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# The Impact of Executive Gender and Overconfidence on Corporate Acquisitions

**Abstract:**

Are female executives less overconfident than their male counterparts? Does this overconfidence explain their acquisition decisions? In this research I analyse 3,441 acquisition, performed by 2,357 executives at 921 firms between 2006 and 2018 in order to answer these questions. Using proven overconfidence measures, I find no conclusive differences between the frequency of overconfidence classification between female and male executives. Furthermore, I find that female executives undertake significantly less acquisitions than males, irrespective of their overconfidence, i.e. both overconfident and rational female executives engage in less acquisitions than male executives. Finally, I find the relation between overconfidence and short-term market performance around the acquisition-announcement to be significantly positive, which goes against previous empirical research. The results suggest that overconfidence manifests itself differently in female and male executives.

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## 1. Introduction

In 2019, the Harvard Business Review published an article about the moderating effect of female board members on CEO behaviour. This article was based on a paper by Chen, Leung, Song, & Goergen (2019) published in the Journal of Empirical Finance. In this article, the authors found a negative, significant effect of female board representation[1] on option moneyness levels of male CEOs. If option moneyness is used as a proxy for overconfidence as in Campbell, Gallmeyer, Johnson, Rutherford, & Stanley (2011); Hirshleifer & Low (2012); Malmendier & Tate (2005, 2008), as it was in Chen, Leung, Song, & Goergen (2019), this would indicate that male CEOs are less likely to exhibit overconfidence if female representation on their corporate boards is higher. Chen et al. (2019) also find the effect to be statistically insignificant for whether female CEOs had fellow female board members. Given that executive overconfidence significantly affects corporate decisions and performance[2], the findings from Chen et al. (2019) suggest that female board members hold significant sway over the actions of their CEO and consequently influence corporate performance. While most existing research focusses on the effect of female supervisory board members on corporations, the effects of female executives on corporate performance and decisions is currently underexposed. This also holds for research into mergers & acquisitions (M&A) and more specifically, research into the influence of executives on acquisition outcomes. In this thesis I set out to build on research by Malmendier & Tate (2005, 2008) on the effect of executive overconfidence on corporate acquisitions by including the aspect of executive sex and using current data. Growing calls for females in top executive and board positions makes research into the effect of their leadership relevant.

Psychological research shows there to be significant differences between men and women in their propensity for risk taking, and research into gender effects on corporate performance has quickly expanded over recent years. A noticeable omission from this body of research are studies into female CEO performance in corporate acquisitions, even though it is an interesting field of research when looking into CEO quality and performance. The market for corporate control is economically highly significant. Between 1985 and June 2019, cumulative global deal volume reached more than $75 trillion, similar to the entire world's GDP, with average annual global deal volume over the same period being equal to the UK's current GDP, at $2 trillion (Institute of Mergers Acquisitions and Alliances, 2019; The World Bank, 2019).

The driving factors behind corporate acquisitions are operational synergies, such as economies of scale or scope and increased monopoly power (Sudarsanam, Holl, & Salami, 1996). Rational managers set out to maximise shareholder value and therefore only engage in acquisition activity with a positive value. However, large numbers of empirical papers show stock market returns for acquirers

[1] Percentage of board members who are female

[2] Andrikopoulos (2009); Ben-David, Graham, & Harvey (2013); Ben Mohamed, Fairchild, & Bouri, (2014); R. Brown & Sarma (2007); Gervais, Heaton, & Odean (2011); Goel & Thakor (2008); Hirshleifer & Low (2012); Ho, Huang, Lin, & Yen (2016); Malmendier & Tate (2005, 2008); Phua, Tham, & Wei (2018); Yilmaz & Mazzeo (2014)

to either be zero or negative (Franks, Harris, & Titman, 1991). This points to either irrational managers or a misalignment of interests with shareholders. The concept of classical agency would suggest that these value-destroying mergers are initiated by managers with misaligned incentives, such as those attributed to empire-building. However, in 1986 Roll hypothesised about the role of managerial hubris: unlike empire-builders, overconfident CEOs believe they are serving shareholder interests but overestimate their ability to extract value. As a result, overconfident CEOs pay too much for the target firm, on average, leading to a negative value for acquiring shareholders.

Malmendier & Tate (2005, 2008) have introduced models in order to quantify managerial overconfidence and extend the research of Roll (1986) and others. They find that overconfidence is persistent among a subset of CEOs, which lead to increased cashflow sensitivity as well as worse corporate acquisition performance, as measured by ACAR[3]. Their measures for overconfidence, or adaptations of it, have widely been used in empirical research on the relation between hubris and different metrics of corporate performance. Interestingly, a change in accounting rules in 2006 made modern information available to re-run Malmendier & Tate's (2005, 2008) overconfidence measure study including data on individual's stock options. Consequently, thirteen years after introduction of FASB 158[4], I am now in the position to extend the analysis of Malmendier & Tate (2008), including the additional aspect of gender effects, and with a refined measure of overconfidence linked to the exercise – or not - of stock options. This is especially interesting in light of Alexandridis, Antypas, & Travlos' (2017) estimation-model-based findings, that overconfidence among CEOs decreased after the global financial crisis and the introduction of Dodd-Frank.

In order to investigate executive sex effects on overconfidence and acquisitions, I analyse the levels of overconfidence, as well as the effect on acquisition frequency and short-term market performance. In my dataset I investigate 921 separate firms, where 2,357 executives completed 3,441 acquisitions between 2006 and 2018. I construct this dataset from data on corporate acquisitions (Thomson One), executive compensation and personal details (ExecuComp), firm accounting data (CompuStat) and stock returns (Datastream). Using proven overconfidence measures from Malmendier & Tate (2005, 2008) I find significant results, which are also robust to the inclusion of control variables, fixed effects and different datasets/event windows. The percentage of executives classified as overconfident is not conclusively different between female and male executives. While one overconfidence measure leads to significantly different percentages of overconfident executives between the sexes, the other does not find significant differences. Furthermore, I find that female executives undertake significantly fewer acquisitions than males, irrespective of their overconfidence,

[3] The performance measure in this case is the value of the acquisition to shareholders. This is often measured by the market reaction to the announcement of an acquisition, or the aggregate cumulative abnormal returns (ACAR) over varying event windows (Ma, Pagán, & Chu, 2009).

[4] The introduction of FASB 158 in FAS 123 compels companies to disclose information about the individual stock options granted to their employees.

i.e. both overconfident and rational female executives engage in fewer acquisitions than male executives. Finally, I find the relation between overconfidence and short-term market performance around the acquisition-announcement to be significantly positive, which goes against previous empirical research. The results suggest that overconfidence manifests itself differently in female and male executives.

Using Malmendier & Tate (2005, 2008) as a framework, and using detailed data from ExecuComp, this research extends the academic literature on the market for corporate control by researching whether female and male CEOs have different levels of overconfidence and acquisition performance and, crucially, whether a potential performance differential is driven by gender differences in hubris.

Of interest to my research is existing literature on the effect of overconfidence on corporate acquisition performance. Malmendier & Tate (2008), the main underpinning of this paper, show that overconfident CEOs overestimate merger synergies and overpay for the target, generating significantly lower ACAR than 'rational' CEOs. Levi *et al.* (2008, 2014), look into corporate acquisitions by female CEOs and overconfidence, finding bid premiums are significantly lower when female executives or board members are involved. They focus on the bid premium and target ACAR, though.

I, however, will be focussing on acquirer returns. Furthermore, Levi *et al.*'s dataset is relatively limited, containing only four unique female bidding CEOs. Huang & Kisgen (2013) find that firms with a female CEO/CFO are less likely to engage in value destroying acquisitions, using a difference-in-differences framework.

Furthermore, I look into empirical research on the psychological differences between men and women, the relation between executive sex diversity in management and firm performance, the value generated by corporate acquisitions and the effects of overconfidence generally.

I set out to add to empirical research on corporate acquisition performance such as in Agrawal, Jaffe, & Mandelkar (1992); Andrade, Mitchell, & Stafford (2001); Franks, Harris, & Titman (1991); Jensen & Ruback (1983); Moeller, Schlingemann, & Stulz (2005), especially with regards to a potential gender performance gap as in Huang & Kisgen (2013); Levi *et al.* (2008, 2014). In addition I contribute to academic literature on the effects of overconfidence on firm performance (Campbell, Gallmeyer, Johnson, Rutherford, & Stanley, 2011; Malmendier & Tate, 2005, 2008) and by following Ho, Huang, Lin, & Yen (2016),

The remainder of the paper is organised as follows. In section 2, I look into relevant empirical literature and form my hypotheses, while section 3 covers the methodology and data. In section 4 I present the descriptive statistics, while I show the main empirical findings in section 5. I show the robustness, limitations and implications of my research in section 6 and finally I conclude the paper.

## 2. Literature review and hypotheses

### *2.1 Corporate acquisition performance*

An extensive catalogue of academic papers researches the value created by corporate acquisitions, to both acquiring and target shareholders. In theory, a rational manager would only bid to acquire a company if it increases value for shareholders, i.e. through synergies, increased market power or misvaluation of the acquirer or target. While results across empirical research vary, the findings generally point to gains flowing to target shareholders at the cost of acquiring shareholders. Andrade *et al.* (2001) investigate 4300 mergers in the US between 1973-1998, finding that total deal 3-day ACAR amounts to 1.8%, with all of the value flowing to target shareholders. In their research review, Jensen & Ruback (1983) find a similar tendency: target shareholders experience positive returns while acquirers have no significant ACAR. Franks *et al.* (1991) and Martynova & Renneboog (2008) also find bidder announcement returns to not be significantly different from zero. Alexandridis, Petmezas, & Travlos (2010) find public acquisitions financed with cash to have at best zero abnormal acquirer returns, while equity bids lead to negative abnormal returns.

Other empirical evidence actually points to even worse results for acquirers. Moeller, Schlingemann, & Stulz find in their 2004 paper that acquirers, on average, lose $25M per acquisition, while their 2005 research shows that between 1998-2001 total ACAR was -$240B, or 12% of total deal value being destroyed. Hackbarth & Morellec (2008) looked into 1086 takeovers between 1985-2002, finding significantly negative abnormal acquirer returns. These findings are corroborated by another study, Officer (2003), whose 1988-2000 sample of 2511 merger bids generates significantly negative ACAR-7 of -1.24%. Agrawal *et al.* (1992) found acquiring shareholders to suffer abnormal losses of about 10% over the five-year, post-merger period. In both their 2012 and 2013 papers, Alexandridis *et al.* find acquisition quality to improve after the introduction of more governance measures and regulation in recent years, but value destruction for acquiring shareholders is still found to be significant.

The general consensus is clearly that acquiring firms fail to realise synergistic or other added value due to the bid premiums they pay. Capron & Pistre (2002) find that acquirers only generate positive ACAR in imperfectly competitive markets, a finding supported by Song, Tippett, & Vivian (2017), showing that Chinese acquirers have, on average, positive ACAR. Interestingly, empirical results have also shown that female CEOs and board members have a negative effect on bid premia paid during acquisitions (Levi *et al.*, 2008, 2014), leading to higher ACAR than male CEOs (Huang & Kisgen, 2013).

### *2.2 Overconfidence*

In their 2013 study Ben-David, Graham, & Harvey state that managerial hubris may take two forms. The first is optimism, which indicates an overestimation of the mean. The other is overconfidence,

which might manifest itself through miscalibration[5], the better than average effect[6] or the illusion of control[7]. To avoid confusion I will follow Malmendier & Tate (2005, 2008) by using overconfidence to indicate overestimation of endogenous outcomes, such as personal ability/talent or the return on investment decisions. I use optimism to indicate overestimation of exogenous outcomes, such as economic growth. Ferris, Jayaraman, & Sabherwal (2013) find overconfidence to be an international phenomenon, which is most extensively observed in Christian countries that emphasise individualism. Differing personality traits between men and women might lead to an overconfidence differential, which in a corporate setting can have significant effects.

One might argue that optimism is a beneficial trait to have in a leader. Indeed Phua, Tham, & Wei (2018) find that firms led by overconfident CEOs induce greater employee and supplier commitment: while employee turnover is 2.4% lower, holdings of company stock by employees is 2.7% higher. For suppliers, business relationships last longer and R&D intensity is higher, with overconfident CEOs generating higher future gross profitability in the process (Phua *et al.*, 2018). Additionally, empirical evidence has shown that overconfident CEOs invest more in research & development (R&D), achieve greater innovation [even after controlling for increased R&D spending] (Hirshleifer & Low, 2012) and that they exert more effort to learn about new projects (Gervais et al., 2011). Furthermore, Goel & Thakor (2008) find that moderate levels of overconfidence in CEOs are beneficial to firm value as they avoid underinvestment, due to the positive link between confidence and risk appetite. Psychological research indicates that overconfidence has a positive effect on personal social status, even after a lack of performance or knowledge becomes apparent, i.e. people still judge overconfident people more positively even after being informed of their unremarkable performance of incompetence (Kennedy, Anderson, & Moore, 2013).

However, overconfidence also has its downsides. In a 10-year panel aggregating over thirteen thousand expected stock market return probability distributions, CFOs of large US companies are shown to produce distributions that are too narrow, i.e. miscalibration is shown to lead CFOs to severely underestimate riskiness of the market, but also their own investment projects (Ben-David *et al.*, 2013). Additionally, it increases cash flow sensitivity, i.e. CEOs overinvest[8] when internal funds are ample and underinvest[9] when cash is scarce (Ben Mohamed et al., 2014; Malmendier & Tate, 2005, 2008). Furthermore, overconfident CEOs generate significant underperformance in SEOs[10], with the negative market performance being driven by a post-offering fall in operating profit, driven by overconfidence (Andrikopoulos, 2009). Ho, Huang, Lin, & Yen (2016) show banks with overconfident CEOs to be

[5] Overprecision, or excessive confidence as regards having accurate information (Kent, Hirshleifer, & Subrahmanyam, 1998)
[6] The perception of people to have above-mean talent/performance, e.g. driving skills (Stevenson, 1981)
[7] The habit of individuals to feel inappropriately confident when factors from skills situations are introduced into a random chance environment (Langer, 1975)
[8] Invest in projects, even though they do not create value for shareholders
[9] Forego investment opportunities, even though they increase value for shareholders
[10] Seasoned Equity Offering, or the practice of bringing new shares to the market after already being a publicly traded company

more aggressive in their lending behaviour while also having higher leverage growth. Due to these choices, the overconfident banks suffer large capital losses in crisis years as their bets turn sour. As a result, their operating and stock performance worsens more severely and their probability of default is also higher (Ho *et al.*, 2016). Strikingly, Ho *et al.* (2016) also find that banks that were overconfident remain so after experiencing the aforementioned detrimental effects in a financial crisis. For example, overconfident banks which suffered through the 1997 Asian financial crisis still displayed the same overconfident behaviour in the 2007 global financial crisis. Yilmaz & Mazzeo (2014) show the appointment of an overconfident CEO causes a significant negative price reaction at the announcement, which persists for the subsequent year.

### *2.3 Overconfidence in corporate acquisitions*

Roll (1986) states that takeovers, as a corporate event, are susceptible to irrationality. This is due to the decision-making lying, to a large degree, with one person. Of relevance here is what is known as the winner's curse. This describes the phenomenon where due to imperfect information, market participants have a certain degree of noise in their valuation estimates. In the case of bids between participants with similar fundamental values, e.g. as is the case with industry-mergers (they generate similar synergies/market power advantages), the bidder with the largest noise error wins the bid (Roll, 1986; Thaler, 1988). Therefore, in order to compensate for the winner's curse, rational managers should alter their bid downward from their estimated value. Decision-makers with hubris fail to do so as they overestimate the value they will be able to extract.

Malmendier & Tate (2008) find that overconfident CEOs overestimate their ability to create value. In their 1980-1994 sample of 477 large public US firms, they find that as a result of overconfidence, CEOs are more likely to engage in merger activity when they have ample internal resources. This is due to the higher investment cashflow sensitivity associated with overconfidence. In addition Malmendier & Tate (2008) show that the overconfident CEOs are more likely to engage in diversifying[11] mergers bids. In line with these findings, Brown & Sarma (2007) also find overconfident CEOs to be more likely to make acquisitions, especially diversifying ones. As a result of their overconfidence, these managers generate significantly lower announcement returns compared to rational CEOs (Malmendier & Tate, 2008).

### *2.4 Differing personality traits between the sexes*

Academic literature on the differences between men and women in general and in a corporate setting is abundant. Anecdotal evidence leads me to believe the gender imbalance is due to both *the old boys'*

[11] When a company buys a target from another industry this is seen as a diversifying merger. In the third merger wave, after the Great Depression, diversifying mergers were very popular leading to large conglomerates, such as GE. More recently, however, we have witnessed the downfall of conglomerates, as the wildly differing business operations do not lend themselves for synergies. Empirical research has shown diversifying mergers to lead to adverse market reactions (Morck et al., 1990)

*club* but also in large part due to differing character traits. The latter assumption finds support in academic literature, with research showing that females are significantly more risk averse than men (Byrnes, Miller, & Schafer, 1999; Jianakoplos & Bernasek, 1998; Powell & Ansic, 1997). Furthermore, men are proven to be more overconfident, especially with regards to what is known as the better-than-average effect (Yang & Zhu, 2016), the psychological phenomenon where a majority of people judge their abilities to be above the mean. In investment experiments men are shown to also trade significantly more frequently than women. Their overconfidence leads them to believe they can beat the market, whereas in reality they accumulate transaction costs, leading them to suffer worse returns than female traders (Cueva, Iturbe-Ormaetxe, Ponti, & Tomás, 2019; Sundén & Surrete, 1998).

It is also shown that women enter a game less frequently than men if they have to self-select by ability because they rationally anticipate their performance (Danková & Servátka, 2019). The tendency for males to bluff, in this case, could also be a possible explanation why they are still overrepresented in high level corporate positions.

### *2.5 Female management performance*

Hypotheses on the effect of managerial gender diversity have been extensively researched. Female board members have been shown to have higher attendance rates than their male counterparts, and as their representation on the board increases, male attendance improves (Adams & Ferreira, 2009). Furthermore, women in the top management team of a firm decrease systematic risk[12] as well as company stock variance and standard deviation (Perryman, Fernando, & Tripathy, 2016). When it comes to women in the top job, US firms with female CEOs have shown to perform better (as measured by return on assets) and have lower firm risk. Research by Huang & Kisgen (2013); Khan & Vieito (2013) has shown that when it comes to corporate acquisitions, female executives make them less frequently and outperform their male counterparts when it comes to announcement returns.

Female board membership can have beneficial effects on several different measures of accounting performance (Bennouri, Chtioui, Nagati, & Nekhili, 2018), operating performance and asset valuation (Bernile, Bhagwat, & Yonker, 2018), and return on assets (Carter, D'Souza, Simkins, & Simpson, 2010). The evidence regarding market performance[13] is inconclusive. While Bennouri *et al.* (2018), in their sample of 394 French firms between 2001-2010, find that increased female directorship negatively affects market performance, Campbell & Mínguez-Vera (2008) find the opposite to be true in their 1995-2000 sample of Spanish firms. They also establish the direction of causality to be from gender to performance, and not the other way around. These findings are confirmed by Perryman, Fernando & Tripathy (2016), who show, using a US sample between 1992-2012, the presence of female directors in the top management team significantly and positively affects firm performance.

[12] As measured by Beta, the correlation of a stock to the market.

[13] As measured by Tobin's Q. A recent paper by Bartlett & Partnoy (2018), however, warns against the use of simplified Tobin's Q as a performance measure, as it produces biased estimates due to omitted variables.

Conversely, other researchers have found no significant relationship between gender diversity on boards and firm performance. While researching Dutch and Danish firms in 2007, Marinova, Plantenga, & Remery (2016) find no significant relationship between gender and firm performance. Robb & Watson (2012) find no significant difference in survival rates or Sharpe-ratio[14] when comparing male- and female-led ventures in the US. Lee & James (2007) find that shareholders react significantly more negatively to the appointment of a female CEO than a male one.

While gender diversity in management often seems to have some benefits, introducing mandatory quotas to effectuate more female executives seems to be detrimental to firm performance. Ahern & Dittmar (2012) show that the introduction of the Norwegian quota system[15] led to a significant drop in stock prices when the law was announced, followed by a fall in performance (as measured by Tobin's Q) in the subsequent year. While quotas might lead to negative performance through their association with tokenism, Joecks, Pull, & Vetter (2013) show that the required percentage is not just an arbitrary number: they find a u-shaped link between gender diversity on boards and firm performance, only after a critical mass of 30% does the effect become positive, rejecting the tokenism hypothesis.

### *2.6 Hypotheses*

Most of the existing research focusses on the effect CEOs have on corporate decision making and performance. However, this poses a challenge to the research question posed here, as the percentage of female CEOs is rather low. Therefore, in the study reported here, CFOs are also included in the sample. The aim is to thereby widen the research base into the effect of executives' sex and overconfidence on acquisitions. In doing so, the example of Huang & Kisgen (2013) is followed, who also researched the decisions made by male and female executives and the role of overconfidence. CFOs are shown to have a significant effect on corporate investment and financial policy (Bertrand & Schoar, 2003), so their addition should not distort the dataset used here.

The main goal of my research is to find whether female and male executives display different levels of overconfidence and whether their sex and differing levels of overconfidence affect corporate acquisitions. Specifically, I look into acquisition frequency and short-term performance.

While the literature on different personality traits between men and women mentioned above, such as Byrnes *et al.* (1999); Jianakoplos & Bernasek (1998) and Powell & Ansic (1997) shows that women are more risk averse than men and that men are more overconfident than women (Barber & Odean, 2001; Yang & Zhu, 2016), some papers suggest that female *CEOs* are not necessarily less overconfident than their male counterparts. Goel & Thakor (2008), for example, show that, regardless of sex, the overconfident manager has the highest probability of being promoted to CEO when

[14] Measure of investment's excess performance over a risk-free asset, after adjusting for its risk

[15] Under the Norwegian law females must account for at least 40% of seats on the board, or a company faces dissolution.

competing with otherwise rational managers. Lemaster & Strough (2014) prove that risk tolerance is not related to executive sex. Instead it is related to adherence to traditionally masculine traits, across both sexes. This might mean that, regardless of sex, people with traditionally masculine traits are more likely to become CEOs. If this were to be the case, then this study should not be able to find a significant difference in overconfidence levels between the women and men executives, be they CEOs or CFOs.

On the contrary, Cueva *et al.* (2019) show in their experiment that while there is a gender gap in trading activity between men and women, this gap persists even when taking into account only overconfident traders. Consequently, while it is not expected to find no overconfidence among female executives, one could expect there to be relatively less overconfidence. Therefore, the first hypothesis is:

*Hypothesis 1: the share of female executives classified as overconfident is relatively lower than the share of male executives.*

Following research by Barber & Odean (2001) and Cueva *et al.* (2019) suggesting that men trade significantly more than women in an experimental setting, I expect male executives to engage in more acquisitions than their female counterparts. Huang & Kisgen (2013) and Levi *et al.* (2014) prove empirically that firms with female directors/CEOs are less likely to engage in acquisitions. This can be put in the context of the Malmendier & Tate (2008) study, which showed overconfident CEOs are more likely to engage in acquisitions. The juxtaposition of these results suggests that the difference between male and female executives in acquisition frequency could hold even after taking overconfidence into account. Therefore, my second hypothesis is:

*Hypothesis 2: female executives conduct less acquisitions than male executives.*

Finally, following Malmendier & Tate (2008), overconfident executives can be expected to create lower shareholder value than rational executives, as measured by ACAR. Given the expectation formulated in hypothesis 1, it therefore logically follows that, on average, female executives generate better returns on acquisitions than their male counterparts. This would seem to be backed by the findings of Levi *et al.* (2008, 2014), who show that a significantly negative relation exists between female CEOs/directors and bid premiums, meaning more of the bid value is left to acquiring shareholders. From this, the final hypothesis emerges:

*Hypothesis 3: female executives create more value on average with their acquisitions than male executives.*

## 3. Data & methodology

*3.1 Data*

In order to research the relationship between executive sex and overconfidence on corporate acquisition quality, I retrieved several different sets of data from online databases. I started off by downloading details on M&A activity from the ThomsonOne Merger database, using the following consecutive criteria to end up with the acquisition dataset:

| | | | |
|---|---|---|---|
| 1) Acquirer nation | must be | United States of America | yielding 352,675 acquisitions |
| 2) Announcement date | between | 01/01/2006-12/31/2018 | yielding 149,059 acquisitions |
| 3) Acquirer status | must be | public | yielding 53,510 acquisitions |
| 4) Acquirer stock holding | must not exceed | 50% of target before transaction | yielding 52,712 acquisitions |
| 5) Acquirer stock holding | must exceed | 50% of target after transaction | yielding 32,633 acquisitions |
| 6) Deal status | must be | completed | yielding 32,632 acquisitions |
| 7) Deal value | must exceed | $2 million | yielding 15,001 acquisitions |
| 8) Acquirer industry | must exclude | financials (SIC 6000-6999) | yielding 10,973 acquisitions |
| 9) Acquirer industry | must exclude | utilities (SIC 4900-4949) | yielding 10,598 acquisitions |

The search criteria yield 10,598 acquisitions performed over the 13-year period by 3,945 separate firms. The output from ThomsonOne includes the announcement date, acquirer and target SIC codes, deal attitude, payment method, transaction value, acquirer market value prior to the transaction, target public status, a variable indicating whether the acquisition is domestic or international as well as different acquirer identifiers such as 6-digit CUSIP and Datastream codes.

After converting the 6-digit CUSIP into an 8-digit CUSIP, I then downloaded executive compensation data between over the same time-period as the M&A data from WRDS ExecuComp for the acquiring firms from ThomsonOne. Given ExecuComp only contains information on S&P1500 firms, of the 3,945 firms in the M&A dataset, compensation data was available for a sub-set of 1,040. From the 'annual awards table' contained in the ExecComp database, I download data on executive stock and option holdings. However, the bulk of the compensation-related data is retrieved from the ExecComp's 'outstanding compensation table', yielding detailed, grant-level data on option packages (exercise prices, end of year stock prices, expiration dates), as well as executive information (age, sex, tenure). This study concerns exclusively CEO and CFO data, so all other executives were removed from the compensation-related dataset, leaving 1,940 CEOs and 2,257 CFOs.

Stock return data was retrieved from WRDS Datastream using the identifying codes from the ThomsonOne database. This leaves 1,000 firms in my dataset. Finally, dropping firms with insufficient data for the estimation window and merging with the ExecuComp-ThomsonOne data leaves my main dataset containing 1,188 CEOs and 1,203 CFOs at 921 separate firms performing a total of 3,441 acquisitions between 2006 and 2018.

*3.2 Performing an event study*

In order to research the short-term effect of sex and overconfidence on acquirer stock returns, acquirer cumulative abnormal returns (ACAR) need to be generated by performing an event study. The theory of such a study, as well as the required techniques, are covered in S. J. Brown & Warner (1985) and MacKinlay (1997). In this thesis, I rely on the OLS market model. Given that the market model removes the part of the stock return generated by the variance of the market, it potentially increases the ability of the model to detect event effects (MacKinlay, 1997).

The market model calculates abnormal returns by subtracting expected returns under normality from the actualised returns for an individual firm. The expected returns are given by Alpha and Beta times the market return. For this analysis, given my sample consists of S&P1500 constituents, the market is naturally defined by the S&P1500. In order to calculate Alpha and Beta, a regression needs to be executed of the firm's returns under normal circumstances against the market return. The firm's returns under normal circumstances are calculated in what is called the estimation window or period, well in advance of the announcement.

Research into abnormal returns and M&A announcements generally use an estimation period that ends 40 days before the announcement. In the research presented here, an estimation window of 120 days is used, ending 46 days before the announcement (i.e. an estimation window of [-166, -46]). Using the market model, I calculate daily abnormal returns for each firm. The event window, or number of days around the event used to calculate the cumulative abnormal returns, are set at 3 (i.e. an event window of [-1, +1])[16].

*3.3 Measuring overconfidence*

In their 2005 paper, Malmendier & Tate construct a measure for CEO overconfidence based on the exposure to their firm's idiosyncratic risk through the CEO's equity/option payment packages. As CEOs are not able to trade their options or short sell company stock to hedge their risk, they can only choose to exercise their options or hold onto them. Lambert, Larcker, & Verrecchia (1991) show that a risk averse manager values their compensation contract significantly lower than the costs that would be perceived by shareholders due to the significant portion of the manager's wealth tied to the firm's stock price. The value to a manager decreases as the equity/option package takes up a larger percentage of their total wealth: it could be said they become overexposed. Naturally, the value to a manager increases as the stock price exceeds the price at which the option would allow them to buy. A rational risk averse manager would therefore exercise their options early, once they reach a sufficiently high price (Hall & Murphy, 2002; Lambert *et al.*, 1991). Malmendier & Tate (2005) however, find that a subset of CEOs consistently fails to exercise their options after vesting, even though the options are sufficiently in-the-money. In 2008, Malmendier & Tate published the application of their overconfidence measure to a set

[16] As robustness checks, I also ran my regression analysis with event windows of 5 (-2, +2) and 11 (-5, +5).

of corporate acquisitions using data from Hall & Liebman (1998) and Yermack (1995), as these contain detailed information about CEOs' personal portfolio. They found that overconfident CEOs make worse acquisitions. However, the study I present here does not use this dataset for a trio of reasons. Firstly, it is not publicly available. Secondly, it contains only a limited number of dated[17] observations. Finally, and most importantly in the context of this thesis research, it contains a negligible number of female CEOs.

In order to investigate the overconfidence measure using more recent data, researchers have long relied on an estimation model introduced by Campbell, Gallmeyer, Johnson, Rutherford & Stanley in their 2011 paper. Using Core & Guay's 2002 estimation model, Campbell *et al.* (2011) estimate the average exercise price of aggregated options in order to compensate for the lack of option-grant-specific exercise prices and confirm Malmendier & Tate's 2008 findings. Based on the detailed database of option holdings and Hall & Murphy's 2002 model, Malmendier & Tate set the level of option moneyness at 67% in order for a CEO to be classified as overconfident. Campbell *et al.* (2011) however, opt for the moneyness level of 100%. However, Campbell's data did not include individual option grants data such as grant dates, expiration dates or exercise prices. The estimation of average moneyness, therefore, is subject to some potentially cofounding factors, given that moneyness at any time varies with the stock price (Malmendier & Tate, 2015).

Interestingly, a change in accounting rules in 2006[18] made the information required to re-run an analysis with an analogous overconfidence measure to that in Malmendier & Tate (2008) available, but now with modern data. The Outstanding Equity Awards table in ExecuComp contains information such as the option exercise price, expiration date, number of underlying securities and year-end closing price. This enables *Holder67* and *Longholder* measures to be developed using the updated data, as demonstrated in Malmendier & Tate (2015). Following Malmendier & Tate (2008) the two overconfidence measures mentioned above are constructed as follows:

*Longholder:* This dummy variable indicated which CEOs hold an option until the year of expiration, at least once during their tenure. The second requirement is that the option is at least 40% in-the-money entering its final year. Malmendier & Tate (2008) base the 40% moneyness on the model by Hall & Murphy (2002)[19]. If a CEO is classified as a *Longholder,* the indicator turns to 1 for all the CEO-years, introducing a managerial fixed effect.

*Holder67:* The second overconfidence measure is a dummy variable focusing on newly vested options. As stated earlier, rational CEOs should exercise their options as soon as they vest, given they are sufficiently in-the-money. Most options grants vest in their fourth year, therefore, this measure looks at options with five years remaining until expiration. As the name suggest, the percentage in-the-money,

[17] Data collected among 477 large publicly traded U.S. firms between 1980-1984

[18] The introduction of FASB 158 in FAS 123 compels companies to disclose information about the individual stock options granted to their employees.

[19] Using constant relative risk aversion (CRRA) of three and 67% of wealth in company stock.

based on the same assumptions from Hall & Murphy (2002) used for *Longholder* mean the options must be at least 67% in-the-money. The sample from which *Holder67* is constructed only contains executives that have the possibility to act in an overconfident way, i.e. excluding executives with options grants that are less that 67% in-the-money with 5 years until expiration. Option moneyness of the individual grants is calculated as[20]:

$$\frac{stock\ price}{exercise\ price} - 1 = \frac{PRCFF}{EXPRIC} - 1$$

*3.4 Control variables*

Before regressing executive sex and overconfidence on acquisition frequency/performance can proceed, a number of control variables need to be added so as to maximally ensure the relationships found are - in fact - driven by executive sex. When it comes to mergers & acquisition, empirical literature has shown there are many different variables that affect the acquisition performance (Alexandridis et al., 2017). In addition to the control variables (discussed below), I will also be including acquirer fixed effects, as they has been shown to double the explanatory power of merger regressions (Golubov, Yawson, & Zhang, 2015), when added on top of managerial fixed effects, such as one of the overconfidence measures. The following sections elaborate on the control variables chosen for inclusion.

*3.4.1 Executive specific control variables*

Lastly, I also introduce controls for executive-specific variables, in addition to our main variable of interest: executive sex. Research by Barber & Odean (2001) suggests younger executives are more willing to engage in M&A activity, therefore I control for executive age (AGE).

As in Hirshleifer & Low (2012), I also control for executive stock ownership and vested options. This, in order to control for the positive effect of executive incentive alignment, or the negative effect of excessive compensation. Stock ownership (STKOWN) is defined as the share of outstanding common equity owned by the executive. Following Malmendier & Tate (2008), vested options (VESTOP) is defined as the vested options (exercisable within 6 months) as a fraction of outstanding common equity, multiplied by 10[21]. Finally, I also control for CEO tenure (TENR) following Ferris, Jayaraman & Sabherwal (2013) and Malmendier & Tate (2005).

[20] Assuming option grants are awarded at-the-money (Hall & Murphy, 2002). The equation displays the formula for option moneyness using the variable names from ExecuComp.

[21] According to (Malmendier & Tate, 2008) this makes the measure comparable to the ownership variable

*3.4.2 Firm specific control variables*

Firstly, following Malmendier & Tate (2008), I control for the acquirer's investment level by creating the CAPEX variable, which is based on the capital expenditures of the firm in a fiscal year.

Free cash flow (FCF) theory Jensen (1988) implies that managers with lots of cash make low value or value destroying acquisitions. This is supported by empirical results from Malmendier & Tate (2005, 2008), which define free cash flow as earnings before extraordinary items plus depreciation. No normalisation for the beginning of year capital is required in this study (unlike in Malmendier & Tate (2008)), as the dataset here is chosen so as to exclude financial firms. This is mainly due to the volatility of their stock returns, which holds especially for the 2008-09 financial crisis and the following period.

Maloney, Mccormick, & Mitchell (1993) find a significantly positive relationship between leverage and the market assessment of takeover costs, i.e. acquisition performance. They hypothesise this is due to the fact that agency costs are real and the interest obligations of debt mitigate this issue. Therefore, a control variable tracks the debt-to-equity ratio (LEVRG), defined as total long-term debt divided by total common equity.

Moeller, Schlingemann & Stulz (2004) show a size effect exists on acquisition ACAR, with larger firms experiencing lower acquisition gains than small acquirers. Firm size is defined as the natural logarithm of total assets. Moeller *et al.* (2004) also find that the market performance measure Tobin's Q is negatively related to ACAR. Malmendier & Tate (2008) also control for Q in their research. The control variable (Q) is defined as the ratio of market value of assets[22] to by book value of assets.

*3.4.3 Deal specific control variables*

Fuller, Netter, & Stegemoller (2002) show that bidders who acquire a public target have significantly negative ACAR while acquirers who buy a private target enjoy significantly gains. Therefore, I introduce the dummy variable PRIVA, which equals 1 if the target is a private firm and 0 is the target is a public firm.

Hostile takeovers are shown to lead to lower acquirer returns. This is due to the fact that the resistance of management to the takeover often leads to an increased offer from the bidder in order to convince target shareholders to sell (Martynova & Renneboog, 2008). In order to control for this phenomenon, I create a dummy variable HOSTL, that takes the value 1 when a merger was classified as hostile.

A well-documented fact throughout empirical M&A research is the significantly positive effect of cash-funded acquisitions compared to equity acquisitions (Andrade *et al.*, 2001; Travlos, 1987). This is due to the signalling effect of financing an acquisition with equity, as this implies to the market that the management believes their shares are relatively overvalued compared to cash (Myers & Majluf,

[22] $Total\ Assets\ (6) - Common\ Equity\ (60) + Market\ Equity\ (25 \times 199)$

1984). Therefore, the dummy variable CASH in introduced, which equals 1 if the deal is financed with any combination of cash and debt and 0 if it is financed by equity.

In their 1990 study, Morck, Shleifer, & Vishny find that the subset of firms performing diversifying mergers systematically and significantly underperform bidders engaging in merger activity in a related sector or area of economic activity. Finance theory suggests that individual shareholders are better able to diversify their risk than managers. If the merger means buying an unrelated firm, managers often extract limited synergies and instead mainly diversify the risk on their own human capital, instead of maximising shareholder value. A diversifying acquisition is defined as a bid on a firm in a different industry, measured by the Fama-French 48 industry groups. Therefore, I introduce the dummy variable DIVSF, which equals 1 if the deal is a diversifying acquisition.

Travlos (1987) found a significantly negative effect of relative deal size on acquisition performance. On the other hand, Asquith, Bruner, & Mullins (1983) find the opposite, with a significantly positive relation between relative deal size and ACAR. In order to address this, I introduce the variable RELTV, defined as the deal value[23] divided by market value of acquirer equity (Moeller *et al.*, 2004).

Finally, Moeller & Schlingemann (2005) have shown that cross-border acquisitions perform significantly worse than domestic transactions. Given my sample consists of large US firms, I introduce the dummy variable DOMST, which takes the value 1 if the deal is a domestic transaction.

### *3.5 Outliers*

Some of the control variables are shown to be skewed following a test for normality. In order to combat any ensuing issues, executive stock ownership (STKOWN), executive vested options (VESTOP), firm investment (CAPEX) and relative deal size (RELTV) are winsorised at the 98% level. Tobin's Q (Q) and the leverage ratio (LEVRG) are winsorised at the 99% level and free cashflow (FCF) at the 1% and 99% level.

### *3.6 Regression models*

In order to investigate the first hypothesis, a simple test of different means, as displayed in the summary statistics, suffices. In order to test my second hypothesis, I run an OLS model regressing the frequency of acquisitions by an executive on the overconfidence and sex measures, as well as the executive and firm specific control variables. To further control for exogenous effects (such as, for example, merger waves [R. Brown & Sarma, 2007]), I include year and industry fixed effects.

[23] Excluding fees and costs

$$Frequency_i = \alpha_0 + \beta_1 lholder_i + \beta_2 holder67_i + \beta_3 SEX_{it} + \beta_3 AGE_{it} + \beta_4 TENURE_{it} + \beta_5 STOKOWN_{it} + \beta_6 VESTOP_{it} + \beta_7 CAPEX_{it} + \beta_8 Q_{it} + \beta_9 SIZE_{it} + \beta_{10} FCF_{it} + \beta_{11} LEVRG_{it} + \varepsilon_i$$

A similar OLS model is run to test the third hypothesis, regarding the effect of overconfidence and sex on acquisition short-term performance. This model also includes the deal specific control variables.

$$ACAR3_{it} = \alpha_0 + \beta_1 lholder_i + \beta_2 holder67_i + \beta_3 SEX_{it} + \beta_3 AGE_{it} + \beta_4 TENURE_{it} + \beta_5 STOKOWN_{it} + \beta_6 VESTOP_{it} + \beta_7 CAPEX_{it} + \beta_8 Q_{it} + \beta_9 SIZE_{it} + \beta_{10} FCF_{it} + \beta_{11} LEVRG_{it} + \beta_{12} PRIVA_{it} + \beta_{13} HOSTL_{it} + \beta_{14} CASH_{it} + \beta_{15} DIVSF_{it} + \beta_{16} RELTV_{it} + \beta_{17} DOMST_{it} + \varepsilon_i$$

While these models have a similar design to those in Malmendier & Tate (2008), which focus on the effect of overconfidence and not executive sex, the richer dataset on which these regressions are run and the sex dummy variable allows me to infer the effects on acquisition frequency and short-term performance.

The total dataset is divided into four separate samples, which are then used for the subsequent analysis. Firstly, one sample only contains CEOs with the relevant acquisitions. The second sample contains the same acquisitions, linked to the relevant CFOs. Thirdly, a sample containing the appended CEO and CFO samples, named: individual executives. The final sample views the CEO and CFO in each firm-year as a team, i.e. if one of them is either overconfident and/or female, they are both labelled as overconfident and/or female. While this generalisation could be seen as rather sweeping, I believe it is warranted, given the large influence of both CEO and CFO over corporate investment and financial policy (Bertrand & Schoar, 2003). The combined overconfidence and executive sex measures for the CEO/CFO-team sample are simply named LH, H67 and SEX2, corresponding to the *Longholder* and *Holder67* measures, as well as executive sex, respectively. The purpose of the fourth dataset is to investigate whether female/overconfident executives can influence their male/rational colleague.

## 4. Descriptive statistics

In this section I present additional information about the dataset used in this research, in order to provide some background and make the results more easily comprehended. As I mentioned earlier, the sample consists of 3,441 acquisitions performed by 1,185 CEOs and 1,201 CFOs at 921 firms between 2006 and 2018. Of the sample's CEOs 4% are female, while female CFOs amount to 10% of the total. The average number of acquisitions is 869 per year, with an average deal value of $524 million.

The description starts with Figure 1, which displays the annual acquisition frequency and average deal value. Obvious outliers with regards to deal frequency are 2006 and 2007, which is in line with the sixth merger wave (Alexandridis et al., 2012). During the 2008 financial crisis the number of acquisitions, predictably, contracted. Interestingly, however, the number of deals does not seem to rebound after the end of the crisis[24], stabilising around 800 acquisitions per year. While acquisition frequency does not increase after the 2008 financial crisis, acquisition value does so, and significantly. Another outlier is the spike in average deal value in 2009, which might be attributable to some outliers in deal size[25] and the relatively low deal frequency.

### *4.1 Main descriptives*

In Table 1 the summary statistics are reported. Most variables have more than 6,500 observations, while the dataset only consists of 3,441 acquisitions. This is due to the fact that I include both CEOs and CFOs in the dataset, i.e. most acquisition have two executive-observations[26]. As the data on executive tenure is only available for CEOs it is excluded from the majority of the analyses.

In Panel A, I display the values for the three abnormal return event windows employed in the analysis: a three-day window (-1, +1), five-day window (-2, +2) and an eleven-day window (-5, +5). In line with research by G. Alexandridis et al. (2017) & Song et al. (2017), I find ACAR to be moderately positive. These positive values hold across event windows, and are all statistically significant at the 1%-level.

In Panel B, I show information on the different overconfidence measures employed in the analysis. The mean percentage in-the-money for the option packages is around 99%, pointing to a large average appreciation in the stock price during the options' lifetime. However, this is likely to be driven by outliers (one option package was over 20,000% in-the-money), given the median percentage in-the-money is about 32%. As the percentage in-the-money is not directly used for the statistical analysis, but rather to generate the overconfidence measures themselves, I accept such skewness in this particular case.

[24] This is not indicative for all M&A activity, just acquisitions by large US firms not in the financial sector

[25] Including Pfizer's $68B acquisition of Wyeth, Berkshire Hathaway's $44B investment in BNSF and Merck & Co.'s $48B acquisition of Schering Plough.

[26] Some acquisitions are linked to only one executive because either the CEO is also listed as CFO in ExecuComp, or there is no data available for one of the executives.

In the sample, more than 29% of executives are classified as being a *Longholder* (holding the options until the year before expiration, even though they are at least 40% in-the-money). This is noticeably higher than the proportion of *Longholders* in Malmendier & Tate (2005, 2008), which is 11%. This might be due to the more widespread adoption of options as incentivisation and compensation for executives. Malmendier and Tate list this as a possible reason in their 2015 paper, finding a comparable fraction of *Longholder* executives to my research. *Holder67* has more relaxed requirements (holding vested options that are at least 67% in-the-money), leading to an even larger percentage of executive qualifying in the present analysis: almost 73%. For the CEO/CFO-team combined measures we find similar values: 37% of executive teams are *Longholders* and more than 75% qualify as *Holder67*.

Despite its relatively large absolute size, the sample I use comprises merely 7% female executives. Nevertheless, this still means nearly 400 female executive-observations, which is a significantly larger number than formed the basis of research such as Huang & Kisgen (2013). The values reported above are different from the values in Table 1: Descriptive Statistics. This is due to the fact that the values of the aforementioned variables in Table 1 is with respect to executive-firm-years, while the percentages for the variables above are for the individual executives. A large majority of targets are private firms (84%) and American based (73%). Cash acquisitions are more pervasive than stock, which may be a remnant from the sixth merger wave (Alexandridis et al., 2012).

*4.2 Descriptives split by executive sex*

For the following part of the analysis, my sample is split by sex, in order to investigate their differences with regards to the descriptive statistics. In order to garner meaningful takeaways, a t-test is used to determine the presence/absence of significant differences. The results of this brief analysis are reported in Table 2. Interestingly, female executives are significantly less overconfident with regards to the *Longholder* measure, yet there is no significant difference between female and male executive overconfidence when measured by *Holder67*. This same pattern holds for the combined CEO/CFO executive-team measures for overconfidence.

Other findings include: female executives are younger, own less company stock and vested options, engage in less diversifying [value destroying (Morck *et al.*, 1990)] mergers and head-up firms with larger free cashflow. This simple analysis provides a partial answer to my first hypothesis. It appears that female executives are less or equally overconfident than their male counterparts, depending on the measure. The results for *Longholder* offer support for studies showing women are more risk averse than men (Byrnes et al., 1999; Jianakoplos & Bernasek, 1998; Powell & Ansic, 1997; Sundén & Surrete, 1998), whereas the *Holder67* results are in line with research suggesting that levels of risk aversion are part of human traits, typically viewed as male (Lemaster & Strough, 2014), which be subject to self-selection in examples such as corporate executives (Danková & Servátka, 2019).

Furthermore, while both measures are used as indicators of overconfidence, they might point to a different psychological aspect all together. (Ben-David et al., 2013) make a distinction between different kinds of overconfidence, the two most applicable in this case of M&A behaviour are the better-than-average effect and the illusion of control. However, on the basis of the data at hand, it is difficult to point out which overconfidence measure correlates with which type of overconfidence. It can be argued that an executive who holds vested options that are 66% in-the-money is equally overconfident as an executive that holds options that are 68% in-the-money. However, for an executive to hold their options until the last year before expiration while they are 40% in-the-money involves a different kind of risk-seeking behaviour that might differ between men and women.

Additionally, the estimation of the two measures might contribute: while *Longholder* is a very restrictive measure due to its requirement to hold the options until the year before expiration, *Holder67* has more relaxed assumptions. This is also observed from the descriptive statistics in Table 1. While it might be due to the less restrictive nature of the *Holder67* measure, these results indicate that female executives are equally willing to hold in-the-money options, but are less willing to hold them until expiration. However, untabulated results indicate the mean amount of years to expiration, for the executive option packages, do not differ significantly across executive sex.

The situation relayed in (Hall & Murphy, 2002), which uses the constant relative risk aversion and the percentage of executive wealth in company stock to calculate the moneyness level at which executives would ordinarily exercise their options might also cause this discrepancy. If female executives have a significantly different percentage of wealth in company stocks (i.e., lower than male executives), their moneyness-level in order to be classified as overconfident would be different. However, I have no access to data with regards to the composition of executive's personal wealth.

*4.3 Correlations*

In Table 3, I report the pairwise correlations for the overconfidence measures and the three sets of control variables. Table 4 presents the same, but using the combined CEO/CFO executive team overconfidence measures. Panel A displays the correlation levels between the overconfidence measures and executive-specific controls. Panel B shows the same for firm-specific controls and panel C displays correlation levels for acquisition-specific controls. The correlations between the overconfidence measures and the control variables are all weak. The low correlation between the two overconfidence measures confirms my previous statement that they might point to different types of risk-seeking behaviour. As reported in the descriptive statistics, only the *Longholder* measure is significantly correlated with executive sex.

Some correlation coefficients are moderately strong, or even strong. For example, the correlation between the percentage of outstanding stock owned by the executive and the relative amount of vested options owned exhibit a correlation coefficient of close to 0.7. While this is completely intuitive, it is

getting close to the 0.9 correlation coefficient, described by (Dohoo, Ducrot, Fourichon, Donald, & Hurnik, 1997) as almost certainly presenting multicollinearity. In addition, (Dohoo et al., 1997) state that such issues could also arise at lower levels of correlation. While most coefficients are well below these risky levels, data is double-checked using the variance inflation factor (VIF), which, following (Lin, 2008), should not exceed 10. The values in Table 4 show very similar correlation levels between the overconfidence measures and the control variables.

## 5. Empirical results

In this section of the research I will present the results of my empirical analysis. I will show the coefficients and statistical significance in the tables and, after describing those values, I will discuss the economic implications of my findings.

### *5.1 Acquisition frequency*

Following the simple t-test from the previous section I use regression analyses to answer my second and third hypotheses. I start off by analysing the relation between executive overconfidence/sex and acquisition frequency. Using the previously described dataset I regress the dependent variable - the number of completed acquisitions per executive between 2006-2018 - on my independent variables of interest, on the overconfidence measures as well as on executive sex. In addition, I include a number of control variables. Finally, as M&A-activity occurs in waves (Martynova & Renneboog, 2008) I use year and industry fixed effects to control for heterogeneity. In all regressions I use robust standard errors. Due to collinearity I exclude the control variable *Hostile* from the combined analyses.

Table 5 displays the four regressions I performed on two different datasets. Firstly, I look at the individual executives using both *Longholder* in regression (1) and *Holder67* in regression (2). Hereafter, I apply the same analyses to the dataset of CEO/CFO-combined groups, generating regressions (3) and (4). As mentioned previously, I use year and industry fixed effects, as well as the executive-specific and firm-specific control variables. Mean VIF for the independent variables ranges from 1.57-1.61, well short of the maximum threshold mentioned in Lin (2008). The variables of interest are all highly significant (i.e. at the 1% level), with p-values of less than 0.01. As a matter of fact, in all cases but one, p-values are 0.001 or lower, indicating the model is reliable due to the very low likelihood of falsely rejecting the null hypothesis.

In all four regression analyses, the overconfidence measures are significantly positive. This means that overconfident executives are more frequently engaging in acquisitions than their rational counterparts, on average. In the case of a *Longholder*-executive, the coefficient is 2.017. This means that a *Longholder*-executive engages in twice as many acquisitions, on average. This finding is in line with Malmendier & Tate (2008), who find overconfidence increases the likelihood of a CEO to engage in mergers. The finding is also in line with research by Brown & Sarma (2007), indicating that overconfident CEOs acquire more frequently while also engaging in more diversifying mergers. The coefficient for a *Holder67*-executive is lower, at 1.64. This means that while *Holder67s* engage in more acquisitions than rational executives, they are still out-acquired by *Longholders*. This finding is in line with my previous assumption that *Longholder* executives are more overconfident than *Holder67s*.

Furthermore, and equally crucial to my second hypothesis, the two executive sex variables (one for individual executives and one for the CEO/CFO-combined teams) are also highly significant. However, as opposed to the overconfidence variables, executive sex has negative coefficients throughout the regression analyses. This indicates that a female executive, on average, engages in fewer

acquisitions. This finding is in line with research suggesting that male traders trade more frequently than their female counterparts because they believe they can beat the market (Cueva *et al.*, 2019; Sundén & Surrete, 1998). Interestingly, the coefficient is higher among the CEO/CFO-combined team overconfidence measures, pointing to a stronger relation. While the executive *sex2*-measure is highly significant (p-value <0.001), it is more likely due to the more relaxed assumption of the *sex2* measure, i.e. an executive team need only contain one female executive to be classed as female.

When it comes to the control variables, executive stock ownership and vested options holdings, as well as firm size and the leverage ratio significantly and positively affect acquisitions frequency. The coefficient for executive stock ownership is very high. Corporate investment (capital expenditures) also significantly affect acquisition frequency, however, this relationship is (weakly) negative. These findings are in line with those of Malmendier & Tate (2008), who previously also found that larger firms are more likely to complete acquisitions, as well as a significantly positive relation between vested option ownership and acquisition likelihood.

I can conclusively reject the null hypothesis: female executives perform significantly less acquisitions than their male counterparts. The findings are, therefore, in line with previous research. Roll (1986); Thaler (1988), for example, show that through the winner's curse, the bidder with the largest noise error wins, i.e., the bidder who is most confident in the benefits they can extract from the acquisition. This has the logical conclusion that executives who overestimate the benefits of the acquisition have larger noise errors and therefore win more acquisition bids. In addition, I show similar findings to Malmendier & Tate (2005, 2008), with regards to acquisition frequency and Huang & Kisgen (2013); Levi, Li, & Zhang (2014) regarding the executive sex aspect.

*5.2 Acquisition frequency split by executive sex*

When splitting the analysis by executive sex I find some interesting results. Results are reported in Table 6. Male executives display a highly significant positive effect of overconfidence on acquisition frequency. This holds across both datasets, i.e. for individual executives and CEO/CFO-combined teams, respectively. However, for female executives this does not hold. Only one of the measures (*Holder67* for the individual executives) is significantly related to acquisition frequency. Both overconfidence measures in the combined teams are weakly significant (p-values > 0.08) and therefore, negligible.

Thus, there is very limited evidence suggesting that overconfidence in female executives actually leads to more frequent corporate acquisitions. This evidence is explicit, though, for male executives. This implies that the previous finding – that overconfident executives engage in more acquisitions – is driven by the male executives in the sample. In other words, female executives appear to not let their overconfidence (or optimism) alter their corporate policies with respect to acquisitions. However, I would like to note the differing significance of the control variables between the female and male regressions. While the analyses run on female executives have more explanatory power, as

witnessed from the higher R-squared, almost none of the control variables are significant whatsoever for the female executives. This might also point to problems with the female executives' analyses, possibly due to the relatively limited number of observations.

*5.3 Short-term market performance*

Now that I have shown that female executives perform significantly less acquisitions, a finding that appears to hold for both rational and overconfident female executives, I set out to answer the third hypothesis. Based on the research by Malmendier & Tate (2008), I expect to find a negative relation between the overconfidence measures and short-term market performance, as measured by ACAR. Furthermore, building on the conclusion in the previous section, I predict that female executives engage in fewer mergers and, therefore, have a better market performance (Cueva *et al.*, 2019; Sundén & Surrete, 1998). The tendency for female executives to have better acquisition performance is echoed in Levi, Li, & Zhang (2008); Levi *et al.* (2014). Using an event window of three days (-1, +1) for my dependent variable, ACAR, I find the following results.

Firstly, the mean VIF for the independent variables ranges from 1.44-1.47, indicating very little risk of multicollinearity. In Table 7 I display the results for the four regressions. Similar to previous analyses, I regress individual executives using both *Longholder* in regression (1) and *Holder67* in regression (2), as well as CEO/CFO-combined groups in regression (3) and (4). Once again, I use year and industry fixed effects and executive-specific and company-specific control variables. However, these analyses also include deal-specific controls, as outlined in the methodology. Interestingly, the deal-specific control variables are the only significant independent variables.

First, however, I turn to the variables of interest: the overconfidence measures, as well as the executive sex measures. In this case I find only the individual *Holder67* and combined *H67* measures of overconfidence to be significantly related to short-term market performance. Both *Longholder* measures are insignificant. I assume this difference is attributable to the restrictive nature of the *Longholder* measures, however, previous research found significant results for *Longholder* using the same definition as I do. Another unexpected finding is the significantly positive relation of the overconfidence measures to ACAR, which directly contradicts the findings from Malmendier & Tate (2005, 2008). In both cases the evidence seems to suggest the market reacts more positively to an acquisition announcement by an overconfident executive. Both sex measures are insignificant, leading to the conclusion that the null for hypothesis three cannot be rejected: there is no significant difference in short-term market performance between male and female executives, directly contradicting findings from Huang & Kisgen (2013; Khan & Vieito (2013); Phua, Tham, & Wei (2018).

The most surprising finding is the positive coefficient for the two *Holder67* measures. This appears to support the hypothesis that executive overconfidence has beneficial effects on firm performance, as in Goel & Thakor (2008); Hirshleifer & Low (2012). They argue that moderate overconfidence is favourable, as these executives invest more in R&D and achieve greater innovation,

as well as avoid underinvestment, due to their higher risk appetite. The key word in the previous statement is moderate. I believe this might also explain the surprising results. While the mean percentage option moneyness royally exceeds 67%, the median is about half, at 31.5%. Obviously, this points to a skewed distribution, however, there might also be a concentration of moderately overconfident executives around the cut-off.

Untabulated analysis does point to this concentration: when creating a hypothetical *Holder75* measure - in which executives are classified as overconfident when their options are 75% in-the-money - the percentage of executives considered overconfident drops from 79% to 41%. In Figure 2, I display a histogram showing the frequency of percentage moneyness of all vested options. While there are many options more than 150% in-the-money, I cut them off in order to visualize the bars around 67% moneyness. Some interesting observations: the bar between 50-55% is significantly lower, leading me to believe that this is the option moneyness level where rational executives exercise their options. Furthermore, the bins between 65-80% moneyness are flat, which might indicate a small concentration around the cut-off level. As I stated previously, I do not believe an executive holding options that are 68% in-the-money to be considerably more overconfident than ones who hold options that are 66% in-the-money. This concentration of overconfident executives around the moderate levels might lead to the positive coefficient.

In order to investigate this further, I re-ran regression (2) from Table 7, including all control variables and fixed effects, using twelve different *HolderXX* measures based on twelve levels of option moneyness, i.e. holding on to the *Holder67* requirement for options to be vested (5 years until expiry), I vary the level of option moneyness to create the measures: between *Holder50-Holder300.* I report the results in Table 8, which shows there to be no clear trend between the level of options moneyness (in constructing different *HolderXX* measures[27]) and the effect on short-term market performance as measured by 3-day ACAR. *A priori*, I would have expected the coefficients to display a broad peak-shaped distribution, i.e. low-overconfidence leading to low positive short-term market performance, moderate-overconfidence leading to higher positive performance and high-overconfidence leading to low positive or even negative ACAR. In the analysis, however, the coefficients appear to meander randomly, fluctuating between 0.653 and 0.849. This means the assumption about moderate overconfidence I made above is not in fact supported by the data, as all investigated levels of the *Holder-*measure have a significantly positive coefficient.

However, I believe the largest contributing factor here to be the general trend in the corporate acquisition market, as witnessed by the significantly positive ACAR in my sample. A large body of research exists showing that acquisition value flows to the target shareholder through the premiums paid by the acquirer, leading to either insignificant gains (Andrade *et al.*, 2001; Jensen & Ruback, 1983), or significantly negative returns (Alexandridis et al., 2013, 2012; Hackbarth & Morellec, 2008; Moeller

[27] Using the percentage of option-moneyness as a measure for overconfidence leads to insignificant results

et al., 2005). However, in their 2017 paper, G. Alexandridis, Antypas, & Travlos find that corporate acquisitions occurring after the financial crisis create more value for acquiring shareholders. They attribute this to improvements in the quality of corporate governance after the 2008 financial crisis. This would also explain why all ACAR in my sample is significantly positive. Furthermore, they state this shift to value creation for acquirers is driven by megadeals (>$500M) and as stated in the descriptive statistics. In my sample, while the number of acquisitions stays flat after the crisis, deal value does increase greatly over time, driven by so-called megadeals.

I will now turn to the control variables, of which only the deal-specific controls are significant. In accordance with Fuller, Netter, & Stegemoller (2002) I find acquisition of private targets to have significantly positive gains. While Martynova & Renneboog (2008) find hostile takeovers to have a significantly negative effect on acquirer returns, I find a significantly positive effect. Cash acquisitions are known to have a significantly positive effect on acquirer returns, due to signalling effects (Andrade *et al.*, 2001; Travlos, 1987). I also find the effect of cash acquisitions to be significantly positive. As well-known as the positive effects of cash acquisitions are, so is the negative effect of diversifying mergers, due to limited synergy realisation (Morck *et al.*, 1990). In line with this theory I find diversifying acquisitions to have a significantly negative effect on acquirer returns. In accordance with Asquith, Bruner, & Mullins (1983) [but contrary to Travlos (1987)] I also find the relative deal size to significantly positively affect ACAR. Finally, my dataset shows that domestic acquisitions, i.e. US targets, perform significantly better for the acquirer, as do Moeller & Schlingemann (2005).

*5.4 Short-term market performance split by executive sex*

Once again, I split the previous regressions by executive sex in order to make some more definitive statements about the differences between females and males (Table 9). Similarly to the previous regression results, the two *Holder67* measures are most strongly significant, and the effect is only significant for male executives. The individual *Longholder* is significant at the 5% level for the individual female executives and the combined measure is weakly significant (p-value of 0.08) for female CEO/CFO teams. As in the ACAR-regression above, the (significant) coefficients for the overconfidence measures are positive. As was the case with the sex-split frequency results, this output leads me to believe that overconfident female executives have no significantly different effect on short-term market performance, compared to their rational counterparts. For male executives, there is far more significant evidence indicating that overconfidence affects acquisition ACAR, leading to the same conclusion as previously: they drive the significant results of overconfidence on short-term stock performance in the analysis above. Once again, the female-analyses have more explanatory power but less significant control variables.

In order to investigate this disparity further I re-ran regressions (2) and (4) from Table 7 and added an interaction variable between the (combined) *Holder67*-measure and the (combined) executive sex measure. This interaction variable shows whether the effect of the overconfidence measure on short-

term market performance is partially driven by executive sex. I report the results in Table 10. In this analysis, both individual and combined overconfidence measures are significantly positive, as in previous analyses. However, for the first time, the individual executive sex variable is significant at the 5%-level (p-value of 0.016), indicating that female executives generate higher short-term market returns than their male counterparts. However, when interacting the overconfidence measure with the sex measure the result turns significantly negative for regression (1). This means that the coefficient for both the overconfidence measure and the sex measure turn negative after subtracting the coefficient for the interaction. The results suggest an overconfident executive performs better than their rational counterpart (whatever the sex), female executives perform better than their male counterparts unless the former are overconfident, in which case they perform significantly worse. This unexpected finding strengthens my belief than the overconfidence measures are less applicable to female executives, as described previously.

The surprising finding with regards to the positive effect of overconfidence on short-term stock returns, is most likely explained by the positive effects of moderate overconfidence amongst executives and the general improvements of acquisition quality in the post-crisis world. Moderately overconfident executives are more willing to invest in risky but profitable projects and in doing so, invest at the first best level while reducing agency costs (T. C. Campbell *et al.*, 2011; Goel & Thakor, 2008). As stated previously, (moderately) overconfident executives also stimulate more innovation (Hirshleifer & Low, 2012), as well as exerting more effort to thoroughly study projects (Gervais *et al.*, 2011). Furthermore, the effect of overconfidence, and the positive market reaction to acquisitions in general might also be a result of improved acquisition quality post-2009, resulting from better synergies and stronger corporate governance (Alexandridis et al., 2017).

## 6. Robustness, limitations and implications for future research

In this research I use several tools to ensure the reliability of the results. This process starts with making sure that the relevant data resembles some form of normality by excluding outliers. After this I include a wide array of control variables to ensure the results are actually driven by the variables of interest, preventing omitted variables bias. Furthermore, results from the pairwise correlations and VIF tests rule out multicollinearity, while the year and industry fixed effects account for heterogeneity. By taking these steps I have ensured the reliability of this research to a large extent. In this section I add another level of reliability by checking the consistency of my results to slightly different datasets.

### *6.1 CEO & CFO-only datasets*

For my analysis into the effect of executive overconfidence and sex on acquisition frequency I check the consistency of my results by comparing the dataset containing all executives with the datasets containing CEOs and CFOs separately. In these separate analyses (Tables A1 and A2 in the Appendix, respectively), I show that the same patterns hold when the executives are separated by role. In both cases the executive overconfidence and sex measures are significant and of the same sign and similar magnitude to the results discussed above, showing that the results are not driven by one particular sub-group of executives.

I repeat this for the regressions of executive overconfidence and sex on short-term market performance, as measured by ACAR, which I display in Tables A3 and A4 in the Appendix. As with the analysis of all executives, the *Longholder* measures are insignificant while the *Holder67* measures are (highly) significant, for both CEO and CFO datasets. The sign and magnitude of the overconfidence coefficients are very similar to the main ACAR-regression. Furthermore, the there is no significant effect of executive sex on short-term market performance. In line with the main regressions as well, is the significance of the deal-specific control variables. However, the hostile deal control variable turns insignificant in the CEO-dataset, while the cash payment and domestic target controls turn insignificant for CFOs. Explanatory power of the models, including all control variables and fixed effects, is similar to the main model. By checking the robustness of my models to different executive roles, I show my results to be reliable.

### *6.2 Different event windows*

After showing the results are consistent across datasets, I test whether the results are also robust against using a different event window. In all short-term market performance regressions, displayed in the empirical results section, I use 3-day ACAR, i.e. the cumulative abnormal returns based on the trading day before, the day of, as well as the day after the acquisition announcement (-1, +1). This event window is commonly used in mergers & acquisitions-related research because it captures event-related price movements without being distorted by other exogenous shocks that may occur over a longer time period. However, ample research exists with slightly longer event windows and in order to show

consistency across longer event windows. Specifically, I redo the ACAR-regressions with 5-day (-2, +2) and 11-day (-5, +5) event windows.

These results are also reported in the Appendix, in Tables A5 and A6, respectively. In both analyses I show similar results are gained as for the main regressions reported in the empirical results section. Both *Longholder* measures are insignificant while both *Holder67* measures are highly significant (p-values <0.01). Interestingly, while the coefficients are of the same sign and similar magnitude, the wider event windows do lead to a stronger positive effect of overconfidence on short-term market performance: the coefficient increasing with the event window duration. The variation in the data explained by the models is, however, negatively affected by the wider event windows. Intuitively this makes perfect sense as a longer measurement period could contain more noise. Both executive sex measures are, once again, insignificant and a majority of significant control variables are deal-related. Interestingly, while the free cashflow control turns significant, both the hostile deal and domestic target dummies have become insignificant. By checking the robustness of my models to different event windows I, again, show my results to be reliable.

*6.3 Limitations*

While in the previous two section I demonstrated the reliability and consistency of my results, there are still a number of limitations to this research. It is important to take these into account before interpreting the results. The first and main limitation is the very limited number of female executives, in particular in the CEO dataset. Obviously, this is not necessarily a specific flaw of my dataset, as the overall number of women in corporate leadership positions is simply very limited. This is well documented in the current debate about female executive quotas, and one of the motivations for this research. However, this might also lead to distortions in the results, as witnessed by the sudden insignificance of control variables when the analysis is split by executive sex. Furthermore, as the existing research on overconfidence measures uses datasets containing very few women, it is difficult to know whether overconfidence manifests itself universally across both sexes.

Furthermore, options moneyness in general could be seen as a debatable tool to measure executive overconfidence. Malmendier & Tate (2005, 2008) point out option moneyness is also determined by factors such as firm characteristics, corporate governance, as well as executive age and tenure. For instance, the moneyness-outlier in my dataset (20,000% in-the-money) is of a Facebook executive, which is indicative of the strong stock movements in the tech sector generally.

Speaking of option moneyness, this is also heavily dependent on exogenous market circumstances. This might distort results in the following way. An executive might be overconfident, however, due to 2008 financial crisis (which is included in the sample) his options might have not sufficiently appreciated to be classified as such. This is an example of possible bias from sample selection. Another example of this is the fact that the dataset only contains large, publicly listed, American companies. As a matter of fact, the dataset has been narrowed further to large, publicly listed,

American companies that have sufficient information about option holdings and executives in order to be able to perform the analyses. In addition to that, the overconfidence measures from Malmendier & Tate (2005, 2008) are very black and white. This, of course, is the nature of a dummy variable: the value is either 1 or 0, while I have argued earlier that overconfidence is more likely to be a spectrum, rather than a binary state.

Finally, the issue of endogeneity can never be fully eliminated from research that is not a natural experiment. Malmendier & Tate (2005) claim some of these issues were alleviated in their study by using control variables and fixed effects. In this research, even more extensive use of control variables is made. Nevertheless, omitted variable bias is still not completely preventable.

### *6.4 Implications for future research*

In this research I show the effect of overconfidence on corporate decisions, such as acquisitions frequency, as well as the market's perception of the quality of said mergers. Building on Malmendier & Tate (2005, 2008) I show that, while overconfidence increases the number of acquisitions made by executives, female executives make significantly less acquisitions, regardless of their levels of overconfidence. Furthermore, overconfidence appears to have a positive effect on the short-term market performance around an acquisition announcement. Results about the female effect on ACAR are inconclusive. In general, though, these results should encourage the installation of more females in corporate leadership positions.

Despite the care taken, the limited (female CEO) sample size and scope of this research, and in particular the insignificant results for the executive sex variable, call for additional research to be carried out. First of all, in the future I hope to be able to read about research on the issue of female executive performance where datasets contain a certain aspect of gender-balance. I believe more research is required into whether currently used overconfidence measures also adequately apply to females: does overconfidence in women express itself differently than it does in men? Additionally, I would like to see the development of new measures of overconfidence, especially ones that seek to address the overly stark, binary nature of *Longholder* and *Holder67*.

Furthermore, as ACAR generally is positive, it would be interesting to see more research conducted into the post-crisis occurrence of positive value for acquiring shareholders: is there a sea-change between pre- and post-crisis behaviours and outcomes? Consequently, mergers & acquisitions in general, but in particular the effect of overconfidence on ACAR after the financial crisis should be the object of further scrutiny. I do warn, however, that option-package-specific data is only available from 2006 onward, making it very challenging to analyse the financial crisis as an exogenous shock and comparing pre- and post-crisis ACAR.

## 7. Conclusion

In this research I set out to investigate differences between male and female executives, especially with regard to overconfidence and its effect on acquisition decisions and quality. In light of increasing pressure on corporations to increase the number of females in top management positions, I set out to show that female executives at least match the performance of their male counterparts.

In doing this research I found support for the hypotheses that female executives are less often classified as overconfident than their male counterparts and that they perform significantly less acquisitions as a result. The fact that both rational and overconfident female executives perform significantly less acquisition might point to different manifestations of overconfidence in females compared to males.

There appears to be no evidence supporting the hypothesis that female executives have *better* short-term market performance due to their lower levels of overconfidence. While overconfident male executives have significantly better market performance than their rational peers, overconfident female executives do not perform significantly differently from their rational peers. This reinforces the conclusion that they either are less influenced by overconfidence in their decision making in general, or that the measures used to quantify overconfidence do not capture overconfident behaviour in female executives in a sufficiently accurate manner.

As a closing statement, I point out that this research has indicated that there are interesting differences between male and female executives regarding their corporate decision making and the subsequent market response. Further research is needed into overconfidence measures for female executives, even though this very task is complicated by the relative lack of female executives. If academic research like this can show investors and corporate boards that female executives will create at least as much value as their male counterparts, quotas might not be needed altogether. A change in perception of female executives may well be an important step towards future gender equality in corporate boardrooms.

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**List of figures and tables**

*Figures*

Figure 1: Annuel number of corporate acquisitions and mean deal value (in millions USD)

This figure shows the annual number of deals and the mean deal value (in millions USD) in the dataset, which consists of 3,441 acquisition, performed by 2,357 executives at 921 firms between 2006 and 2018. Acquisition data was retrieved from the Thomson One database. The restrictions applied to the database in order to end up with this paper's dataset is outlined in section 3.1

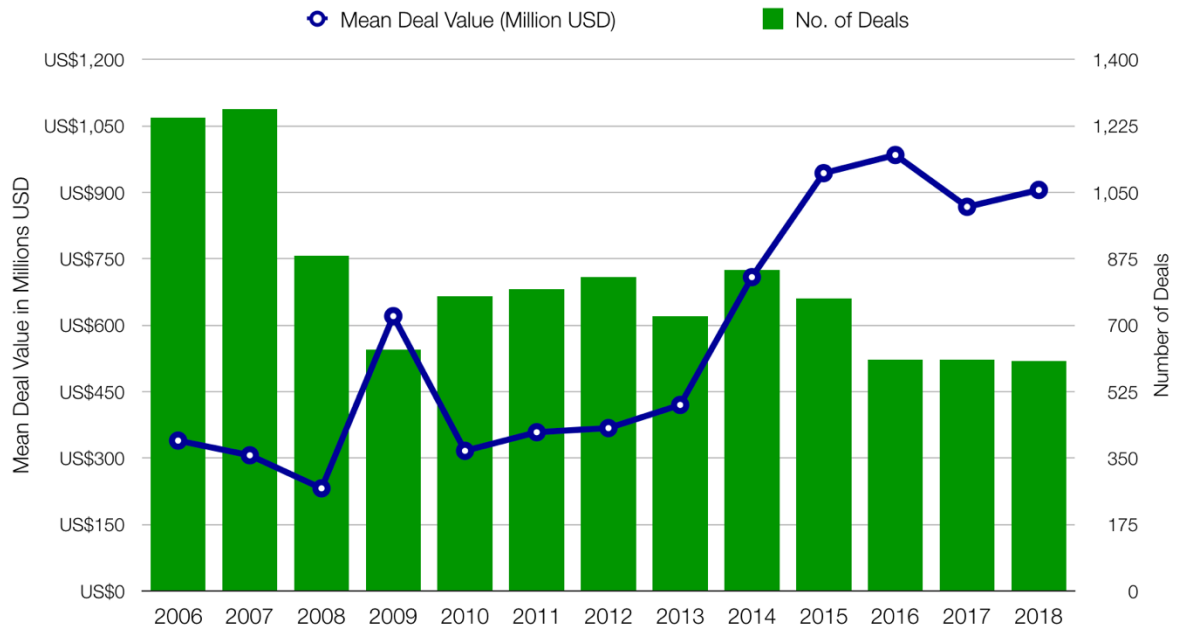
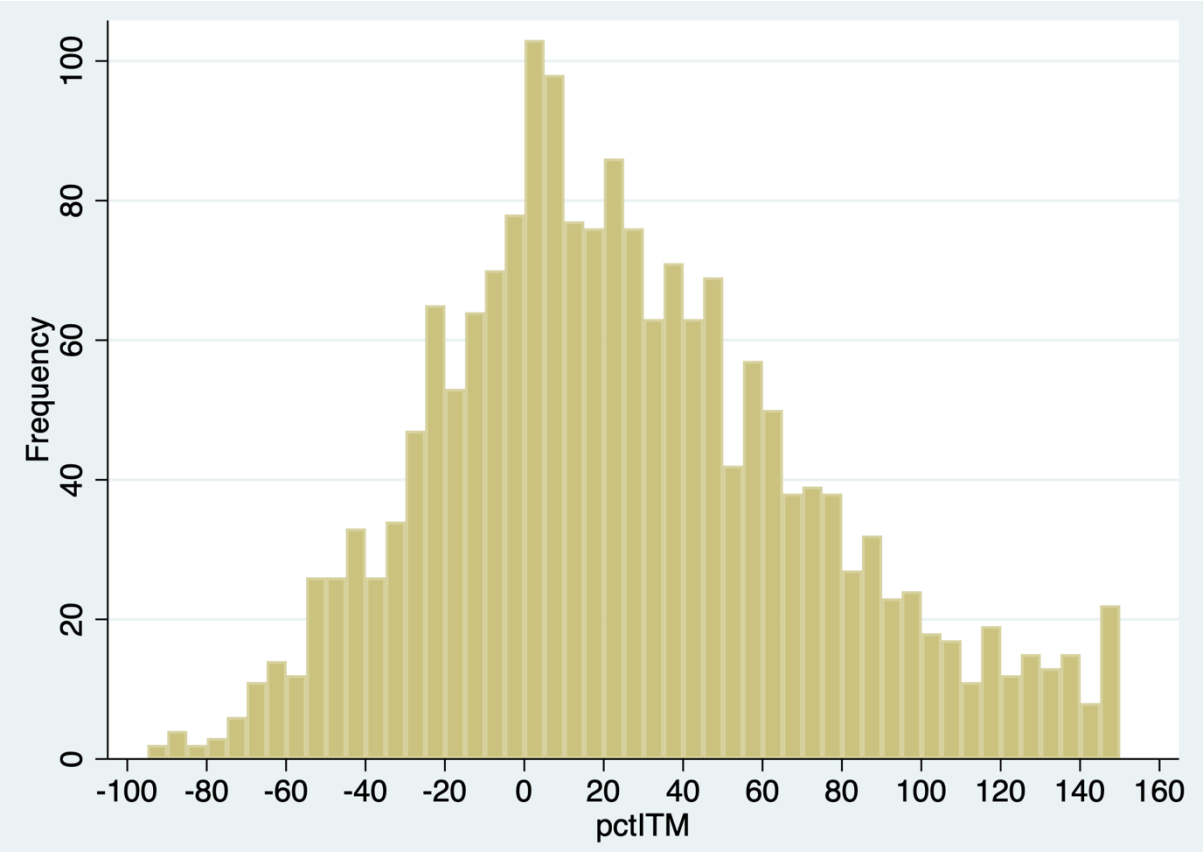


Figure 2: Histogram of options moneyness frequency

This figure displays the frequency of option moneyness of the executive option packages. Each bin is 5% wide. While the range of option moneyness spans from negative 99% to positive 20,000%, the top values were removed in order to visualise the frequency of option packages that are in-the-money around the overconfidence cut-off levels of 40% (*Longholder*) and 67% (*Holder67*). Option moneyness data was retrieved from ExecuComp.



*Tables*

Table A: Description and origin database of variables

| Variable | Database | Description |
|---|---|---|
| ACAR%-3 (-1, +1) | DataStream | ACAR% is the Acquirer Cumulative Abnormal Returns, calculated as described in section 3.2. The 3 indicates the event window of three days: one day before, the day of and after. |
| ACAR%-5 (-2, +2) | DataStream | The 5 indicates the event window of five days: two days before, the day of and after the announcement. |
| ACAR%-11 (-5, +5) | DataStream | The 11 indicates the event window of eleven days: five days before, the day of and after the announcement. |
| Percent in-the-money | ExecuComp | Describes the moneyness of options based on the detailed option package-level data. Calculated as in section 3.3 |
| Longholder | ExecuComp | *Longholder* is a dummy equal to 1 if an executive holds a 40% in-the-money option package until the last year before expiry. |
| Holder67 | ExecuComp | *Holder67* is a dummy equali to 1 if an executive holds a vested option that is 67% or more in-the-money |
| Longholder (combined) | ExecuComp | This alternate measure of the original *Longholder* classifies a CEO/CFO-team as overconfident when one or both executives classify as *Longholder* individually. |
| Holder67 (combined) | ExecuComp | This alternate measure of the original *Holder67* classifies a CEO/CFO-team as overconfident when one or both executives classify as *Holder67* individually. |
| Executive Sex | ExecuComp | Dummy variable equal to 1 if an executive is female |
| Executive Age | ExecuComp | Dummy variable equal to 1 if either or both executives in a CEO/CFO-team are female |
| CEO Tenure | ExecuComp | The number of years since a CEO started his function. This data unavailable for CFOs. |
| Stock Ownership | ExecuComp | Relative ownership of company shares by the executive at fiscal year-end. Calculated by dividing the number of shares owned by the executive by the total number of shares outstanding. |
| Vested Options | ExecuComp | Aggregate number of unexercised vested options held by executive at fiscal year-end, divided by the total number of shares outstanding, thereafter, multiplied by 10. |
| Investments | Compustat | Capital expenditures at the beginning of the year. |
| Tobin's Q | Compustat | Commonly used performance measure. Market value of assets divided by book value of assets. |
| Acquirer Size | Compustat | Natural logarithm of total assets |
| Free Cashflow | Compustat | Earnings before extraordinary items plus depreciation, normalised by beginning of year book value of assets |
| Leverage Ratio | Compustat | Book value of total long-term debt divided by book value of assets. |
| Private Target | Thomson One | Dummy variable equal to 1 if the target of the acquisition was a private corporation |
| Hostile Acquisition | Thomson One | Dummy variable equal to 1 if the acquisition was classified as hostile |
| Cash Payment | Thomson One | Dummy variable equal to 1 if the acquisition was fully financed without using debt |
| Diversifying Acquisition | Thomson One | Dummy variable equal to 1 if the target was from a different industry than the acquirer, based on the Fama-French 48 industry groups. |
| Relative Deal Size | Thomson One | Value of the transaction divided by the market value of the acquirer four weeks prior to the deal |
| Domestic (USA) Target | Thomson One | Dummy variable equal to 1 if the target was located in the United States of America |

Table 1: Descriptive statistics

This table reports the number of observations, mean, standard deviation, median, minimum and maximum values for all test and control variables. Description are found in table A, above. The sample contains 3,441 acquisition, performed by 2,357 executives at 921 firms between 2006 and 2018. The filters applied to the merger database to winnow it down to the dataset used in this research are outlined in section 3.1. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile.

| Variables | N | Mean | St. Dev. | Median | Min | Max |
|---|---|---|---|---|---|---|
| **Panel A: Summary Statistics for Acquirer Cumulative Abnormal Returns (ACAR)** | | | | | | |
| ACAR%-3 (-1, +1) | 6,576 | 0.696 | 5.622 | 0.419 | -75.79 | 56.15 |
| ACAR%-5 (-2, +2) | 6,576 | 0.675 | 6.223 | 0.513 | -87.52 | 41.48 |
| ACAR%-11 (-5, +5) | 6,576 | 0.700 | 7.746 | 0.498 | -111.5 | 47.04 |
| **Panel B: Summary Statistics for Overconfidence Measures** | | | | | | |
| Percent in-the-money | 6,555 | 98.65 | 509.0 | 31.46 | -94.91 | 20,872 |
| Longholder | 6,576 | 0.356 | 0.479 | 0 | 0 | 1 |
| Holder67 | 6,576 | 0.788 | 0.409 | 1 | 0 | 1 |
| Longholder (combined) | 6,576 | 0.500 | 0.500 | 0 | 0 | 1 |
| Holder67 (combined) | 6,576 | 0.864 | 0.343 | 1 | 0 | 1 |
| **Panel C: Summary Statistics for CEO-specific Controls** | | | | | | |
| Sex | 6,576 | 0.0595 | 0.236 | 0 | 0 | 1 |
| Age | 6,561 | 59.93 | 7.239 | 60 | 32 | 91 |
| Tenure | 3,500 | 11.01 | 6.865 | 10 | 1 | 46 |
| Stock Ownership | 6,549 | 0.0112 | 0.0161 | 0.00495 | 1.59E-05 | 0.0811 |
| Vested Options | 6,302 | 0.435 | 0.563 | 0.205 | 9.23E-05 | 2.521 |
| **Panel D: Summary Statistics for Firm-specific Controls** | | | | | | |
| Investments | 6,566 | 422.5 | 973.7 | 73.69 | 0.0320 | 5,492 |
| Tobin's Q | 6,569 | 1.967 | 0.899 | 1.751 | 0.662 | 5.856 |
| Acquirer Size | 6,574 | 8.120 | 1.672 | 7.974 | 3.350 | 13.59 |
| Free Cashflow | 6,574 | 0.0915 | 0.0672 | 0.0929 | -0.200 | 0.276 |
| Leverage Ratio | 5,848 | 0.236 | 0.152 | 0.218 | 2.27E-06 | 0.735 |
| **Panel E: Summary Statistics for Acquisition-specific Controls** | | | | | | |
| Private Target | 6,576 | 0.840 | 0.367 | 1 | 0 | 1 |
| Hostile Acquisition | 6,576 | 0.000304 | 0.0174 | 0 | 0 | 1 |
| Cash Payment | 6,576 | 0.659 | 0.474 | 1 | 0 | 1 |
| Diversifying Acquisition | 6,576 | 0.423 | 0.494 | 0 | 0 | 1 |
| Relative Deal Size | 5,892 | 0.115 | 0.195 | 0.0361 | 7.67E-05 | 0.978 |
| Domestic (USA) Target | 6,576 | 0.730 | 0.444 | 1 | 0 | 1 |

Table 2: Descriptive statistics split by executive sex

This table reports the number of observations, mean, standard deviation, median, minimum and maximum values for all test and control variables, split by the sex of executives. A simple t-test shows whether differences in mean values are statistically significant. Description are found in table A, above. The sample contains 3,441 acquisition, performed by 2,357 executives at 921 firms between 2006 and 2018. The filters applied to the merger database to winnow it down to the dataset used in this research are outlined in section 3.1. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

| Variables | N | Female Executives | N | Male Executives | t-stat |
|---|---|---|---|---|---|
| **Panel A: Summary Statistics for Overconfidence Measures** | | | | | |
| Percent in-the-money | 390 | 123.1 | 6,165 | 97.11 | -0.9775 |
| Longholder | 391 | 0.238 | 6,185 | 0.364 | 5.0517*** |
| Holder67 | 391 | 0.757 | 6,185 | 0.789 | 1.5217 |
| Longholder (combined) | 391 | 0.412 | 6,185 | 0.505 | 3.5824*** |
| Holder67 (combined) | 391 | 0.839 | 6,185 | 0.866 | 1.5075 |
| **Panel B: Summary Statistics for CEO-specific Controls** | | | | | |
| Age | 390 | 57.54 | 6,171 | 60.08 | 6.7492*** |
| Tenure | 124 | 7.613 | 3,376 | 11.13 | 5.6342*** |
| Stock Ownership | 391 | 0.00730 | 6,158 | 0.0114 | 4.9065*** |
| Vested Options | 370 | 0.313 | 5,932 | 0.443 | 4.2990*** |
| **Panel C: Summary Statistics for Firm-specific Controls** | | | | | |
| Investments | 391 | 368.5 | 6,175 | 425.9 | 1.1310 |
| Tobin's Q | 391 | 2.045 | 6,178 | 1.962 | -1.7551* |
| Acquirer Size | 391 | 8.075 | 6,183 | 8.123 | 0.5477 |
| Free Cashflow | 391 | 0.100 | 6,183 | 0.0910 | -2.6353*** |
| Leverage Ratio | 342 | 0.230 | 5,506 | 0.237 | 0.7777 |
| **Panel D: Summary Statistics for Acquisition-specific Controls** | | | | | |
| Private Target | 391 | 0.829 | 6,185 | 0.841 | 0.6329 |
| Hostile Acquisition | 391 | 0 | 6,185 | 0.000323 | 0.3556 |
| Cash Payment | 391 | 0.662 | 6,185 | 0.659 | -0.1306 |
| Diversifying Acquisition | 391 | 0.371 | 6,185 | 0.427 | 2.1675** |
| Relative Deal Size | 341 | 0.118 | 5,551 | 0.115 | -0.3033 |
| Domestic (USA) Target | 391 | 0.772 | 6,185 | 0.728 | -1.9364* |

Table 3: Pairwise correlations between overconfidence measures and control variables

This table reports the pairwise correlations between the overconfidence measures and control variables. Description are found in table A, above. The sample contains 3,441 acquisition, performed by 2,357 executives at 921 firms between 2006 and 2018. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

**Panel A: Correlation Matrix for Overconfidence Measures and Executive-specific Controls**

| | Longholder | Holder67 | Sex | Age | Tenure | Ownership | V.Options |
|---|---|---|---|---|---|---|---|
| Longholder | 1 | | | | | | |
| Holder67 | 0.0760*** | 1 | | | | | |
| Sex | -0.0693*** | -0.00958 | 1 | | | | |
| Age | 0.113*** | -0.00867 | -0.0513** | 1 | | | |
| Tenure | 0.291*** | 0.173*** | -0.0957*** | 0.350*** | 1 | | |
| Ownership | 0.127*** | 0.0812*** | -0.0124 | 0.120*** | 0.504*** | 1 | |
| V.Options | 0.118*** | 0.108*** | -0.0144 | 0.103*** | 0.297*** | 0.657*** | 1 |

**Panel B: Correlation Matrix for Overconfidence Measures and Firm-specific Controls**

| | Longholder | Holder67 | Investment | Tobin's Q | Size | FCF | LeverageR |
|---|---|---|---|---|---|---|---|
| Longholder | 1 | | | | | | |
| Holder67 | 0.0957*** | 1 | | | | | |
| Investment | 0.0245 | -0.0197 | 1 | | | | |
| Tobin's Q | 0.0457*** | 0.101*** | -0.0546*** | 1 | | | |
| Size | 0.0161 | -0.0328* | 0.627*** | -0.0205 | 1 | | |
| FCF | 0.0675*** | 0.0750*** | 0.174*** | 0.452*** | 0.125*** | 1 | |
| LeverageR | -0.0438*** | 0.0350** | -0.00986 | -0.0867*** | 0.0944*** | -0.114*** | 1 |

**Panel C: Correlation Matrix for Overconfidence Measures and Acquisition-specific Controls**

| | Longholder | Holder67 | Private | Hostile | Cash | Diversify | Relative | Domestic |
|---|---|---|---|---|---|---|---|---|
| Longholder | 1 | | | | | | | |
| Holder67 | 0.104*** | 1 | | | | | | |
| Private | -0.00559 | 0.00864 | 1 | | | | | |
| Hostile | 0.00518 | -0.0130 | -0.0398** | 1 | | | | |
| Cash | 0.0269* | 0.00243 | -0.0856*** | 0.0141 | 1 | | | |
| Diversify | 0.0208 | 0.0156 | 0.0392** | -0.0154 | 0.0211 | 1 | | |
| Relative | -0.0418** | -0.0105 | -0.251*** | 0.0217 | -0.132*** | -0.0570*** | 1 | |
| Domestic | 0.0213 | -0.0140 | -0.0892*** | -0.0307* | 0.0402** | -0.0414** | 0.125*** | 1 |

Table 4: Pairwise correlations between combined overconfidence measures and control variables

This table reports the pairwise correlations between the combined CEO/CFO-teams overconfidence measures and control variables. Description are found in table A, above. The sample contains 3,441 acquisition, performed by 2,357 executives at 921 firms between 2006 and 2018. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

**Panel A: Correlation Matrix for Overconfidence Measures and CEO-specific Controls**

| | LH | H67 | Sex | Age | Tenure | Ownership | V.Options |
|---|---|---|---|---|---|---|---|
| LH | 1 | | | | | | |
| H67 | 0.0703*** | 1 | | | | | |
| Sex | -0.0708*** | -0.0373* | 1 | | | | |
| Age | 0.101*** | 0.00649 | -0.0513** | 1 | | | |
| Tenure | 0.227*** | 0.131*** | -0.0957*** | 0.350*** | 1 | | |
| Ownership | 0.0870*** | 0.0951*** | -0.0124 | 0.120*** | 0.504*** | 1 | |
| V.Options | 0.0813*** | 0.0990*** | -0.0144 | 0.103*** | 0.297*** | 0.657*** | 1 |

**Panel B: Correlation Matrix for Overconfidence Measures and Firm-specific Controls**

| | LH | H67 | Investment | Tobin's Q | Size | FCF | LeverageR |
|---|---|---|---|---|---|---|---|
| LH | 1 | | | | | | |
| H67 | 0.0853*** | 1 | | | | | |
| Investment | 0.0398** | 0.0190 | 1 | | | | |
| Tobin's Q | 0.0557*** | 0.0804*** | -0.0546*** | 1 | | | |
| Size | 0.0341** | -0.00233 | 0.627*** | -0.0205 | 1 | | |
| FCF | 0.0896*** | 0.0622*** | 0.174*** | 0.452*** | 0.125*** | 1 | |
| LeverageR | -0.0616*** | 0.0224 | -0.00986 | -0.0867*** | 0.0944*** | -0.114*** | 1 |

**Panel C: Correlation Matrix for Overconfidence Measures and Acquisition-specific Controls**

| | LH | H67 | Private | Hostile | Cash | Diversify | Relative | Domestic |
|---|---|---|---|---|---|---|---|---|
| LH | 1 | | | | | | | |
| H67 | 0.0996*** | 1 | | | | | | |
| Private | -0.0307* | -0.00524 | 1 | | | | | |
| Hostile | 0.0180 | 0.00727 | -0.0399** | 1 | | | | |
| Cash | 0.0339** | -0.00931 | -0.0856*** | 0.0141 | 1 | | | |
| Diversify | 0.00446 | 0.0326 | 0.0392** | -0.0154 | 0.0211 | 1 | | |
| Relative | -0.0558*** | -0.00874 | -0.251*** | 0.0217 | -0.132*** | -0.0570*** | 1 | |
| Domestic | 0.0416 | -0.0118 | -0.0892*** | -0.0307* | 0.0402** | -0.0414** | 0.125*** | 1 |

Table 5: The effect of executive overconfidence and sex on acquisition frequency

This table reports the effect of executive overconfidence and sex on acquisition frequency. Acquisition frequency is the number of acquisitions completed under the leadership of any executive between 2006 and 2018. Other descriptions are found in table A, above. Regressions (1) and (2) use the dataset containing individual executives, while regressions (3) and (4) use the dataset of combined CEO/CFO-teams. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. Robust standard errors in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

| Variables | (1) Independent Exec. | (2) Independent Exec. | (3) Combined Exec. | (4) Combined Exec. |
|---|---|---|---|---|
| **Longholder** | **2.017*** ** (0.151) | | | |
| **Holder67** | | **1.640*** ** (0.134) | | |
| **Longholder (combined)** | | | **1.066*** ** (0.195) | |
| **Holder67 (combined)** | | | | **1.933*** ** (0.193) |
| **Executive sex** | **-0.694*** ** (0.215) | **-0.813*** ** (0.208) | | |
| **Executive sex (combined)** | | | **-1.671*** ** (0.225) | **-1.740*** ** (0.218) |
| Executive age | -0.000608 (0.00968) | 0.0132 (0.00984) | -0.0137 (0.0145) | -0.00769 (0.0148) |
| **Stock ownership** | **19.52*** ** (7.290) | **23.06*** ** (6.865) | **28.06*** ** (7.635) | **26.89*** ** (7.288) |
| **Vested options** | **0.687*** ** (0.201) | **0.750*** ** (0.203) | **0.926*** ** (0.224) | **0.895*** ** (0.227) |
| **Investments** | **-0.000486*** ** (7.98e-05) | **-0.000502*** ** (7.66e-05) | **-0.000394*** ** (0.000115) | **-0.000414*** ** (0.000112) |
| Tobin's Q | 0.0591 (0.0784) | 0.0443 (0.0786) | 0.223* (0.127) | 0.202 (0.127) |
| **Acquirer Size** | **1.095*** ** (0.0612) | **1.141*** ** (0.0617) | **1.172*** ** (0.100) | **1.186*** ** (0.0997) |
| Free Cashflow | 1.324 (0.964) | 1.667* (0.921) | 3.262** (1.473) | 3.445** (1.441) |
| **Leverage Ratio** | **2.622*** ** (0.507) | **2.228*** ** (0.525) | **3.171*** ** (0.782) | **2.867*** ** (0.796) |
| Year fixed effects | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Constant | -9.214*** (1.028) | -10.77*** (1.146) | -9.519*** (1.686) | -11.07*** (1.779) |
| Observations | 5,571 | 5,571 | 2,914 | 2,914 |
| R-squared | 0.179 | 0.162 | 0.160 | 0.163 |

Table 6: The effect of executive overconfidence and sex on acquisition frequency, split by executive sex

This table reports the effect of executive overconfidence and sex on acquisition frequency, split by executive sex. Acquisition frequency is the number of acquisitions completed under the leadership of any executive between 2006 and 2018. Other descriptions are found in table A, above. Regressions (1) and (2) use the dataset containing individual executives, while regressions (3) and (4) use the dataset of combined CEO/CFO-teams. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. Robust standard errors in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

| Variables | (1) Female Independent | (2) Male Independent | (3) Female Independent | (4) Male Independent |
|---|---|---|---|---|
| Longholder | -0.137<br>(0.355) | **2.080*****<br>(0.157) | | |
| Holder67 | **1.312*****<br>(0.362) | **1.560*****<br>(0.136) | | |
| Longholder (combined) | | | -0.666**<br>(0.273) | **1.345*****<br>(0.214) |
| Holder67 (combined) | | | 0.427<br>(0.369) | **2.003*****<br>(0.211) |
| Executive age | **-0.166*****<br>(0.0287) | 0.00837<br>(0.00995) | -0.0269<br>(0.0240) | -0.0169<br>(0.0159) |
| Stock ownership | 6.191<br>(33.33) | **19.34*****<br>(7.372) | **63.14*****<br>(12.07) | 15.82*<br>(8.124) |
| Vested options | 2.056**<br>(0.976) | 0.470**<br>(0.204) | **-1.089*****<br>(0.361) | **1.016*****<br>(0.241) |
| Investments | **-0.00111*****<br>(0.000211) | **-0.000448*****<br>(8.04e-05) | **-0.000617*****<br>(0.000212) | **-0.000366*****<br>(0.000122) |
| Tobin's Q | -0.324<br>(0.209) | -0.00139<br>(0.0823) | -0.0745<br>(0.196) | 0.226<br>(0.142) |
| Acquirer Size | **1.281*****<br>(0.149) | **1.068*****<br>(0.0633) | **0.724*****<br>(0.118) | **1.158*****<br>(0.113) |
| Free Cashflow | 4.055<br>(2.791) | 0.924<br>(0.980) | 2.341<br>(3.056) | 3.284**<br>(1.571) |
| Leverage Ratio | 1.454<br>(1.188) | **2.411*****<br>(0.527) | -1.691<br>(1.108) | **3.310*****<br>(0.845) |
| Year fixed effects | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Constant | 0.495<br>(2.241) | -10.69***<br>(1.064) | -3.153<br>(1.922) | -10.73***<br>(1.877) |
| Observations | 324 | 5,247 | 321 | 2,593 |
| R-squared | 0.465 | 0.194 | 0.503 | 0.173 |

Table 7: The effect of executive overconfidence and sex on short-term market performance, as measured by 3-day ACAR

This table reports the effect of executive overconfidence and sex on short-term market performance, as measured by 3-day ACAR. Acquirer cumulative abnormal returns are calculated using the market model with an event window of three days around the announcement (-1, +1). Normal returns are calculated based on the S&P1500 using an estimation window of (-166, -46). Other descriptions are found in table A, above. Regressions (1) and (2) use the dataset containing individual executives, while regressions (3) and (4) use the dataset of combined CEO/CFO-teams. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. Robust standard errors in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

| Variables | (1) Independent Exec. | (2) Independent Exec. | (3) Combined Exec. | (4) Combined Exec. |
|---|---|---|---|---|
| Longholder | 0.194<br>(0.158) | | | |
| **Holder67** | | **0.994*****<br>(0.215) | | |
| Longholder (combined) | | | 0.0964<br>(0.216) | |
| **Holder67 (combined)** | | | | **1.008*****<br>(0.363) |
| Executive Sex | 0.123<br>(0.268) | 0.109<br>(0.269) | | |
| Executive Sex (combined) | | | 0.107<br>(0.289) | 0.119<br>(0.289) |
| Executive age | -0.00851<br>(0.0137) | -0.00676<br>(0.0136) | 0.00485<br>(0.0197) | 0.00532<br>(0.0197) |
| Stock ownership | 1.245<br>(7.865) | 1.230<br>(7.936) | 1.147<br>(8.266) | -0.00915<br>(8.303) |
| Vested options | 0.0798<br>(0.266) | 0.0156<br>(0.264) | 0.161<br>(0.298) | 0.107<br>(0.295) |
| Investments | -0.000108<br>(0.000104) | -0.000110<br>(0.000104) | -0.000128<br>(0.000149) | -0.000136<br>(0.000149) |
| Tobin's Q | 0.0305<br>(0.120) | -0.0116<br>(0.121) | 0.0405<br>(0.168) | 0.00982<br>(0.171) |
| Acquirer Size | -0.169**<br>(0.0794) | -0.165**<br>(0.0790) | -0.131<br>(0.119) | -0.139<br>(0.117) |
| Free Cashflow | 3.931*<br>(2.241) | 3.788*<br>(2.217) | 4.019<br>(3.131) | 3.940<br>(3.101) |
| Leverage Ratio | 1.375*<br>(0.759) | 1.177<br>(0.767) | 1.209<br>(1.067) | 1.107<br>(1.075) |
| **Private Target** | **1.320*****<br>(0.217) | **1.320*****<br>(0.217) | **1.392*****<br>(0.301) | **1.387*****<br>(0.302) |
| **Hostile Acquisiion** | **1.337*****<br>(0.421) | **1.716*****<br>(0.548) | **1.414****<br>(0.586) | **1.403****<br>(0.574) |
| **Cash Payment** | **0.486*****<br>(0.168) | **0.492*****<br>(0.168) | **0.548****<br>(0.232) | **0.552****<br>(0.231) |

| Variables | (1) Independent Exec. | (2) Independent Exec. | (3) Combined Exec. | (4) Combined Exec. |
|---|---|---|---|---|
| **Diversifying Acquisition** | **-0.643***** | **-0.658***** | **-0.660***** | **-0.673***** |
| | (0.172) | (0.172) | (0.235) | (0.236) |
| **Relative Acquisition Size** | **2.980***** | **2.983***** | **2.969***** | **2.952***** |
| | (0.712) | (0.709) | (0.972) | (0.966) |
| **Domestic (USA) Target** | **0.484***** | **0.498***** | **0.544***** | **0.554***** |
| | (0.151) | (0.151) | (0.208) | (0.208) |
| Year fixed effects | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Constant | -4.025*** | -4.764*** | -5.180*** | -5.900*** |
| | (1.404) | (1.410) | (1.973) | (1.995) |
| Observations | 4,996 | 4,996 | 2,605 | 2,605 |
| R-squared | 0.054 | 0.058 | 0.054 | 0.057 |

Table 8: The effect of executive overconfidence and sex on short-term market performance, as measured by 3-day ACAR using different levels of option-moneyness.

This table reports the effect of executive overconfidence and sex on short-term market performance, as measured by 3-day ACAR using twelve different levels of option-moneyness. Acquirer cumulative abnormal returns are calculated using the market model with an event window of three days around the announcement (-1, +1). Normal returns are calculated based on the S&P1500 using an estimation window of (-166, -46). Other descriptions are found in table A, above. Each regression uses all control variables from regression (2) displayed in Table 7. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. Robust standard errors in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Holder50** | **0.695*** (0.162)** | | | | | | | | | | | |
| **Holder60** | | **0.746*** (0.160)** | | | | | | | | | | |
| **Holder70** | | | **0.732*** (0.159)** | | | | | | | | | |
| **Holder80** | | | | **0.734*** (0.167)** | | | | | | | | |
| **Holder90** | | | | | **0.782*** (0.172)** | | | | | | | |
| **Holder100** | | | | | | **0.685*** (0.180)** | | | | | | |
| **Holder120** | | | | | | | **0.747*** (0.187)** | | | | | |
| **Holder140** | | | | | | | | **0.771*** (0.205)** | | | | |
| **Holder160** | | | | | | | | | **0.653*** (0.218)** | | | |
| **Holder180** | | | | | | | | | | **0.806*** (0.236)** | | |
| **Holder200** | | | | | | | | | | | **0.743*** (0.253)** | |
| **Holder300** | | | | | | | | | | | | **0.849** (0.343)** |
| Control var. | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | -4.254*** (1.366) | -4.254*** (1.361) | -4.246*** (1.363) | -4.333*** (1.365) | -4.350*** (1.362) | -4.381*** (1.371) | -4.371*** (1.366) | -4.427*** (1.366) | -4.458*** (1.381) | -4.605*** (1.372) | -4.571*** (1.384) | -4.578*** (1.374) |
| Observations | 4,996 | 4,996 | 4,996 | 4,996 | 4,996 | 4,996 | 4,996 | 4,996 | 4,996 | 4,996 | 4,996 | 4,996 |
| R-squared | 0.057 | 0.057 | 0.057 | 0.057 | 0.057 | 0.056 | 0.056 | 0.056 | 0.055 | 0.056 | 0.055 | 0.055 |

Table 9: The effect of executive overconfidence and sex on short-term market performance, as measured by 3-day ACAR, split by executive sex

This table reports the effect of executive overconfidence and sex on short-term market performance, as measured by 3-day ACAR, split by executive sex. Acquirer cumulative abnormal returns are calculated using the market model with an event window of three days around the announcement (-1, +1). Normal returns are calculated based on the S&P1500 using an estimation window of (-166, -46). Other descriptions are found in table A, above. Regressions (1) and (2) use the dataset containing individual executives, while regressions (3) and (4) use the dataset of combined CEO/CFO-teams. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. Robust standard errors in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

| Variables | (1) Female Independent | (2) Male Independent | (3) Female Independent | (4) Male Independent |
|---|---|---|---|---|
| Longholder | 1.373** | 0.104 | | |
| | (0.617) | (0.163) | | |
| **Holder67** | 0.0929 | **1.066*** ** | | |
| | (0.638) | (0.226) | | |
| Longholder (combined) | | | 1.111* | -0.0507 |
| | | | (0.630) | (0.235) |
| **Holder67 (combined)** | | | 0.590 | **1.172*** ** |
| | | | (0.789) | (0.409) |
| Executive age | 0.0141 | -0.00651 | 0.0716 | -0.00577 |
| | (0.0493) | (0.0140) | (0.0509) | (0.0211) |
| Stock ownership | -70.03 | 1.942 | -29.53 | 5.039 |
| | (60.68) | (7.949) | (20.47) | (9.688) |
| Vested options | 1.791 | -0.0108 | 0.0789 | 0.182 |
| | (1.653) | (0.271) | (0.735) | (0.323) |
| Investments | **-0.000770** ** | -8.25e-05 | **-0.000720** ** | -0.000112 |
| | (0.000316) | (0.000108) | (0.000314) | (0.000166) |
| Tobin's Q | 0.00701 | -0.00610 | -0.101 | 0.0239 |
| | (0.349) | (0.127) | (0.329) | (0.186) |
| Acquirer Size | 0.202 | **-0.189** ** | 0.0692 | -0.127 |
| | (0.223) | (0.0837) | (0.253) | (0.134) |
| Free Cashflow | -3.326 | 3.881* | -3.580 | 4.396 |
| | (4.556) | (2.314) | (4.901) | (3.351) |
| Leverage Ratio | 1.046 | 1.106 | 1.399 | 0.761 |
| | (2.317) | (0.799) | (2.310) | (1.184) |
| **Private Target** | 0.418 | **1.367*** ** | 0.274 | **1.478*** ** |
| | (0.628) | (0.226) | (0.710) | (0.328) |
| **Cash Payment** | 0.531 | **0.479*** ** | 0.331 | **0.528** ** |
| | (0.570) | (0.175) | (0.583) | (0.250) |
| **Diversifying Acquisition** | **-1.283** ** | **-0.625*** ** | **-1.436*** ** | **-0.594** ** |
| | (0.519) | (0.181) | (0.526) | (0.261) |
| **Relative Acquisition Size** | **4.969*** ** | **2.898*** ** | **4.909*** ** | **2.704** ** |
| | (1.808) | (0.740) | (1.757) | (1.049) |
| **Domestic (USA) Target** | **0.875** | **0.486*** ** | **0.853** | **0.543** ** |
| | (0.585) | (0.157) | (0.569) | (0.225) |

| Variables | (1) Female Independent | (2) Male Independent | (3) Female Independent | (4) Male Independent |
|---|---|---|---|---|
| | | | | |
| Year fixed effects | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Constant | -10.86***<br>(4.148) | -4.324***<br>(1.474) | -13.00***<br>(4.198) | -4.645**<br>(2.231) |
| Observations | 286 | 4,710 | 283 | 2,322 |
| R-squared | 0.236 | 0.057 | 0.239 | 0.057 |

Table 10: The effect of executive overconfidence and sex, both individually and interacted, on short-term market performance, as measured by 3-day ACAR

This table reports the effect of executive overconfidence and sex on short term market performance, as measured by 3-day ACAR. Acquirer cumulative abnormal returns are calculated using the market model with an event window of three days around the announcement (-1, +1). Normal returns are calculated based on the S&P1500 using an estimation window of (-166, -46). The two interaction variables (using the individual and combined executive datasets) show whether executive sex influences the effect of executive overconfidence on short-term market performance. Other descriptions are found in table A, above. Regression (1) uses the dataset containing individual executives, while regression (2) uses the dataset of combined CEO/CFO-teams. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. Robust standard errors in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

| Variables | (1) Individual executives | (2) Combined executives |
|---|---|---|
| **Holder67** | **1.077*** (0.226)** | |
| **Executive Sex** | **1.191** (0.494)** | |
| **Holder67 (combined)** | | **1.187*** (0.408)** |
| Executive Sex (combined) | | 1.321* (0.749) |
| **Holder67 interacted with Executive Sex** | **-1.374** (0.591)** | |
| Holder67 (combined) interacted with Executive Sex (combined) | | -1.413* (0.841) |
| Executive Age | -0.00663 (0.0136) | 0.00484 (0.0197) |
| Stock Ownership | 1.315 (7.936) | 0.895 (8.361) |
| Vested Options | 0.0157 (0.264) | 0.101 (0.295) |
| Investments | -0.000108 (0.000103) | -0.000142 (0.000150) |
| Tobin's Q | -0.00785 (0.121) | 0.0142 (0.170) |
| Acquirer Size | -0.168** (0.0789) | -0.136 (0.117) |
| Free Cashflow | 3.794* (2.216) | 3.906 (3.093) |
| Leverage Ratio | 1.134 (0.770) | 1.016 (1.090) |
| **Private Target** | **1.313*** (0.217)** | **1.369*** (0.302)** |

| Variables | (1) Individual executives | (2) Combined executives |
|---|---|---|
| **Hostile Acquisition** | **1.728*** (0.568)** | **1.361** (0.576)** |
| **Cash Payment** | **0.488*** (0.168)** | **0.550** (0.232)** |
| **Diversifying Acquisition** | **-0.662*** (0.172)** | **-0.681*** (0.237)** |
| **Relative Acquisition Size** | **2.993*** (0.709)** | **2.963*** (0.966)** |
| **Domestic (USA) Target** | **0.504*** (0.151)** | **0.556*** (0.208)** |
| Year fixed effects | Yes | Yes |
| Industry fixed effects | Yes | Yes |
| Constant | -4.794*** (1.403) | -6.022*** (1.986) |
| Observations | 4,996 | 2,605 |
| R-squared | 0.059 | 0.058 |

## Appendix

Table A1: The effect of CEO overconfidence and sex on acquisition frequency

This table reports the effect of CEO overconfidence and sex on acquisition frequency. Acquisition frequency is the number of acquisitions completed under the leadership of any CEO between 2006 and 2018. Other descriptions are found in table A, above. Regression (1) and (2) only regress the overconfidence measure on the dependent variable, no fixed effects are included. Regression (3) includes control variables and year fixed effects, while regression (4) includes industry fixed effects instead. Finally, regression (5) includes control variables and both fixed effects. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. Robust standard errors in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Longholder** | **1.637*** ** (0.203) | | | | |
| **Holder67** | | **2.748*** ** (0.153) | **1.859*** ** (0.177) | **1.640*** ** (0.179) | **1.600*** ** (0.178) |
| **Executive Sex** | | | **-1.303*** ** (0.333) | **-1.247*** ** (0.356) | **-1.152*** ** (0.367) |
| Executive Age | | | **-0.0254*** (0.0146) | **-0.0431*** ** (0.0141) | **-0.0364*** ** (0.0145) |
| **Executive Tenure** | | | **0.234*** ** (0.0199) | **0.239*** ** (0.0192) | **0.240*** ** (0.0193) |
| **Stock Ownership** | | | **-29.15*** ** (5.895) | **-19.00*** ** (5.723) | **-18.96*** ** (5.693) |
| **Vested Options** | | | **0.907*** ** (0.197) | **0.811*** ** (0.191) | **0.839*** ** (0.191) |
| **Investments** | | | **-0.00042*** ** (0.000110) | **-0.00030*** ** (0.000114) | **-0.00028*** (0.000114) |
| Tobin's Q | | | 0.157 (0.124) | 0.0642 (0.124) | 0.101 (0.125) |
| **Acquirer Size** | | | **0.945*** ** (0.0909) | **0.931*** ** (0.0919) | **0.922*** ** (0.0930) |
| Free Cashflow | | | 2.199 (1.430) | 2.124 (1.401) | 2.372* (1.413) |
| **Leverage Ratio** | | | **2.787*** ** (0.805) | **3.138*** ** (0.795) | **3.181*** ** (0.785) |
| Year fixed effects | No | No | Yes | No | Yes |
| Industry fixed effects | No | No | No | Yes | Yes |
| Constant | 5.101*** (0.107) | 3.566*** (0.101) | -6.508*** (1.408) | -9.849*** (1.493) | -11.87*** (1.673) |
| Observations | 3,393 | 3,393 | 2,874 | 2,874 | 2,874 |
| R-squared | 0.021 | 0.037 | 0.154 | 0.196 | 0.205 |

Table A2: The effect of CFO overconfidence and sex on acquisition frequency

This table reports the effect of CFO overconfidence and sex on acquisition frequency. Acquisition frequency is the number of acquisitions completed under the leadership of any CFO between 2006 and 2018. Other descriptions are found in table A, above. Regression (1) and (2) only regress the overconfidence measure on the dependent variable, no fixed effects are included. Regression (3) includes control variables and year fixed effects, while regression (4) includes industry fixed effects instead. Finally, regression (5) includes control variables and both fixed effects. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. Robust standard errors in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Longholder** | **2.720*** ** (0.217) | | | | |
| **Holder67** | | **1.219*** ** (0.186) | **0.760*** ** (0.211) | **0.957*** ** (0.206) | **0.759*** ** (0.207) |
| **Executive sex** | | | **-1.050*** ** (0.216) | **-0.750*** ** (0.215) | **-0.670*** ** (0.218) |
| Executive age | | | **0.0481*** ** (0.0119) | **0.0617*** ** (0.0116) | **0.0434*** ** (0.0118) |
| **Stock ownership** | | | 9.457 (42.62) | 44.01 (43.07) | 37.05 (43.42) |
| **Vested options** | | | 1.377** (0.692) | 1.024 (0.703) | 1.162 (0.710) |
| **Investments** | | | **-0.00060*** ** (0.000101) | **-0.00057*** ** (0.000106) | **-0.00059*** ** (0.000105) |
| Tobin's Q | | | -0.0550 (0.0952) | -0.196** (0.0942) | -0.0529 (0.0970) |
| **Acquirer Size** | | | **1.096*** ** (0.0844) | **1.085*** ** (0.0870) | **1.127*** ** (0.0852) |
| Free Cashflow | | | 0.201 (1.164) | 0.667 (1.186) | 0.534 (1.192) |
| **Leverage Ratio** | | | 1.224* (0.660) | 0.833 (0.645) | 1.519** (0.654) |
| | | | | | |
| Year fixed effects | No | No | Yes | No | Yes |
| Industry fixed effects | No | No | No | Yes | Yes |
| Constant | 4.278*** (0.0738) | 4.127*** (0.161) | -7.518*** (1.055) | -10.65*** (1.195) | -10.97*** (1.372) |
| Observations | 3,188 | 3,188 | 2,661 | 2,661 | 2,661 |
| R-squared | 0.071 | 0.013 | 0.121 | 0.150 | 0.172 |

Table A3: The effect of CEO overconfidence and sex on short-term market performance, as measured by 3-day ACAR

This table reports the effect of CEO overconfidence and sex on short-term market performance, as measured by 3-day ACAR. Acquirer cumulative abnormal returns are calculated using the market model with an event window of three days around the announcement (-1, +1). Normal returns are calculated based on the S&P1500 using an estimation window of (-166, -46). Other descriptions are found in table A, above. Regression (1) and (2) only regress the overconfidence measure on the dependent variable, no fixed effects are included. Regression (3) includes control variables and year fixed effects, while regression (4) includes industry fixed effects instead. Finally, regression (5) includes control variables and both fixed effects. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. Robust standard errors in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Longholder | 0.207<br>(0.190) | | | | |
| **Holder67** | | **0.531**<br>(0.262) | **0.729**<br>(0.329) | **0.875**<br>(0.334) | **0.754**<br>(0.327) |
| Executive Sex | | | -0.244<br>(0.449) | 0.0226<br>(0.447) | -0.106<br>(0.450) |
| Executive Age | | | -0.00232<br>(0.0203) | -0.00627<br>(0.0187) | -0.000392<br>(0.0200) |
| Executive Tenure | | | 0.0168<br>(0.0230) | 0.0234<br>(0.0227) | 0.0257<br>(0.0229) |
| Stock Ownership | | | -0.139<br>(6.980) | -1.307<br>(7.087) | -0.840<br>(6.988) |
| Vested Options | | | -0.0477<br>(0.252) | -0.00746<br>(0.262) | -0.00611<br>(0.259) |
| Investments | | | -2.83e-05<br>(0.000131) | -0.000152<br>(0.000153) | -0.000107<br>(0.000150) |
| Tobin's Q | | | 0.0102<br>(0.170) | 0.0582<br>(0.163) | 0.0124<br>(0.172) |
| Acquirer Size | | | -0.163<br>(0.115) | -0.138<br>(0.120) | -0.178<br>(0.118) |
| Free Cashflow | | | 3.865<br>(3.185) | 3.065<br>(3.185) | 3.571<br>(3.162) |
| Leverage Ratio | | | 1.110<br>(1.133) | 0.837<br>(1.085) | 0.957<br>(1.104) |
| **Private Target** | | | **1.395**<br>(0.302) | **1.449**<br>(0.303) | **1.379**<br>(0.304) |
| Hostile Acquisition | | | 1.100*<br>(0.579) | 0.908*<br>(0.499) | **1.235**<br>(0.585) |
| **Cash Payment** | | | **0.531**<br>(0.232) | **0.570**<br>(0.234) | **0.553**<br>(0.233) |
| **Diversifying Acquisition** | | | **-0.744**<br>(0.234) | **-0.693**<br>(0.236) | **-0.666**<br>(0.239) |
| **Relative Acquisition Size** | | | **3.251**<br>(0.991) | **3.240**<br>(1.000) | **3.105**<br>(0.985) |

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Domestic (USA) Target** | | | **0.561***** (0.211) | **0.540***** (0.208) | **0.560***** (0.211) |
| Year fixed effects | No | No | Yes | No | Yes |
| Industry fixed effects | No | No | No | Yes | Yes |
| Constant | 0.605*** (0.133) | 0.263 (0.240) | -1.932 (1.459) | -4.395** (1.728) | -5.436*** (1.923) |
| Observations | 3,393 | 3,393 | 2,571 | 2,571 | 2,571 |
| R-squared | 0.000 | 0.001 | 0.050 | 0.044 | 0.057 |

Table A4: The effect of CFO overconfidence and sex on short-term market performance, as measured by 3-day ACAR

This table reports the effect of CFO overconfidence and sex on short-term market performance, as measured by 3-day ACAR. Acquirer cumulative abnormal returns are calculated using the market model with an event window of three days around the announcement (-1, +1). Normal returns are calculated based on the S&P1500 using an estimation window of (-166, -46). Other descriptions are found in table A, above. Regression (1) and (2) only regress the overconfidence measure on the dependent variable, no fixed effects are included. Regression (3) includes control variables and year fixed effects, while regression (4) includes industry fixed effects instead. Finally, regression (5) includes control variables and both fixed effects. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. Robust standard errors in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Longholder | 0.164<br>(0.206) | | | | |
| **Holder67** | | **0.978*****<br>(0.259) | **1.177*****<br>(0.315) | **1.342*****<br>(0.313) | **1.215*****<br>(0.310) |
| Executive Sex | | | 0.154<br>(0.350) | 0.0926<br>(0.349) | 0.130<br>(0.347) |
| Executive Age | | | -0.0152<br>(0.0203) | -0.0239<br>(0.0194) | -0.0172<br>(0.0205) |
| Stock Ownership | | | 16.39<br>(76.95) | 30.51<br>(77.92) | 21.60<br>(76.83) |
| Vested Options | | | -0.509<br>(1.259) | -0.571<br>(1.295) | -0.337<br>(1.261) |
| Investments | | | -6.97e-06<br>(0.000129) | -0.000128<br>(0.000155) | -9.96e-05<br>(0.000150) |
| Tobin's Q | | | -0.0613<br>(0.170) | 0.00461<br>(0.163) | -0.0427<br>(0.177) |
| Acquirer Size | | | -0.184<br>(0.125) | -0.159<br>(0.130) | 3.952<br>(3.216) |
| Free Cashflow | | | 3.269<br>(3.224) | 3.673<br>(3.223) | 1.228<br>(1.126) |
| Leverage Ratio | | | 1.228<br>(1.126) | 1.099<br>(1.047) | 1.175<br>(1.086) |
| **Private Target** | | | **1.235*****<br>(0.310) | **1.300*****<br>(0.311) | **1.217*****<br>(0.312) |
| **Hostile Acquisition** | | | **2.031*****<br>(0.646) | **2.065*****<br>(0.530) | **2.240*****<br>(0.657) |
| Cash Payment | | | 0.427*<br>(0.244) | **0.514****<br>(0.245) | 0.461*<br>(0.246) |
| **Diversifying Acquisition** | | | **-0.728*****<br>(0.247) | **-0.679*****<br>(0.255) | **-0.679*****<br>(0.255) |
| **Relative Acquisition Size** | | | **3.090*****<br>(1.052) | **3.043*****<br>(1.065) | **2.922*****<br>(1.043) |

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| Domestic (USA) Target | | | 0.398* | 0.401* | 0.415* |
| | | | (0.222) | (0.219) | (0.221) |
| Year fixed effects | No | No | Yes | No | Yes |
| Industry fixed effects | No | No | No | Yes | Yes |
| Constant | 0.658*** | -0.563 | -3.181 | -4.306* | -4.306* |
| | (0.125) | (1.558) | (2.011) | (2.232) | (2.232) |
| Observations | 3,188 | 3,188 | 2,395 | 2,395 | 2,395 |
| R-squared | 0.000 | 0.005 | 0.054 | 0.048 | 0.062 |

Table A5: The effect of executive overconfidence and sex on short-term market performance, as measured by 5-day ACAR

This table reports the effect of executive overconfidence and sex on short-term market performance, as measured by 5-day ACAR. Acquirer cumulative abnormal returns are calculated using the market model with an event window of five days around the announcement (-2, +2). Normal returns are calculated based on the S&P1500 using an estimation window of (-166, -46). Other descriptions are found in table A, above. Regressions (1) and (2) use the dataset containing individual executives, while regressions (3) and (4) use the dataset of combined CEO/CFO-teams. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. Robust standard errors in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

| Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Longholder | 0.196<br>(0.175) | | | |
| **Holder67** | | **1.093*****<br>(0.245) | | |
| Longholder (combined) | | | 0.0586<br>(0.236) | |
| **Holder67 (combined)** | | | | **1.136*****<br>(0.425) |
| Executive Sex | 0.0637<br>(0.314) | 0.0500<br>(0.316) | | |
| Executive Sex (combined) | | | 0.0435<br>(0.336) | 0.0630<br>(0.336) |
| Executive Age | -0.00890<br>(0.0145) | -0.00706<br>(0.0144) | -0.00362<br>(0.0208) | -0.00333<br>(0.0207) |
| Stock Ownership | 1.819<br>(8.864) | 1.763<br>(8.939) | 2.219<br>(9.329) | 0.846<br>(9.348) |
| Vested Options | -0.00992<br>(0.279) | -0.0823<br>(0.278) | 0.0657<br>(0.308) | 0.00147<br>(0.306) |
| Investments | -0.000203*<br>(0.000108) | -0.000206*<br>(0.000108) | -0.000213<br>(0.000155) | -0.000223<br>(0.000155) |
| Tobin's Q | 0.00883<br>(0.132) | -0.0379<br>(0.133) | -0.00307<br>(0.183) | -0.0390<br>(0.186) |
| Acquirer Size | -0.106<br>(0.0883) | -0.102<br>(0.0879) | -0.0677<br>(0.130) | -0.0779<br>(0.128) |
| Free Cashflow | 4.224*<br>(2.560) | 4.059<br>(2.534) | 4.408<br>(3.558) | 4.291<br>(3.521) |
| Leverage Ratio | 0.910<br>(0.807) | 0.692<br>(0.819) | 0.896<br>(1.127) | 0.785<br>(1.139) |
| **Private Target** | **1.380*****<br>(0.243) | **1.381*****<br>(0.243) | **1.511*****<br>(0.337) | **1.508*****<br>(0.338) |
| Hostile Acquisition | **3.082*****<br>(0.440) | **3.497*****<br>(0.571) | **3.348*****<br>(0.621) | **3.314*****<br>(0.610) |
| **Cash Payment** | **0.442****<br>(0.187) | **0.448****<br>(0.186) | **0.504***<br>(0.257) | **0.507****<br>(0.257) |

| Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| **Diversifying Acquisition** | **-0.718***** | **-0.735***** | **-0.673**** | **-0.687**** |
| | (0.195) | (0.195) | (0.267) | (0.268) |
| **Relative Acquisition Size** | **3.281***** | **3.284***** | **3.183***** | **3.167***** |
| | (0.781) | (0.777) | (1.073) | (1.066) |
| **Domestic (USA) Target** | 0.166 | 0.182 | 0.302 | 0.313 |
| | (0.172) | (0.172) | (0.237) | (0.237) |
| Year fixed effects | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Constant | -3.000* | -3.811** | -3.809* | -4.620** |
| | (1.580) | (1.589) | (2.219) | (2.237) |
| Observations | 4,996 | 4,996 | 2,605 | 2,605 |
| R-squared | 0.044 | 0.048 | 0.044 | 0.048 |

Table A6: The effect of executive overconfidence and sex on short-term market performance, as measured by 11-day ACAR

This table reports the effect of executive overconfidence and sex on short-term market performance, as measured by 11-day ACAR. Acquirer cumulative abnormal returns are calculated using the market model with an event window of five days around the announcement (-5, +5). Normal returns are calculated based on the S&P1500 using an estimation window of (-166, -46). Other descriptions are found in table A, above. Regressions (1) and (2) use the dataset containing individual executives, while regressions (3) and (4) use the dataset of combined CEO/CFO-teams. Stock ownership, vested options, investments and relative acquisition size were winsorised at the 98th percentile. Tobin's Q and leverage ratio were winsorised at the 99th percentile. Free cashflow was winsorised at the 1st and 99th percentile. Robust standard errors in parentheses. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively.

| Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Longholder | 0.0646<br>(0.220) | | | |
| **Holder67** | | **1.236*****<br>(0.311) | | |
| Longholder (combined) | | | -0.190<br>(0.298) | |
| **Holder67 (combined)** | | | | **1.319****<br>(0.555) |
| Executive Sex | 0.0359<br>(0.421) | 0.0344<br>(0.420) | | |
| Executive Sex (combined) | | | 0.0246<br>(0.446) | 0.0802<br>(0.442) |
| Executive Age | -0.000589<br>(0.0184) | 0.000656<br>(0.0182) | -0.00730<br>(0.0267) | -0.00821<br>(0.0266) |
| Stock Ownership | 5.661<br>(11.05) | 5.233<br>(11.14) | 5.797<br>(11.64) | 3.851<br>(11.65) |
| Vested Options | -0.133<br>(0.344) | -0.231<br>(0.342) | 0.0348<br>(0.381) | -0.0601<br>(0.378) |
| Investments | -0.000322**<br>(0.000147) | -0.000324**<br>(0.000147) | -0.000352*<br>(0.000211) | -0.000362*<br>(0.000211) |
| Tobin's Q | -0.120<br>(0.174) | -0.178<br>(0.177) | -0.0971<br>(0.247) | -0.146<br>(0.251) |
| Acquirer Size | -0.147<br>(0.111) | -0.0795<br>(0.165) | -0.0795<br>(0.165) | -0.0962<br>(0.162) |
| Free Cashflow | **10.04***<br>(3.329) | **9.789***<br>(3.294) | **10.01****<br>(4.644) | **9.729****<br>(4.598) |
| Leverage Ratio | 0.162<br>(1.028) | -0.0820<br>(1.043) | -0.0674<br>(1.440) | -0.174<br>(1.454) |
| **Private Target** | **1.046***<br>(0.294) | **1.048***<br>(0.294) | **1.220***<br>(0.408) | **1.228***<br>(0.408) |
| Hostile Acquisition | -0.431<br>(0.516) | 0.0246<br>(0.645) | 0.0125<br>(0.742) | -0.136<br>(0.727) |
| **Cash Payment** | **0.488****<br>(0.236) | **0.492****<br>(0.236) | **0.567***<br>(0.326) | **0.564***<br>(0.325) |

| Variables | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| **Diversifying Acquisition** | **-0.681***** | **-0.702***** | **-0.580*** | **-0.592*** |
| | (0.241) | (0.242) | (0.331) | (0.333) |
| **Relative Acquisition Size** | **3.369***** | **3.378***** | **3.275***** | **3.275***** |
| | (0.888) | (0.883) | (1.225) | (1.215) |
| **Domestic (USA) Target** | -0.283 | -0.269 | -0.149 | -0.139 |
| | (0.223) | (0.223) | (0.311) | (0.311) |
| Year fixed effects | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes |
| Constant | -1.547 | -1.809 | -1.809 | -2.743 |
| | (1.739) | (2.506) | (2.506) | (2.539) |
| Observations | 4,996 | 4,996 | 2,605 | 2,605 |
| R-squared | 0.038 | 0.041 | 0.038 | 0.041 |