

CEO Overconfidence:

What are the implications of CEO attributes on certain aspects of M&A activity for U.S. companies?

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Abstract

This research analyzes the effect of CEO overconfidence on M&A performance, M&A frequency, and takeover premiums. Furthermore, this study aims to find a moderating effect of certain CEO attributes on that relationship. The CEO attributes include compensation, gender, tenure, ethnicity, age, and education. The sample consists of U.S. companies between 2007 and 2020. This research adds to current financial literature on M&A activity and CEOs behavior. CEO overconfidence is based on the option holding behavior of the CEO, following the research of Malmendier and Tate (2004) and Campbell et al. (2011). Via an event study, cumulative abnormal returns (CARs) are calculated to measure M&A performance. M&A frequency is analyzed by using a dummy variable for CEOs who engaged in more than one transaction. Third, the takeover premium for the target is calculated using the ratio of the offer price to the share price 30 days before the announcement. The hypotheses state that CEO overconfidence has a negative effect on M&A performance, increases the likelihood of greater M&A frequency, and leads to greater takeover premiums. However, no significant results were found for the 3-day CAR. Only for the highly overconfident measure introduced by Campbell et al. (2011), the findings imply CEO overconfidence affected the 5-day CAR negatively. Thus, the finding is not robust. The results suggest that CEO overconfidence increases the likelihood of greater M&A frequency and is robust. For takeover premiums, no significant results were found. In addition, no moderating effect was detected for compensation, tenure, ethnicity, and education. Unexpectedly, the moderating effect of the variable female shows a strengthening effect on the negative relationship between CEO overconfidence and M&A performance. Lastly, the variable age's moderating effect implies to weaken the positive relationship between CEO overconfidence and M&A frequency.

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1. Introduction

During the first six months of 2021, a recent article from the *Financieel Dagblad* mentions an increase of 55.0% in business takeovers compared to the same period in 2020 in the Netherlands (Brinker, 2021). Globally, the increase in the number of deals was 42.0% during this period. From the *Refinitiv Deals Intelligence*, Toole (2021) showed the number of announced Mergers and Acquisitions (M&A) deals to have almost doubled from 2005 until 2021. The same holds for the value of those M&A deals. In 2021, the global M&A market reached a value of nearly \$4.5trn from over 45,000 transactions. Compared to 2005, the total M&A value reached \$1.8trn from a little over 25,000 transactions (Toole, 2021). This significant increase in M&A activity is also reflected in the performance of JPMorgan Chase. An article in the *Financieel Dagblad* shows an increase in revenue from the investment banking division of JPMorgan Chase of 45.0% to \$3bn (Boer, 2021).

The substantial growth in M&A deals is studied by Makrygiannis (2021) from the Ernst & Young LLP Analysis. The author found that global M&A activity has fluctuated over time but generally follows global business cycles. According to this article, one accelerator was rising corporate confidence (Makrygiannis, 2021).

However, is shareholder value actually created via this increase in deals? M&A deals after 2009 create more value for the acquiring firms' shareholders than before that period (Alexandridis, Antypas & Travlos, 2017). This study shows that for public M&A deals, there is a positive abnormal return for the acquirer's shareholders. According to academic literature, motivation for takeover decisions can be influenced by executives' personal motivation and economic business cycles (Roll, 1986; Shleifer & Vishny, 1988). Roll (1986) argues that decision-making and risk-taking are affected by psychological traits such as overconfidence for Chief Executive Officers (CEOs). Typically, a CEO is held accountable by the board of directors. CEOs tasks primarily include maximizing business value (Lin, 2013). Furthermore, managers tend to engage in M&A activity for personal reasons instead of increasing shareholder value (Roll, 1986). Malmendier and Tate (2005) prove that overconfident CEOs tend to take part in more deals and the transactions by this type of CEOs destroy the acquirer's shareholder value. Aktas, Bodt, and Roll (2012) found that CEOs overbid due to overconfidence. CEOs then overestimate positive future returns from synergies. Renneboog and Vansteenkiste (2019) state CEO overconfidence is the primary driver of underperformance in M&A deals. Underperformance is caused by poor acquirer governance in CEO overconfidence and lacking shareholder intervention.

So, literature has found that overconfidence can substantially influence on M&A activity. A successful or unsuccessful M&A deal might also be a consequence of choices in the execution and integration phase. A well-known merger example is between Exxon and Mobil, large oil producers in the United States. A successful horizontal merger, leaving the combined firms as one of the leaders in the oil market. On the other hand, the horizontal merger between Daimler-Benz and Chrysler resulted in a cultural clash, lower sales, and eventually a significant loss. Having seen both success and failure, the following statement symbolizes the two sides of the same coin: “Sometimes your best investments are the ones you don’t make!” – Donald J. Trump. Hence, success or failure of a transaction might be the consequence of personal motivation in strategic decision-making.

As mentioned, having an overconfident CEO might lead to suboptimal corporate decision-making. This research looks at the effect of CEO overconfidence on multiple aspects of M&A activity: M&A performance, M&A frequency, and takeover premiums. Nonetheless, how this relationship becomes stronger or weaker is not yet investigated. Thus, this paper looks at a possible strengthening or weakening effect because of specific CEO attributes. Namely CEO: compensation, gender, tenure, ethnicity, age, and education. Therefore, the research question is stated as follows:

What is the effect of CEO attributes on the relationship between CEO overconfidence and different aspects of M&A activities?

Hence, the outcome of M&A deals might imply both value creation and value destruction. Value is created when the strategy of both companies is aligned, focused, followed, and the combined businesses are thriving, such as the Exxon and Mobil case. However, value destruction could come from, among others, operational complications, lack of integration, diversification, size maximization, empire-building, or hubris (Bruner, 2002), such as the Daimler-Benz and Chrysler case. This same study found evidence in favor of both outcomes. The majority of the summarized research shows that the target’s shareholder return is positive, and bidders earn zero returns. More specifically, for buyer’s shareholders, the returns only exceed the opportunity costs of capital 20.0% to 30.0% of the time. Bruner (2002) also found that for 60.0% to 70.0% of all M&A deals, the financial performance equals the required return. Thus, the investors are compensated for the opportunity costs associated with the transaction. He argues that the zero return to the buyers’ shareholders should raise caution for management to engage in M&A activity. Furthermore, to carefully structure deals and prevent paying a too

large takeover premium. It is empirically shown that most business takeovers do not meet the anticipated forecast. This is reflected in the negative abnormal returns (Moeller, Schlingemann, & Stulz, 2005; Malmendier & Tate, 2008).

Showing numerous studies indicating that M&A deals often lack in value creation and can therefore be perceived as unsuccessful, how come the amount of M&A deals is still growing rapidly? What is the rationale behind this merger activity considering the awareness around these observations? Besides measurements such as company identifiers or deal characteristics, what behavioral aspects could be identified as drivers in explaining M&A activity?

Executives' individual motivation to engage in acquisitions is most likely included in the overall acquisition decision. Furthermore, managers' remuneration might persuade managers to engage in acquisitions since they try to gain from the stock announcement return. Petmezas (2009) argues that this might also be a reason for short-term positive announcement returns and long-term negative returns because of overvaluation. Kahneman and Tversky (1982) and Kahneman and Lovallo (2019) show that the behavioral or psychological determinant of overconfidence could set off other biases such as optimism-, self-serving-, or confirmation bias. According to Malmendier and Tate (2005), one explanation of the positive relation of CEO overconfidence on the responsiveness of investments to cash flow is the agency view. This means that managers purposely overinvest to realize greater personal benefits such as salary, empire-building, and managerial entrenchment. Overconfidence can be manifested in miscalibration and the so-called "better-than-the-average-effect". This is caused by agents overestimating the correctness of the information and underestimating both the volatility of random events and the corresponding range of possible outcomes (Ben-David, Graham, & Harvey, 2013). This might influence how and if corporate actions are taken.

On a positive note, overconfident CEOs are more likely to alter the innovation strategy for the firm. Also, overconfidence stimulates innovation. This is because CEOs do not expect failure. However, this is shown by the number of patents and citations and not profitability. Therefore, only overinvestment and the selection of growth opportunities are considered (Galasso & Simcoe, 2011). These arguments are in line with Hirshleifer, Low, and Teoh (2012), who found that overconfident CEOs invest to a greater extent in innovation and have higher benefits from these innovations. Also, these CEOs are better at finding these growth opportunities and converting the opportunities into value for their shareholders.

Therefore, both positive and negative effects of overconfidence have been found in academic literature. This paper focuses on the effect of CEO overconfidence on M&A performance, frequency, and takeover premiums and the CEO attributes that relationship.

Therefore, this research may contribute to behavioral- and corporate finance literature as well as possible new corporate governance mechanisms. Also, this study is likely to be relevant for shareholders. Acquiring firm shareholders might force CEOs to become more hesitant as the transaction might not translate into returns or overpaying, which reduces returns. As for target firm shareholders, the merger might not lead to an increase in firm value. As a result, corporate governance might focus on different items for overall evaluating CEOs. To test the hypotheses, the sample used consists of publicly traded firms in the U.S. from 2007 until 2020.

Based on previous literature, the expectations about CEO overconfidence on M&A activity and the possible moderating effect of the CEO attributes are formulated in the hypotheses. The first hypothesis states the expectation of a negative effect of CEO overconfidence on M&A performance. Unfortunately, this is not found in the 3-day Cumulative Abnormal Return (CAR)¹. The results found that a highly overconfident CEO leads to a decrease of 0.559 percentage points in M&A performance measured by 5-day CAR. This is in line with the expectations. This study's findings support the second hypothesis: CEO overconfidence increases the likelihood of greater M&A frequency with 5.62 and 6.69 percentage points for "OV67" and "OV100", respectively. The third hypothesis predicts CEO overconfidence to lead to higher takeover premiums. However, the results showed no significance. Hypotheses 4, 6, 7, and 9 test a possible moderating effect of CEOs: compensation, tenure, ethnicity, and education on the relationship between CEO overconfidence and M&A activity. These are inconclusive as no significant results were found. The female interaction term is found to amplify the negative relationship between CEO overconfidence on M&A performance. This contradicts hypothesis 4, stating a weakening effect. Results also show the moderating effect of age to weaken the positive relationship between CEO overconfidence and M&A frequency. This is in line with hypothesis 8.

This paper is structured as follows: In Section 2, the literature review is presented. This section includes a conceptual framework. A variety of theories are presented as argued in academic literature. These theories are the basis for the hypotheses development. Next, Section 3 provides details on the data analysis. Section 4, the methodology is described. Section 5 elaborates on the results, and Section 6 the discussion, limitations, and recommendations for future research. Lastly, Section 7 provides the overall conclusion and implications of the results.

¹ This study also conducted robustness tests by using the 7-day and 11-day CARs. However, these regressions did not show significant results. Furthermore, including the control variable deal size in the regressions of the 7- and 11-day CAR showed no significant results.

2. Literature Review

This chapter aims to offer information found in financial literature and the link to the behavioral characteristics. A general description of overconfidence will be given and the corresponding implications explained. The significance of these studies is described in light of corporate finance literature. Other potential factors corresponding to CEO overconfidence that will be reviewed are CEO attributes. These are CEO: compensation, gender, tenure, ethnicity, age, and education. The hypotheses are constructed and contribute to understanding the research question, namely the effect of CEO overconfidence on M&A performance, M&A frequency, and takeover premiums. Furthermore, to analyze a possible strengthening or weakening link because of one (or more) specific CEO attribute.

2.1. Traditional and Behavioral Finance Theory

Traditional behavioral economics or traditional finance is based on a rational expectations hypothesis. In short, this comes down to investors and managers being generally rational, and the market is efficient. An efficient market is when the asset prices have all available information incorporated, and participants can make predictions about asset prices in the future. The price in the efficient market is equal to the sum of the discounted future expected cash flows with a discount factor consistent with a normatively acceptable specification. A rational individual bases decisions on their current assets and the possible consequences of the choice. This means there is no effect of framing. Furthermore, an agent's decision is in line with the expected utility framework. This refers to an agent considering multiple outcomes with the corresponding value of this outcome and the weight measured by the probability of that outcome. Expectations are constantly updated with new information. When agents do not comply with the traditional economics hypothesis, they follow biased estimates, implicating behavioral finance. In behavioral finance, some (or all) agents are not entirely rational. Asset prices systematically differ from their fundamental values, impacting corporate finance decision-making in investments and asset prices. Agents then fail to incorporate all available information correctly, making normatively unacceptable choices. Furthermore, agents might be biased in decision-making when evaluating risk and forming expectations, often driven by emotions. For instance, psychology in behavioral biases as overconfidence is seen as overoptimism and wishful thinking (Malmendier & Tate, 2005), overprecision (Ben-David et al., 2013), an illusion of control, self-attribution bias, and hindsight bias (Kahneman & Tversky, 1974).

In market efficiency, prices follow a so-called “random walk”, meaning all information comes up randomly and corresponding prices fluctuate randomly. In this situation, it is not possible for an investment strategy to systematically create excess risk-adjusted returns on average, thus a zero-sum game. When assets are not priced to fundamental value, there is an arbitrage opportunity. With arbitrage, rational investors take advantage of mispricing in the market, and prices are corrected and move back to equilibrium or fundamental value. Behavioral finance argues that a mispricing event is not automatically a risk-free arbitrage situation. The costs and risks associated with correcting the mispricing refer to fundamental risk, where an asset held by an agent loses value, and finding a perfect hedge is usually impossible. In addition, noise trader risk refers to mispricing becoming worse due to investor sentiment, forcing arbitrageurs to sell their positions too early. Lastly, another aspect of the process includes implementation costs such as transaction costs, trading constraints, and information costs. Situations to limit arbitrage includes being risk-averse, having short horizons, and having systematic noise trader risk.

Thus, the efficient market hypothesis is not able to completely capture market movements as, in the real world, assets are not always priced to their fundamental value. Kahneman and Tversky (2013) came up with the prospect theory, which is a model showing how agents actually behave and how risk is evaluated. The authors argue that agents can act irrationally when making decisions between projects with different levels of risk and uncertainty. How people behave under specific circumstances has implications for decision-making since both emotional and rational thinking are considered.

2.2. What is overconfidence

Overconfidence can be explained by: (1) overestimating their own real performance, (2) over-placement of their own performance compared to others, and (3) excessive precision in their own beliefs (Moore & Healy, 2008). In this same study, it is found that individuals are overconfident as a behavioral bias when it causes individuals to overestimate how accurate information is and their capabilities compared to other people. This is called the “better-than-average” effect. This effect can be displayed as optimistic thinking about future performance concerning their own capabilities and an illusion of control (Malmendier & Tate, 2005). This paper also argues that CEO overconfidence leads to CEOs systematically overestimating a firm’s value and the expected return for investment opportunities. Individuals tend to become overconfident when they have the self-attribution behavioral bias, where agents explain success and good performance to their own skills. In contrast, failure and bad performance are caused

by everything but themselves (Langer & Roth, 1975). A study by Benoît, Dubra, and Moore (2015) shows that, in general, participants over-place themselves when two experimental tests are conducted and compared to others.

When an executive overestimates their skills and performance, this could harm shareholder value. Furthermore, executives can act in their personal interest rather than shareholders', conflicting with the agency theory. An example in academic literature is the hubris hypothesis by Roll (1986). Roll (1986) investigates why there are so many takeovers when there is little evidence for value creation for the acquirer on average. The hubris hypothesis argues that acquisitions rationale comes from executives individual motives and advantages and not necessarily financial benefits for the acquirer's firm. Trautwein (1990) mentions the valuation theory, which explains M&A activity because an executive has better information about the target than the market, e.g., undervaluation. Therefore, the executive will offer a premium based on their personal expectations. The study mentions that executives might overestimate their skills to value the target based on their information correctly. Furthermore, this same study mentions managers' own utility maximization above shareholder value, referred to as empire-building. Malmendier and Tate (2004) suggest that overconfident CEOs overestimate their own performance in generating returns. Subsequently, they engage in mergers that destroy shareholder value when excessive internal funds are available and vice versa. Furthermore, overestimating CEOs fail to value possible takeover targets correctly. Malmendier and Tate (2004) found a more negative market reaction when this type of executive undertakes the M&A activity. This is supported by Schneider and Spalt (2017), who found negative CARs for the acquirer after the announcement. In a study by McCarthy, Oliver, and Song (2017), research states that confident CEOs underestimate risk, decreasing hedging activities. In general, Croci, Petmezas, and Vagenas-Nanos (2010) state that firms are always better off when there is no overconfident manager in charge. In addition, the authors argue that non-overconfident executives realize larger returns and are able to increase shareholder value through M&A activity. Lastly, overconfident management might take on excessive risk, invest more, and have a negative effect on corporate actions and decision-making (Ben-David et al., 2007).

In a later study by Ben-David, Graham, and Harvey (2013), CFOs were asked to make quarterly predictions over a 10-year panel data. After which, the CFOs were asked to estimate one-point of future return and a corresponding confidence level. Thus, the one-point forecast, or the mean, should measure optimism and the confidence level indicates miscalibration. The paper found that CFOs are severely miscalibrated as only 36.0% of the time, the realized returns

fall in the given confidence interval of 80.0% suggested by management. Lastly, the study shows that firms where management is miscalibrated, pursue more investments and use more debt financing.

On the other hand, the importance of a certain level of confidence is argued as well. The previously mentioned paper by McCarthy et al. (2017) also concludes that overconfident CEOs are better innovators. This finding is supported by Galasso and Simcoe (2011), who suggest that overconfident CEOs are more likely to change their innovation strategy by investing in research & development (R&D). Hirshleifer et al. (2012) also support this belief and found overconfident CEOs to invest more in innovation, receive more patents, and achieve great benefits from their R&D expenditures. Naturally, investments that could potentially be beneficial and generate a substantial value come at a certain risk. Thus, it could be in shareholders' best interest to have a confident CEO willing to take on this risk (Hirshleifer et al., 2012). The writers also argue that overconfident CEOs are more efficient in transforming growth opportunities into value. Lastly, an experiment by Fransen et al. (2016) analyzes team confidence and performance measured by the contagion of leaders' confidence. The authors found that team members are more confident of winning and performing better, with a highly confident leader.

2.3. Overconfidence related to M&A performance

Executive biases such as overconfidence are likely to raise distortions in corporate investments and decision-making. This could result in over- or underinvestment and affects the rationale behind financing decisions, e.g., internal or external sources of funds. Roll (1986) came up with the hubris hypothesis, where the irrational managers approach argues that a takeover is an individual decision. Furthermore, managers might be overconfident in their own skills and capabilities, perceive an illusion of control, and are inexperienced in engaging in M&A activity. This study claims that when the hubris hypothesis can be used to explain takeovers, the following statements should hold: the stock price of the acquiring firm should fall after information of the bid is public, and there is an increase in the stock price of the target. Combined, the rising target value and falling acquiring value should be negative due to other costs. As the M&A activity is partly driven by irrationality in decision-making by individual managers, the market is not (completely) rational (Roll, 1986).

Roll's (1986) hubris hypothesis is tested by Malmendier and Tate (2004). The authors argue that optimistic CEOs finalize more takeovers, notably diversifying mergers. Furthermore, optimism has the largest effect on the least equity reliable companies. Malmendier and Tate

(2005) studied the implications of CEO overconfidence on corporate investment opportunities. The authors found that CEOs tend to invest too much when there are enough internal funds available, and they are not constrained by, e.g., corporate governance systems. On the other hand, when there are insufficient internal funds, CEOs invest less. In general, overconfident managers are under the impression that external funds are too costly. This paper argues that CEOs with overconfident personality traits believe they do act in the interest of the shareholders. This has governance implications since regular compensation in stock might not have the desired effect from a principal-agent theory perspective. Furthermore, it might be in the interest of the shareholders to reduce the free cash flow. In general, it would benefit the shareholders if, in the scenario of a two-tier board, the supervisory board of independent directors is more actively involved.

Doukas and Petmezas (2007) provide evidence showing that for the long-term effect of M&A activity, companies with an overconfident CEO underperform. According to Malmendier and Tate's study in 2008, in general, investors in the market tend to question bids from optimistic CEOs more than non-optimistic CEOs, having a negative reaction to the takeover when the acquiring firm's CEO is overconfident. Malmendier and Tate (2008) show that overconfident CEOs are prone to overestimating their firm's performance. Moreover, the paper states that having these CEOs lead to a greater possibility of a low-quality takeover. Similarly, value-destroying M&A deals are likely to be driven by overconfident CEOs (Ben-David et al., 2007). After Malmendier and Tate (2008), Schneider and Spalt, (2017) also test the hubris theory. The authors argue that CEOs gamble more with their decisions when the acquirer announcement returns are much lower. CEOs engage more in M&A if the CEO is more entrenched, younger, or more susceptible to gambling. To continue, the CEOs engage more in M&A when the firm has last 12 months' performance is bad, has a large difference between the target firm's current stock price and 52-week high stock price, has negative earnings in the last fiscal year. Thus, literature has found overconfidence to lead to poor M&A performance. Therefore, the first hypothesis is formulated as shown below:

Hypothesis₁: Overconfident CEOs have a negative effect on M&A performance

2.4. Overconfidence related to M&A frequency

The study by Roll (1986) explains the hubris hypothesis. In short, irrational managers engage in takeovers as an individual decision, and managers might exhibit overconfident behavior in their own skills and capabilities, perceive an illusion of control, and are inexperienced in engaging in M&A activity. This leads to value destructive takeovers. Malmendier and Tate (2005) show that overconfident CEOs tend to take part in more deals, evoking a negative reaction from investors. Similarly, the role of CEOs previous M&A activity is studied by Billett and Qian (2008), who found that value destructing takeovers can be motivated by previous acquisition experience. In general, this study states that CEOs are more likely to take part in M&A activity after value-creating (positive) deals even though the proposed target would be value destructive. Therefore, the self-attribution bias, discussed in Roll's hubris theory, is a driver of overconfidence in M&A decision-making.

Nonetheless, empirical research indicates that when a company engages in multiple acquisitions, there is an improvement in the process and long-term advantages because of learning (Aktas et al., 2009). This study also shows a decrease in time between a new and previous acquisition, indicating a greater frequency. A rational CEO, who learns from deals, exhibits a somewhat more aggressive bidding strategy, resulting in a decrease in CARs. Due to the self-attribution bias, overconfidence increases following each deal a CEO undertakes. This, in turn, leads to higher acquisitiveness for that CEO (Doukas & Petmezas, 2007). Therefore, the second hypothesis is stated as follows:

Hypothesis₂: CEO overconfidence increases the likelihood of greater M&A frequency

2.5. Overconfidence related to takeover premiums

The "winner's curse" from Roll (1986) resembles that the winner in action is the person who (over) pays most. Furthermore, Roll (1986) argues that overconfident managers fail to value a target correctly. By doing so, mispricing leads to negative corresponding acquirer returns due to premiums paid. In short, this valuation error reflects the irrational behavior of individuals and their bid price strategy, which is higher than the actual market value.

In M&A processes, this refers to CEOs, who presumably have better information and overestimate their capabilities in projecting the future expected returns by paying higher takeover premiums (Roll, 1986; Trautwein, 1990). This "winner's curse" hypothesis is studied by Varaiya and Ferris (1987), showing that the winning bid premium is found to overstate the expected gain of the acquisitions as expected by the market. Hayward and Hambrick (1997)

argue that overconfident executives might turn into the misinterpretation of investment opportunities. The study discovers that greater shareholder losses result from greater CEO hubris and the corresponding high acquisition premium. This is also found by John, Liu, and Taffler (2011), who argue that overconfident CEOs pay higher premiums. This especially holds when both the target and acquiring firm's CEO are perceived as overconfident. Liu and Chen (2017) found the same significant relationship. The effect of misvaluation on M&A activity is studied by Rhodes-Kropf, Robinson, and Viswanathan (2005). The study found that during merger waves, the activity was primarily dominated by overvalued bidders and that both parties cluster in overvalued sectors. More specifically, the misvaluation can be used to explain almost 15.0% of all M&A activity. Rhodes-Kropf and Viswanathan (2004) and Shleifer and Vishny (2003) both predict that misvaluation can be seen as the main driving factor for takeover activity. Another explanation is that managers act on asymmetric private information and cannot distinguish between individual firm mispricing and market overvaluation. Previous papers have found evidence that overconfidence leads to a larger takeover premium. To test this effect, the third hypothesis is developed:

Hypothesis₃: Overconfident CEOs lead to greater takeover premiums

2.6. Overconfidence related to CEO compensation

As mentioned in a section above, Malmendier and Tate (2004) studied the implications of CEO overconfidence and the consequences on corporate finance decision-making. This study also suggests that when overconfidence is known during the recruitment process, the CEO should be constrained by corporate governance systems such as compensation. From the shareholders' perspective, it is in their best interest to construct the remuneration in such a way it limits the principal-agent problem. An executive can be affected by the composition of the compensation in the way risk that is taken in order to be aligned with shareholders' preferences. Rajgopal and Shevlin (2002) state that executive stock options incentivizes management to mitigate risk.

A study by Harfold, Humphery-Janner, and Powell (2012) states that entrenched management is prone to making value destructive takeovers, as the market reaction to M&A activity undertaken by entrenched management is negative. It is found that overconfident CEOs receive more option-intensive compensation packages, especially for riskier and more innovative companies (Humphery-Jenner, Lisic, Nanda, & Silveri, 2016). When there are

higher levels of equity-based remuneration, it is more likely that the manager will engage in M&A activities with target companies with greater growth opportunities.

Furthermore, the positive link between equity-based remuneration and stock price performance surrounding the announcements is partly explained by lower takeover premiums (Datta, Iskandar-Datta, & Raman, 2001). Lastly, in the period after the announcement of an acquisition, firms with low equity-based compensation underperform compared to firms with high equity-based compensation. Thus, the following hypothesis is developed:

Hypothesis₄: High equity – based compensation weakens the relationship between overconfidence and M&A performance, frequency, and takeover premiums

2.7. Overconfidence related to CEO gender

Barber and Odean (2001) argue that, in general, men trade more than females throughout all ages. More specifically, their study shows a link between excessive trading of investors and overconfidence as a proxy by gender. Furthermore, the study claims that women display more risk-averse characteristics compared to men and that men are more overconfident in their decision-making. In general, Barber and Odean (2001) state that, when it comes to financial topics, men are more overconfident than women. Also, female CEOs operate less risky compared to male CEOs, and firm performance increases (Khan & Vieito, 2013).

Grinblatt and Keloharju (2009) mention in their study that there is a difference in the preferred type of gambling between men and women. Namely, men's gambling preferences lie in action-based games such as blackjack and sports betting, whereas women prefer passive and escape-oriented types. Again showing the more risk-averse mindset of women.

Evidence suggests that men show relatively greater overconfidence in corporate decision-making. This is found when looking at stock options, where female executives are prone to exercise deep in-the-money stock options early. This is not likely for men (Huang & Kisgen, 2013). In terms of acquisitions, male CEOs engage more in M&A activity and use more leverage compared to females. Furthermore, this study found a 2.0% lower announcement return from acquisitions by male-led companies opposed to female-led firms (Huang & Kisgen, 2013). Male CEOs are argued to engage more in M&A activity which destroys value. In addition, men display a narrower earnings forecast, suggesting miscalibration. Outside investors tend to react in favor of decisions made by female management when it comes to corporate finance topics. All in all, this paper strongly reasons that female executives are preferred by shareholders.

When looking at female board representation, Chen, Leung, Song, and Goergen (2019) argue companies led by male CEOs with a female represented board of directors display less overconfidence. This is because male CEOs in companies with female board representation are less likely to hold options that are deep in-the-money. Furthermore, the authors state that female directors are perceived to be less aggressive in investments, reduce investment to cash flow sensitivity, improve M&A decision-making, and result in an improvement in financial performance. This is found in an earlier study by Terjesen, Couto, and Francisco (2016), who claim that firms with female directors have greater financial performance calculated by Tobin's Q as a market measure and Return on Assets (ROA) as an accounting measure. Therefore, the following hypothesis regarding gender is formulated:

Hypothesis₅: Female CEOs weaken the relationship between overconfidence and M&A performance, frequency, and takeover premiums

2.8. Overconfidence related to CEO tenure

Corporate governance mechanisms are in place to align shareholders' and managements' interests. Also, CEOs are to be held accountable for certain choices and performance. If a CEO is not performing well in any way, they face a risk of being fired. When CEOs are elected, it often has a limited duration, which can be extended. A study by Zhou, Dutta, and Zhu (2020), shows that CEOs with a long tenure perform better in M&A deals compared to CEOs with short tenure when looking at U.S. firms from 1999 to 2015. Thus, creating more shareholder value. Furthermore, the study found that long-tenured CEOs acquire domestic companies in the same industry.

On the other hand, there is also evidence stating contrary outcomes in academic literature, namely that long-tenured CEOs have a greater likelihood of being entrenched. This leads to poor M&A activity. For instance, Walters, Kroll, and Wright (2005) argue that acquisition profitability and long-tenured managers are negatively related when there is no vigilant board. An earlier study by Shleifer and Vishny (1989) shows a positive relationship between the level of entrenchment and tenure, which again has a negative consequence on performance. Also, there is evidence of a positive relationship between executives' tenure and risk-taking (Chen & Zheng, 2014). The view is that long-tenured management is under the impression that they have gained sufficient skills and knowledge, which might stimulate risk-taking. Furthermore, longer tenure corresponds with strong and long-lasting relationships with stakeholders. Consequently, hypothesis six is mentioned below:

Hypothesis₆: Long – tenured CEOs strengthen the relationship between overconfidence and M&A performance, frequency, and takeover premiums

2.9. Overconfidence related to CEO ethnicity

Cultural differences between individuals could also imply a different development of behavioral traits. By looking at nine world regions and their performance on cognitive ability experiments and the confidence intervals, Stankov and Lee (2014) found differences in confidence levels between cultures. However, the differences are to a small degree. The conclusion from the paper is that global confidence levels are comparable. In addition, the researchers found differences in accuracy scores. For participants with high scoring abilities, overconfidence was small. This paper also refers to an earlier study by Stankov (2010) in which the finding was that people from East Asia had good calibration levels, lower levels of overconfidence, more self-doubt, and greater anxiety levels. He further argues that Asian students have a particularly strong drive for success. Differences in overconfidence, risk preferences, and diligence can possibly be captured by ethnic diversity (Harjoto, Laksamana, & Lee, 2015). In a different research, Li, Chen, and Yu (2006) claim that Asian cultures exhibited higher levels of overconfidence compared to Western cultures when groups were culturally matched. From a National Financial Capability Study in 2018 in the United States, evidence showed significant deviations in financial knowledge and overconfidence in this knowledge because of ethnic differences (Lee & Kim, 2021). As a result, the following hypothesis is formulated:

Hypothesis₇: The ethnicity group of Caucasian or White CEOs strengthens the relationship between overconfidence and M&A performance, frequency, and takeover premiums

2.10. Overconfidence related to CEO age

Naturally, how individuals perceive and process information might vary throughout their professional career. Ben-David et al. (2013) found a positive effect of age on long-term miscalibration. However, there was no relation when looking at the short-term. A study by Yim (2013) found a negative effect between CEOs age and the number of acquisitions undertaken. More specifically, because of the increase in CEO compensation after acquisitions, as argued in the paper, younger CEOs are more incentivized for takeovers. This incentive could lead to overinvestment and value destruction (Yim, 2013). Serfling (2014) argues that older CEOs tend

to be in charge of low stock return volatility companies. Moreover, the paper indicates that older CEOs spend less on R&D, operate at lower leverage levels, and diversify their firms by acquisitions. In general, the risk behavior decreases with the CEOs age. Furthermore, young CEOs are more overconfident than older CEOs (Citci & Inci, 2016; Navaretti, Castellani, & Pieri, 2021). Navaretti et al. (2021) argue that younger CEOs are encouraged to push company growth to show their capabilities to the world. This, however, does not lead to higher profits. Therefore, the hypothesis below is developed:

Hypothesis₈: Younger CEOs strengthen the relationship between overconfidence and M&A performance, frequency, and takeover premiums

2.11. Overconfidence related to CEO education

Differences in the educational background might lead to different skill- and mindsets, which impacts the evaluation of investment opportunities (Hayward & Hambrick, 1997). Malmendier and Tate (2005) argue that the investment to cash flow sensitivity is lower when the CEO is financially educated. Later, Malmendier and Tate (2008) found a positive relationship between a CEOs financial education and acquisitiveness. Furthermore, this study indicates this effect to be slightly correlated to overconfidence. In later research by Ben-David et al. (2013), a positive effect of education on long-term miscalibration was found. However, there was no relation when looking at the short-term. Also, educational differences could lead to different performances. When looking at bank performance and the CEOs educational background, and more specifically MBAs, it is found that certain capabilities are developed. These capabilities result in CEOs being able to lead larger and more complex banks and, by doing so, deliver greater performance than peers without MBAs (King, Srivastav, & Williams, 2016). In addition, this paper argues that CEOs with MBAs pursue more risky and innovative strategies for the firm to reach that greater financial performance. Hence, the following hypothesis is stated as follows:

Hypothesis₉: Higher educated CEOs strengthen the relationship between overconfidence and M&A performance, frequency, and takeover premiums

2.12. Conceptual framework

In **Figure 1** below, the possible relationships between the variables are shown. As can be seen from the figure, CEO overconfidence is the independent variable, and M&A

performance, M&A frequency, and takeover premiums are the dependent variables. Furthermore, the moderating variables constitute of the different CEO attributes. The framework below shows the regressions where the moderating variables might show a strengthening or weakening relation. In the Data Analysis chapter, the extraction of relevant data is discussed. Next, the Methodology chapter describes the conceptual model more thoroughly.

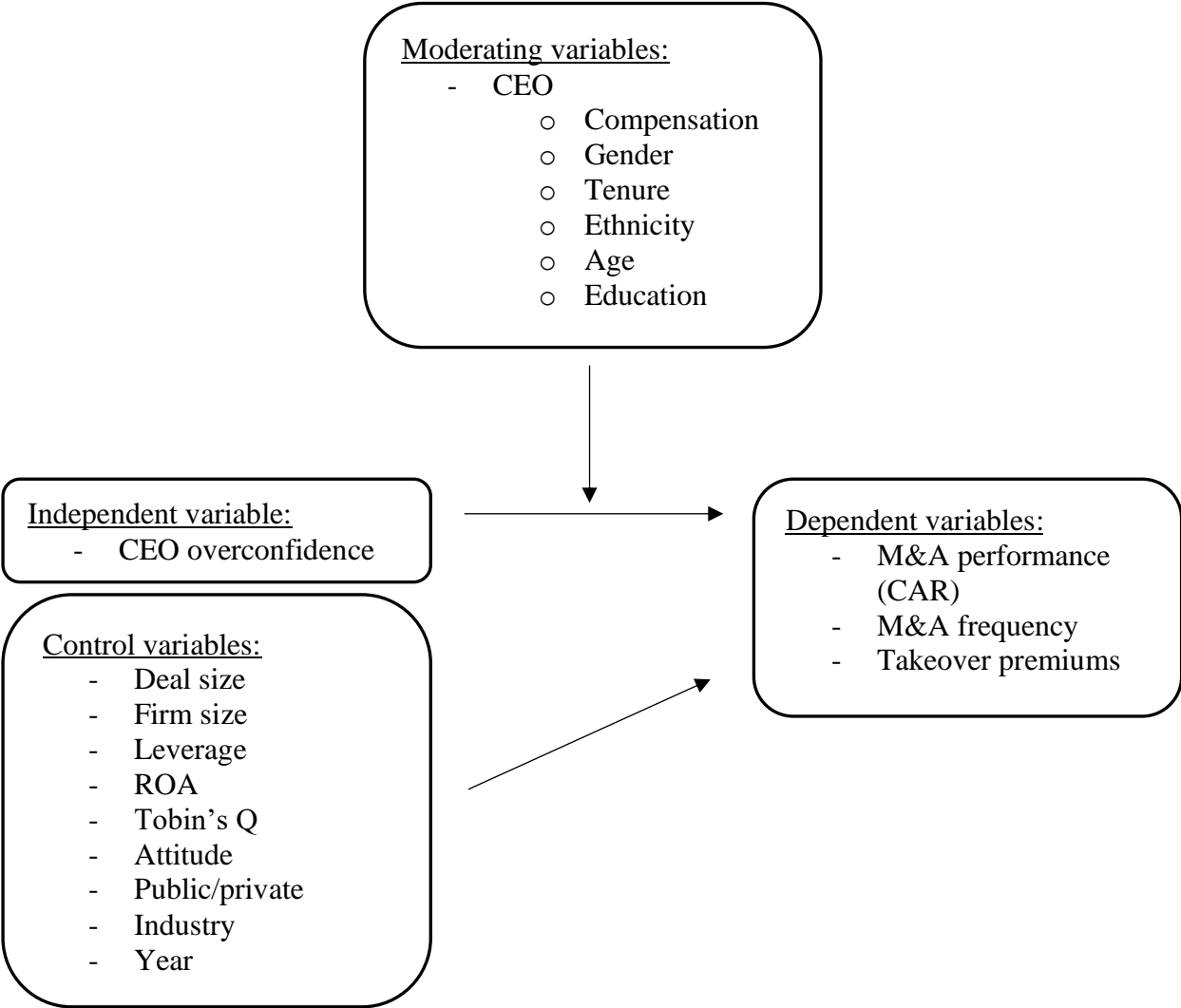


Figure 1: *Conceptual model*

3. Data Analysis

In order to extract all the relevant information about the M&A activities and CEO data, multiple databases are necessary. The Wharton Research Data Service (WRDS) is used to access the databases for the CEO attributes data. In all databases, a company's CUSIP code is used for extracting data. The CUSIP codes either have eight or nine digits.

First, the M&A transactions need to be obtained. Via the SDC Thomson One database, this information can be extracted. In this database, financial data from annual reports, M&A, and IPO specifics are collected. To narrow the search, the following filters were used: (1) The acquirer is publicly traded and operates in the United States of America, (2) The target operates in the United States of America, (3) The deal type is a merger or acquisition, (4) The takeover entails a sale of at least 50.01% of the outstanding shares, (5) The deal announcement period is between 01/01/2007 and 31/12/2020, (6) Deal status is completed, and (7) In the search, no minimum deal value is added to prevent searching errors and the possibility of missing observations. This resulted in a dataset consisting of 31,425 transactions. All firms operate in the United States of America as cross-border M&A activity might reflect issues resulting from differences between countries. This could vary from accounting standards to corporate governance mechanisms. After filtering for companies trading on the NYSE and NASDAQ and excluding financial and utility firms due to regulatory differences, the dataset consists of 16,812 transactions.

Additional information regarding annual reports is added from the CRSP/Compustat Merged database. All acquiring firm data must be obtainable through this database. These include balance sheet items of total assets and total debt. Total debt is divided into long-term and short-term. Also, shareholders' equity and fiscal year-end stock prices are added. These items are primarily used for the control variables.

Then, for the CEO attributes multiple databases are used to gather the required data. For the variable CEO Compensation, Compustat Executive Compensation is consulted. When looking at this database, all yearly compensation information regarding the CEO can be extracted. This database, ExecuComp, gathers all CEO and Board data from S&P1500 active companies, companies removed from the S&P1500 that are still trading, and some additional companies are added at request from users. Furthermore, firms can be filtered by using the Standard Industry Classification (SIC) four-digit code. Another filter in this database is to exclusively select CEOs in the dataset by selecting CEOANN and entering CEO. Via ExecuComp, CEO Gender is also added as a variable, which is included from different

databases as well. Lastly, CEO Tenure is constructed using the item BECAME_CEO and the year of the specific transaction. To measure overconfidence, a CEO holds an option that is 67% or more in-the-money. As a robustness check, overconfidence is also calculated the same as for the 67% in-the-money, however, now it resembles overconfidence when a CEO holds an option that is 100% or more in-the-money. Using variables from ExecuComp and CRSP/Compustat Merged databases, the proxy for an overconfident CEO can be calculated.

For the variables CEO Gender, CEO Ethnicity, and CEO Age, the Institutional Shareholder Services (ISS) is consulted. The ISS provides access to these variables for S&P1500 companies. The variables Gender, Ethnicity, and Age are easily extracted as options from the list of variables.

It is not possible to add the variable M&A Education in the ExecuComp or ISS database. Therefore, BoardEx is consulted. From the ExecuComp and ISS databases, the Executive ID number can be found, which is used as an input parameter for the BoardEx database. The data extracted contains both the company and director names, the company and director ID, and their education level. The latter is added by selecting the variable Qualification in BoardEx.

As this research paper is an event study, the WRDS Event Study Tool is used. Through this tool, the collected events dates from the SDC Thomson One database are put in. After, the estimation parameters are set. These constitute of an estimation window of 100-days, a minimum number of valid observations of 70, and a gap of 50 trading days between the estimation window and the start of the event window. The latter is used to reduce the probability that the estimation for the risk model is affected by the return variance induced by the event. The daily returns for each company are used to calculate the CARs. The market model from Malmendier and Tate (2004) is used as a benchmark.

Lastly, all datasets are combined into one merged set into STATA. As the data is extracted from different databases, the firms, CEOs, and CEO attributes need to be matched. This is done by using the firm's CUSIP and the event dates. However, in order to add educational achievements to a specific CEO, the unique Executive's- or Director's ID is used. After doing so, all corresponding measures are put together as one unique group of data points. This resulted in a dataset consisting of 1,042 observations with complete CEO attributes data for each transaction.

To be able to analyze the dataset, the variables are reviewed. It is important to take outliers into account. The outliers can be found by the Descriptive statistics Table or by analyzing the histograms of each individual variable, excluding the dummy variables. In line with studies from Campbell et al. (2011), Hirshleifer et al. (2012), and Ben-David et al. (2013),

variables can be winsorized to replace the outliers with values more tolerable for the research. The dependent variables for M&A performance, 3-, 5-, 7-, and 11-Day CAR, leverage, ROA, and Tobin's Q are winsorized at the 1st and the 99th percentiles, hence at a 1% level. As a result, the kurtosis for all variables measured by CARs is below 6. Furthermore, the variable takeover premiums is winsorized at the 0th, and 96th percentiles as 1% of 57 observations did not result in the replacement of the single outlier case. Lastly, as will be mentioned in the Methodology chapter below, the natural logarithm of shares owned, deal size, and buyers' firm size are taken to deal with outliers. Consequently, after adjusting, the variables used in this research are close to being normally distributed.

4. Methodology

This chapter will discuss the method of research utilized in this paper. For this paper, an event study will be performed to assess the M&A performance. Both the measure for M&A performance and the event study methodology are discussed. Next, M&A frequency and takeover premiums are reviewed. After, the measure for CEO overconfidence will be described. Furthermore, the CEOs attributes, the moderating variables, are divided into the above-mentioned subsections and are reviewed alternately. The CEO attributes are analyzed to look for a possible strengthening or weakening relationship between CEO overconfidence and the dependent variables. Next, the control variables are discussed. The technicality of the method will be discussed below. In the appendix in Table 1, an overview is provided of the variables.

4.1. Dependent variable

4.1.1. M&A performance

The dependent variable consists of the Cumulative Abnormal Returns (CARs), which are formed by an event study of the daily stock returns for a firm. These CARs are constructed by different time windows. CARs are formed by using a specific company's expectancy of the market return on a daily basis. In line with the study from Malmendier and Tate (2004), this paper looks at daily market returns as an estimation for the expected returns. Furthermore, from this same paper, the proxy for the expected market returns is the S&P500.

The event study framework, proposed by MacKinlay (1997), is used for the construction of the dependent variable M&A performance measured by CARs. MacKinley (1997) empirically studies the reaction of events on the stock return. For this study, the impact of a merger or acquisition announcement on the stock is analyzed. This research will look at the 3-day time span around the announcement, which means an equal amount of days before as after the announcement (-1, +1). This event window is taken because stock return behavior by the market might not be reflected instantly and can take several days to fully cover the reaction (MacKinley, 1997). Stock return is affected by events regarding that specific firm or the overall market. According to MacKinley (1997), the market model parameters should be estimated over 120 days prior to the actual event when looking at an event study with both daily data and the market model. With this amount of days before the event window, MacKinley (1997) assumes a normal performance, meaning that there are no special situations of substantial influence on the actual event. Thus, the estimation period reflects the point in time prior to the event.

The abnormal return formula below is set up as follows: $AR_{i,t}$ reflects the abnormal return with i meaning a specific company. $R_{i,t}$ denotes the realized return for company i . Furthermore, $E(R_{i,t})$ denotes the expected return. Lastly, t reflects the time.

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \quad (1)$$

The expected return $E(R_{i,t})$ from formula (1) is mentioned below. The market model predicts the parameters α_i and β_i over the estimation window. The market model, used to calculate the expected return, as this method is used in the study of Malmendier and Tate (2004). This assumes a linear and constant relationship between a market index (e.g. S&P500) and individual asset returns. The expected return $E(R_{i,t})$ is shown in formula (2).

$$E(R_{i,t}) = \alpha_i + \beta_i R_{m,t} \quad (2)$$

The market model from Mackinley (1997) represents the return of a specific security to the return of the market. The assumed market model is shown in formula (3). In the formula, the $R_{i,t}$ is the securities return at time t and the $R_{m,t}$ is the return of the market portfolio. $\varepsilon_{i,t}$ is the zero mean disturbance term and the market model estimates the parameters α_i and β_i .

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (3)$$

The cumulative abnormal return, CAR, for a specific company i is calculated as reflected in formula (4). This formula means aggregating the daily AR to measure the effect over the time event window. The time window is reflected from T_1 to T_2 .

$$CAR_i(T_1, T_2) = \sum_{T_1}^{T_2} AR_{i,t} \quad (4)$$

For the CARs, the event window is 3-days, meaning one day prior, the day of the event, and one day after the event, as a dependent variable (CAR 3-day; -1,+1). To test for robustness, the 5-day CAR (CAR 5-day; -2,+2), the 7-day CAR (CAR 7-day; -3,+3), and the 11-day CAR (CAR 11-day; -5,+5) are added as regressions. The multiple day CARs are executed the same as the 3-day CAR.

4.1.2. M&A frequency

This measure indicates whether a CEO has engaged in multiple acquisitions. This is done by programming the variable to show whether a CEO has engaged in multiple deals. Thus, the number of takeover announcements for an individual CEO is the second dependent variable. Naturally, all CEOs in the sample have engaged in a minimum of one transaction, otherwise, the CEO would not come up in the search. As this variable analyses whether overconfidence leads to more acquisitions, it holds that $N > 1$. As N indicates the number of announcements. In the sample used in this research, 39.4% of the CEOs only engaged in one M&A transaction. The rest of the CEOs has engaged in multiple M&A deals. A dummy variable is used to indicate whether a CEO has engaged in more than one deal, then the value equals 1. If the CEO has only engaged in a transaction once, the value equals zero.

4.1.3. Takeover premiums

A takeover premium in M&A deals can be described as what is paid for a target in excess of the estimated value of the target. Thus, what additional price is needed to be paid to obtain control over the desired target. This is partly due to the fact that some shareholders do not want to sell their shares for the current share price. The acquirer has to present an attractive opportunity for those shareholders to sell by adding a takeover premium. The acquirer, therefore, increases the price to persuade shareholders to sell their shares to the acquirer. In an auction, the more the acquirer wants to gain control of the target, the higher the willingness to pay a premium.

In this research paper, the target must be a listed company as the premium is calculated using the share price at different points in time. The calculation of the premium is introduced by Hayward and Hambrick (1997). In their study, the authors use the share price at the time of the announcement and the share price thirty days before that event. The thirty days before the event resembles an unaffected regular share price. The premium is calculated by subtracting the takeover offered price per share and the share price of the target thirty days before the announcement is public. The latter is found by using the share price four weeks before the announcement information is public. The subtracted number is then divided by the share price of four weeks in the past. This ratio resembles the takeover premium at deal i . For clarification, the formula for calculating the takeover premium is shown in formula (5) below.

$$Premium_i = \frac{Price\ per\ share\ paid_{t=0} - Unaffected\ price\ per\ share_{t-30}}{Unaffected\ price\ per\ share_{t-30}} \quad (5)$$

4.2. Independent variable

4.2.1. CEO overconfidence

The independent variable CEO overconfidence is measured according to the description of Malmendier and Tate (2004; 2008). As mentioned, overconfidence is reflected in the decision-making and behavior of the CEO. In general, academic literature indicates a CEO as being overconfident when they hold options deep in-the-money. This is called “Holder 67” (Malmendier & Tate, 2004; Campbell, Gallmeyer, Johnson, Rutherford, & Stanley, 2011). Furthermore, the holding period of an option could also indicate overconfidence, namely, holding an in-the-money option until the option expires might reflect overconfident behavior, or “Longholder”. A third measure from the authors is the “Net buyer”, reflecting the actions in which a CEO buys back shares from the company, thus, share repurchasing behavior. However, it is not possible to use the original measure to construct the overconfidence for this study, as the data used by Malmendier and Tate (2004; 2008) is protected by a patent. To replicate the variable, similar research papers measure overconfidence based on “Holder 67” using The Wharton Research Data Service (WRDS). In this database, Campbell et al. (2011) and Hirshleifer et al. (2012) construct overconfidence by looking at the altitude at which an option is in-the-money. More specifically, a CEO is perceived to be overconfident when the CEO holds an option equal to or more than 67.0% in-the-money. Naturally, the option is not yet exercised during the time period in this research paper. Thus, an option equal to or greater than 67% in-the-money is called “Moneyiness” or “Holder67”. The variable for overconfidence is reflected as a dummy variable with a value of 1, meaning an overconfident CEO, and 0 when the CEO is not perceived as overconfident.

From the paper of Campbell et al. (2012), an additional measure for overconfidence is included as a robustness check. The additional variable is also option-based. More specifically, Campbell et al. (2012) uses the same equation, but uses 100% as a threshold that proxies overconfidence. The 100% or deeper in-the-money again is reflected with a 1 valued dummy variable for overconfidence. This proxy reflects high levels of overconfidence.

Thus, the Holder67 and the Holder100 measures from the paper by Hirshleifer et al. (2012) and Campbell et al. (2011) are used as a proxy for overconfidence. It reflects a CEOs rationale of believing the stock price of their firm to gain value even more. Furthermore, it is assumed that an overconfident CEO remains classified as such during the whole period. Concluding, all options from the CEOs holding are not exercised while the calculated moneyiness is perceived to be high (Hirshleifer et al., 2012).

From WRDS ExecuComp, the option data is extracted. To construct the option-based overconfidence variable, the following steps are taken:

$$Money_{p,t} = \frac{Stock\ price_t}{Stock\ price_t - \frac{Total\ realizable\ value_t}{Nr\ exercisable\ options\ held_t}} - 1 \quad (6)$$

$Money_{p,t}$ is the fraction of the option holding classified as in-the-money at time t for an individual CEO. $Stock\ price_t$ is the stock price of the company of that CEO at time t . $Total\ realizable\ value_t$ is the total difference between the strike price and the stock price at time t . Finally, the $Nr\ exercisable\ options\ held_t$ is the number of non-exercised total options at time t . The first step is to calculate the average realizable value per option (ARVO). This is done by the total realizable value divided by the number of the CEOs held options. This strike price, in the denominator, is calculated by the end of the fiscal year stock price minus the ARVO. Finally, the average moneyness for the option equals the stock price as the nominator and the strike price as the denominator, then subtracting one. To replicate this using ExecuComp, the following variables are taken and determined as follows: The total realizable value divided by the number of options held. This equals the items OPT_UNEX_EXER_EST_VAL divided by OPT_UNEX_EXER_NUM. This gives the per option realizable value. The fiscal year-end stock price equals the ExecuComp item PRCC_F. The dummy variable equals 1 if the outcome of this equation is > 0.67 and 0 when < 0.67 . Similarly, for robustness check purposes, the dummy equals 1 if > 1 and 0 when < 1 . This is similar to the measures of both Hirshleifer et al. (2012) and Campbell et al. (2011).

4.3. Moderating variables: CEO attributes

Using the WRDS' ExecuComp, BoardEx, and ISS databases, certain attributes were extracted. The following variables are used to find a possible moderating effect. This paper looks at the moderating variables: CEOs (1) Compensation, (2) Gender, (3) Tenure, (4) Ethnicity, (5) Age, and (6) Education. Below is a description of each variable and how the variable is measured.

Compensation

This variable consists of the stock owned by the CEO annually. This excludes the stock option remuneration. Furthermore, the natural logarithm is used to control for skewness and

kurtosis. The variable can be added using ExecuComp database item SHROWN_EXCL_OPTS_OCT.

Gender

Naturally, this variable indicates whether the CEO is male or female. This is reflected as a dummy variable with a value of 1 for female CEOs and 0 when otherwise. This can be added using ExecuComp and ISS databases item GENDER.

Tenure

Tenure resembles the number of years that specific CEO is in their role as CEO. As the measure is in years, the variable is continuous. The variable can be added using ExecuComp database item YEAR and subtracting item BECAMECEO. As an additional check, the item LEFTOFC is added, representing the date left as CEO.

Ethnicity

In the data, multiple categories for ethnicity can be distinguished. The groups are African American, Asian, Caucasian/White, Hispanic/Latin American, Indian, or Unknown. As the majority of groups in the sample show the classification Caucasian/White, a dummy variable is used with a value of 1 for Caucasian/White and 0 if otherwise. The variable can be added using ISS database item ETHNICITY.

Age

The age of the CEO as a variable. This measurement is shown in years. Hence, a continuous variable. The variable can be added using ExecuComp and ISS database item AGE.

Education

Besides the measure of Ethnicity, Education also has categories. The brackets are among others, from lowest to highest, No University degree, Bachelor's degree, Master's degree, or Doctorate degree. This variable can be added using BoardEx database item Qualification. For this study, a dummy variable is used with a value of 1 for higher education starting from a Master's degree or higher and 0 if otherwise.

4.4. Control variables

When testing for a possible effect of the CEO attributes on the relationship between CEO overconfidence on M&A performance, M&A frequency, and takeover premiums, other factors might already be of effect. Therefore, control variables are added to the regressions to correct for the effect these factors might have. The possible relationship between the variables of interest and the dependent variables might not come up when not doing so. In line with

previous studies, certain control variables are added to the regression. To test the significance, the adjusted R-squared is measured.

Deal size

Moeller et al. (2005), Aktas et al. (2012), and Alexandridis et al. (2017) use the natural logarithm as a normalization method for the control variable. In addition, deal size is a specific measure for each different transaction to control for the announcement influence.

However, only 459 cases of the 1,042 observations contained information about the deal size. And as can be seen in the Pearson correlation matrix in the Appendix in Table 3, there is no significant relationship between deal size and the dependent variables M&A performance and M&A frequency. Only for takeover premiums a significant relationship is found. To prevent the sample size from dropping to half of the total observations, deal size is excluded from the M&A performance and M&A frequency regressions. The results for these dependent variables, when including deal size in the regressions, can be found in the appendix in Tables 15 until 20. These results are discussed in the final paragraph. For takeover premiums, the sample size would not decrease when adding deal size, therefore, the control variable is included.

Buyers' firm size

In line with a study from Moeller et al. (2005), firm size is added as a control variable, as the authors found that larger firms tend to pay greater takeover premiums. Also, when looking at firm performance, Moeller et al. (2005) claim that larger firms have lower announcement returns compared to smaller ones. Hence, firm size is negatively related to announcement effects. It might be that larger firms have greater capacity and funds available to engage in acquisition. According to Roll (1986), there is a positive relationship between firm size and the altitude of the takeover premium. To control for firm size skewness is taken into account. Thus, the natural logarithm is taken from a company's total assets at the end of the fiscal year. To remove possible outliers from the observations, the natural logarithm is taken.

Leverage

Huang and Kisgen (2013) and Serfling (2014) show different levels of leverage can be found related to certain CEO attributes. Prior to these studies, Ben-David et al. (2007) claim a positive relationship between the level of leverage and overconfidence. To measure levels of overconfidence and the role of CEO attributes, leverage is controlled for. To calculate leverage, total debt is divided by total capital. More specifically, total debt consists of both long-term debt and short-term debt from current liabilities. And total capital consists of total debt and total shareholders' equity.

Return on Assets (ROA)

Since firm profit is related to the cashflow, the paper of Malmendier and Tate (2004, 2005, 2008) shows the positive relation of CEO overconfidence on the investments to cash flow sensitivity. Profit is often replicated by ROA. This control variable is calculated by a company's net income divided by their total assets.

Tobin's Q

Another check for robustness used by Hirshleifer et al. (2012) include the Tobin's Q as a control variable. This measure indicates the valuation of the target and the influence on the takeover premium. The variable controls for investment and growth opportunities. Tobin's Q is calculated by dividing the market value of the assets over the book value of the assets.

Attitude

As another deal characteristic, the classification hostile or friendly takeover can be added to the sample as well. It is argued that takeover premiums are higher in hostile takeovers. This is due to the target management displaying resistance during the process (Alexandridis et al., 2011). A dummy variable is created with a value of 1 for hostile takeovers and 0 if otherwise.

Public/private

According to Capron and Shen (2007), acquirers are favorable to private targets in industries with which they are familiar. Also, the acquirers target public firms when trying to enter a new business line or a new industry. Furthermore, an acquirer who targets private firms performs better than those who target a public firm on the merger announcement. Lastly, acquirers who targeted a public firm would have performed better if the target was private. Therefore, this research controls for the choice of target by adding a dummy variable. The dummy variable takes a value of 1 for a public target and 0 if otherwise.

Industry

Following Alexandridis et al. (2011), who argue that industry Fixed Effects are used to control for the different dynamics within each industry. Differences in dynamics include performance differences, merger waves, and a variety of takeover premiums. The industry Fixed Effects are constructed using the SIC codes. As financial and utility companies are excluded due to regulatory differences, this refers to the SIC codes 4900-4999 and 6000-6999. A dummy variable is created using STATA FFI10 code, which divides the industry into 9 groups.

Year

In line with Hirshleifer et al. (2012), to reduce endogeneity, year Fixed Effects are added to the regression. As discussed above, merger waves and the number of transactions cluster, leading to a period with the possibility of outliers. Thus, M&A activity varies during the sample period, this is offset with year Fixed Effects. For every year in the sample, a dummy variable is made. The dummy has value 1 for the specific announcement year and 0 when otherwise.

4.5. Regression model

An Ordinary Least Squared (OLS) regression is used to test the hypothesis. As mentioned in the section above, this model uses the CARs as a proxy for the dependent variable M&A performance and CEO overconfidence as an independent variable. Next, the dependent variables M&A frequency and takeover premiums are tested with CEO overconfidence as an independent variable. Besides these variables, certain control variables are added.

Below are the regressions used in this research paper. The subscripts are defined as follows: deal i , firm j , industry k , time t , and for a specific CEO h .

$$(1) CAR3DAY_{i,j,t} = \beta_1 D(Overconfidence67)_{i,h,t} + \beta_2 (CEO\ Attributes)_{h,j,i}^2 + (\beta_1 D(Overconfidence67)_{i,h,t} \times \beta_2 (CEO\ Attributes)_{h,j,i}^1) + \beta_3 (LNDealValue)_{i,t} + \beta_4 (LNFirmSize)_{j,t} + \beta_5 (Leverage)_{j,t} + \beta_6 (ROA)_{j,t} + \beta_7 (TobinsQ)_{j,t} + \beta_8 D(HF)_{i,t} + \beta_9 D(Public)_{i,t} + \eta_k + \delta_t + \varepsilon_{i,j,t}$$

$$(2) \#Announcements_{h,t} = \beta_1 D(Overconfidence67)_{i,h,t} + \beta_2 (CEO\ Attributes)_{h,j,i}^1 + (\beta_1 D(Overconfidence67)_{i,h,t} \times \beta_2 (CEO\ Attributes)_{h,j,i}^1) + \beta_3 (LNDealValue)_{i,t} + \beta_4 (LNFirmSize)_{j,t} + \beta_5 (Leverage)_{j,t} + \beta_6 (ROA)_{j,t} + \beta_7 (TobinsQ)_{j,t} + \beta_8 D(HF)_{i,t} + \beta_9 D(Public)_{i,t} + \eta_k + \delta_t + \varepsilon_{h,t}$$

$$(3) Premium_{i,t} = \beta_1 D(Overconfidence67)_{i,h,t} + \beta_2 (CEO\ Attributes)_{h,j,i}^1 + (\beta_1 D(Overconfidence67)_{i,h,t} \times \beta_2 (CEO\ Attributes)_{h,j,i}^1) + \beta_3 (LNDealValue)_{i,t} + \beta_4 (LNFirmSize)_{j,t} + \beta_5 (Leverage)_{j,t} + \beta_6 (ROA)_{j,t} + \beta_7 (TobinsQ)_{j,t} + \beta_8 D(HF)_{i,t} + \beta_9 D(Public)_{i,t} + \eta_k + \delta_t + \varepsilon_{i,t}$$

² The CEO Attributes can take the following form: $(Compensation)_{h,j,t}$; $D(Gender)_{h,j,i}$; $(Tenure)_{h,j,i}$; $D(Ethnicity)_{h,j,i}$; $(Age)_{h,j,i}$; $D(Education)_{h,j,i}$

To test the effect of the CEO attributes as moderation, this research looks at whether the relationship of CEO overconfidence on M&A performance, M&A frequency, and takeover premiums is strengthened or weakened by a third variable. The third variable, or the moderator variable, can be characterized as an intersection. This could be a quantitative measure such as compensation, tenure, or age or a categorical measure such as gender, ethnicity, or education. A regression, which includes moderation, used in the study of Cohen, West, and Aiken (2014) show that the moderator can influence the strength of the relationship. In the regressions, the independent variable, the moderator, and an estimation variable are included. In the regressions above, the $(\beta_1 D(Overconfidence67))_{i,h,t} \times \beta_2 (CEO\ Attributes)_{h,j,i}$ ³ represents this interaction term to test a possible moderating effect. This is done by adding an interaction term for each of the attributes, as found in the footnote.

Lastly, as additional robustness tests, the 5-, 7-, and 11-day CAR will be used instead of the CAR3DAY variable in regression (1). Also, for all these multiple day CARs a regression is executed with both overconfidence measures. These are the 67% and 100% in-the-money measures from Campbell et al. (2011). The 3-day CAR is also executed in a regression using the 100% in-the-money overconfidence measure. In addition, for the other dependent variables, the number of M&A announcements and the takeover premiums, robustness checks are conducted by using the 100% in-the-money overconfidence measure.

³ The CEO Attributes can take the following form: $(Compensation)_{h,j,t}; D(Gender)_{h,j,i}; (Tenure)_{h,j,i}; D(Ethnicity)_{h,j,i}; (Age)_{h,j,i}; D(Education)_{h,j,i}$

5. Results

This chapter will discuss how the data is processed according to the methodology described above. First, the descriptive statistics are presented, followed by the Pearson correlation matrix, which looks at the correlation between variables. Before running the regression, assumptions are checked using statistical tests, which can be found in the appendix. Finally, the output and findings of these regressions are discussed.

5.1. Descriptive statistics

For all variables used in this research the statistics can be found in Table 2 below. In Table 4, the distribution announcements can be found, which is an overview of the transactions per year.

As shown in Table 2 the mean CAR for 3-, 5-, 7- and 11-day indicates 0.18%, 0.09%, 0.11% and -0.05%, respectively. The positive numbers of the 3-, 5-, and 7-day CAR show that M&A activity is beneficial for the shareholders, whereas the 11-day CAR shows otherwise. This is in line with the finding of Doukas and Petmezas (2007) and Petmezas (2009), who argue that the short-term effect is positive, whereas the long-term effect is negative for the shareholders.

Furthermore, the mean M&A frequency is 0.6056, which means that in the sample, 60.56% of the CEOs complete multiple M&A deals. Next, the mean takeover premium in the sample is 51.56%. However, the number of observations for the premium is only 57 transactions since the target has to be a public company to measure the premium, which reduced the sample size.

To continue with the measures for CEO overconfidence, the mean for overconfidence using the 67% in-the-money classification is 0.5672. This means that 56.72% of the CEOs are overconfident. In addition, using the 100% in-the-money classification, the mean for high overconfidence is 0.4664 or 46.64%. In comparison to the paper from Malmendier and Tate (2004), 244 out of 408 CEOs can be classified as being overconfident, which equals almost 60%. In addition, the research by Campbell et al. (2011), 34% of the CEOs have high levels of optimism, and 57% are moderately optimistic. In this case, moderate levels resemble the 67% in-the-money measure, and high levels resemble the 100% in-the-money measure. A difference in the sample from Campbell et al. (2011) and this paper is, Campbell et al. (2011) analyze the period between 1992 and 2005, whereas this paper looks at 2007 and 2020.

The CEO attributes show that the average CEO holds over 1,400 shares in the company, with a maximum of almost 143,000. In the sample, 5.47% of all CEOs are female. Next, the

average tenure in years is approximately 8.5 years. The maximum tenure is a little over 50 years. This represents a CEO who was appointed on January 1st, 1968. When looking at the ethnicity variable, 84.55% of the CEOs can be classified as Caucasian/White. Also, the average age is almost 57 years old, with a minimum of 37 and a maximum of 82 years old. Next, 27.73% of the CEOs have completed a higher level education.

Finally, the control variables are also shown in Table 2. First, the average deal size is USD 1.02 million. Also, the average firm size is USD 9.47 million, which is the total assets of the buyer. The average leverage ratio for the acquirer, which indicates the ratio of the total debt compared to the total capital, is 38.90%. For ROA, the average is 5.98%. As for the market to book value of the assets represented by Tobin's Q, the average is 1.55. And finally, only 4.80% of the deals can be classified as hostile when looking at the variable attitude and only 6.33% of the targets were listed firms. Because the skewness and kurtosis of shares owned, deal size, and firm size are high, as seen in Table 2, the natural logarithm is also provided.

Table 2: Descriptive statistics

<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>Sd.</i>	<i>Min.</i>	<i>Max.</i>	<i>Skew.</i>	<i>Kurtosis</i>	<i>p50</i>
Dependent variables								
CAR3DAY	1,042	0.0018	0.0402	-0.1260	0.1478	0.1456	5.7658	0.0012
CAR5DAY	1,042	0.0009	0.0472	-0.1475	0.1569	0.1144	5.0468	0.0015
CAR7DAY	1,042	0.0011	0.0547	-0.1570	0.1829	0.2302	4.7383	0.0022
CAR11DAY	1,042	-0.0005	0.0637	-0.1798	0.1846	0.0424	3.9169	-0.0012
M&A frequency (dummy)	1,042	0.6056	0.4890	0	1	-0.4320	1.1866	1
Premium	57	0.5146	0.3639	0.0429	1.5385	1.5369	4.6609	0.3824
CEO overconfidence								
OV67 (dummy)	1,042	0.5672	0.4957	0	1	-0.2712	1.0735	1
OV100 (dummy)	1,042	0.4664	0.4991	0	1	0.1347	1.0181	0
CEO attributes								
Shares owned	1,042	1418.566	5493.686	1	142993.6	17.8348	433.1993	266.427
LN Shares owned	1,042	5.6910	1.7623	0	11.8705	-0.1720	4.1029	5.5851
Female (dummy)	1,042	0.0547	0.2275	0	1	3.9164	16.339	0
Tenure	1,042	8.4257	7.4389	0.0027	50.2849	1.3999	5.7584	6.1822
Ethnicity (dummy)	1,042	0.8455	0.3616	0	1	-1.9118	4.6548	1
Age	1,042	56.9866	7.5028	37	82	0.3367	3.2007	56
Education (dummy)	1,042	0.2773	0.4479	0	1	0.9947	1.9893	0
Control variables								

Deal size	459	1021.283	4888.329	0.043	79376.83	11.1106	157.6554	100
LN Deal size	459	4.5305	2.1990	-3.1466	11.2820	-0.1423	3.7417	4.6052
Buyers' firm size	990	9470.438	26035.99	0.008	252978	4.8851	31.8923	1310.023
LN Buyers' firm size	990	7.1136	2.4122	-4.8283	12.4411	-1.1483	6.6892	7.1778
Leverage	1,042	0.3890	0.2919	0	1.4016	0.8104	3.7483	0.3596
ROA	1,042	0.0598	0.0519	-0.1588	0.2117	-0.5915	6.3353	0.0603
Tobin's Q	1,042	1.5526	1.1590	0	6.6404	1.7883	7.3465	1.2673
Attitude (dummy)	1,042	0.0048	0.0691	0	1	14.3320	206.4048	0
Public/private (dummy)	1,042	0.0633	0.2437	0	1	3.5855	13.8555	0

5.2. Pearson correlation matrix

In the appendix, Table 3 can be found, which shows the Pearson correlation matrix. This statistical test displayed in a matrix illustrates the statistical relationship between the variables used in the regressions. The correlations in the matrix range from value -1 to 1. More specifically, a value of -1 resembles a strong but negative relationship. This means that those two variables move in adverse directions. Naturally, an opposite value of 1 reflects a positive relationship. Lastly, a value of 0, or close to 0, means there is no apparent relationship between those variables. Besides the corresponding correlation value between variables, the significance is indicated on the levels shown below the Table. The significance only reflects that relationship, not the relationship within the overall regression model.

First, the correlation matrix shows that the CARs are significantly correlated with one another at the 1% level. Next, the independent variable for overconfidence measured by 67% in-the-money, OV67, has a significant positive relationship with M&A frequency as a dependent variable at the 1% level. In addition, OV100 is significantly positively associated with M&A frequency at the 5% level. This is in line with hypothesis 2, stating that CEOs who exhibit overconfident behavior leads to greater M&A frequency. However, the correlations do not confirm nor disprove the hypothesis, as the correlation matrix only shows the relationship between two variables without taking other variables into account. Nonetheless, the overconfidence measures do not have a significant relationship with takeover premiums.

As for the 100% in-the-money overconfidence measure, OV100, there is a significant negative association with the dependent variable M&A performance reflected by the 5-day and 11-day CAR. These are significant at the 5% and 10% level, respectively. Whether this is a causal relationship is to be proven in the regressions. However, this relationship is in line with the first hypothesis.

As for the control variables, deal size has a significant negative link with takeover premiums at the 5% level. Second, ROA, Tobin's Q, and deal attitude all have a positive

correlation with M&A frequency. However, this is only a slightly positive relationship at the 10% level. The type of target, public or private, is not significantly correlated to any dependent variable. As deal size does not have a significant relationship with the CARs or M&A frequency, the variable is left out of these regressions in order to maintain the sample size. Including this variable would reduce the sample size by more than half for those regressions. In the appendix in Tables 19 until 28, the output is shown when deal size is included. These results are discussed in sections 5.3.1., 5.3.2., and 5.3.4. at the end. As can be seen from Table 3, deal size is significantly correlated with takeover premiums, hence the control variable is included in this regression. Including this variable in the regression did not reduce the sample size for the dependent variable premiums.

Finally, when looking at the correlation between the control variables, only deal attitude and target type are strongly correlated. It is important that the other variables are not too similar or close to one another. This means there is no evidence for multicollinearity concerns.

5.3. Regression model

This part of the Results chapter tests the hypotheses. In the first section, I explore whether CEO overconfidence has an influence on M&A performance. Next, the second and third section analyze the effect of CEO overconfidence on M&A frequency and takeover premiums. Building on these analyses, each section evaluates whether the CEO attributes have a moderating effect on the relationship between CEO overconfidence and the M&A activity.

5.3.1. M&A performance

In Table 7, the results from the regression can be found. This regression tests hypothesis 1, which states that CEO overconfidence has a negative effect on M&A performance. As can be seen from the Table, the 3-day CAR is used (-1,+1).

In Table 7, column *A* shows the impact of overconfidence “OV67” on the performance measure 3-day CAR with the control variables included. Column *B* then adds the CEO attributes to the regression as additional variables. Next, from column *C* until *H*, the interaction terms of each CEO attribute multiplied by the overconfidence measure “OV67” are added separately. Lastly, column *I* shows all variables simultaneously.

The effect of CEO overconfidence on M&A performance is shown in Table 7. Previous studies found a negative influence, which is also stated in the hypothesis. In order for this to hold “OV67” should have negative values in all columns. Even though these values are indeed negative, there is no significance. Thus, the results are inconclusive.

Building on this analysis, this research aims to find whether the CEO attributes influence M&A performance and have a moderating effect on the relationship between CEO overconfidence and M&A performance. From the table it can be seen in columns *B* to *H* that the variable shares owned and the variable tenure lead to a decrease in M&A performance of 0.137 and 0.17 percentage points at the 10% significance level, respectively. For tenure, this significance is not found in column *E*. Thus, compensation and tenure negatively coincide with the 3-day CAR according to the regressions in these columns. Humphery-Jenner (2016) argue that incentive-heavy compensation stimulates CEOs to exploit their biased perspectives of the firm, this could explain the relationship. The research from Cook and Buress (2013) shows that less monitoring is experienced by long-tenured CEOs, which could explain the negative effect.

Furthermore, this study is interested in a possible moderating effect for the CEO attributes: compensation, gender, tenure, ethnicity, age, and education. For an effect to be apparent, the coefficients should be significant. However, only the interaction term *OVxFemale* shows any significant value. Column *D* and *I* explore the moderating effect of a female CEO on the relationship between CEO overconfidence and M&A performance, which is hypothesized to have a weakening effect. However, the interaction term *OVxFemale* strengthens the negative relationship between CEO overconfidence and M&A performance with 1.95 and 2.07 percentage points, at the 10% significance level. This is shown as the main effect for CEO overconfidence suggests an insignificant decrease of 0.156 and 1.42 percentage points in the 3-day CAR and *OVxFemale* amplifies this decrease with 1.95 and 2.07 percentage points. This contradicts hypothesis 5 for the dependent variable M&A performance. However, the small proportion of female CEOs in the sample could explain this effect.

As there is no significance detected for the other interaction terms, there is no evidence for a moderating effect. Hence, hypotheses 4, 6, 7, 8, and 9 are inconclusive in this regression.

Drawing conclusions should be done with caution as adding deal size as an additional control variable yields different results, as shown in Table 15. By adding this control variable, the sample size halves. An important distinction between Table 7 and Table 15 is that the significant and strengthening moderating effect of a female CEO found in Table 7 ceases to be visible. Furthermore, when adding deal size, the moderating effect of tenure is shown to strengthen the relationship between CEO overconfidence and M&A performance by 0.635 percentage points, at the 10% significance level. This is in line with the 6th hypothesis. In Table 15, the main effect of CEO overconfidence in Column *I* suggests an insignificant decrease in M&A performance of 3.65 percentage points and *OVXTenure* amplifies this with 0.635 percentage points. Hence, the interaction term indeed strengthens this negative effect. The

finding that long-tenured CEOs experience less monitoring, as argued by Cook and Bures (2013), could explain this.

Robustness

In the appendix, in Tables 8, 9, and 10, the robustness checks for M&A performance can be found. The robustness checks explore whether the 100% in-the-money overconfidence measure (“OV100”) has a negative influence on the 3-day CAR. Second, the influence of the 67% and 100% in-the-money overconfidence measure on the 5-CAR⁴ is examined.

3-DAY CAR with “OV100”

In this section, the regression examines whether a highly overconfident CEO has a negative effect on M&A performance. Building on this, this regression aims to find whether the CEO attributes have a moderating effect on the relationship between CEO overconfidence and M&A performance. However, similar to Table 7, overconfidence has no significant effect on M&A performance. The strengthening moderating effect because of a female CEO on the relationship between CEO overconfidence and M&A performance is also found, and, thus is robust. OVxFemale amplifies the main negative effect of CEO overconfidence on M&A performance with 2.03 and 2.09 percentage points for columns *D* and *I*, respectively. The insignificant effect of “OV100” in those columns suggest 0.153 and 0.102 percentage points lower returns, respectively. Thus, the findings from Tables 7 and 8 contradict hypothesis 5.

Again, caution should be taken for drawing this conclusion as adding deal size to the “OV100” regression shows different results. In Table 16, “OV100” leads to a decrease in the 3-day CAR of 1.32, 1.34, and 1.41 percentage points in columns *C*, *F*, and *I*, respectively. Hence, this negative effect of CEO overconfidence on M&A performance, as found in these columns, is in line with hypothesis 1, at the 10% significance level. Furthermore, this research aims to find whether CEO attributes, such as ethnicity, influences the relationship between CEO overconfidence and M&A activity. Table 16 shows a contradiction of hypothesis 7, stating that the ethnicity group of Caucasian or White CEOs strengthens the relationship between overconfidence and M&A performance. From Table 16, OVxEthnicity weakens this relationship with 1.36 percentage points, at the 10% significance level. Thus, this indicates a weakening effect. It should be considered that almost 85% of the CEOs from the sample can be classified as Caucasian or White. Also, the sample consists of 1,042 observations whereas Lee

⁴ This study also conducted robustness tests by using the 7-day and 11-day CARs. However, these regressions did not show significant results. Furthermore, including the control variable deal size in the regressions of the 7- and 11-day CAR showed no significant results.

and Kim (2021) used a sample of 21,038 observations when studying the levels of overconfidence in ethnic groups.

5-DAY CAR with “OV67” and “OV100”

In this section, the regression examines whether CEO overconfidence has a negative effect on M&A performance. Building on this, this regressions aims to find whether the CEO attributes have a moderating effect on the relationship between CEO overconfidence and M&A performance. Tables 9 and 10 show the results of the 5-day CAR using “OV67” and “OV100”. In Table 10, CEO overconfidence leads to a decrease of 0.559 percentage points in M&A performance. This is at the 10% significance level. As this is not found when using “OV67”, the finding is not robust. In Table 9, the CEO attribute tenure leads to a decrease of approximately 0.2115 percentage points in CAR at the 10% (columns *B*, *D*, *F*, and *I*) and 5% (columns *C* and *G*) confidence level. Besides this effect, neither a negative effect of CEO overconfidence on M&A performance nor a moderating effect of any of the CEO attributes on this relationship was found.

When including deal size in the 5-day CAR regressions, only “OV100” in Table 18 leads to a decrease of 1.56 percentage points in M&A performance in column *F*. Besides this finding, including this variable leads to inconclusive results for a moderating effect.

Table 7: CEO overconfidence on M&A performance measured by 3-day CAR

Significance is indicated as follows *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Variables	Dependent variable: CAR3DAY								
	A	B	C	D	E	F	G	H	I
OV67	-0.00324 (0.00272)	-0.00270 (0.00281)	-0.00270 (0.00281)	-0.00156 (0.00289)	-0.00208 (0.00286)	-0.00298 (0.00680)	-0.00945 (0.0214)	-0.00243 (0.00328)	-0.0142 (0.0237)
Shares owned		-0.00137* (0.000810)	-0.00137* (0.000810)	-0.00143* (0.000810)	-0.00143* (0.000812)	-0.00136* (0.000811)	-0.00137* (0.000810)	-0.00136* (0.000812)	-0.00143 (0.00135)
Female		-0.00617 (0.00623)	-0.00617 (0.00623)	0.00465 (0.00902)	-0.00566 (0.00624)	-0.00616 (0.00623)	-0.00630 (0.00624)	-0.00619 (0.00623)	0.00568 (0.00910)
Tenure		-0.00174* (0.000920)	-0.00174* (0.000920)	-0.00170* (0.000920)	-0.00085 (0.001219)	-0.00174* (0.000920)	-0.00171* (0.000923)	-0.00174* (0.000920)	-0.00063 (0.00124)
Ethnicity		0.00428 (0.00390)	0.00428 (0.00390)	0.00414 (0.00389)	0.00397 (0.00391)	0.00412 (0.00528)	0.00433 (0.00390)	0.00429 (0.00390)	0.00314 (0.00533)
Age		0.000209 (0.000192)	0.000209 (0.000192)	0.000229 (0.000192)	0.000196 (0.000192)	0.000209 (0.000192)	0.000136 (0.000298)	0.000215 (0.000196)	8.84e-05 (0.000310)
Education		-0.00128 (0.00300)	-0.00128 (0.00300)	-0.00138 (0.00299)	-0.00109 (0.00300)	-0.00128 (0.00300)	-0.00148 (0.00306)	-0.000770 (0.00437)	-0.000275 (0.00440)
OvxShares			0.000234 (0.00162)						-8.64e-05 (0.00167)
OVxFemale				-0.0195* (0.0117)					-0.0207* (0.0119)
OVxTenure					-0.00206				-0.00231

					(0.00184)				(0.00187)
OVxEthnicity					0.000329				0.00150
					(0.00731)				(0.00744)
OVxAge						0.000119			0.000233
						(0.000372)			(0.000395)
OVxEducation							-0.000978		-0.00231
							(0.00605)		(0.00615)
Firm size	-0.000408	-0.000356	-0.000356	-0.000324	-0.000307	-0.000355	-0.000354	-0.000354	-0.000260
	(0.000577)	(0.000578)	(0.000578)	(0.000578)	(0.000580)	(0.000579)	(0.000578)	(0.000579)	(0.000581)
Leverage	0.000231	0.00209	0.00209	0.00230	0.00191	0.00208	0.00218	0.00217	0.00242
	(0.00500)	(0.00517)	(0.00517)	(0.00517)	(0.00517)	(0.00518)	(0.00518)	(0.00520)	(0.00522)
ROA	0.0277	0.0283	0.0283	0.0279	0.0283	0.0283	0.0283	0.0282	0.0272
	(0.0286)	(0.0294)	(0.0294)	(0.0294)	(0.0294)	(0.0295)	(0.0294)	(0.0294)	(0.0295)
Tobin'Q	6.04e-05	0.000106	0.000106	0.000123	8.39e-05	0.000107	0.000137	0.000116	0.000186
	(0.00138)	(0.00141)	(0.00141)	(0.00141)	(0.00141)	(0.00141)	(0.00141)	(0.00141)	(0.00142)
Attitude	-0.0233	-0.0222	-0.0222	-0.0247	-0.0218	-0.0223	-0.0214	-0.0222	-0.0235
	(0.0236)	(0.0237)	(0.0237)	(0.0237)	(0.0237)	(0.0237)	(0.0238)	(0.0237)	(0.0239)
Public	-0.00537	-0.00585	-0.00585	-0.00552	-0.00603	-0.00583	-0.00586	-0.00586	-0.00572
	(0.00536)	(0.00537)	(0.00537)	(0.00536)	(0.00537)	(0.00538)	(0.00537)	(0.00537)	(0.00539)
Constant	0.0144	0.00533	0.00533	0.00402	0.00599	0.00541	0.00940	0.00484	0.0115
	(0.00952)	(0.0149)	(0.0149)	(0.0149)	(0.0149)	(0.0150)	(0.0196)	(0.0152)	(0.0203)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	988	988	988	988	988	988	988	988	988
R-squared	0.043	0.051	0.051	0.054	0.052	0.051	0.051	0.051	0.055

5.3.2. M&A frequency

The regression is shown in Table 11 tests hypothesis 2, which states that overconfident CEOs are more likely to have greater M&A frequency. Column *A* shows the impact of overconfidence “OV67” on M&A frequency with the control variables included. Column *B* then adds the CEO attributes to the regression as additional variables. Next, from column *C* until *H*, the interaction terms of each CEO attribute multiplied by the overconfidence measure “OV67” are added separately. Lastly, column *I* shows all variables simultaneously.

The effect of CEO overconfidence on M&A frequency is shown in Table 11. Previous studies found a positive influence, which is also stated in the hypothesis. Therefore, in order to confirm this, “OV67” should have positive values in all columns as then CEO overconfidence leads to greater M&A frequency. From Table 11, column *A* suggests that “OV67” increases the likelihood of greater M&A frequency with 5.62 percentage points, at the 10% significance level. This, however, becomes insignificant when adding the CEO attributes in column *B* and the interaction terms in the other columns. Thus, in the baseline scenario, in which “OV67” and the control variables are included in the regression, overconfident CEOs are more likely to have greater M&A frequency. Hence, in that scenario, hypothesis 2 is not rejected.

Building on this analysis, this research aims to find whether CEO attributes influence M&A frequency and have a moderating effect on the relationship between CEO overconfidence and M&A frequency. Thus, when testing the moderating effect of compensation, gender, tenure, ethnicity, age, and education, the interaction terms are of interest. However, as the hypotheses look for a strengthening or weakening effect, an interaction term should show significant results. As shown in Table 11, no coefficient of the interaction terms shows significance. Therefore, the results for a moderating effect are inconclusive. When looking at the CEO attributes on M&A performance, the following is found. The CEO attributes compensation, tenure, and education show significant coefficients. For compensation, higher equity-based remuneration leads to a higher likelihood that the CEO takes part in more M&A deals of around 5.45 percentage points, at the 1% significance level. When there are positive CARs resulting from an acquisition, a CEO with high equity-based compensation then benefits from these events. Furthermore, CEO tenure decreases the likelihood of greater M&A frequency with 2.49 percentage points, at the 5% significance level. The finding by Xueming, Kanuri, and Andrews (2013) might explain this. The authors argue that long-tenured CEOs are weak strategists, rely more on internal resources, and are less responsive. Finally, a higher-educated CEO is less likely to have greater M&A frequency as results suggest a decrease of approximately 6.51 percentage points, at the 10% significance level. Lucey, Plaksina, and Dowling (2013) explain this by assigning higher social status to higher social norms and that lower status CEOs are attracted to wealth and status improvements which can be achieved by takeovers.

In Table 19, the findings from the regression, which includes deal size as a control variable, are shown. By including this variable, the sample size halves. The result from Table 11, suggesting that CEO overconfidence leads to greater M&A frequency, is not found in Table 12. Thus, a general conclusion should be drawn with caution.

Robustness

In this section, the regression examines whether high CEO overconfidence has a positive effect on M&A frequency. Building on this, this regression aims to find whether the CEO attributes have a moderating effect on the relationship between CEO overconfidence and M&A frequency. The finding from Table 11 shows that “OV67” leads to greater M&A frequency. In the appendix in Table 12, the robustness test results using the 100% in-the-money overconfidence measure are presented. Table 12 shows similar values for overconfidence as Table 11, however, Table 12 only shows positive coefficients. The findings suggest that CEO

overconfidence, measured by “OV100”, leads to an increase of 6.69 percentage points in the likelihood an overconfident CEO participates in multiple M&A at the 95% confidence level. Therefore, the findings from Tables 11 and 12 are robust, and there is stronger evidence when using the overconfidence measure of “OV100” over “OV67”.

As this paper is interested in whether the CEO attributes have a moderating effect on the relationship between CEO overconfidence and M&A performance, the interaction terms are presented. Columns *C* until *I* analyze whether the CEO attributes have a moderating effect by adding the interaction terms to the regressions. For “OV67”, no moderating effect is found to support the hypotheses when looking at these columns. The findings from Table 12 are in line with hypothesis 8, stating that a younger CEO strengthens the positive relationship between overconfidence and M&A frequency by 0.51 percentage points. This can be found by looking at column *I* at the interaction term $OV \times Age$. This indicates a coefficient of -0.00510 significant at the 95% confidence level. The main effect of CEO overconfidence on M&A frequency is positive, as the coefficient is 0.0499. Overall, this means that when a CEO becomes older, the positive relationship of CEO overconfidence on M&A frequency becomes less strong. Yim (2013) argues that acquisitions increase CEOs compensation, which stimulates CEOs to engage in M&A activity at an early phase in their career. Concluding, these findings are not robust as the interaction term of “OV67” and age is also negative but insignificant in Table 11.

The results from Table 11 regarding the CEO attributes compensation, tenure, and education are robust when looking at Table 12. Lastly, the R-squared increases from the baseline scenario when adding the CEO attributes and the interaction terms. This is the case in both Tables 11 and 12.

The results when adding deal size as an additional control variable can be found in the appendix in Table 20. The finding from Table 12, when using the overconfidence measure “OV100”, suggests that overconfident CEOs take part in M&A more frequently. However, this no longer holds when adding deal size to the regression. Therefore, concluding should be done with caution. The conclusion that a younger CEO strengthens the relationship between CEO overconfidence and M&A performance is also found in Table 20. However, $OV \times Age$ decreases the relationship with 0.606 percentage points when a CEO becomes older. This only remains significant at the 90% confidence level.

Table 11: CEO overconfidence on M&A frequency

Significance is indicated as follows *** p<0.01, ** p<0.05, * p<0.1

<i>Variables</i>	Dependent variable: M&A frequency								
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>
OV67	0.0562* (0.0321)	0.00226 (0.0325)	-0.128 (0.109)	0.00416 (0.0335)	0.0107 (0.0331)	-0.105 (0.0786)	0.267 (0.247)	-0.00215 (0.0379)	0.0237 (0.274)
Shares owned		0.0587*** (0.00937)	0.0434*** (0.0153)	0.0586*** (0.00939)	0.0578*** (0.00939)	0.0595*** (0.00938)	0.0589*** (0.00937)	0.0586*** (0.00940)	0.0403*** (0.0156)
Female		0.0603 (0.0721)	0.0609 (0.0720)	0.0784 (0.105)	0.0672 (0.0722)	0.0640 (0.0721)	0.0652 (0.0722)	0.0606 (0.0721)	0.0985 (0.105)
Tenure		-0.02511** (0.01066)	-0.02369** (0.01069)	-0.02504** (0.01066)	-0.01299 (0.01409)	-0.02438** (0.01066)	-0.02632** (0.01069)	-0.02515** (0.01066)	-0.01427 (0.01434)
Ethnicity		0.0162 (0.0451)	0.0200 (0.0452)	0.0159 (0.0451)	0.0119 (0.0452)	-0.0452 (0.0610)	0.0142 (0.0451)	0.0161 (0.0451)	-0.0429 (0.0616)
Age		-0.00252 (0.00222)	-0.00249 (0.00222)	-0.00249 (0.00223)	-0.00269 (0.00223)	-0.00241 (0.00222)	0.000325 (0.00345)	-0.00262 (0.00226)	0.000337 (0.00359)
Education		-0.0664* (0.0347)	-0.0716** (0.0349)	-0.0666* (0.0347)	-0.0639* (0.0347)	-0.0632* (0.0347)	-0.0589* (0.0354)	-0.0748 (0.0506)	-0.0741 (0.0508)
OvxShares			0.0236 (0.0187)						0.0282 (0.0193)
OVxFemale				-0.0325 (0.136)					-0.0412 (0.137)
OVxTenure					-0.02799 (0.02132)				-0.02259 (0.02164)
OVxEthnicity						0.126 (0.0846)			0.119 (0.0861)
OVxAge							-0.00464 (0.00431)		-0.00486 (0.00457)
OVxEducation								0.0158 (0.0701)	0.0271 (0.0711)
Firm size	0.00834 (0.00682)	0.00911 (0.00669)	0.00914 (0.00669)	0.00916 (0.00670)	0.00977 (0.00671)	0.00931 (0.00669)	0.00907 (0.00669)	0.00908 (0.00670)	0.00985 (0.00672)
Leverage	0.0548 (0.0591)	0.00103 (0.0598)	0.00252 (0.0598)	0.00139 (0.0599)	-0.00136 (0.0598)	-0.00291 (0.0599)	-0.00239 (0.0599)	-0.000249 (0.0601)	-0.00815 (0.0603)
ROA	0.320 (0.339)	0.0913 (0.341)	0.0945 (0.341)	0.0905 (0.341)	0.0909 (0.341)	0.0718 (0.341)	0.0937 (0.341)	0.0930 (0.341)	0.0810 (0.341)
Tobin'Q	0.0163 (0.0163)	0.0235 (0.0163)	0.0247 (0.0163)	0.0235 (0.0163)	0.0232 (0.0163)	0.0241 (0.0163)	0.0223 (0.0164)	0.0233 (0.0163)	0.0237 (0.0164)
Attitude	0.284 (0.279)	0.268 (0.274)	0.281 (0.274)	0.264 (0.275)	0.273 (0.274)	0.239 (0.274)	0.238 (0.275)	0.269 (0.274)	0.227 (0.276)
Public	-0.0703 (0.0633)	-0.0634 (0.0621)	-0.0608 (0.0621)	-0.0628 (0.0622)	-0.0659 (0.0621)	-0.0575 (0.0622)	-0.0627 (0.0621)	-0.0631 (0.0622)	-0.0550 (0.0624)
Constant	0.189* (0.113)	0.0804 (0.172)	0.157 (0.183)	0.0782 (0.173)	0.0894 (0.172)	0.108 (0.173)	-0.0787 (0.227)	0.0883 (0.176)	0.0494 (0.234)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	988	988	988	988	988	988	988	988	988
R-squared	0.086	0.131	0.131	0.131	0.133	0.133	0.132	0.131	0.137

5.3.3. Takeover premiums

The regression shown in Table 13 tests hypothesis 3, which states that CEO overconfidence leads to higher takeover premiums. In the Table, column *A* shows the impact of overconfidence “OV67” on takeover premiums with the control variables included. Column *B* then adds the CEO attributes to the regression as additional variables. Next, from column *C* until *H*, the interaction terms of each CEO attribute multiplied by the overconfidence measure “OV67” are added separately. Lastly, column *I* shows all variables simultaneously.

The effect of CEO overconfidence on takeover premiums is shown in Table 13. Previous studies found a positive influence, which is also stated in the hypothesis. Therefore, in order to confirm this, “OV67” should have positive values in all columns as then CEO overconfidence leads to greater takeover premiums. However, in the baseline scenario, variable “OV67” shows a negative coefficient on takeover premiums, but this is not significant. When the interaction term for ethnicity is included in column *F*, the value is also negative but insignificant. In the other columns, “OV67” is also insignificant, but now the coefficients show a positive value. Therefore, there is no significant change in the altitude of takeover premiums because of overconfidence, and the results are inconclusive.

Building on this analysis, this research aims to find whether the CEO attributes influence takeover premiums and have a moderating effect on the relationship between CEO overconfidence and takeover premiums. However, when testing the hypotheses regarding a possible moderating effect for the CEO attributes: compensation, gender, tenure, ethnicity, age, and education, no significant values are found. Hence, the results for hypotheses 4, 5, 6, 7, 8, and 9 are inconclusive in the takeover premiums regression.

Robustness

In the appendix in Table 14, the robustness test shows the relationship of “OV100” on takeover premiums. The regression aims to find whether CEO overconfidence influences takeover premiums. However, no findings indicate that CEO overconfidence leads to greater takeover premiums as, similar to Table 13, Table 14’s “OV100” is not significant. Again, this paper is interested in whether CEO attributes have a moderating effect on the relationship between CEO overconfidence and takeover premiums. Thus, looking at the results testing the moderating effect of the CEO attributes, from columns *C* until *I*, no significance is found. Lastly, the R-squared increases from the baseline scenario when adding the CEO attributes and the interaction terms. This is the case in both Tables 13 and 14.

Table 13: CEO overconfidence on takeover premiums

Significance is indicated as follows *** p<0.01, ** p<0.05, * p<0.1

<i>Variables</i>	Dependent variable: Premium								
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>
OV67	-0.0102 (0.164)	0.0188 (0.178)	0.662 (0.748)	0.0337 (0.196)	0.176 (0.260)	-0.00489 (0.432)	1.345 (1.805)	0.0628 (0.191)	2.188 (2.676)
Shares owned		0.0261 (0.0560)	0.0835 (0.0857)	0.0256 (0.0572)	0.0433 (0.0600)	0.0255 (0.0581)	0.0181 (0.0576)	0.0282 (0.0567)	0.0681 (0.106)
Female		0.475* (0.267)	0.471* (0.268)	0.534 (0.401)	0.454 (0.269)	0.473* (0.274)	0.502* (0.272)	0.520* (0.278)	0.631 (0.468)
Tenure		-0.00715 (0.09125)	0.00548 (0.093075)	-0.07957 (0.009344)	-0.00715 (0.09198)	-0.00609 (0.09490)	-0.03449 (0.099645)	-0.00485 (0.09271)	-0.02748 (0.11716)
Ethnicity		-0.112 (0.252)	-0.0675 (0.258)	-0.0986 (0.266)	-0.0800 (0.257)	-0.130 (0.395)	-0.0994 (0.256)	-0.145 (0.260)	-0.0329 (0.451)
Age		0.0176 (0.0144)	0.0148 (0.0148)	0.0181 (0.0150)	0.0196 (0.0147)	0.0173 (0.0156)	0.0275 (0.0198)	0.0205 (0.0152)	0.0309 (0.0266)
Education		-0.130 (0.196)	-0.110 (0.199)	-0.122 (0.204)	-0.0974 (0.202)	-0.127 (0.207)	-0.0478 (0.228)	-0.0357 (0.241)	0.0951 (0.333)
OvxShares			-0.118 (0.133)						-0.109 (0.198)
OVxFemale				-0.111 (0.549)					-0.0895 (0.651)
OVxTenure					-0.0200 (0.0239)				0.00846 (0.0442)
OVxEthnicity						0.0266 (0.440)			-0.110 (0.539)
OVxAge							-0.0235 (0.0318)		-0.0260 (0.0415)
OVxEducation								-0.276 (0.398)	-0.399 (0.591)
Firm size	-0.0109 (0.0375)	-0.0192 (0.0430)	-0.00600 (0.0457)	-0.0186 (0.0440)	-0.0201 (0.0433)	-0.0191 (0.0440)	-0.0175 (0.0435)	-0.0229 (0.0438)	-0.00997 (0.0525)
Leverage	-0.123 (0.266)	-0.455 (0.310)	-0.561 (0.334)	-0.454 (0.317)	-0.525 (0.323)	-0.450 (0.328)	-0.473 (0.314)	-0.475 (0.315)	-0.592 (0.392)
ROA	1.675 (1.845)	0.0786 (2.307)	0.111 (2.319)	0.0636 (2.358)	0.307 (2.339)	0.0808 (2.359)	0.207 (2.337)	0.0116 (2.336)	0.0366 (2.630)
Tobin'Q	-0.122 (0.154)	-0.00632 (0.172)	-0.0158 (0.173)	-0.000844 (0.178)	-0.0407 (0.178)	-0.00769 (0.177)	-0.0187 (0.174)	0.00171 (0.174)	0.00748 (0.209)
Attitude	-	-	-	-	-	-	-	-	-
Public	0.521 (0.621)	0.909 (0.705)	0.965 (0.711)	0.884 (0.731)	1.116 (0.752)	0.919 (0.742)	0.906 (0.712)	1.092 (0.761)	1.070 (0.880)
Constant	0.293 (0.658)	-0.823 (1.131)	-1.051 (1.165)	-0.849 (1.162)	-0.990 (1.156)	-0.804 (1.198)	-1.354 (1.350)	-1.081 (1.203)	-2.021 (1.824)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	56	56	56	56	56	56	56	56	56
R-squared	0.346	0.475	0.493	0.476	0.491	0.475	0.488	0.486	0.516

6. Discussion

This chapter will provide a brief description of the topic discussed in this paper. In addition, an overview of the main findings are provided. Next, the limitations of this paper and the recommendations for futures studies are mentioned.

6.1. Discussion

The main results of this research will be addressed in this section. This research explores whether CEO overconfidence has an influence on M&A performance, M&A frequency, and takeover premiums. Based on the regression results testing hypotheses 1, 2, and 3, the following can be concluded. When looking at the effect of CEO overconfidence (both “OV67” and “OV100”) on M&A performance, there are inconclusive results when looking at the 3-day⁵. However, for the 5-day CAR, only when using the “OV100” overconfidence measure, CEO overconfidence leads to a 0.559 percentage points decrease in M&A performance at the 90% confidence level. This is not robust as the “OV67” measure shows insignificant coefficients. Hence, only partial evidence support the findings by Doukas and Petmezas (2007) and Malmendier and Tate (2008). Next is the effect of CEO overconfidence on M&A frequency. CEO overconfidence, measured by “OV67” and “OV100”, leads to an increase in M&A frequency of 5.62 and 6.69 percentage points at the 90% and 95% confidence levels, respectively. Thus, there is evidence in line with the expectation of hypothesis 2. These results support the findings mentioned in academic literature from Doukas and Petmezas (2007), Malmendier and Tate (2008), and Aktas et al. (2009). The results testing hypothesis 3, stating that CEO overconfidence leads to greater takeover premiums, are insignificant for both overconfidence measures. Nonetheless, studies from Hayward and Hambrick (1997), John, Liu, and Taffler (2011), and Liu and Chen (2017) found evidence showing that overconfident CEOs pay higher premiums. Like this paper, Aktas, de Bodt, Bollaerts, and Roll (2016) also showed insignificant results. The authors argue that formulating an unambiguous hypothesis was not possible. Furthermore, a narcissistic target CEO does not aim to seek the highest price for their shareholders. Lastly, this paper uses a relatively small sample size, which might also affect the results.

Building upon these analyses, this paper aims to find whether CEO attributes have an influence on the relationship between CEO overconfidence and M&A activity. First, the CEO

⁵ This study also conducted robustness tests by using the 7-day and 11-day CARs. However, these regressions did not show significant results. Furthermore, including the control variable deal size in the regressions of the 7- and 11-day CAR showed no significant results.

attribute compensation leads to a decrease of approximately 0.139 percentage points in the 3-day CAR and an increase in the number of M&A deals of 5.49 percentage points. This is also found in the research of Harfold et al. (2012) and Humphery-Jenner (2016). Thus, this implies that CEO compensation can have an effect on corporate decision making. Taking this into account might be in the interest of share- and stakeholders. The compensation can be constructed to constrain or stimulate certain behavior which, in turn, leads to actions. However, looking at the interaction term of interest for hypothesis 4 to test whether compensation has a weakening effect on the relationship between overconfidence and the dependent variables, the results were inconclusive.

The following results are shown when looking at CEO attribute female and the interaction term $OV \times Female$. The interaction term $OV \times Female$ leads to an amplification of approximately 2.03 percentage points in the negative relationship between CEO overconfidence and M&A performance. This is found as $OV \times Female$ has a negative value of approximately -0.0203 at the 90% confidence level in the 3-day CAR regression for “OV67” and “OV100” and the coefficients for CEO overconfidence measures are -0.00156, -0.0142, -0.00153, and -0.00102 (but insignificant). Thus, $OV \times Female$ strengthens the negative relationship between CEO overconfidence and M&A performance, which contradicts hypothesis 5. To be noted, the variable for the CEO attribute female is not significant in the regressions for M&A performance and M&A frequency. Thus, this suggests that for M&A performance and M&A frequency CEO gender is not relevant. Further, for the CEO attribute female, the findings suggest an increase of around 48.8 percentage points for takeover premiums, at the 10% significance level. This is not robust as this only holds for the “OV67” regression. The results imply that a female CEO has a moderating effect. This is relevant as the gender of the CEO might stimulate certain behavior, whether this is desired or not. Again, this should be considered in the selection of the CEO and, for instance, the composition of the board of directors. In general, as only 5.47% of the total sample is female and the regression for takeover premiums only includes 56 observations, generalizing these results might be difficult. In addition, sensitivity to selection bias should be considered. To compare this to a study by Faccio, Marchica, and Mura (2016), 9.4% of the total CEO sample was female. This study showed that the percentage of female CEOs is higher for private companies (10.2%) compared to publicly listed companies (7.2%).

Further, CEO attribute tenure is significant at the 10% and 5% significance level for M&A performance and M&A frequency, respectively. Tenure leads to a decrease of 0.178 percentage points in M&A performance and a decrease of 2.51 percentage points in the likelihood of an overconfident CEO taking part in multiple M&A deals. These findings are

robust for both “OV67” and “OV100”. This is in line with the studies from Shleifer and Vishny (1989) and Walters et al. (2005). This is relevant as this could imply that appointing a new CEO after a certain amount of time might be in shareholders’ best interest. Regularly evaluating a CEO’s performance and strategic choices could result in a quicker change of CEO. However, results for a strengthening or weakening effect of overconfidence on M&A activity are inconclusive, as hypothesis 6 seeks. This could be explained by the finding of Cook and Buress (2013), arguing that less monitoring of the board is experienced by long-tenured CEOs. It is also argued that long-tenured CEOs are weak strategists, rely more on internal company sources, become less aware of market movements, and are less responsive (Xueming et al., 2013).

The fourth CEO attribute, ethnicity, and the corresponding interaction term show no significant values. As shown in the descriptive statistics from Table 2, almost 85% of CEOs from the sample can be classified as Caucasian or White. Even though different levels of overconfidence are found because of ethnic and cultural differences (Lee & Kim, 2021), the results from this paper are inconclusive for hypothesis 7. The study by Lee and Kim (2021) used a sample of 21,038 observations and five ethnic groups. In this study, the largest ethnic group was white, namely 64% of the total sample. Again, sensitivity to selection bias should be considered. Therefore, as no significance is found, a CEO should be selected, evaluated, and judged by performance and decisions and not by ethnic background.

Regarding hypothesis 8, the study by Yim (2013) argues a negative effect between CEOs age and the number of acquisitions undertaken. In line with this research, the interaction term $OV \times Age$ when using “OV100” strengthens the relationship between CEO overconfidence and M&A frequency with 0.510 percentage points at the 95% confidence level. This is found as the coefficient for “OV100” on M&A frequency has a positive value of 0.0499 and the interaction term is negative. Thus, an older CEO decreases the main effect of overconfidence with 0.510 percentage points. For M&A performance and takeover premiums, no significant values are found. Furthermore, the CEO attribute age is not significant in any of the results. This implies that age does not influence M&A performance, M&A frequency, or takeover premiums. Again, what to take from this is that a CEO should be selected, evaluated, and judged by performance and decisions and not by age.

Finally, the results test the moderating effect of education level on the relationship between overconfidence and M&A activity. Hypothesis 9 states that higher education has a strengthening effect on this relationship. However, no significant coefficients are found when looking at the interaction term $OV \times Education$ for all dependent variables. Hence, the effect on

the relationship between overconfidence and M&A activity is inconclusive. The CEO attribute education indicates a decrease in the likelihood a highly educated CEO participates in more than one M&A deal. This is indicated by a decrease of 6.51 and 6.57 percentage points from the regressions using “OV67” and “OV100” and are significant at the 90% confidence level, respectively. This effect, arguing that CEO with higher levels of education are likely to engage in fewer acquisitions, is also found in a study by Lucey et al. (2013). The authors found that higher social states lead to fewer M&A deals. Social status is constructed using three measures first, using secondary and higher education prestige; secondly, if the CEO attended Oxford, Cambridge, or Harvard. And third, the university rank among the top universities. The outcome is relevant as level of education has some implications to corporate decision making in terms of M&A frequency. Naturally, educational achievements are known during the recruitment and selection process. A company aiming to grow by undertaking a series of acquisitions, for instance, could take this into account.

6.2. Limitations and future research

There are some limitations to the used methods in this research. First, overconfidence is a behavioral bias. However, this variable is constructed by a single formula that looks at the holding of options. This is in line with the research from Malmendier and Tate (2004) and Campbell et al. (2011). The information for this formula must be disclosed, therefore, raising selection bias concerns. In addition, the formula only captures a specific part of overconfidence; external factors could also stimulate overconfidence. Besides, as the behavioral bias is proxied by the option holding behavior, other quantifiable measures in future research might yield a different outcome when researching the effect of overconfidence on M&A activity. Thus, future research might combine external and other behavioral factors. Furthermore, multiple databases are consulted to gather this data. Another limitation of the measure for overconfidence is that the measure could also be a proxy for tax decisions, investor pressure, board of director motives, signaling of private information, and risk appetite (Malmendier and Tate, 2008; Campbell et al., 2011; Hirshleifer et al., 2012). Even though the proxy for overconfidence is commonly used in financial literature; combining psychologists and financial experts could improve the validity of the overconfidence measure.

The information regarding the CEO attributes is combined using multiple databases; it might be more accurate to consult another database with more complete information. Besides, it is possible that not all CEO data regarding Ethnicity and Education is entirely precise, as it was found that these are not always documented. This could impose selection bias as a large

number of transactions were deleted from the original sample in the matching process. When not all CEO attribute data was complete, the CEOs and corresponding transactions were excluded from the final sample. To address this, future research could investigate the effect of education on a deeper and possibly more precise level, for instance, by analyzing the CEOs field of major or the type of university, such as Ivy League universities. Then, different databases might be needed, or interviews are to be conducted to complement the unavailable information. Also, when looking at the effect of female executives, a suggestion for future research is to increase the sample size of female CEOs by adding private firms or to take female board representation into account. Also, female board proportion and target firm board structure might be an interesting angle for future research. In general, the limitation imposed by the possibility of selection bias might have affected the results of this research. Future research might complement missing data points or create sub-samples for each CEO attribute. Finally, future research could include other executives (e.g. Chief Financial Officer) or board members as they also influence financial decision-making.

Another limitation results from the validity of the data. As this paper focuses on companies listed on the NYSE and NASDAQ and operating in the U.S., external validity concerns should be considered. Public firms are often monitored by analysts and external rating agencies, which could influence director behavior. Also, years from the sample of transactions (2007-2020) fall into certain macroeconomic crises and recovery periods. These difficult periods might also affect decision-making (Malmendier and Tate, 2008). In addition, countries outside of the U.S. might imply cultural differences, which affect the influence of the CEO attributes. This could be expressed in a CEOs possibility to express their overconfident behavior in different cultures. Also, corporate governance standards are different between countries. Thus, it is uncertain whether these results for the U.S. hold for other countries. Future research could extend the sample to European or Asian countries to compare the outcomes.

Furthermore, the first dependent variable, M&A performance, is constructed by using cumulative abnormal returns. These are found using the WRDS Event Study Tool. Even though CARs are a common measure of performance in academic literature as can be found in the papers from Malmendier and Tate (2004), Campbell et al. (2011), and Hirshleifer et al. (2012), other external factors could also influence these stock prices. In addition, this study uses the Event Study Tool. Using this Tool does not require to extract the daily stock prices of each firm, therefore, a variable controlling for a possible stock price run-up in the days prior to the event cannot be constructed. Results when including this control variable might show different results. Furthermore, to interpret CARs, an efficient market and rational investors are assumed,

which does not hold according to Shleifer and Vishny (2003). Lastly, each R-squared from the regressions varies between 4.2% and 5.7%. This low explanatory power means that the dependent variable is substantially influenced by other determinants.

Second, the dependent variable, M&A frequency, looks at whether an overconfident CEO engages in more M&A transactions compared to non-overconfident CEOs. This paper uses a dummy variable with a threshold of one deal, as the sample only includes CEOs who have engaged in a minimum of one M&A deal. Future research could look at M&A frequency more in-depth by using a continuous measure for frequency. In addition, including CEOs from private firms would increase the sample size. However, for those firms, it is difficult to construct the overconfidence measure using the CEOs option holding behavior from Malmendier and Tate (2004) and Campbell et al. (2011).

Lastly, the third dependent variable, takeover premiums, is measured based on the ratio of the offer price to the target's stock price 30 days prior to the announcement of the transaction. A limitation of this paper is the relatively small sample size of 56 observations. This makes generalizing the results difficult. However, a small sample size is not uncommon as the target must be a listed firm. To compare this with the study by Hayward and Hambrick (1997), the sample size was 106 large acquisitions with a deal value of over \$100 million. Yet, Hayward and Hambrick (1997) only looked at two years, 1989 and 1992. Nonetheless, this paper looks at a possible relationship between overconfidence as a driving factor in managerial behavior and takeover premiums. This relationship could also change due to regulatory or financial constraints in M&A deals. Therefore, a recommendation for future research would be to increase the sample size and look at potential external factors.

7. Conclusion and Implications

In conclusion, this research investigates the effect of CEO overconfidence on M&A performance, M&A frequency, and takeover premiums. Furthermore, a possible effect on this relationship is tested by looking at various CEO attributes. To test this, hypotheses were created to examine the general and moderating effects. The CEO overconfidence measure is based upon the option holding behavior following the study of Malmendier and Tate (2004) and Campbell et al. (2011). Overall, the following research question is formed:

What is the effect of CEO attributes on the relationship between CEO overconfidence and different aspects of M&A activities?

The hypotheses are tested by using 1,042 transactions with corresponding CEO data for U.S. publicly listed companies between 2007 and 2020. From the regression results described above, some implications can be determined. The results from the robustness checks regarding the different overconfidence measure yield similar results. First, hypothesis 1 states that CEO overconfidence has a negative effect on M&A performance. When measuring M&A performance by the 3-day CAR⁶, the results are inconclusive. Only for the 5-day CAR, “OV100” leads to a decrease of 0.559 percentage points in M&A performance at the 90% confidence level. Even though this is not economically significant, the statistical implication is that a highly overconfident CEO decreases firm value by engaging in M&A when looking at the 5-day CAR. Results show that CEO overconfidence increases the likelihood of greater M&A frequency with 5.62 and 6.69 percentage points. This is at the 90% and 95% confidence level for “OV67” and “OV100”, respectively. Hypothesis 2 is therefore not rejected. The effect of CEO overconfidence on takeover premiums is insignificant for all regressions. These significant findings confirm that CEO overconfidence impacts M&A processes and activity. This might be considered in the recruitment and selection process and included in corporate governance mechanisms, for instance, by taking overconfidence as a characteristic into account in personality and capability tests throughout the selection process.

Secondly, this research looks at the moderating effects of compensation, gender, tenure, ethnicity, age, and education. All these variables are attributes of the CEO. The variables compensation (shares owned), female, and age were expected to result in a less strong

⁶ This study also conducted robustness tests by using the 7-day and 11-day CARs. However, these regressions did not show significant results. Furthermore, including the control variable deal size in the regressions of the 7- and 11-day CAR showed no significant results.

relationship between CEO overconfidence and the dependent variables. The variables tenure, ethnicity, and education were expected to increase the power and thus strengthen the relationship of CEO overconfidence on the dependent variables. However, the interaction terms for compensation tenure, ethnicity, and education for M&A performance, M&A frequency, and takeover premiums are insignificant. Furthermore, the interaction term OVxFemale amplifies this negative relationship between CEO overconfidence on M&A performance with 2.01 percentage points. In addition, OVxAge weakens the positive relationship between CEO overconfidence and M&A frequency with 0.510 percentage points at the 95% confidence level.

To test the moderating effects, CEO overconfidence and each CEO attribute are included in the models next to the interaction terms. Noteworthy, the CEO attribute compensation shows a decrease of around 0.139 percentage points in M&A performance at the 90% confidence level. Furthermore, the CEO attribute compensation indicates that a higher equity-based remuneration increases the likelihood of greater M&A frequency by approximately 5.49 percentage points at the 99% confidence level. Next, in the sample, a takeover premium in a deal with a female CEO is 48.8 percentage points higher at the 90% confidence level. However, this is not robust. CEO tenure decreases M&A performance by 0.178 percentage points and leads to a decrease of 2.51 percentage points in the likelihood of greater M&A frequency at the 90% and 95% confidence level, respectively. Lastly, the CEO attribute education indicates that higher-educated CEOs are less likely to have greater M&A frequency, as a decrease of approximately 6.54 percentage points was found, at the 10% confidence level.

Concluding, these findings contribute to the existing literature about financial decision-making by CEOs. A distinction of this paper is the in-depth analysis of the CEO attributes and the (possible) moderating effect. Some of these results are in line with current literature. In addition, the overconfidence coefficients are (mostly) in line with earlier research but lack significant evidence. Hence, the context in which behavioral finance research is conducted is important. However, some are also insignificant or contradictive to current literature. This shows the difficulty of explaining behavioral aspects in financial models. Therefore, more research in the field of behavioral finance is still necessary.

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Appendix

Table 1: Definition, description, and measurement of the variables

Variable	Description	Measurement
<i>Dependent</i>		
M&A performance	3-day Cumulative Abnormal Return	Calculated by the WRDS Event Study tool using the event date, a 3-day event window, and the daily stock of the company
M&A frequency	How often a CEO engages in M&A activity	Programmed to look for CEOs with multiple M&A transactions. Dummy with a value 1 if the CEO has engaged in multiple transactions and 0 if otherwise
Takeover premiums	The premium paid for a target	Calculated as the offer price paid for the target at the announcement date minus the stock price 4 weeks before announcement divided by to the stock price 4 weeks before the announcement
<i>Independent</i>		
CEO overconfidence: Overconfidence67	Overconfidence	Constructed as a dummy variable which has a value 1 if the CEO is overconfident and 0 if not overconfident. Calculated as the $(\text{Stock price})/(\text{Stock price} - ((\text{Total realizable value})/(\text{Nr exercisable options held}))) - 1$. Thus, value

1 if the formula is > 0.67 and 0 if <0.67

Overconfidence100

Overconfidence

Robustness check:
Constructed as a dummy variable which has a value 1 if the CEO is overconfident and 0 if not overconfident. Calculated as the $(\text{Stock price})/(\text{Stock price} - ((\text{Total realizable value})/(\text{Nr exercisable options held}))) - 1$. Thus, value 1 if the formula is > 1.0 and 0 if <1.0

Moderating

CEO attributes:

CEO Compensation

Amount of stock owned in the fiscal year

Natural logarithm of the equity-based compensation for that year excluding options

CEO Gender

Male / Female

Dummy variable which has a value 1 if the CEO is female and 0 if male

CEO Tenure

Tenure

Indicates the number of years that the CEO is in that current role at that company

CEO Ethnicity

Background

Dummy variable which has a value 1 if the ethnic background is Caucasian/White and 0 if other

CEO Age	Age	The age of the CEO at the time of the deal
CEO Education	Education level	Dummy variable which has a value 1 if the CEO has completed higher levels of education (MSc or higher) and 0 if otherwise
<i>Control variables</i>		
Deal size	Size of the transaction	Natural logarithm of the transaction value in USD
Buyers' firm size	Size of the buyer	Natural logarithm of the buyer's total assets
Leverage	Leverage ratio of the buyer	This variable is calculated by taking both long-term and short-term debt and dividing this by the sum of total shareholders' equity and total debt
ROA	Return On Assets of the buyer	This variable is calculated by dividing net income over total assets
Tobin's Q	Market to book ratio	The valuation the acquirer takes into account by looking at the Tobin's Q. The Tobin's Q is calculated by the market value of the assets divided by the book value of the assets
Attitude	Deal attitude	Dummy variable which has a value 1 if the transaction is marked as hostile and 0 if otherwise

Public/private	Target shares characteristics	Dummy variable which has a value 1 if the target is public and 0 if otherwise
Industry	Industry effects	Dummy variable for industry using FFI10 in STATA
Year	Year effects	Dummy variable for year which takes 1 in the particular announcement year and 0 if otherwise

Table 3: Pearson correlation matrix

	CAR 3DAY	CAR 5DAY	CAR 7DAY	CAR 11DAY	MA frequency	Premium	OV67	OV100	Shares owned	Female	Tenure	Ethnicity	Age	Education	Deal size	Buyers' firm size	Leverage	ROA	Tobin's Q	Attitude	Public/ private	
CAR3DAY	1.000																					
CAR5DAY	0.850***	1.000																				
CAR7DAY	0.753***	0.876***	1.000																			
CAR11DAY	0.654***	0.750***	0.841***	1.000																		
M&A frequency	0.019	0.005	-0.004	-0.002	1.000																	
PREMIUM	0.211	0.119	0.118	0.054	0.141	1.000																
OV67	-0.040	-0.048	-0.029	-0.041	0.088***	-0.099	1.000															
OV100	-0.038	-0.061**	-0.040	-0.054*	0.070**	-0.118	0.817***	1.000														
Shares owned	-0.064**	-0.042	-0.049	-0.047	0.195***	-0.027	0.222***	0.250***	1.000													
Female	-0.034	-0.036	-0.035	-0.025	0.030	0.080	-0.011	-0.081***	-0.058*	1.000												
Tenure	-0.008	-0.019	-0.028	-0.010	0.166***	0.204	0.133***	0.168***	0.513***	-0.130***	1.000											
Ethnicity	0.040	0.038	0.009	-0.027	0.024	-0.031	0.098***	0.048	-0.036	0.091***	-0.033	1.000										
Age	-0.003	-0.008	0.004	0.006	-0.005	0.220*	0.029	0.074**	0.288***	0.024	0.333***	-0.160***	1.000									
Education	-0.003	-0.033	-0.016	-0.016	-0.053*	-0.124	-0.021	0.005	0.098***	-0.055*	0.110***	-0.103***	0.165***	1.000								
Deal size	-0.022	0.024	0.046	0.023	0.009	-0.277**	0.030	0.050	-0.011	0.042	-0.078*	-0.094**	0.021	-0.019	1.000							
Buyers' firm size	-0.034	-0.007	0.000	-0.011	0.029	-0.119	0.005	-0.016	-0.007	0.087***	-0.093***	-0.010	0.062*	-0.031	0.664***	1.000						
Leverage	-0.030	0.012	0.015	-0.013	0.002	-0.116	0.034	0.065**	0.102***	0.175***	-0.072**	-0.065**	0.044	-0.030	0.200***	0.204***	1.000					
ROA	0.017	0.001	-0.015	0.037	0.058*	-0.013	0.123***	0.061**	0.064**	0.134***	0.077**	-0.088***	0.106***	-0.005	-0.032	0.010	-0.096***	1.000				
Tobin's Q	-0.005	0.005	-0.002	0.004	0.051*	-0.082	0.205***	0.174***	0.006	-0.054*	0.050*	-0.085***	-0.009	0.062**	0.027	-0.019	-0.256***	0.465***	1.000			
Attitude	-0.034	-0.007	-0.016	-0.004	0.056*		-0.023	-0.009	-0.008	0.044	-0.024	-0.086***	0.056*	-0.012	0.114**	0.072**	0.036	0.078**	0.047	1.000		
Public/private	-0.032	-0.001	0.001	-0.019	-0.016	0.067	-0.035	-0.046	-0.052*	0.041	-0.022	0.002	-0.045	-0.038	0.406***	0.140***	0.072**	-0.006	-0.006	0.0960***	1.000	

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4: Deal announcement distribution

Year	N	Percentage	Cum. Percentage
2007	58	5.57	5.57
2008	71	6.81	12.38
2009	55	5.28	17.66
2010	98	9.41	27.07
2011	79	7.58	34.65
2012	95	9.12	43.77
2013	61	5.85	49.62
2014	70	6.72	56.34
2015	76	7.29	63.63
2016	84	8.06	71.69
2017	71	6.81	78.50
2018	82	7.87	86.37
2019	87	8.35	94.72
2020	55	5.28	100.00
Total	1,042	100.00	

Table 5: VIF test

Variable	VIF	1/VIF
OV67	1.19	0.837620
Shares owned	1.28	0.778832
Female	1.26	0.793446
Tenure	1.09	0.920046
Ethnicity	1.24	0.809309
Age	1.28	0.784272
Education	1.12	0.890822
Firm size	1.20	0.830482
Leverage	1.35	0.738769
ROA	1.44	0.696097
Tobin's Q	1.68	0.596898
Attitude	1.05	0.953506
Public/private	1.05	0.954661
Mean VIF	1.25	

Note: A mean VIF <10 indicates that between the explanatory variables there is no multicollinearity detected

Table 6: Breusch-Pagan/Cook-Weisberg test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

H0: Constant variance

Variables: fitted values of dependent variables

	chi2(1)	Prob>chi2
OV67		
CAR3DAY_w	0.92	0.3367
CAR5DAY_w	0.22	0.6363
CAR7DAY_w	0.97	0.3258
CAR11DAY_w	1.83	0.1759
M&A frequency	11.75	0.0006
Premium	27.00	0.0000
OV100		
CAR3DAY_w	1.41	0.2348
CAR5DAY_w	0.15	0.7014
CAR7DAY_w	1.67	0.1962
CAR11DAY_w	2.46	0.1167
M&A frequency	11.46	0.0007
Premium	24.37	0.0000

Note: Heteroscedasticity is detected when the chi-square is significant. For the significant values found for M&A frequency and Premium, the regression is run using robust standard errors.

Table 8: CEO overconfidence on M&A performance measured by the 3-day CAR (OV100)

Significance is indicated as follows *** p<0.01, ** p<0.05, * p<0.1

<i>Variables</i>	Dependent variable: CAR3DAY								
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>
OV100	-0.00277 (0.00269)	-0.00208 (0.00280)	-0.000483 (0.00440)	-0.00153 (0.00281)	-0.00145 (0.00285)	-0.000763 (0.00398)	-0.000153 (0.00461)	-0.00163 (0.00306)	-0.00102 (0.00467)
Shares owned		-0.00140* (0.000812)	-0.00115 (0.000974)	-0.00143* (0.000811)	-0.00147* (0.000814)	-0.00139* (0.000812)	-0.00137* (0.000814)	-0.00138* (0.000815)	-0.00135 (0.00134)
Female		-0.00646 (0.00624)	-0.00624 (0.00626)	0.00488 (0.00895)	-0.00584 (0.00627)	-0.00633 (0.00625)	-0.00615 (0.00627)	-0.00643 (0.00625)	0.00576 (0.00910)
Tenure		-0.00171* (0.00092)	-0.00176* (0.00093)	-0.00169* (0.00092)	-0.00079 (0.00121)	-0.00174* (0.00092)	-0.00175* (0.00093)	-0.00172* (0.00092)	-0.00074 (0.00123)
Ethnicity		0.00415 (0.00389)	0.00418 (0.00389)	0.00409 (0.00389)	0.00384 (0.00390)	0.00520 (0.00451)	0.00424 (0.00390)	0.00419 (0.00389)	0.00386 (0.00519)
Age		0.000215 (0.000192)	0.000210 (0.000192)	0.000233 (0.000192)	0.000200 (0.000192)	0.000209 (0.000192)	0.000236 (0.000196)	0.000226 (0.000195)	0.000210 (0.000229)
Education		-0.00121 (0.00299)	-0.00118 (0.00300)	-0.00134 (0.00299)	-0.00103 (0.00300)	-0.00131 (0.00300)	-0.00121 (0.00300)	-0.000143 (0.00420)	5.72e-05 (0.00437)
OvxShares			-0.000358 (0.000762)						-0.000212 (0.00166)
OVxFemale				-0.0203* (0.0115)					-0.0209* (0.0120)
OVxTenure					-0.00213 (0.00184)				-0.00218 (0.00186)
OVxEthnicity						-0.00200 (0.00430)			-0.000209 (0.00687)
OVxAge							-4.24e-05 (8.07e-05)		3.86e-05 (0.000200)
OVxEducation								-0.00205 (0.00568)	-0.00235 (0.00616)
Firm size	-0.000414 (0.000577)	-0.000361 (0.000578)	-0.000357 (0.000579)	-0.000328 (0.000578)	-0.000308 (0.000580)	-0.000361 (0.000579)	-0.000356 (0.000579)	-0.000357 (0.000579)	-0.000271 (0.000581)
Leverage	0.000278 (0.00501)	0.00215 (0.00518)	0.00207 (0.00519)	0.00240 (0.00518)	0.00193 (0.00518)	0.00217 (0.00518)	0.00205 (0.00519)	0.00230 (0.00520)	0.00240 (0.00523)
ROA	0.0255 (0.0286)	0.0268 (0.0294)	0.0279 (0.0295)	0.0269 (0.0294)	0.0272 (0.0294)	0.0281 (0.0296)	0.0282 (0.0296)	0.0269 (0.0295)	0.0269 (0.0296)
Tobin'Q	1.99e-05 (0.00138)	4.34e-05 (0.00141)	6.55e-05 (0.00141)	0.000119 (0.00141)	2.44e-05 (0.00141)	7.21e-05 (0.00141)	8.26e-05 (0.00141)	7.62e-05 (0.00141)	0.000120 (0.00141)
Attitude	-0.0227 (0.0236)	-0.0216 (0.0237)	-0.0222 (0.0237)	-0.0247 (0.0237)	-0.0213 (0.0236)	-0.0215 (0.0237)	-0.0224 (0.0237)	-0.0219 (0.0237)	-0.0244 (0.0239)
Public	-0.00540 (0.00536)	-0.00584 (0.00537)	-0.00588 (0.00537)	-0.00552 (0.00536)	-0.00603 (0.00537)	-0.00594 (0.00537)	-0.00584 (0.00537)	-0.00588 (0.00537)	-0.00578 (0.00539)
Constant	0.0141 (0.00951)	0.00494 (0.0149)	0.00408 (0.0150)	0.00373 (0.0149)	0.00573 (0.0149)	0.00475 (0.0149)	0.00384 (0.0150)	0.00400 (0.0151)	0.00388 (0.0153)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	988	988	988	988	988	988	988	988	988
R-squared	0.042	0.050	0.051	0.054	0.052	0.051	0.051	0.051	0.055

Table 9: CEO overconfidence on M&A performance measured by the 5-day CAR (OV67)

Significance is indicated as follows *** p<0.01, ** p<0.05, * p<0.1

<i>Variables</i>	Dependent variable: CAR5DAY								
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>
OV67	-0.00465 (0.00319)	-0.00475 (0.00330)	-8.40e-05 (0.0110)	-0.00379 (0.00340)	-0.00387 (0.00336)	-0.00772 (0.00799)	0.0186 (0.0251)	-0.00393 (0.00385)	0.0125 (0.0279)
Shares owned		-0.000901 (0.000951)	-0.000355 (0.00155)	-0.000955 (0.000952)	-0.000995 (0.000953)	-0.000878 (0.000953)	-0.000889 (0.000951)	-0.000876 (0.000953)	-0.000573 (0.00159)
Female		-0.00863 (0.00731)	-0.00865 (0.00732)	0.000479 (0.0106)	-0.00791 (0.00733)	-0.00853 (0.00732)	-0.00820 (0.00733)	-0.00868 (0.00732)	0.00228 (0.0107)
Tenure		-0.00210* (0.00108)	-0.00215** (0.00109)	-0.00207* (0.00108)	-0.00084 (0.00143)	-0.00208* (0.00108)	-0.00220** (0.00109)	-0.00209* (0.00108)	-0.00092 (0.00146)
Ethnicity		0.00590 (0.00458)	0.00576 (0.00459)	0.00577 (0.00458)	0.00545 (0.00459)	0.00419 (0.00620)	0.00572 (0.00458)	0.00591 (0.00458)	0.00367 (0.00626)
Age		0.000229 (0.000226)	0.000227 (0.000226)	0.000245 (0.000226)	0.000211 (0.000226)	0.000232 (0.000226)	0.000481 (0.000351)	0.000246 (0.000230)	0.000394 (0.000364)
Education		-0.00547 (0.00352)	-0.00528 (0.00355)	-0.00554 (0.00352)	-0.00520 (0.00352)	-0.00538 (0.00353)	-0.00480 (0.00359)	-0.00390 (0.00514)	-0.00309 (0.00517)
OvxShares			-0.000843 (0.00190)						-0.000657 (0.00197)
OVxFemale				-0.0164 (0.0138)					-0.0179 (0.0140)
OVxTenure					-0.00292 (0.00216)				-0.00282 (0.00220)
OVxEthnicity						0.00351 (0.00859)			0.00302 (0.00875)
OVxAge							-0.000411 (0.000437)		-0.000235 (0.000464)
OVxEducation								-0.00297 (0.00711)	-0.00304 (0.00723)
Firm size	-0.000584 (0.000678)	-0.000510 (0.000679)	-0.000510 (0.000679)	-0.000484 (0.000679)	-0.000441 (0.000681)	-0.000505 (0.000680)	-0.000514 (0.000679)	-0.000506 (0.000680)	-0.000408 (0.000683)
Leverage	0.00749 (0.00588)	0.00954 (0.00607)	0.00954 (0.00607)	0.00972 (0.00607)	0.00930 (0.00607)	0.00943 (0.00608)	0.00924 (0.00608)	0.00979 (0.00610)	0.00944 (0.00613)
ROA	0.0191 (0.0337)	0.0171 (0.0346)	0.0171 (0.0346)	0.0168 (0.0346)	0.0171 (0.0346)	0.0166 (0.0346)	0.0173 (0.0346)	0.0168 (0.0346)	0.0159 (0.0346)
Tobin'Q	0.000861 (0.00162)	0.00119 (0.00166)	0.00119 (0.00166)	0.00121 (0.00166)	0.00116 (0.00165)	0.00121 (0.00166)	0.00108 (0.00166)	0.00122 (0.00166)	0.00113 (0.00167)
Attitude	-0.0113 (0.0277)	-0.00953 (0.0278)	-0.00953 (0.0278)	-0.0117 (0.0279)	-0.00899 (0.0278)	-0.0103 (0.0279)	-0.0122 (0.0279)	-0.00976 (0.0278)	-0.0141 (0.0281)
Public	-0.00117 (0.00630)	-0.00176 (0.00630)	-0.00176 (0.00630)	-0.00149 (0.00631)	-0.00203 (0.00630)	-0.00160 (0.00632)	-0.00171 (0.00630)	-0.00181 (0.00631)	-0.00167 (0.00634)
Constant	0.000399 (0.0112)	-0.0117 (0.0175)	-0.0117 (0.0175)	-0.0128 (0.0175)	-0.0107 (0.0175)	-0.0109 (0.0176)	-0.0258 (0.0230)	-0.0132 (0.0179)	-0.0230 (0.0238)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	988	988	988	988	988	988	988	988	988
R-squared	0.042	0.052	0.052	0.053	0.054	0.052	0.053	0.052	0.056

Table 10: CEO overconfidence on M&A performance measured by the 5-day CAR (OV100)

Significance is indicated as follows *** p<0.01, ** p<0.05, * p<0.1

<i>Variables</i>	Dependent variable: CAR5DAY								
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>
OV100	-0.00559* (0.00316)	-0.00559* (0.00328)	-0.00437 (0.00517)	-0.00510 (0.00330)	-0.00476 (0.00335)	-0.00591 (0.00468)	-0.00418 (0.00542)	-0.00494 (0.00360)	-0.00489 (0.00549)
Shares owned		-0.000828 (0.000953)	-0.000635 (0.00114)	-0.000850 (0.000953)	-0.000920 (0.000955)	-0.000830 (0.000954)	-0.000807 (0.000955)	-0.000792 (0.000957)	-0.000646 (0.00158)
Female		-0.00946 (0.00733)	-0.00929 (0.00735)	0.000458 (0.0105)	-0.00864 (0.00735)	-0.00949 (0.00734)	-0.00923 (0.00737)	-0.00942 (0.00733)	0.00235 (0.0107)
Tenure		-0.00201* (0.00108)	-0.00201* (0.00108)	-0.00203* (0.00108)	-0.00084 (0.00142)	-0.00205* (0.00108)	-0.00208* (0.00108)	-0.00205* (0.00108)	-0.00078 (0.00144)
Ethnicity		0.00583 (0.00457)	0.00585 (0.00457)	0.00578 (0.00457)	0.00542 (0.00458)	0.00557 (0.00529)	0.00590 (0.00458)	0.00588 (0.00457)	0.00304 (0.00610)
Age		0.000240 (0.000225)	0.000237 (0.000226)	0.000257 (0.000226)	0.000221 (0.000226)	0.000242 (0.000226)	0.000256 (0.000230)	0.000256 (0.000228)	0.000262 (0.000269)
Education		-0.00535 (0.00352)	-0.00534 (0.00352)	-0.00547 (0.00352)	-0.00512 (0.00352)	-0.00533 (0.00353)	-0.00535 (0.00352)	-0.00381 (0.00493)	-0.00331 (0.00513)
OvxShares			-0.000273 (0.000894)						-0.000398 (0.00195)
OVxFemale				-0.0177 (0.0135)					-0.0197 (0.0141)
OVxTenure					-0.00281 (0.00216)				-0.00284 (0.00219)
OVxEthnicity						0.000489 (0.00505)			0.00458 (0.00806)
OVxAge							-3.11e-05 (9.47e-05)		3.41e-06 (0.000235)
OVxEducation								-0.00298 (0.00667)	-0.00325 (0.00723)
Firm size	-0.000603 (0.000678)	-0.000531 (0.000679)	-0.000528 (0.000680)	-0.000503 (0.000679)	-0.000462 (0.000681)	-0.000531 (0.000680)	-0.000528 (0.000680)	-0.000525 (0.000680)	-0.000420 (0.000683)
Leverage	0.00783 (0.00589)	0.00994 (0.00608)	0.00988 (0.00609)	0.0102* (0.00608)	0.00965 (0.00608)	0.00993 (0.00609)	0.00987 (0.00609)	0.0102* (0.00610)	0.01000 (0.00615)
ROA	0.0155 (0.0336)	0.0139 (0.0346)	0.0147 (0.0347)	0.0139 (0.0345)	0.0143 (0.0346)	0.0136 (0.0347)	0.0149 (0.0347)	0.0140 (0.0346)	0.0128 (0.0348)
Tobin'Q	0.000933 (0.00162)	0.00124 (0.00165)	0.00126 (0.00165)	0.00131 (0.00165)	0.00122 (0.00165)	0.00124 (0.00165)	0.00127 (0.00166)	0.00129 (0.00166)	0.00130 (0.00166)
Attitude	-0.0110 (0.0277)	-0.00929 (0.0278)	-0.00973 (0.0278)	-0.0119 (0.0278)	-0.00887 (0.0278)	-0.00932 (0.0278)	-0.00983 (0.0278)	-0.00968 (0.0278)	-0.0131 (0.0280)
Public	-0.00137 (0.00630)	-0.00188 (0.00630)	-0.00191 (0.00631)	-0.00160 (0.00630)	-0.00212 (0.00630)	-0.00185 (0.00631)	-0.00188 (0.00631)	-0.00193 (0.00631)	-0.00170 (0.00633)
Constant	0.000662 (0.0112)	-0.0124 (0.0175)	-0.0131 (0.0176)	-0.0135 (0.0175)	-0.0114 (0.0175)	-0.0124 (0.0175)	-0.0133 (0.0177)	-0.0138 (0.0178)	-0.0145 (0.0180)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	988	988	988	988	988	988	988	988	988
R-squared	0.043	0.053	0.053	0.054	0.054	0.053	0.053	0.053	0.057

Table 12: CEO overconfidence on M&A frequency (OV100)

Significance is indicated as follows *** p<0.01, ** p<0.05, * p<0.1

<i>Variables</i>	Dependent variable: M&A frequency								
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>
OV100	0.0669** (0.0318)	0.0180 (0.0324)	0.0171 (0.0510)	0.0190 (0.0326)	0.0269 (0.0330)	0.00477 (0.0461)	0.0541 (0.0534)	0.0180 (0.0355)	0.0499 (0.0540)
Shares owned		0.0576*** (0.00939)	0.0575*** (0.0113)	0.0575*** (0.00940)	0.0566*** (0.00941)	0.0575*** (0.00940)	0.0581*** (0.00941)	0.0576*** (0.00943)	0.0401*** (0.0155)
Female		0.0633 (0.0723)	0.0631 (0.0725)	0.0840 (0.104)	0.0719 (0.0725)	0.0620 (0.0724)	0.0691 (0.0726)	0.0633 (0.0723)	0.0973 (0.105)
Tenure		-0.02515** (0.01062)	-0.02511** (0.01069)	-0.02511** (0.01066)	-0.01226 (0.01405)	-0.02486** (0.01066)	-0.02581** (0.01066)	-0.02515** (0.01066)	-0.01442 (0.01416)
Ethnicity		0.0148 (0.0450)	0.0148 (0.0451)	0.0147 (0.0450)	0.0105 (0.0451)	0.00421 (0.0522)	0.0166 (0.0451)	0.0148 (0.0451)	-0.0441 (0.0600)
Age		-0.00254 (0.00222)	-0.00254 (0.00223)	-0.00251 (0.00223)	-0.00274 (0.00223)	-0.00248 (0.00223)	-0.00215 (0.00227)	-0.00254 (0.00225)	0.000349 (0.00265)
Education		-0.0663* (0.0347)	-0.0663* (0.0347)	-0.0665* (0.0347)	-0.0637* (0.0347)	-0.0653* (0.0348)	-0.0663* (0.0347)	-0.0664 (0.0486)	-0.0752 (0.0504)
OvxShares			0.000198 (0.00882)						0.0272 (0.0192)
OVxFemale				-0.0371 (0.133)					-0.0245 (0.139)
OVxTenure					-0.02997 (0.02132)				-0.02362 (0.02154)
OVxEthnicity						0.0201 (0.0498)			0.121 (0.0793)
OVxAge							-0.000793 (0.000934)		-0.00510** (0.00232)
OVxEducation								0.000212 (0.0658)	0.0292 (0.0711)
Firm size	0.00857 (0.00682)	0.00921 (0.00669)	0.00921 (0.00670)	0.00927 (0.00670)	0.00995 (0.00671)	0.00920 (0.00670)	0.00930 (0.00670)	0.00921 (0.00670)	0.0100 (0.00672)
Leverage	0.0508 (0.0592)	-0.00140 (0.0600)	-0.00136 (0.0600)	-0.000953 (0.0600)	-0.00445 (0.0600)	-0.00162 (0.0600)	-0.00321 (0.0600)	-0.00142 (0.0602)	-0.0126 (0.0605)
ROA	0.364 (0.338)	0.0983 (0.341)	0.0977 (0.342)	0.0984 (0.341)	0.103 (0.340)	0.0858 (0.342)	0.124 (0.342)	0.0982 (0.341)	0.110 (0.342)
Tobin'Q	0.0155 (0.0163)	0.0222 (0.0163)	0.0222 (0.0163)	0.0223 (0.0163)	0.0219 (0.0163)	0.0219 (0.0163)	0.0229 (0.0163)	0.0222 (0.0163)	0.0229 (0.0163)
Attitude	0.281 (0.278)	0.274 (0.274)	0.274 (0.274)	0.268 (0.275)	0.278 (0.274)	0.273 (0.274)	0.260 (0.274)	0.274 (0.274)	0.226 (0.276)
Public	-0.0679 (0.0633)	-0.0623 (0.0621)	-0.0623 (0.0622)	-0.0617 (0.0622)	-0.0649 (0.0621)	-0.0613 (0.0622)	-0.0622 (0.0621)	-0.0623 (0.0622)	-0.0542 (0.0623)
Constant	0.186* (0.112)	0.0815 (0.172)	0.0820 (0.174)	0.0793 (0.172)	0.0925 (0.172)	0.0835 (0.172)	0.0609 (0.174)	0.0816 (0.175)	0.0474 (0.177)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	988	988	988	988	988	988	988	988	988
R-squared	0.087	0.131	0.131	0.131	0.133	0.132	0.132	0.131	0.138

Table 14: CEO overconfidence on takeover premiums (OV100)

Significance is indicated as follows *** p<0.01, ** p<0.05, * p<0.1

<i>Variables</i>	Dependent variable: Premium								
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>
OV100	-0.0948 (0.160)	-0.0849 (0.184)	-0.114 (0.237)	-0.0835 (0.189)	-0.0520 (0.215)	-0.139 (0.224)	-0.173 (0.262)	-0.0759 (0.188)	-0.431 (0.372)
Shares owned		0.0185 (0.0578)	0.0127 (0.0654)	0.0182 (0.0591)	0.0257 (0.0631)	0.0133 (0.0600)	0.0139 (0.0596)	0.0204 (0.0588)	0.0831 (0.105)
Female		0.436 (0.270)	0.438 (0.276)	0.468 (0.378)	0.430 (0.277)	0.434 (0.275)	0.434 (0.275)	0.466 (0.279)	0.640 (0.458)
Tenure		-0.00850 (0.09052)	-0.00741 (0.09271)	-0.00934 (0.09308)	-0.01055 (0.09271)	-0.00942 (0.09381)	-0.00759 (0.09344)	-0.00829 (0.09198)	-0.04745 (0.11315)
Ethnicity		-0.140 (0.256)	-0.145 (0.262)	-0.133 (0.267)	-0.128 (0.264)	-0.209 (0.304)	-0.149 (0.261)	-0.169 (0.264)	-0.131 (0.418)
Age		0.0186 (0.0145)	0.0193 (0.0152)	0.0189 (0.0150)	0.0187 (0.0148)	0.0184 (0.0148)	0.0191 (0.0148)	0.0208 (0.0152)	0.0158 (0.0204)
Education		-0.154 (0.192)	-0.148 (0.199)	-0.152 (0.198)	-0.151 (0.197)	-0.128 (0.204)	-0.144 (0.197)	-0.0873 (0.226)	-0.0387 (0.284)
OvxShares			0.00835 (0.0404)						-0.168 (0.208)
OVxFemale				-0.0622 (0.509)					-0.409 (0.651)
OVxTenure					-0.00602 (0.0190)				0.00337 (0.0385)
OVxEthnicity						0.0964 (0.219)			-0.0330 (0.476)
OVxAge							0.00214 (0.00443)		0.0234 (0.0236)
OVxEducation								-0.220 (0.377)	-0.406 (0.551)
Firm size	0.00798 (0.0377)	-0.0155 (0.0434)	-0.0157 (0.0444)	-0.0151 (0.0445)	-0.0166 (0.0445)	-0.0137 (0.0444)	-0.0133 (0.0444)	-0.0184 (0.0444)	0.00988 (0.0557)
Leverage	-0.0988 (0.268)	-0.436 (0.312)	-0.421 (0.326)	-0.436 (0.318)	-0.465 (0.331)	-0.404 (0.325)	-0.412 (0.321)	-0.454 (0.318)	-0.505 (0.374)
ROA	1.447 (1.873)	-0.302 (2.423)	-0.387 (2.509)	-0.313 (2.478)	-0.139 (2.525)	-0.442 (2.487)	-0.575 (2.528)	-0.351 (2.460)	-1.783 (3.058)
Tobin'Q	-0.0991 (0.153)	0.0301 (0.176)	0.0282 (0.180)	0.0351 (0.185)	0.0217 (0.182)	0.0196 (0.181)	0.0278 (0.179)	0.0436 (0.180)	0.110 (0.230)
Attitude	-	-	-	-	-	-	-	-	-
Public	0.472 (0.622)	0.894 (0.700)	0.864 (0.730)	0.884 (0.720)	0.985 (0.769)	0.884 (0.713)	0.822 (0.727)	1.057 (0.763)	0.901 (0.885)
Constant	0.231 (0.656)	-0.882 (1.132)	-0.878 (1.157)	-0.897 (1.163)	-0.919 (1.161)	-0.834 (1.158)	-0.872 (1.152)	-1.087 (1.201)	-1.324 (1.348)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	56	56	56	56	56	56	56	56	56
R-squared	0.354	0.480	0.481	0.480	0.482	0.484	0.485	0.488	0.533

Table 15: CEO overconfidence on M&A performance measured by the 3-day CAR (OV67) with deal size included as a control variable

Significance is indicated as follows *** p<0.01, ** p<0.05, * p<0.1

<i>Variables</i>	Dependent variable: CAR3DAY								
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>
OV67	0.000662 (0.00471)	0.000689 (0.00487)	-0.00964 (0.0161)	0.00234 (0.00504)	0.00221 (0.00497)	-0.0134 (0.0125)	-0.00263 (0.0378)	0.000815 (0.00582)	-0.0365 (0.0420)
Shares owned		-0.00108 (0.00143)	-0.00222 (0.00221)	-0.00114 (0.00143)	-0.00138 (0.00144)	-0.00102 (0.00143)	-0.00108 (0.00143)	-0.00107 (0.00144)	-0.00226 (0.00224)
Female		-0.00837 (0.0104)	-0.00817 (0.0105)	0.00383 (0.0142)	-0.00773 (0.0104)	-0.00836 (0.0104)	-0.00843 (0.0105)	-0.00836 (0.0105)	0.00662 (0.0143)
Tenure		-0.00146 (0.00179)	-0.00127 (0.00181)	-0.00150 (0.00179)	0.00057 (0.00223)	-0.00149 (0.00179)	-0.00145 (0.00179)	-0.00146 (0.00179)	0.00087 (0.00225)
Ethnicity		0.00335 (0.00715)	0.00347 (0.00716)	0.00356 (0.00715)	0.00350 (0.00714)	-0.00433 (0.00951)	0.00336 (0.00716)	0.00335 (0.00716)	-0.00528 (0.00956)
Age		0.000106 (0.000333)	0.000105 (0.000333)	0.000140 (0.000333)	0.000128 (0.000332)	0.000113 (0.000332)	7.32e-05 (0.000499)	0.000109 (0.000342)	1.90e-05 (0.000512)
Education		-0.00191 (0.00509)	-0.00242 (0.00515)	-0.00165 (0.00509)	-0.00118 (0.00510)	-0.00166 (0.00509)	-0.00203 (0.00529)	-0.00170 (0.00729)	-0.00127 (0.00739)
OvxShares			0.00190 (0.00283)						0.00140 (0.00291)
OVxFemale				-0.0254 (0.0200)					-0.0301 (0.0202)
OVxTenure					-0.00566 (0.00372)				-0.00635* (0.00038)
OVxEthnicity						0.0164 (0.0134)			0.0197 (0.0136)
OVxAge							5.82e-05 (0.000656)		0.000289 (0.000686)
OVxEducation								-0.000416 (0.0104)	-0.000468 (0.0105)
Deal size	-0.00147 (0.00154)	-0.00138 (0.00157)	-0.00143 (0.00157)	-0.00137 (0.00157)	-0.00150 (0.00157)	-0.00137 (0.00157)	-0.00138 (0.00157)	-0.00138 (0.00157)	-0.00156 (0.00158)
Firm size	0.00188 (0.00132)	0.00187 (0.00134)	0.00189 (0.00134)	0.00185 (0.00134)	0.00193 (0.00133)	0.00195 (0.00134)	0.00187 (0.00134)	0.00187 (0.00134)	0.00200 (0.00134)
Leverage	0.0101 (0.00873)	0.0114 (0.00894)	0.0120 (0.00901)	0.0119 (0.00895)	0.0106 (0.00894)	0.0112 (0.00894)	0.0114 (0.00896)	0.0114 (0.00900)	0.0117 (0.00908)
ROA	0.0161 (0.0491)	0.0263 (0.0511)	0.0260 (0.0511)	0.0265 (0.0510)	0.0225 (0.0510)	0.0286 (0.0511)	0.0263 (0.0511)	0.0263 (0.0511)	0.0243 (0.0511)
Tobin'Q	0.00252 (0.00245)	0.00234 (0.00251)	0.00246 (0.00252)	0.00231 (0.00251)	0.00246 (0.00251)	0.00239 (0.00251)	0.00236 (0.00252)	0.00234 (0.00252)	0.00266 (0.00253)
Attitude	-0.0515 (0.0481)	-0.0485 (0.0490)	-0.0457 (0.0492)	-0.0464 (0.0490)	-0.0479 (0.0489)	-0.0552 (0.0492)	-0.0477 (0.0497)	-0.0487 (0.0492)	-0.0478 (0.0500)
Public	-0.00645 (0.00715)	-0.00673 (0.00725)	-0.00644 (0.00726)	-0.00603 (0.00726)	-0.00668 (0.00723)	-0.00625 (0.00725)	-0.00673 (0.00726)	-0.00674 (0.00726)	-0.00504 (0.00729)
Constant	-0.000971 (0.0160)	-0.00374 (0.0267)	0.00243 (0.0283)	-0.00565 (0.0268)	-0.00471 (0.0267)	-0.000552 (0.0269)	-0.00176 (0.0349)	-0.00400 (0.0275)	0.0109 (0.0360)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Observations	442	442	442	442	442	442	442	442	442
R-squared	0.062	0.067	0.068	0.070	0.072	0.070	0.067	0.067	0.082

Table 16: CEO overconfidence on M&A performance measured by the 3-day CAR (OV100) with deal size included as a control variable

Significance is indicated as follows *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Variables	Dependent variable: CAR3DAY								
	A	B	C	D	E	F	G	H	I
OV100	-0.00393 (0.00473)	-0.00415 (0.00490)	-0.0132* (0.00762)	-0.00332 (0.00496)	-0.00290 (0.00498)	-0.0134* (0.00711)	-0.0128 (0.00806)	-0.00519 (0.00542)	-0.0141* (0.00809)
Shares owned		-0.000798 (0.00143)	-0.00214 (0.00167)	-0.000821 (0.00143)	-0.00106 (0.00144)	-0.000876 (0.00142)	-0.000907 (0.00143)	-0.000877 (0.00144)	-0.00199 (0.00222)
Female		-0.00948 (0.0105)	-0.00968 (0.0105)	0.000553 (0.0141)	-0.00884 (0.0105)	-0.00986 (0.0105)	-0.0101 (0.0105)	-0.00961 (0.0105)	0.00659 (0.0142)
Tenure		-0.00147 (0.00179)	-0.00116 (0.00180)	-0.00152 (0.00179)	0.00028 (0.00222)	-0.00138 (0.00178)	-0.00135 (0.00179)	-0.00149 (0.00179)	0.00076 (0.00223)
Ethnicity		0.00374 (0.00713)	0.00324 (0.00713)	0.00401 (0.00713)	0.00394 (0.00713)	-0.00330 (0.00813)	0.00316 (0.00714)	0.00362 (0.00714)	-0.00376 (0.00928)
Age		0.000100 (0.000332)	0.000110 (0.000332)	0.000127 (0.000333)	0.000118 (0.000332)	0.000118 (0.000331)	4.11e-06 (0.000339)	6.84e-05 (0.000340)	0.000234 (0.000385)
Education		-0.00218 (0.00509)	-0.00262 (0.00508)	-0.00200 (0.00509)	-0.00155 (0.00510)	-0.00183 (0.00508)	-0.00247 (0.00508)	-0.00433 (0.00699)	-0.000283 (0.00721)
OvxShares			0.00206 (0.00133)						0.00126 (0.00286)
OVxFemale				-0.0210 (0.0196)					-0.0326 (0.0202)
OVxTenure					-0.00493 (0.00372)				-0.00577 (0.00376)
OVxEthnicity						0.0136* (0.00760)			0.0156 (0.0125)
OVxAge							0.000189 (0.000139)		-6.95e-05 (0.000343)
OVxEducation								0.00433 (0.00966)	-0.00128 (0.0105)
Deal size	-0.00141 (0.00154)	-0.00131 (0.00157)	-0.00128 (0.00157)	-0.00132 (0.00157)	-0.00143 (0.00157)	-0.00121 (0.00157)	-0.00124 (0.00157)	-0.00132 (0.00157)	-0.00134 (0.00157)
Firm size	0.00185 (0.00132)	0.00184 (0.00134)	0.00175 (0.00133)	0.00183 (0.00134)	0.00190 (0.00134)	0.00179 (0.00133)	0.00173 (0.00134)	0.00185 (0.00134)	0.00184 (0.00134)
Leverage	0.0103 (0.00873)	0.0117 (0.00894)	0.0124 (0.00893)	0.0122 (0.00895)	0.0111 (0.00894)	0.0115 (0.00891)	0.0117 (0.00893)	0.0113 (0.00899)	0.0119 (0.00905)
ROA	0.0148 (0.0491)	0.0247 (0.0510)	0.0184 (0.0511)	0.0254 (0.0510)	0.0221 (0.0510)	0.0204 (0.0510)	0.0187 (0.0512)	0.0247 (0.0511)	0.0162 (0.0512)
Tobin'Q	0.00291 (0.00245)	0.00278 (0.00251)	0.00266 (0.00251)	0.00281 (0.00251)	0.00290 (0.00251)	0.00254 (0.00251)	0.00258 (0.00251)	0.00272 (0.00251)	0.00270 (0.00251)
Attitude	-0.0549 (0.0480)	-0.0519 (0.0489)	-0.0470 (0.0489)	-0.0506 (0.0489)	-0.0515 (0.0489)	-0.0553 (0.0488)	-0.0476 (0.0490)	-0.0499 (0.0492)	-0.0525 (0.0495)
Public	-0.00681 (0.00716)	-0.00709 (0.00725)	-0.00702 (0.00724)	-0.00650 (0.00727)	-0.00700 (0.00724)	-0.00692 (0.00723)	-0.00731 (0.00724)	-0.00704 (0.00726)	-0.00577 (0.00727)
Constant	0.00175	-0.00211	0.00346	-0.00345	-0.00288	-0.000672	0.00328	0.000399	-0.00277

	(0.0160)	(0.0267)	(0.0269)	(0.0267)	(0.0267)	(0.0267)	(0.0270)	(0.0273)	(0.0275)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	442	442	442	442	442	442	442	442	442
R-squared	0.063	0.068	0.074	0.071	0.072	0.075	0.072	0.069	0.087

Table 17: CEO overconfidence on M&A performance measured by the 5-day CAR (OV67) with deal size included as a control variable

Significance is indicated as follows *** p<0.01, ** p<0.05, * p<0.1

Variables	Dependent variable: CAR5DAY								
	A	B	C	D	E	F	G	H	I
OV67	0.000304 (0.00535)	-0.00149 (0.00551)	0.00458 (0.0182)	-5.28e-05 (0.00571)	0.000198 (0.00562)	-0.0176 (0.0141)	0.0305 (0.0427)	-0.000551 (0.00659)	0.00213 (0.0475)
Shares owned		0.000537 (0.00162)	0.00121 (0.00251)	0.000482 (0.00162)	0.000200 (0.00163)	0.000604 (0.00161)	0.000535 (0.00162)	0.000582 (0.00163)	0.000911 (0.00254)
Female		-0.0157 (0.0118)	-0.0158 (0.0118)	-0.00508 (0.0161)	-0.0150 (0.0118)	-0.0157 (0.0118)	-0.0151 (0.0118)	-0.0156 (0.0118)	-0.00183 (0.0162)
Tenure		-0.00174 (0.00203)	-0.00185 (0.00205)	-0.00178 (0.00203)	0.00050 (0.00252)	-0.00178 (0.00202)	-0.00177 (0.00203)	-0.00172 (0.00203)	0.00046 (0.00255)
Ethnicity		0.00938 (0.00809)	0.00931 (0.00810)	0.00957 (0.00809)	0.00956 (0.00808)	0.000602 (0.0108)	0.00927 (0.00809)	0.00941 (0.00810)	0.000151 (0.0108)
Age		-2.44e-05 (0.000376)	-2.39e-05 (0.000377)	5.06e-06 (0.000377)	-1.12e-08 (0.000376)	-1.59e-05 (0.000376)	0.000292 (0.000564)	-8.70e-07 (0.000387)	0.000166 (0.000580)
Education		-0.00389 (0.00576)	-0.00358 (0.00583)	-0.00366 (0.00576)	-0.00308 (0.00577)	-0.00360 (0.00576)	-0.00266 (0.00598)	-0.00236 (0.00824)	-0.000867 (0.00837)
OvxShares			-0.00112 (0.00320)						-0.00118 (0.00329)
OVxFemale				-0.0221 (0.0227)					-0.0270 (0.0229)
OVxTenure					-0.00628 (0.00419)				-0.00672 (0.00431)
OVxEthnicity						0.0188 (0.0152)			0.0204 (0.0154)
OVxAge							-0.000560 (0.000742)		-0.000186 (0.000777)
OVxEducation								-0.00307 (0.0118)	-0.00169 (0.0119)
Deal size	-0.000989 (0.00175)	-0.000771 (0.00178)	-0.000739 (0.00178)	-0.000766 (0.00178)	-0.000908 (0.00178)	-0.000758 (0.00178)	-0.000718 (0.00178)	-0.000757 (0.00178)	-0.000837 (0.00178)
Firm size	0.00169 (0.00150)	0.00166 (0.00151)	0.00165 (0.00151)	0.00164 (0.00151)	0.00172 (0.00151)	0.00175 (0.00151)	0.00168 (0.00151)	0.00164 (0.00151)	0.00179 (0.00152)
Leverage	0.0157 (0.00990)	0.0183* (0.0101)	0.0179* (0.0102)	0.0187* (0.0101)	0.0175* (0.0101)	0.0181* (0.0101)	0.0180* (0.0101)	0.0185* (0.0102)	0.0174* (0.0103)
ROA	-0.0275 (0.0557)	-0.0134 (0.0577)	-0.0132 (0.0578)	-0.0132 (0.0578)	-0.0177 (0.0577)	-0.0108 (0.0577)	-0.0128 (0.0578)	-0.0139 (0.0578)	-0.0149 (0.0579)
Tobin'Q	0.00411 (0.00278)	0.00434 (0.00284)	0.00427 (0.00286)	0.00431 (0.00284)	0.00447 (0.00284)	0.00439 (0.00284)	0.00419 (0.00285)	0.00436 (0.00285)	0.00439 (0.00286)
Attitude	-0.0178	-0.0101	-0.0117	-0.00830	-0.00948	-0.0178	-0.0173	-0.0113	-0.0203

	(0.0545)	(0.0554)	(0.0556)	(0.0554)	(0.0553)	(0.0557)	(0.0562)	(0.0557)	(0.0567)
Public	-0.00385	-0.00455	-0.00472	-0.00394	-0.00449	-0.00399	-0.00458	-0.00460	-0.00335
	(0.00811)	(0.00820)	(0.00822)	(0.00822)	(0.00818)	(0.00820)	(0.00820)	(0.00821)	(0.00826)
Constant	-0.0182	-0.0256	-0.0293	-0.0273	-0.0267	-0.0220	-0.0448	-0.0275	-0.0361
	(0.0182)	(0.0303)	(0.0320)	(0.0303)	(0.0302)	(0.0304)	(0.0395)	(0.0311)	(0.0408)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	442	442	442	442	442	442	442	442	442
R-squared	0.057	0.066	0.067	0.069	0.072	0.070	0.068	0.067	0.079

Table 18: CEO overconfidence on M&A performance measured by the 5-day CAR (OV100)

with deal size included as a control variable

Significance is indicated as follows *** p<0.01, ** p<0.05, * p<0.1

Variables	Dependent variable: CAR5DAY								
	A	B	C	D	E	F	G	H	I
OV100	-0.00438 (0.00536)	-0.00643 (0.00554)	-0.0119 (0.00864)	-0.00569 (0.00561)	-0.00503 (0.00563)	-0.0156* (0.00805)	-0.0131 (0.00912)	-0.00681 (0.00613)	-0.0139 (0.00916)
Shares owned		0.000827 (0.00161)	1.96e-05 (0.00189)	0.000807 (0.00161)	0.000533 (0.00163)	0.000750 (0.00161)	0.000744 (0.00162)	0.000798 (0.00163)	0.000934 (0.00251)
Female		-0.0170 (0.0118)	-0.0171 (0.0118)	-0.00809 (0.0159)	-0.0163 (0.0118)	-0.0174 (0.0118)	-0.0174 (0.0119)	-0.0170 (0.0119)	-0.00227 (0.0161)
Tenure		-0.00173 (0.00202)	-0.00155 (0.00203)	-0.00178 (0.00202)	0.00233 (0.00251)	-0.00164 (0.00201)	-0.00164 (0.00202)	-0.00174 (0.00202)	0.00054 (0.00253)
Ethnicity		0.00969 (0.00806)	0.00939 (0.00807)	0.00993 (0.00807)	0.00992 (0.00805)	0.00268 (0.00920)	0.00925 (0.00808)	0.00965 (0.00807)	-0.000381 (0.0105)
Age		-2.87e-05 (0.000375)	-2.25e-05 (0.000376)	-5.33e-06 (0.000377)	-8.40e-06 (0.000375)	-1.08e-05 (0.000375)	-0.000102 (0.000384)	-4.02e-05 (0.000384)	6.89e-05 (0.000436)
Education		-0.00417 (0.00575)	-0.00443 (0.00576)	-0.00400 (0.00575)	-0.00346 (0.00577)	-0.00382 (0.00574)	-0.00439 (0.00575)	-0.00495 (0.00790)	-0.00130 (0.00817)
OvxShares			0.00124 (0.00151)						-0.000879 (0.00324)
OVxFemale				-0.0186 (0.0222)					-0.0299 (0.0229)
OVxTenure					-0.00555 (0.00419)				-0.00657 (0.00427)
OVxEthnicity						0.0135 (0.00860)			0.0212 (0.0142)
OVxAge							0.000144 (0.000157)		6.28e-06 (0.000388)
OVxEducation								0.00157 (0.0109)	-0.00212 (0.0119)
Deal size	-0.000924 (0.00175)	-0.000679 (0.00178)	-0.000657 (0.00178)	-0.000682 (0.00178)	-0.000815 (0.00178)	-0.000573 (0.00177)	-0.000623 (0.00178)	-0.000682 (0.00178)	-0.000687 (0.00178)
Firm size	0.00166 (0.00150)	0.00160 (0.00151)	0.00155 (0.00151)	0.00160 (0.00151)	0.00167 (0.00151)	0.00156 (0.00151)	0.00152 (0.00151)	0.00161 (0.00151)	0.00164 (0.00152)
Leverage	0.0160 (0.00990)	0.0187* (0.0101)	0.0190* (0.0101)	0.0191* (0.0101)	0.0180* (0.0101)	0.0184* (0.0101)	0.0187* (0.0101)	0.0185* (0.0102)	0.0180* (0.0102)
ROA	-0.0290	-0.0164	-0.0202	-0.0158	-0.0193	-0.0207	-0.0210	-0.0164	-0.0230

	(0.0557)	(0.0577)	(0.0579)	(0.0577)	(0.0577)	(0.0577)	(0.0579)	(0.0578)	(0.0580)
Tobin'Q	0.00451	0.00477*	0.00470*	0.00480*	0.00490*	0.00453	0.00462	0.00475*	0.00467
	(0.00278)	(0.00284)	(0.00284)	(0.00284)	(0.00283)	(0.00283)	(0.00284)	(0.00284)	(0.00284)
Attitude	-0.0213	-0.0135	-0.0105	-0.0123	-0.0131	-0.0169	-0.0102	-0.0128	-0.0193
	(0.0544)	(0.0553)	(0.0554)	(0.0553)	(0.0552)	(0.0552)	(0.0554)	(0.0556)	(0.0561)
Public	-0.00423	-0.00499	-0.00495	-0.00447	-0.00489	-0.00483	-0.00516	-0.00497	-0.00384
	(0.00812)	(0.00819)	(0.00820)	(0.00822)	(0.00818)	(0.00818)	(0.00820)	(0.00820)	(0.00824)
Constant	-0.0154	-0.0241	-0.0207	-0.0252	-0.0249	-0.0226	-0.0199	-0.0231	-0.0282
	(0.0181)	(0.0302)	(0.0305)	(0.0302)	(0.0302)	(0.0302)	(0.0305)	(0.0309)	(0.0312)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	442	442	442	442	442	442	442	442	442
R-squared	0.058	0.069	0.071	0.071	0.073	0.075	0.071	0.069	0.084

Table 19: CEO overconfidence on M&A frequency (OV67) with deal size included as a control variable

Significance is indicated as follows *** p<0.01, ** p<0.05, * p<0.1

Variables	Dependent variable: M&A frequency								
	A	B	C	D	E	F	G	H	I
OV67	-0.0337 (0.0492)	-0.0671 (0.0503)	-0.181 (0.166)	-0.0778 (0.0521)	-0.0634 (0.0514)	-0.184 (0.129)	0.248 (0.390)	-0.0769 (0.0602)	0.0193 (0.435)
Shares owned		0.0378** (0.0147)	0.0252 (0.0229)	0.0382** (0.0148)	0.0370** (0.0149)	0.0383*** (0.0148)	0.0378** (0.0148)	0.0373** (0.0149)	0.0220 (0.0233)
Female		-0.0246 (0.108)	-0.0224 (0.108)	-0.103 (0.147)	-0.0230 (0.108)	-0.0245 (0.108)	-0.0187 (0.108)	-0.0252 (0.108)	-0.0913 (0.148)
Tenure		-0.03577* (0.01851)	-0.03376* (0.01872)	-0.03551* (0.01851)	-0.03081 (0.02307)	-0.03606* (0.01851)	-0.03606* (0.01851)	-0.03598* (0.01854)	-0.03176 (0.02336)
Ethnicity		0.0445 (0.0739)	0.0459 (0.0739)	0.0432 (0.0739)	0.0449 (0.0739)	-0.0191 (0.0983)	0.0434 (0.0739)	0.0442 (0.0739)	-0.0135 (0.0992)
Age		-0.000748 (0.00343)	-0.000758 (0.00344)	-0.000966 (0.00345)	-0.000694 (0.00344)	-0.000687 (0.00344)	0.00237 (0.00515)	-0.000994 (0.00354)	0.00226 (0.00531)
Education		-0.0168 (0.0526)	-0.0225 (0.0532)	-0.0185 (0.0526)	-0.0151 (0.0529)	-0.0148 (0.0526)	-0.00477 (0.0546)	-0.0329 (0.0753)	-0.0330 (0.0767)
OvxShares			0.0210 (0.0292)						0.0260 (0.0302)
OvxFemale				0.164 (0.207)					0.158 (0.210)
OvxTenure					-0.01387 (0.03869)				-0.00621 (0.03942)
OvxEthnicity						0.136 (0.139)			0.122 (0.141)
OvxAge							-0.00551 (0.00677)		-0.00621 (0.00711)
OvxEducation								0.0321 (0.108)	0.0476 (0.109)
Deal size	-0.0103 (0.0161)	-0.0131 (0.0162)	-0.0137 (0.0163)	-0.0131 (0.0162)	-0.0134 (0.0163)	-0.0130 (0.0162)	-0.0126 (0.0163)	-0.0132 (0.0163)	-0.0136 (0.0163)

Firm size	0.00581 (0.0138)	0.00911 (0.0138)	0.00933 (0.0138)	0.00924 (0.0138)	0.00924 (0.0138)	0.00975 (0.0138)	0.00930 (0.0138)	0.00926 (0.0138)	0.0106 (0.0139)
Leverage	0.0252 (0.0912)	0.0252 (0.0924)	0.0327 (0.0930)	0.0219 (0.0925)	0.0235 (0.0926)	0.0239 (0.0924)	0.0223 (0.0925)	0.0224 (0.0930)	0.0218 (0.0942)
ROA	-0.149 (0.513)	-0.244 (0.527)	-0.247 (0.528)	-0.245 (0.528)	-0.253 (0.529)	-0.225 (0.528)	-0.238 (0.528)	-0.239 (0.528)	-0.222 (0.531)
Tobin'Q	0.0224 (0.0256)	0.0267 (0.0260)	0.0281 (0.0261)	0.0269 (0.0260)	0.0270 (0.0260)	0.0271 (0.0260)	0.0253 (0.0261)	0.0265 (0.0260)	0.0271 (0.0262)
Attitude	0.253 (0.502)	0.236 (0.506)	0.266 (0.508)	0.222 (0.506)	0.237 (0.506)	0.180 (0.509)	0.165 (0.513)	0.248 (0.508)	0.151 (0.519)
Public	0.0107 (0.0747)	0.0107 (0.0749)	0.0139 (0.0750)	0.00619 (0.0751)	0.0108 (0.0749)	0.0148 (0.0750)	0.0104 (0.0749)	0.0113 (0.0750)	0.0145 (0.0756)
Constant	0.193 (0.167)	0.0210 (0.276)	0.0890 (0.292)	0.0333 (0.277)	0.0187 (0.277)	0.0475 (0.278)	-0.167 (0.361)	0.0407 (0.284)	-0.0437 (0.374)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	442	442	442	442	442	442	442	442	442
R-squared	0.108	0.132	0.133	0.133	0.132	0.134	0.133	0.132	0.138

Table 20: CEO overconfidence on M&A frequency (OV100) with deal size included as a control variable

Significance is indicated as follows *** p<0.01, ** p<0.05, * p<0.1

<i>Variables</i>	Dependent variable: M&A frequency								
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>
OV100	-0.0230 (0.0494)	-0.0537 (0.0507)	-0.0310 (0.0791)	-0.0585 (0.0514)	-0.0495 (0.0517)	-0.0480 (0.0739)	0.0101 (0.0835)	-0.0530 (0.0561)	0.0104 (0.0842)
Shares owned		0.0371** (0.0148)	0.0404** (0.0173)	0.0372** (0.0148)	0.0362** (0.0149)	0.0371** (0.0148)	0.0379** (0.0148)	0.0371** (0.0149)	0.0219 (0.0231)
Female		-0.0269 (0.108)	-0.0264 (0.109)	-0.0845 (0.146)	-0.0247 (0.109)	-0.0266 (0.109)	-0.0226 (0.108)	-0.0268 (0.109)	-0.0912 (0.148)
Tenure		-0.03508* (0.01851)	-0.03584* (0.01865)	-0.03478* (0.01851)	-0.02924 (0.02299)	-0.03511* (0.01854)	-0.03598* (0.01851)	-0.03508* (0.01851)	-0.03172 (0.02325)
Ethnicity		0.0406 (0.0738)	0.0419 (0.0739)	0.0391 (0.0739)	0.0413 (0.0739)	0.0450 (0.0844)	0.0449 (0.0739)	0.0407 (0.0739)	-0.0142 (0.0965)
Age		-0.000680 (0.00344)	-0.000706 (0.00344)	-0.000831 (0.00345)	-0.000620 (0.00344)	-0.000691 (0.00344)	2.50e-05 (0.00351)	-0.000660 (0.00352)	0.00216 (0.00401)
Education		-0.0161 (0.0526)	-0.0150 (0.0528)	-0.0171 (0.0527)	-0.0140 (0.0529)	-0.0163 (0.0527)	-0.0139 (0.0527)	-0.0147 (0.0723)	-0.0335 (0.0751)
OvxShares			-0.00515 (0.0138)						0.0260 (0.0298)
OvxFemale				0.120 (0.203)					0.160 (0.210)
OvxTenure					-0.01646 (0.03869)				-0.00653 (0.03906)
OvxEthnicity						-0.00842			0.124

						(0.0789)			(0.130)
OVxAge							-0.00139		-0.00606*
							(0.00144)		(0.00357)
OVxEducation								-0.00276	0.0482
								(0.1000)	(0.109)
Deal size	-0.0101	-0.0125	-0.0125	-0.0125	-0.0129	-0.0126	-0.0131	-0.0125	-0.0137
	(0.0162)	(0.0163)	(0.0163)	(0.0163)	(0.0163)	(0.0163)	(0.0163)	(0.0163)	(0.0164)
Firm size	0.00555	0.00847	0.00847	0.00851	0.00868	0.00850	0.00927	0.00847	0.0107
	(0.0138)	(0.0138)	(0.0138)	(0.0138)	(0.0138)	(0.0138)	(0.0138)	(0.0138)	(0.0139)
Leverage	0.0246	0.0246	0.0246	0.0220	0.0225	0.0247	0.0246	0.0248	0.0216
	(0.0912)	(0.0925)	(0.0925)	(0.0926)	(0.0927)	(0.0926)	(0.0925)	(0.0930)	(0.0942)
ROA	-0.166	-0.280	-0.280	-0.284	-0.288	-0.277	-0.236	-0.280	-0.216
	(0.514)	(0.528)	(0.528)	(0.529)	(0.529)	(0.529)	(0.530)	(0.529)	(0.533)
Tobin'Q	0.0214	0.0251	0.0251	0.0249	0.0255	0.0253	0.0266	0.0252	0.0270
	(0.0256)	(0.0260)	(0.0260)	(0.0260)	(0.0260)	(0.0260)	(0.0260)	(0.0260)	(0.0261)
Attitude	0.264	0.248	0.248	0.240	0.249	0.250	0.216	0.247	0.153
	(0.502)	(0.506)	(0.506)	(0.507)	(0.507)	(0.507)	(0.507)	(0.509)	(0.515)
Public	0.0101	0.00931	0.00931	0.00593	0.00961	0.00921	0.0109	0.00927	0.0150
	(0.0748)	(0.0750)	(0.0750)	(0.0753)	(0.0751)	(0.0751)	(0.0750)	(0.0751)	(0.0757)
Constant	0.185	0.0142	0.000249	0.0219	0.0116	0.0133	-0.0253	0.0126	-0.0378
	(0.167)	(0.276)	(0.279)	(0.277)	(0.277)	(0.277)	(0.279)	(0.283)	(0.286)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	442	442	442	442	442	442	442	442	442
R-squared	0.107	0.130	0.131	0.131	0.131	0.130	0.132	0.130	0.138