have a positive but insignificant

effect on the probability of the buyer being a financial player. Because of the insignificant results, no conclusions can be drawn from the binomial logistic regression. A recommendation for future research is to use a more extensive data set of auctions won by financial players to find out what characteristics influence the probabilities of winning an auction as a financial firm.

5.3 Robustness tests

All models discussed in this chapter are tested on their assumptions and evaluated on their robustness to see if the regression results are skewed by serial correlation (Breusch-Godfrey test (Breusch, 1978)), heteroskedasticity (White's Test (White, 1980)), or non-normality of the residual distribution (Shapiro & Wilk, 1965).

To test whether the effect of being a financial player can not be attributed to the difference in the relative size of the target to the acquirer of the two acquirer types, an interaction effect is added to the model. It could be possible that the deal premium paid by financial players differs from strategic players because of a difference in relative size to the target. The interaction effect of the *Financial player* dummy and the *Relative size* is highly insignificant ($p = 0.87$). Hence, it can be concluded that the impact of financial players on the deal premium can not be attributed to the difference in relative size between the groups.

The robustness of the results is tested by detecting and removing possible outliers to see if these bias the results. Chi-square tests are used to detect outliers. According to the test, three possible outliers (two positives and one negative) are present in the sample. To find out if these outliers bias the results, the outliers are removed and the models are run again without the outliers, no significant changes appear.

As a final robustness check, the deal premium is calculated by using the offer price to the target price one week before the announcement date instead of four weeks. This resulted in no major differences and similar significance. Adjusting the premium was not expected to have significant implications for the results based on a paper by Fidrmuc et al. (2012). However, the four-week deal premium is preferred as it contains less noise.

6 Conclusion

The first hypothesis focuses on the deal premium and if the deal premium paid is affected by the type of buyer in the complete sample of the M&A market. This hypothesis relates to the price part of the research question. This study finds that in the overall M&A market, being a financial

player has a negative impact of almost 10% on the deal premium (see Table 5.1 in Section 5.1). Therefore, hypothesis 1 can be confirmed. The median deal premium in the full sample equals 36.8% for strategic firms and 28.2% for financial firms. A possible explanation for this finding is that strategic acquirers have more possibilities for operational synergies or that managerial hubris in strategic firms leads to overpaying.

Now that it is clear that being a financial acquirer negatively affects the deal premium paid in the full sample, it is essential to find out if specific characteristics can influence this effect. The data does not support the first part of hypothesis 2 related to a positive effect of *Industry specialisation* on the deal premium. The significant negative impact of *Specialisation* levels two and four as opposed to level one (see Table 5.4 in Section 5.1) stipulates that a higher level of sector-specific knowledge leads to financial players paying a lower deal premium. This negative effect could be due to increased bargaining power, as stated by Kaplan and Schoar (2005). The hypothesis that *Size* has a negative impact on the deal premium paid is found to be valid according to the significant coefficient in Table 5.4 in Section 5.1. The effect, however, is small. If the *Size* of the financial acquirer, measured via the assets under management, increases by one million US dollars, the deal premium will decrease by only 0.0003%. This negative correlation could indicate an increase in the bargaining power of larger financial firms.

The sub-analysis on auctions was done to determine if the more noticeable increase in competition and the difference in targets influence the effect (characteristics of) financial players have on the deal premium. Contrary to the entire M&A market, there is a significant positive influence of the type of player on the deal premium paid in an auction setting (see Table 5.3). Contrary to the complete M&A data set, a theoretical explanation of this positive effect could be because of a decrease in bargaining power. Another possible answer could lay in the type of target firms that opt for the selling process of auctions. Based on the targets in our sample, the target firms in auctions have lower (operational) cash flow ratios, lower Tobin's Q ratios, lower cash ratios, and higher leverage ratios than target firms in the full sample. These ratios can indicate that the target firms in auctions are performing less well than the target firms in the full sample. These differences in target characteristics in the data sets confirm the theories of Gorbenko and Malenko (2014) and Anilowski Cain et al. (2009). It is possible that PE firms are able to pay higher premiums for these companies as they have more expertise in restructuring them and have lower debt costs. Another difference that is noticeable in the analysis of target characteristics is the difference in both relative and absolute target size between the full sample and the auction sub sample. Target companies in the auction sample are smaller in both absolute

and relative values. These smaller companies might be less valuable to strategic buyers as they offer less synergistic possibilities than the larger companies in the full sample, this could be another reason financial firms pay higher premiums in auctions. Strategic acquirers are more active in the M&A market in terms of deal numbers, nevertheless they do not pay higher premiums than their financial counterparties in an auction setting. For that reason, hypothesis three is rejected.

Equal to the analysis of the complete M&A data set, a cross-sectional multivariate linear regression model with fixed effects is used to test the influence of the *Size* and *Specialisation* of financial players on the deal premium paid. Table 5.3 in Section 5.2 shows a significant positive correlation between the second and third *Specialisation* levels in comparison to level one, no sector specialisation. This positive correlation is in line with theories by Walkling (1985) and Cressy et al. (2007). However, this positive correlation between *Specialisation* and deal premium is not found in the analysis of the full M&A data set. Again, it is possible that the lower quality target firms in auctions are more preferred by financial players and that previous expertise in this sector makes it less difficult to transform these target firms into highly profitable companies.

The negative effect *Size* has on the deal premium paid in the complete data set is also visible in the subset of auctions (Table 5.3) in Section 5.2). Hypothesis four cannot be rejected within the scope of this paper.

The main inquiry this study tries to answer is the following:

Do financial acquirers still pay lower deal premiums and how does their specialisation and size influence the price paid?

The answer to the research question can be derived from the results of the hypotheses. Based on the analysis done in Section 5, it can be concluded that financial acquirers pay lower deal premiums. This result is only visible in the overall M&A market; being a financial firm has a negative impact of almost 10% on the deal premium paid (Table 5.1 in Section 5.1). However, the same conclusion can not be drawn for the more competitive M&A market of auctions. The impact competition has on bidder behaviour or the type of target firms that opt for this type of selling process transposes the association between financial players and the deal premium from negative to positive. Being a financial player has a positive association with the deal premium of over 20% in the M&A auction selling process.

A higher level of *Industry specialisation* has a negative effect on the deal premium in the overall M&A market (Table 5.2). A contradicting effect is found in deal premiums from winning

auction bids (Table 5.4). A possible explanation for this could be the diminishing effect of the bargaining power of specialised PE firms in the more competitive auction environment. This effect was promulgated by Ahlers et al. (2016). Another possible explanation is that the type of target firms that go to auctions are performing less well, but could be transformed into highly profitable companies by PE firms. Therefore more specialised PE firms are willing to pay extra for this value option only they can create. A definite explanation is beyond the scope of this paper, however further research on this topic is recommended.

The *Size* of financial acquirers has a negative impact on the deal premium paid in both the overall M&A market and the subset of auctions. This negative impact was expected, and a plausible explanation is an increase in the bargaining power of larger financial firms.

7 Discussion

Because of missing values, the analysis were completed on a smaller number of deals than anticipated beforehand. Re-sampling methods and value imputations were tried, however these methods are unwanted in economic research as real financial values are preferred and drawing theoretical conclusions from fabricated data is inadequate. However, the restrictions imposed on the data in this paper preserved enough complete observations to perform analysis on. The significant results together with previous research made it possible to draw vital conclusions from the results with theoretical substantiation that can be generalised for the Western M&A market.

It would be interesting to find out, with a more extensive and different data set, what might cause the difference influence being a financial player has in an auction setting and in the general M&A market. This paper gave possible theoretical explanations based on earlier research done by scholars, backed by data on target characteristics used in this research. Examples of this are the different types of targets that opt for an auction selling process and the different reactions of financial and strategic players on competition increases. More empirical research on the causes of the different influences of buyer and PE characteristics in different types of selling mechanisms is highly relevant. This paper found evidence of a difference in the type of target firms that opt for negotiations or selling via an auction. However, I suspect that on top of target characteristics, competition increase, bargaining power, and other factors influence the difference in premium between acquirer types. It would be interesting to find out how each of these factors influence the difference in deal premium paid by the acquirer types in auctions versus negotiations. However, it is beyond the scope of this paper.

A final suggestion for future research would be to determine if these findings can be generalised to the global M&A market and see if a difference can be found between more advanced economies and less developed financial markets. For this, a study on financial data of M&A deals in multiple economically developed and less developed countries would comply.

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Appendix

Table 7.1: Impact of restrictions on sample size

This table shows how the data restrictions influence the size of the sample used in this study.

Restriction	Sample size
Announced between January 1st, 2000, and January 1st, 2022.	n/a
The target is a company in the UK or US.	318,645
The target is a publicly-traded non-financial company.	34,763
The bidder holds at least 50% of the target after the deal completion.	9,770
The final deal value is at least \$5 million.	8,176
The takeover is entirely cash-based.	2,780
The deal status is completed.	2,750
No undisclosed value, spinoff, recapitalisation, self-tender, exchange offer, or repurchase.	2,687
Auction sub-analysis: The deal is made with at least two bidders.	125

Table 7.2: Independent variables summary table

<i>Regression 1 and 3</i>	
Variable name	Variable explanation
<i>Financial player</i>	$F_i = 1$ for Financial buyers and $F_i = 0$ for strategic buyers
<i>Industry</i>	Categorical variable with the following categories: agriculture, business, consumer, electronics, financial services, food & drinks, housing, industrial, IT, medical, research, transportation, and vehicles
<i>Size_s</i>	Strategic acquirer book value of total assets
<i>Size_t</i>	Target book value of total assets
<i>Relative size_t</i>	$\frac{\text{Target book value of assets}}{\text{Size}_f \text{ or } \text{Size}_s}$
<i>Tobin's Q</i>	$\frac{\text{Target market value of equity} + \text{liabilities}}{\text{Target EBIT}}$
<i>Profitability</i>	$\frac{\text{Target EBIT}}{\text{Target book value of assets}}$
<i>Cash flow</i>	Operating cash flow over the year
<i>Cash</i>	Target cash + short term investments over the year
<i>R&D expenses</i>	Target R&D expenses over the year
<i>Intangible assets</i>	Target intangible assets
<i>Leverage</i>	$\frac{\text{Target long term debt}}{\text{Target book value of assets}}$
<i>Year-fixed effects</i>	Timing effects of acquisitions
<i>Country-fixed effects</i>	Country-specific effect for the UK or the US. The country is specified as the country in which the target firm is based.
<i>Additional variables regression 2,4 and 5</i>	
Variable name	Variable explanation
$N_i = N_{f,i} + N_{s,i}$	The number of total bidders in an auction
<i>Bidder types</i>	Categorical variable that indicates if the auction participants consist of only financial players, only strategic players, or both
<i>Specialisation</i>	Specialisation level of financial buyer in a [0:4] range ⁴⁷
<i>Size_f</i>	Assets under management of the financial buyer