AGE IS NOT JUST A NUMBER:

A study on CEO age and the propensity to be acquired

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ABSTRACT

In common finance theory, all CEOs should act the same – namely to maximize shareholder value. This thesis examines the likelihood of a firm being acquired conditional to the age of the target CEO. We further investigate whether a CEO board membership of the same firm has an impact on the analysis as well as if the pricing of takeover bids differ between age groups. With firm- and M&A-data on Swedish companies for the years 2002-2016, we employ logit and standard OLS regression models to test our hypotheses. We find strong evidence for a retirement-age effect, namely that the likelihood of being acquired is sharply higher for firms with CEOs in near retirement-age. This effect is amplified when the CEO gets extended control through a board seat. Our findings thus imply that target CEOs' self-interest has a substantial impact on companies' M&A-decisions and eventually on shareholder value.

Keywords: CEO Age, M&A, Takeovers, Golden Parachutes, Executive Pay, Agency Problems

JEL Classification: G34, G35, J32, J33

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I. INTRODUCTION

"I couldn't do anything to help the merger go through. I was not the CEO anymore – only the Chairman"

– **Pehr G. Gyllenhammar** (former CEO and later Chairman of Volvo), in response to the failed merger between Volvo and Renault in 1993.[1]

Golden parachutes cannot seem to stay out of the news. Ever since Percy Barnevik's SEK 900m one-off pension payment in 1996 (of which a large part was later repaid to ABB), the compensation scheme for Chief Executive Officers (CEOs) has been widely discussed, both in the news and in board rooms. Despite being frequently criticized in the media, golden parachutes were introduced with the clearly defined goal to make sure that shareholders do not lose out on beneficial M&A deals, in addition to protect top executives from the uncertainty of being fired. The concept became popular following the merger- and takeover wave of the 1980s (Fiss et al. 2012; Fiss, 2016).

The most common motivation behind mergers and acquisitions (M&As) is that they create synergy effects. In other words, the combined entity is worth more than the two separate companies. Accordingly, large synergy effects enable the acquiring firm to pay a premium for the target firm, which in turn generate additional target shareholder value. From 2002 to 2016, 271 public Swedish firms were successfully acquired (MergerMarket, 2017). For the firms with available data, the median bid premium was 24 %, implying that M&As indeed can generate substantial value for the target shareholders. However, the outlook for the CEO of a targeted company is not always very bright. A study by Agrawal and Walkling (1994) shows that most target CEOs lose their jobs in the case of a successful takeover, and are often worse off both career- and monetary-wise after their departure. Golden parachutes and other types of severance packages are designed to mitigate these issues, though the extent to which they eliminate the inherent agency problem is unclear (Fiss et al., 2012; Jenter and Lewellen, 2015).

Nonetheless, the target CEO is arguably one of the more important players in any M&A-transaction. The Swedish Corporate Governance Code (2016) states that the CEO should be responsible for the day-to-day management of the firm, whilst the strategic decisions (such as a merger or acquisition) should be left to the board. Yet, the target CEO plays a vital role in any takeover attempt. Not only can she influence the board with her recommendations once a bid is made and lead the negotiations, but also act as an important gatekeeper before a bid is even made (e.g. by making public announcements regarding the firm's willingness to initiate merger talks, or

[1] Please note that the authors of this thesis have translated the quote from Swedish. The quote comes from a documentary about Pehr G. Gyllenhammar called ""Sveriges mest beundrade man".

by actively seeking out a buyer or not). Pehr G. Gyllenhammar's eloquent quote in the opening of this thesis further demonstrates the power and influence the CEO has in a takeover attempt. Therefore, target CEOs find themselves in a peculiar situation; an M&A-deal can imply large private costs, but also generate substantial shareholder value. This thesis investigates the target CEO's situation further, and provides evidence that the CEO's age has an important impact on M&A-decisions within a firm, especially if she is in retirement-age. In common finance theory, all CEOs should act in the same way, regardless of age, namely in the best interest of the shareholders.[2] Yet, if a CEO near retirement acts differently than a younger CEO, it may be possible that either one of them is not acting in the best interest of their shareholders. Hence, being aware of this age-effect can be crucial for boards when monitoring and electing the CEO.

Prior studies related to this topic have predominantly focused on how personal CEO aspects, such as risk-aversion and overconfidence, impact corporate finance decisions, along with research on broader agency problems in M&As. However, when trying to explain agency problems in M&As most prior literature focus on firm characteristics, such as excessive free cash flow (Jensen, 1986; Harford, 1999), and weak corporate governance (Bertrand and Mullainathan, 2003; Masulis et al., 2007). In this paper we want to shift the focus from firm characteristics to CEO characteristics, and more importantly CEO age, when trying to explain agency problems in M&As.

Jenter and Lewellen (2015) investigate the impact of target CEOs' retirement preferences on takeovers for U.S. public companies (spanning 1989-2007). The authors find strong evidence that target CEOs' retirement preferences affect merger activity. Their paper has been used as the theoretical basis for our thesis. However, we argue that there are several considerable institutional differences in corporate environment between Sweden and the U.S., which motivates further research in this area. To the best of our knowledge, no previous paper has addressed this issue in a Swedish setting, and for the three main reasons we will outline in Section II.A we believe there is a gap in the research on the Swedish market. This thesis intends to address that gap.

Starting with company- and CEO data on public Swedish companies from Bisnode[3], and M&A data from SDC Platinum, MergerMarket and Bloomberg, for the years 2002-2016, we test if there is indeed an increased likelihood of being acquired if the target CEO is near retirement (this will be referred to as the "retirement-age effect"). Our primary analysis is performed by running a logit regression model with the dependent variable being *Acquired* and *Age cluster* as our independent dummy variables for various age spans, as suggested in prior literature. We further control for other

[2] This is according to the "shareholder value theory". Moreover, the Swedish Corporate Governance Code states that companies should be run in the best interest of their owners. We are, however, also aware of the "stakeholder theory".
[3] Recevied through the Serrano database at the Swedish House of Finance

CEO- and firm characteristics, as well as for industry- and year fixed effects. Our main (adjusted) sample consists of 12,348 CEO years[4] (1,276 public firms and 3,716 CEO-employments for the years 2002-2016). Secondly, we test if our first analysis differs when the CEO is a member of the board of the company. Given that the board is the decision-making body in a company and ultimately responsible for all strategic decisions, such as a potential M&A-transaction, we expect CEOs with a board seat to have more influence and consequently the retirement-age effect to be amplified.[5] Finally, we run a standard OLS regression with the dependent variable being *Bid premium* and the same independent and control variables as before. We thus test if bid premiums received differ depending on the age of the target CEO, and especially if the CEO is in retirement-age. Our findings provide support with high statistical significance for the first two hypotheses. Yet, despite a large difference in predicted bid premiums received we cannot draw any statistically significant conclusions regarding our third hypothesis, which is most likely a result of the small number of transactions with publicly disclosed bid premiums in our dataset.

The implications of this thesis are threefold. First of all, we reaffirm the findings of Jenter and Lewellen (2015), and argue that the retirement-age effect is present also in a Swedish setting. This is interesting given the rather different corporate environments. Thus, we reason that the agency costs that arise in M&A-transactions are not efficiently compensated for in either market, which can distort takeover decisions and eventually shareholder value. Second, we suggest that the design of incentive packages should, to a greater extent, take the age of the CEO into consideration rather than more or less merely focusing on firm size (Hartzell et al., 2004; Jensen and Murphy, 2010). However, it is unclear whether our results imply that retirement-aged CEOs accept value-destroying takeover bids to exploit too-generous severance packages, or that younger CEOs forego value-creating takeovers because it carries larger personal costs than the severance packages compensate for. Likewise, we cannot determine if most golden parachutes are too bounteous for old CEOs, or if they are too small for their younger dittos.[6] Both conclusions would nonetheless imply that target CEOs' self-interest has a substantial influence on companies' M&A-decisions and ultimately on shareholder value. Consequently, we further debate whether firms may need to turn to non-financial incentives to adequately eliminate the inherent agency problem in mergers and

[4] Our panel data is on the CEO-firm-year level, hence a CEO-year is one observation. Note that there can be multiple observations at the firm-year level due to mid-year CEO turnover for some companies some years.

[5] We expect the effect will be amplified in "both directions", i.e. that young CEOs who are unwilling to sell will use their influence to hinder a takeover, whilst retirement-aged CEOs who are prone to sell will use their influence to actualize it.

[6] Please note that the design of golden parachutes is not the primary focus of this thesis and that there might be many other variables affecting the size of the golden parachute. We are simply pointing to the fact that the age of the CEO might be an overlooked factor. Please see Appendix 1.5 for a mathematical derivation of our suggested golden parachute.

acquisitions, as suggested by the motivation crowding theory. Finally, this thesis supplements the literature on corporate governance by shedding light on the fact that when a CEO gets extended control through a board seat, she will exploit this additional influence with self-serving activities that may possibly be at the expense of shareholders.

The remainder of this thesis is structured as follows. Section II provides an introduction to related literature and develops the hypotheses. Section III describes the data construction process and outlines descriptive statistics. Section IV explains the empirical methods used and contains a detailed overview of the econometric models applied. Section V presents the main results from our regressions. Section VI discusses potential biases and explores various alternative explanations to the retirement-age effect and other results. Finally, Section VII concludes the thesis and provides suggestions for future research.

II. RELATED LITERATURE AND HYPOTHESES DEVELOPMENT

The impact that the age of target CEOs has on the likelihood of being acquired is a rather niche topic with limited previous literature. Nonetheless, there are countless of papers written in neighboring research areas, namely (1) CEO age and career concerns, (2) CEO characteristics and corporate finance decisions, and (3) theories on how to reward executives, corporate governance, and agency problems in M&A-transactions.[7]

A. CEO Age and Career Concerns

To the best of our knowledge solely one other paper, written by Jenter and Lewellen (2015), links merger activity to the age of the target CEO. Their research is based on the U.S. market with data for the years 1989-2007. The authors conclude that there is a clear spike in the merger activity when the target CEO is in retirement-age. Whilst their paper has been used as the theoretical basis for our thesis, we believe there are certain fundamental differences in corporate environment between the U.S. and Sweden that motivate further research in this area. First of all, the corporate governance norm differs widely between the two markets. In the U.S., it is common for the CEO to also be the Chairman and the President of the company, whereas in Sweden it is forbidden to be both the CEO and Chairman of the same public company (Brickley et al., 1997; Swedish Corporate Governance Code, 2016). Accordingly, one would anticipate U.S. CEOs to have much greater power and influence than their Swedish counterparts. Furthermore, a disproportionately large part of Swedish companies are owned or controlled by strong family foundations, investment companies or private equity firms (Henrekson and Jakobsson, 2003; Henrekson and Jakobsson,

[7] It should be noted that most prior literature is based on the US market.

2011; Swedish Corporate Governance Code, 2016). One would expect that these strong owners are the ones to call the shots, and hence that these CEOs would have a less significant impact on takeover decisions. Finally, the labor markets in Sweden and the U.S. differ considerably. Not only in terms of trade unions and collective agreements, but also with regards to the extent of which golden parachutes and other lucrative severance packages are used (Sandström and Wernhoff, 2009; Bebchuk et al., 2014). Our thesis thus extends the literature on this topic and investigates whether a retirement-age effect can be found in markets with stronger corporate governance norms, a different type of ownership structure, and with a different labor market.

Research by Yim (2013) suggests that the propensity to acquire other firms is higher for younger CEOs relative to older CEOs. According to Yim, this is because acquiring CEOs enjoy large and permanent increases in salary following a successful acquisition, and therefore "younger CEOs enjoy greater compensation benefits from acquisitions than older CEOs". Yim's paper concerns the acquiring CEO, and much in line with Yim's logic, this thesis provides evidence that the opposite is true for target CEOs – that younger CEOs are less prone to sell their companies relative to older CEOs.

This thesis also extends the literature on career concerns. Previous literature suggests that CEO career concerns vary with age. Gibbons and Murphy (1992) suggest that for a young CEO, with more of her career ahead of her, the career concerns are greater. Following this, Gibbons and Murphy (1992) and Holmström (1999) argue that as career concerns decline with age, the agency problems with managers worsen as they approach retirement. Consistent with this view, Hambrick and Fukutomi (1991) document that long-tenured CEOs are less likely to immerse in new initiatives and are hence more likely to favor the status quo. Other papers suggest that CEOs focus too much on projects with short-term gains as they get older (Dechow and Sloan, 1991). We offer a different perspective on career concerns for CEOs by exploring if a company's likelihood of being acquired increases with the CEO's age.

B. CEO Characteristics and Corporate Finance Decisions

Whilst there is little research relating the age of target CEOs to the likelihood of being acquired, there is a growing number of research papers investigating the effects of other CEO characteristics on corporate finance decisions. Overconfidence is a widely debated CEO trait. For example, in a well-known paper by Richard Roll (1986) he proposes the "hubris hypothesis" to explain takeovers, which advocates that overconfident CEOs pursue mergers because they truly believe their ability to manage is great enough to succeed - even though the mergers have a low chance of generating value. Moreover, Malmendier and Tate (2008) argue that "overconfident managers [...] overinvest when they have abundant internal funds, but curtail investment when they require external financing". Bertrand and Schoar (2003) adopt a wider approach and claim that manager "style" affect corporate finance decisions (e.g. dividend policy, leverage, and investments), and further that manager style is strongly linked to personal characteristics, such as risk aversion, life experience, and education. Additionally, these personal characteristics can change over time and with age (Bertrand and Mullainathan, 2003). This thesis broadens this field of literature and provides evidence that also the age of the target CEO has an impact on a potential takeover, which undoubtedly is an important corporate finance decision.

C. Theories on Rewards, Corporate Governance and Agency Problems in M&As

Moreover, this thesis contributes to the literature on executive rewards, implicit incentives, and corporate governance. There are many theories about what motivates people. Douglas McGregor (1960) sums it up rather well in his acclaimed book "The Human Side of Enterprise", where he proposes two theories about human beings: *Theory X* and *Theory Y*. Stemming from this, there are two contrasting theories about rewards and motivation. The *Agency Theory* (*Theory X*), derived from economics (see for instance Jensen and Meckling, 1976), and the *Motivation Crowding Theory* (*Theory Y*), which is instead derived from psychology and sociology (Frey and Jegen, 2001).

According to the agency theory, there is an inherent problem with asymmetric information between the principal (shareholders and board of directors), and the agent (the CEO). The agent is assumed to be a self-interested individual with a primary interest to maximize her utility (financial wealth) and will exploit the asymmetric information to shirk from responsibility and duty. Therefore, it is crucial to align the agent's interests with those of the principal by introducing financial incentives, such as bonuses and severance packages. Research by Jensen and Murphy (1990) further recommends that CEOs should be substantial owners of the stock in the firm.

The motivation crowding theory introduces intrinsic motivation as an important factor (Deci and Ryan, 1985; Frey and Jegen, 2001), and particularly focuses on how intrinsic and extrinsic motivation relate to each other. This theory suggests that when intrinsic motivation is weak, external rewards might be very important. However, when intrinsic motivation is strong (i.e. when the work is found to be interesting and challenging), which should be the case for most CEOs (Finkelstein and Boyd, 1998), one should be cautious with external rewards as these could decrease total motivation due to the crowding-out effect (Frey and Jegen, 2001). In the context of this thesis, the motivation crowding theory begs the question whether financial incentives is the proper way of eliminating the agency problem in takeover attempts.

The design and existence of golden parachutes and other lucrative severance packages are, for most firms, rooted in the agency theory (Fiss et al., 2012). Moreover, research has shown that most golden parachutes and similar incentive schemes are primarily designed as a function of firm size and growth, rather than performance and value (Hartzell et al., 2004; Jensen and Murphy, 2010).

Prior studies have consistently found that whilst the target company in M&A-transactions on average enjoy a gain of 15% in stock price post-announcement, the acquiring company see an average gain of only 1%. More importantly, in half of the transactions the stock price decline (see for instance Andrade et al., 2001; Moeller et al., 2005). Corporate finance literature offers two possible explanations for why managers would engage in value-destroying transactions, namely conflict of interest between the CEO and its shareholders (the agency problem), and CEO overconfidence (discussed in Section II.B).

With regards to the agency problem in corporate takeovers, golden parachutes play an important role for target CEOs. Agrawal and Walkling (1994) argue that target CEOs generally lose their jobs in relation to a takeover and rarely find another executive position. Golden parachutes and similar compensation schemes are supposed to mitigate these problems. Though, it is ambiguous to what extent they actually eliminate the fundamental agency problem (Fiss et al., 2012; Jenter and Lewellen, 2015). On the other hand, Harford and Li (2007) show that in 75% of mergers that are value-destroying, acquiring CEOs are actually better off financially. This is because boards typically increase the pay of CEOs along with the size of the firm, even if the size comes at the expense of poorly performing acquisitions. Therefore, CEOs may prefer to run a larger company thanks to the additional prestige and pay it entails (Yim, 2013). In summary, target CEOs often suffer from a takeover, whereas the acquiring CEO generally benefit greatly (even for bad acquisitions). In this thesis, we address the agency problem in M&As from a different angle. Most prior studies focus on firms when trying to explain bad acquisitions as a consequence of the agency problem. Firm characteristics such as excessive free cash flow (Jensen, 1986; Harford, 1999), weak corporate governance (Bertrand and Mullainathan, 2003; Masulis et al., 2007), and poorly structured compensation schedules (Lewellen et al., 1985; Datta et al., 2001) have been used to explain why CEOs would engage in value-destroying transactions. Yet, research often neglects the possibility that agency problems is more related to the characteristics of the individual CEO rather than the firm. This thesis offers a new standpoint to the existence of agency problems and value-destroying M&A-transactions by including the age of the target CEO as a possible explanatory variable.

D. Hypotheses Development

Based on the theories above, there are three underlying arguments for our first hypothesis. (1) The target CEO is arguably one of the most important decision-makers in any M&A-transaction. Not only is she a key actor once a bid has been made (by providing recommendations to the board and leading negotiations), but also in the time periods leading up to a bid – for example by publicly showing/not showing willingness to be acquired (Graham, Harvey and Puri, 2015).

(2) If a takeover forces target CEOs to take a less important/valuable position or even retire (see Section II.B), the private costs (i.e. lost future salary, lost status, lost influence) for younger CEOs will be much higher compared to CEOs near retirement. Thus one would expect that the willingness to be acquired is much lower for a young CEO than an old one, and vice versa.

(3) The compensation that CEOs receive from losing their job following an acquisition is in the forms of golden parachutes and other severance packages. If firm size is the primary determinant of these compensation schemes rather than CEO age (see Section II.C), then these severance packages better offset the lost future salary for older CEOs than for younger ones (assuming the same average life-span). Following this logic, one would also expect that some CEOs in near retirement-age would actually want to be acquired in order to retire with a lucrative severance package as a final bonus in the end of her career. This effect is something one would expect to see in only the near retirement-age span, rather than as a gradual increase with age. Derived from these three arguments, we believe that the likelihood of being acquired will be higher for firms with CEOs in near-retirement than for firms with CEOs in other age groups. However, we are doing a two-tailed hypothesis test, thus our first null hypothesis is:

$H_0$1: The likelihood of being acquired is the same for firms with retirement-aged CEOs as for firms with CEOs in other age spans.

We have already noted that the target CEO is one of the most important decision-makers in a corporate takeover. Given that the board is responsible for hiring, firing and compensating the CEO, and more importantly ultimately responsible for all strategic decisions in a company (Swedish Corporate Governance Code, 2016), it is fair to assume that CEOs who are a member of the board have greater influence than other CEOs. Moreover, corporate governance literature argue that enhanced corporate governance quality, such as having a board of independent directors, increase shareholder value – especially during takeovers (Cotter et al., 1997). Therefore, we expect the effect from hypothesis 1 to be amplified[8] for this type of CEO, and henceforth that the likelihood of a takeover is greater for firms with CEOs who also have a board seat. Given this alternative hypothesis, we perform a one-tailed hypothesis test and our second null hypothesis is thus:

[8] We expect the effect to be amplified in "both directions", i.e. that young CEOs who are unwilling to sell will use their influence to hinder a takeover, whilst retirement-aged CEOs who are prone to sell will use their influence to actualize it.

$H_0$2: The likelihood of being acquired is equal or lower for firms with retirement-aged CEOs who are also board members, relative to all other types of CEOs.[9]

Lastly, we investigate whether the bid premium paid to target companies vary depending on the age of the target CEO. There are two main reasons to believe that the bid premium is lower for target companies with retirement-aged CEOs. First, retirement-aged CEOs might feel ready to retire after a long career and thus see a bid as a good way to exit. This would suggest that they bargain less hard, and/or accept bids with lower synergy effects, which in turn imply that they "let go" of their companies more easily. Consequently, the received bid premiums would be lower for retirement-aged CEOs. Second, assuming that the loss from a takeover (in future salary and other benefits of being the CEO) is larger for younger target CEOs than for their older dittos, one would expect them to demand a higher bid premium to accept the bid in order to compensate for their greater personal takeover costs. In short, younger CEOs would require, as Don Corleone is swift to remind us in the Godfather trilogy – "an offer [they] can't refuse". These two principal reasons lead us to our third null hypothesis (two-tailed test):

$H_0$3: The bid premium received is the same for target firms with retirement-aged CEOs as for target firms with CEOs in other age groups.

III. DATA

A. Datasets and Sample Construction

To test our hypotheses we need four different datasets: (1) historic data on Swedish companies, including the organizational number to be able to uniquely identify a company, (2) the age of the CEO at any point in time, (3) all public[10] companies in Sweden, and finally (4) data on mergers and acquisitions on the Swedish market. We obtain (1), (2) and (3) from the Serrano-database at the Swedish House of Finance, who in turn receives the data from Bisnode. Bisnode acquires most of its original data from Statistics Sweden (Swedish: Statistiska Centralbyrån) and the Swedish Companies Registration Office (Swedish: Bolagsverket). After close examination of the data, we note that in order to receive as complete and reliable a dataset as possible we only keep data for

[9] In this context there are three other types of CEOs: (1) a retirement-aged CEO who is not a board member, (2) a non-retirement-aged CEO who is a member of the board, and (3) a non-retirement-aged CEO who is not a member of the board.
[10] Please see Appendix 1.2 for definition of a public company.

the years 2001 to 2016. Prior to 2001 the data is incomplete and unreliable[11], and we also choose to exclude 2017 from our dataset as the year has not ended at the time of writing. As some of our variables are lagged by one year, the time period for our analysis will thus be 2002-2016. Moreover, 2002-2016 is 15 years of data and represent roughly two business cycles (Hassler et al., 1992), which we believe is adequate for our study. In conclusion, our scope of study is public Swedish companies and M&A-transactions[12] for the years 2002-2016, which comply with the company- and deal criteria outlined below and in Appendix 1.4.

We started by merging all the various datasets and removed all companies that are not public and those that we did not have complete CEO-data on. The data needed for our analysis is, in addition to the company's organizational number, the birth year of the CEO; the dates the CEO took office and left office; the gender of the CEO; whether or not the CEO is also a member of the board (will be referred to as CEOBMs); the industry the company operates in; the original registration date of the company to the Swedish Companies Registration Office (to use as a proxy for firm age); and finally information on the companies' total assets, return on assets (ROA), and equity ratio for each year.[13] Using the CEO birth year together with the start- and end date for CEOs, we computed the CEO age at any given year and the number of years the CEO had been in office at any given year, and obtained a panel of CEO employments by firm spanning 2002-2016. We excluded all observations for CEOs whose total time in office were less than six months in order to exclude possible errors in misreported data and very short-term or interim CEOs.[14] The ensuing dataset is at the CEO-firm-year level[15], with multiple observations possible at the firm-year level due to mid-year CEO turnover for some companies some years. Given that we have more CEO-years than firm-years, this will slightly underestimate the implied probability for a takeover for a certain year, as the denominator is at the CEO-firm-year level. However, this will be the same across all ages. Given that our primary analysis is not to compute the implied probability of a takeover, but rather if the implied probability of a takeover differ depending on the age of the target CEO, this will not impact our result. Moreover, using the registration date as a proxy for firm inception we computed the firm age at any given year. Lastly, we used Bisnode's definition of the various industries (Appendix Table A.7).

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[11] For example, the number of firms increases from 186 to 981 to 1236 between 1999, 2000 and 2001 in the dataset, and are then rather stable. The data prior to 2001 thus seem incorrect, and since we use some lagging variables (t-1) we can only use data from 2002 and onwards.
[12] Note that the acquirer can be non-public and non-Swedish.
[13] Note that 2001 information is needed since these measures will be used as lagging variables.
[14] When removing observations we set the end date of the incumbent CEO equal to the end date for the CEO that was removed in order to avoid gaps in the data.
[15] Hence, one CEO at one firm at a certain year is one observation. We call one observation one "CEO-year", see Appendix 1.3 for more details.

We compiled M&A data (4) from three different sources, namely SDC Platinum, Bloomberg and MergerMarket. These were then manually crosschecked between the sources and news articles to achieve consistency and reliability in the data. Before any adjustments, our dataset contains 208[16] completed transactions for the years 2002-2016. For a full description of the deal criteria used, please see Appendix 1.4.

The variables we are interested in from the M&A-dataset are the following: the target company's organizational number (to be able to match it with our other dataset); the deal value (if available); the announcement date[17]; the bid premium (if available); and finally, the stake acquired (%) as well as the ownership (%) prior to the acquisition.[18] By merging the datasets we obtained a complete CEO panel, including the age of the CEO at the announcement date, the number of years the CEO has been in office at the announcement date, if the CEO is also a board member (CEOBM) at the announcement date, and the firm age at the announcement date. In our later regression models we include a company's equity ratio, the logarithm of total assets, and the arctangent of ROA as lagging variables, see Table A.8 for details.

The last adjustment we make is to remove all observations with total assets below SEK 100m. We exclude these micro-/small-cap companies for primarily three reasons: First of all, it is unlikely that these companies will have equally widespread severance package policies as other companies (Frydman and Jenter, 2010), which is an essential part of our analysis. Second, since we only include M&A-transactions with a deal value exceeding €5m (Appendix 1.4 for detailed deal criteria), we believe our data would be unbalanced if we were to include micro-cap companies but exclude micro-cap transactions. Finally, Jenter and Lewellen (2015) exclude companies with total assets less than $10m, hence this adjustment facilitates a comparison of the results.

B. Descriptive Statistics

Table I.a reports descriptive statistics for the full sample as well as for two subsamples: if the CEO is board member (CEOBM) or not. The average CEO is 49.6 years old and has on average been in office for 3.3 years (the medians are 50.0 and 2.0). We note that CEOBMs are slightly older and more long-tenured. The average firm is 27.3 years old (median: 16.0), with no significant differences across our subsamples. Looking at gender, it is notable that 84% of the CEOs in our sample are male, and that number increases to 87% for CEOBMs. With regards to the total assets, the average

[16] The observant reader will note that this figure differs from the number used as an example in Section I. This is because not all of the transactions comply with our deal criteria. See Appendix 1.4 for more details.
[17] We choose the announcement date rather than the completion date as we think that the CEO present during the announcement date is the CEO that has been ultimately responsible for the transaction and negotiations.
[18] We exclude all transactions labelled as minority stake purchases, share repurchases, recapitalizations, privatizations and exchange offers, see Appendix 1.4 for full deal criteria.

firm has a total balance sheet of c. SEK 9.5bn. However, the median is only c. SEK 730m and the standard deviation is hence exceptionally high.

Table I.a: Descriptive Statistics for the Full Panel Before Adjustments

Our full dataset include 16,592 CEO-years (2,319 firms and 5,378 CEO-employments) over the years 2002-2016. The first part of Table I.a is the complete sample with all observations. The right hand side is split between CEOs that hold a board seat in the company (CEOBMs) and CEOs that are not board members. *CEO Age* is the age of the CEO. *Years as CEO* is the number of years the CEO has held the position. *Firm age* is the number of years a company has been registered at the Swedish Companies Registration Office. *Gender* is a dummy variable for the gender of the CEO; 1 for male and 0 for female. *Board member* is a dummy variable with 1 for CEOBMs and 0 for non-board members. *Equity ratio* is the equity ratio of the company. The ratio is calculated with the closing balance figures for a fiscal year and then matched with the following fiscal year in the dataset (hence lagged by one year). *Total assets* is the ingoing balance (SEK millions) for a company. *ROA* is the return on assets, defined as EBIT/Total assets. This variable is also lagged by one year. Thus, both *Total assets* and *ROA* can also be considered to be lagging variables. Detailed description of the variables can be found in Table A.8 (appendix).

	All observations				Board member (CEOBM)				Non-board member			
	Mean	Median	Std	N	Mean	Median	Std	N	Mean	Median	Std	N
CEO Age	49.56	50.00	8.26	16,592	49.91	50.00	8.62	9,414	49.10	49.00	7.74	7,178
Years as CEO	3.28	2.00	3.38	16,592	3.45	2.00	3.48	9,414	3.05	2.00	3.23	7,178
Firm age	27.25	16.00	29.41	16,516	28.03	16.00	30.94	9,349	26.22	17.00	27.24	7,167
Gender	0.84	1.00	0.37	16,592	0.87	1.00	0.34	9,414	0.80	1.00	0.40	7,178
CEOBM	0.57	1.00	0.50	16,592	1.00	1.00	0.00	9,414	0.00	0.00	0.00	7,178
Equity ratio	0.55	0.55	0.30	12,705	0.52	0.51	0.30	6,853	0.58	0.60	0.29	5,852
ROA	2.79	4.50	25.69	12,770	3.69	4.80	25.47	6,887	1.75	4.30	25.91	5,883
Total assets	9,533	730	45,891	12,782	11,284	849	52,737	6,914	7,469	627	36,096	5,868

Table I.b describes the same information as Table I.a, but the dataset is adjusted for missing observations among the variables.[19] All variables but *Firm age, ROA, Equity ratio* and *Total assets* have data for all CEO-years (i.e. observations). When adjusting for this, 4,244 observations are dropped in total. The subsequent, adjusted, dataset does not differ that much from our full sample in terms of descriptive statistics, except for the number of observations. This is the main sample we will use for our regression models. The observant reader will note that CEOBMs have been in office for almost 24% longer than non-board members, even though the actual numbers are fairly equal. Moreover, CEOBMs seem to manage slightly older firms.

Table I.c includes firm- and CEO information for the acquired companies in our sample. There are 164 transactions in our main sample (same adjustments as in Table I.b), and 100 of them have disclosed bid premiums. Comparing the main sample in Table I.b with the main sample in Table I.c, the descriptive statistics for acquired companies are rather similar with regards to *CEO age*, *Years as CEO* and *Firm age*. Notable is the reasonably large difference in proportion of CEOBMs, where only 39% of target CEOs are also board members compared to 54% of our full sample. Furthermore, we can see that the bid premium is rather similar for CEOBMs and non-

[19] Observations are dropped to represent the dataset used in the regression models in Tables III-V.

board members (31.49% and 28.97% respectively). Acquired firms with CEOBMs are on average older, and more male-heavy compared to CEOs without a board seat, as can be seen in Table I.c. There are also fewer females among CEOBMs for acquired firms relative to CEOBMs of all firms (8% and 13% respectively).

Table I.b: Descriptive Statistics for the Adjusted Panel Dataset

The adjusted dataset contains 12,348 firm-years (1,276 firms and 3,716 CEO-employments) from 2002 to 2016. Table I.b is based on the sample described in Table I.a, but reduced by removing all observations with incomplete data among the variables in Table I.a. 4,244 CEO-years are removed after the adjustments. All observations now have data for all variables. The first part of Table I.b displays descriptive statistics for the main (adjusted) sample. The right hand side is split between CEOBMs and CEOs that are not board members. The variables are defined in Table I.a (and detailed in Appendix Table A.8). This will be our main sample for the regressions in Tables III and IV.

	All observations (N =12,348)			CEOBM (N =6,664)			Non-board members (N =5,684)		
	Mean	Median	Std	Mean	Median	Std	Mean	Median	Std
CEO Age	49.91	50.00	7.63	50.47	51.00	7.72	49.24	49.00	7.48
Years as CEO	3.58	3.00	3.47	3.93	3.00	3.59	3.17	2.00	3.28
Firm age	31.71	20.00	30.16	34.40	21.00	31.73	28.56	18.00	27.89
Gender	0.85	1.00	0.36	0.87	1.00	0.34	0.82	1.00	0.39
Board member	0.54	1.00	0.50	1.00	1.00	0.00	0.00	0.00	0.00
Equity ratio	0.55	0.54	0.29	0.53	0.51	0.30	0.57	0.58	0.29
ROA	3.07	4.70	24.87	3.89	4.85	25.27	2.11	4.40	24.36
Total assets	9,756	731	46,662	11,545	844	53,685	7,659	629	36,653

Table I.c: Descriptive Statistics for Target Firms

Table I.c is based on the full adjusted sample reported in Table I.b, but includes only acquired firms (i.e. only the observation when the firm is acquired) for the years 2002-2016. There are 148 companies in this sample with 164 unique acquisitions (100 acquisitions with disclosed bid premiums). *Bid* premium *(%)* is defined as $\frac{Final\ bid\ price\ per\ share}{Closing\ price_{t-1}}$. In the case of a takeover contest (if there are several public bids on the same target) the final bid is used. All other variables are defined in Table I.a (and detailed in Table A.8). These samples will be used for the regressions in Table V.

	All observations (N =164) Obs. with bid premium =100			CEOBM (N =64) Obs. with bid premium=39			Non-board members (N =100) Obs. with bid premium=61		
	Mean	Median	Std	Mean	Median	Std	Mean	Median	Std
CEO Age	50.63	51.00	7.46	52.06	52.50	7.68	49.72	51.00	7.21
Years as CEO	3.74	3.00	2.84	4.55	4.50	3.21	3.22	3.00	2.45
Firm age	30.28	21.00	28.13	35.41	21.50	30.94	27.00	20.50	25.79
Gender	0.84	1.00	0.37	0.92	1.00	0.27	0.79	1.00	0.41
Board member	0.39	0.00	0.49	1.00	1.00	0.00	0.00	0.00	0.00
Equity ratio	0.62	0.62	0.23	0.61	0.60	0.23	0.63	0.64	0.24
ROA	3.73	6.75	15.07	4.06	7.45	12.75	3.52	6.05	16.44
Total assets	2,515	754	5,813	3,024	906	5,993	2,190	636	5,700
Bid premium	29.95	25.50	28.40	31.49	25.00	40.14	28.97	26.00	17.54

Table II.a and II.b report descriptive statistics for our main (adjusted) sample split up in subsamples based on CEO age. *Years as CEO* in Table II.a indicates that CEOs in the older age groups have on average held the position longer, which one would expect as these variables are somewhat correlated (see Table A.6). *Gender* also shows the same trend, where the CEO-position becomes increasingly male-dominated with age. *Board membership* for CEOs also seems to increase with age for our full sample. Comparing board membership in Table II.a and Table II.b, it can be noted that the proportion of CEOs who are also board members decreases for all age cluster except for the retirement-age cluster (61-65 years old). And more notably, the difference in board membership between the retirement-age cluster and other age groups are over 30 percentage points. Attentive readers will notice that total average assets for each subsample in Table II.a and II.b differ quite significantly, where the acquired companies on average have much smaller balance sheets. However, the median for total assets are rather similar, which suggests that the largest companies with massive balance sheets are not as frequently sold. Furthermore, retirement-aged CEOs manage companies with the highest *ROA*, as can be seen in Tables II.a and II.b.

Table II.a: Descriptive Statistics for Adjusted Panel Based on Age Intervals

Table II.a describes the main sample presented in Table I.b divided on different age intervals (see Section IV.F for motivations behind age intervals). Descriptive statistics for mean and median is shown for the five age clusters with data from 2002-2016. The panel includes 12,348 CEO-years (1,276 firms and 3,716 CEO-employments) spread out over the different age intervals. All variables are defined in Table I.a (and detailed in Table A.8).

	Means based on CEO age (N=12,348)					Medians based on CEO age (N=12,348)				
	≤40	41-50	51-60	61-65	≥66	≤40	41-50	51-60	61-65	≥66
	N=1,374	N=5,091	N=4,901	N=809	N=173	N=1,374	N=5,091	N=4,901	N=809	N=173
CEO Age	37.10	45.81	55.04	62.39	68.43	38.00	46.00	55.00	62.00	68.00
Years as CEO	2.23	2.96	4.12	5.92	6.46	2.00	2.00	3.00	5.00	5.00
Firm age	21.75	30.36	35.41	36.17	25.29	14.00	19.00	22.00	22.00	19.00
Gender	0.84	0.83	0.85	0.90	0.95	1.00	1.00	1.00	1.00	1.00
Board member	0.49	0.51	0.56	0.62	0.71	0.00	1.00	1.00	1.00	1.00
Equity ratio	0.58	0.55	0.54	0.54	0.49	0.60	0.55	0.53	0.51	0.49
ROA	-0.56	3.07	3.82	5.04	1.68	3.10	4.60	4.90	5.50	4.40
Total assets	3,011	9,433	12,559	7,693	3,060	380	647	1,079	1,161	448

Table II.b: Descriptive Statistics for Target Firms Based on Age Intervals

Table II.b is based on the main sample reported in Table I.b, but includes only acquired firms (i.e. only the CEO-years when the firm is acquired) for the years 2002-2016. There are 148 companies in this sample with 164 unique acquisitions (100 acquisitions with disclosed information about bid premium). *Bid premium (%)* is defined in Table I.c and in more details in Appendix Table A.8. All other variables are defined in Table I.a (and detailed in Table A.8).

	Means based on CEO age					Medians based on CEO age				
	≤40	41-50	51-60	61-65	≥66	≤40	41-50	51-60	61-65	≥66
	N=14	N=62	N=68	N=19	N=1	N=14	N=62	N=68	N=19	N=1
CEO Age	38.21	45.23	54.50	62.68	68.00	38.50	45.00	54.50	63.00	68.00
Years as CEO	2.07	3.32	3.99	5.47	3.00	1.50	3.00	3.00	6.00	3.00
Firm age	18.14	30.31	33.79	27.21	18.00	13.00	21.50	21.00	23.00	18.00
Gender	0.64	0.87	0.85	0.89	0.00	1.00	1.00	1.00	1.00	0.00
Board member	0.29	0.37	0.35	0.68	0.00	0.00	0.00	0.00	1.00	0.00
Equity ratio	0.74	0.59	0.62	0.63	0.95	0.73	0.58	0.63	0.65	0.95
ROA	-6.64	5.50	3.19	8.75	-19.40	-4.50	7.00	6.25	8.00	-19.40
Total assets	618	1,677	3,827	2,078	137	304	613	1,108	887	137
Bid premium	30.86	26.97	30.76	36.44		24.00	26.00	25.00	27.00	
N (bid premium)	7	35	49	9	0	7	35	49	9	0

IV. EMPIRICAL APPROACH

In this section we establish five statistical models for how we want to use the data in order to test our null hypotheses. We begin by using the regular logit model, which is a non-linear regression model used when the dependent variable has a binary outcome (Cox 1958). We set the dependent variable, *Acquired,* equal to 1 if a firm is successfully acquired and *Age cluster* as our independent dummy variables of interest, whilst controlling for other CEO- and firm characteristics as well as fixed effects for industry and year. Standard errors are clustered by firm. Secondly, we use a modification of the logit model, which we will call the "logit2"-model (Table A.1). The logit2 model is a model, written by us in line with the findings of Petersen (2009). It is based on the regular logit model but it also allows for clustering standard errors by two variables. Jenter and Lewellen (2015) cluster standard errors by firm and year, and thus this model let us compare our findings with Jenter and Lewellen on an "apples to apples"-basis.

As only about 1% of our observations are acquisitions, the acquisitions can be considered to be "rare events" (King and Zeng, 2001) and therefore we also choose to include the ReLogit-model developed by King and Zeng. Similar to the logit2, this model is based on the regular logit model, but it compensates for the fact that the dependent variable can be considered a rare event. Additionally, the multivariate linear probability model is applied to our dataset in order to see how a linear regression model affects our results. Finally, to test hypothesis 3, we run a multivariate linear ordinary least squares (OLS) regression. We set *Bid premium* as our dependent variable and *Age cluster* as our independent dummy variables of interest, whilst still controlling for other CEO- and firm characteristics as well as fixed effects for industry and year and cluster standard errors by firm.

A. The Logit Model

To test hypothesis 1 and 2 we use the logit model. The logit model has especially two advantages over the more common linear regression models when testing our hypotheses. First, a linear regression model may lead to predictions less than zero or greater than one, which violate the rules of probability (Woolridge, 2009). Second, for a binomial distribution the theoretical mean and variance are np and $np(1-p)$, respectively, where p is the probability of success (an acquisition) and n being the total number of observations (CEO-years). Henceforth, the variance is a function of the mean and a residuals plot would reveal great heteroscedasticity (Gujarati, 2004). Moreover, binary data does not have a normal distribution, which is a condition needed for many types of linear regressions. In a binary response model (such as the logit and probit models) these problems are solved by fitting a non-linear function to the data, and instead paying attention to the response probability:

$$P(y = 1 \mid \boldsymbol{x}) = P(y = 1 \mid x_1, x_2, \dots, x_i), \quad [1]$$

Where $\mathbf{x}$ denotes the full set of observed explanatory variables (Woolridge, 2009). Both logit and probit take the form:

$$P(y = 1 \mid \boldsymbol{x}) = G(z) = G(\beta_0 + \beta_1 x_1 + \cdots + \beta_i x_i), \quad [2]$$

Where $G(z)$ is a function taking on values strictly between 0 and 1 for all real numbers z. In the logit model, G is the logistic function:

$$G(z) = \frac{1}{1+e^{-(\beta_0+\beta_1 x_1+\cdots+\beta_i x_i)}} = \frac{e^{(\beta_0+\beta_1 x_1+\cdots+\beta_i x_i)}}{1+e^{(\beta_0+\beta_1 x_1+\cdots+\beta_i x_i)}} = \frac{e^z}{1+e^z}, \quad [3]$$

Hence:

$$P(y = 1 \mid x) = \frac{e^z}{1+e^z}, \quad [4]$$

An advantage by presenting the relationship like this is that P (the probability of "success") moves closer to 0 or 1 as $z = \beta_0 + \beta_1 x_1 + \cdots + \beta_i x_i$ approaches -∞ and ∞ respectively, but never reaches or surpasses those boundaries (0 and 1). Consequently, the important requirement $0 \leq P \leq 1$ is satisfied for all real numbers (Woolridge, 2009), which could be violated when using an LPM regression.

As P is the probability of being acquired in our case, $1 - P$ is the probability of not being acquired. By taking $\frac{P}{1-P}$ we get the odds ratio of an acquisition happening. The logistic model is thus:

$$\frac{P}{1-P} = \frac{1+e^{(\beta_0+\beta_1 x_1+\cdots+\beta_i x_i)}}{1+e^{-(\beta_0+\beta_1 x_1+\cdots+\beta_i x_i)}} = e^{(\beta_0+\beta_1 x_1+\cdots+\beta_i x_i)}, \quad [5]$$

The odds ratio of the logistic regression model can be harder to interpret than the output from linear models. Therefore, we use the logit model (*L*), as we believe that the log odds allow for easier interpretation:

$$L = ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 x_1 + \cdots + \beta_i x_i, \quad [6]$$

The logit model is thus linear in x and linear in the parameters. Plugging in our variables, our first regression, when testing hypothesis 1, takes the form:

$$P(Acquired_{it} \mid \boldsymbol{x}) = L(\beta_0 + \beta_1 RetAge_{it} + \beta_2 Years\ as\ CEO_{it} + \beta_3 Board\ member_{it} + \beta_4 Gender_{it} + \beta_5 Log(Assets)_{it} + \beta_6 Firm\ age_{it} + \beta_7 Equity\ ratio_{it} + \beta_8 Arctan(ROA)_{it} + \varepsilon_{it}), \quad [7]$$

When looking at all age clusters, and adding controls for fixed effects, the regression becomes:

$$P(Acquired_{it}|\,\boldsymbol{x}) = L(\beta_0 + \beta_j Age\ cluster_{ijt} + \beta_6 Years\ as\ CEO_{it} + \beta_7 Board\ member_{it} + \beta_8 Gender_{it} + \beta_9 Log(Assets)_{it} + \beta_{10} Firm\ age_{it} + \beta_{11} Equity\ ratio_{it} + \beta_{12} Arctan(ROA)_{it} + fe_{kt} + \varepsilon_{it}), \quad [8]$$

Where L denotes that it is a logit function, *Acquired* is a dependent dummy variable and *RetAge* is the independent dummy variable of interest in the first regression, indicating whether the CEO is in retirement-age or not. In our second regression, the *Age cluster* dummies are instead the most relevant independent variables, indicating what age cluster the CEO belongs to. The other variables are controlling for various CEO- and firm characteristics. We also control for fixed effects (*fe*) by industry *k* and year *t* (see Section IV.G for details). The subscripts *i*, and *t* correspond to firm *i* in year *t,* while the subscript *j* denotes age cluster 1-5.[20] Due to several extreme outliers and a rather odd distribution of ROA among the firms in our dataset, we choose to include the arctangent of the ROA in our regression model. Ultimately, it becomes a rather philosophical question, but we argue that going from 200% ROA to 230% ROA does not have the same impact on our dependent variable as going from 0% in ROA to 30% in ROA. In other words, we believe that an increase in ROA has a diminishing effect on our dependent variable. To see more details about how we modeled the *Arctan*ROA, please see Appendix Figure A.2. To allow for a closer comparison with the results of Jenter and Lewellen (2015) we also include a regression with the regular *ROA* as a control variable (Table A.1).

As can be seen in the descriptive statistics (Section III.B) and in Figure A.1, the distribution for total assets is very positively skewed. Moreover, we believe that when being an asset-heavy company there is a diminishing effect of having more assets. Therefore, the natural logarithm of total assets is used in our regression model. The logarithm of total assets is instead almost normally distributed (see Figure A.1) and should better fit our regression models.

Both the logit and the probit models follow the cumulative distribution function (CDF). However, the logit uses the CDF of the logistic distribution whereas the probit uses the CDF of the normal distribution (Woolridge, 2009). The two models generate similar results and thus the choice is to a large extent a matter of taste. The probit model was considered, but statistically the probit curve approaches the axes steeper, that is to say that the conditional probability *P* approaches 0 or 1 at a faster rate in probit than in logit (Gujarati, 2004). Henceforth, given the low probability

[20] Age cluster 1 = ≤40 years old; age cluster 2 = 41-50 years old; age cluster 3 = 51-60 years old; age cluster 4 = 61-65 years old; age cluster 5 = ≥66 years old.

of an acquisition in our dataset, the logit model was chosen because of its flatter curve and fatter tails.

In the model, we set age cluster 4 (61-65 years old) as our comparable base in order to easily see the difference between the retirement-age cluster and other age clusters. It does not have an impact on the results but allows for an easier interpretation of the output.

B. The Logit2 Model

In order to be able to compare our results with those of Jenter and Lewellen on an "apples to apples"-basis, we want to run a logit regression where standard errors are clustered by both firm and year. However, to the best of our knowledge, it is not possible to cluster standard errors in the logit model by two variables in our version of Stata. Therefore, based on findings from Petersen (2009), we write our own logit model in Stata, which allow us to cluster the standard errors by two variables (see Table A.2). Other than this, the model works in the same way as the regular logit model.

C. The ReLogit Model

In our dataset, the binary dependent variable (*Acquired*) has approximately 100 times more zeros than ones, i.e. on average c. 1.3% of all CEO-years (i.e. observations) in our data are acquisitions. Similar to wars, presidential vetoes in the U.S. and epidemiological infections, an acquisition can thus be classed as a "rare event" (King and Zeng, 2001). According to King and Zeng, a standard logit regression model can sharply underestimate the probability of a rare event. To compensate for this we also use the ReLogit model, developed by King and Zeng, which is also based on the standard logit model. However, it should be noted that this model does not allow us to cluster the standard errors by more than one variable.

D. The Linear Probability Model (LPM)

To see the impact of applying a linear model to our dataset, we also run a regression using the more common linear probability model. This is also a binary response model, which too computes the "probability of success" (Woolridge, 2009). Thus, we have the equation:

$$P(y = 1 \mid \boldsymbol{x}) = \beta_0 + \beta_1 x_1 + \cdots + \beta_i x_{i)}, \qquad [9]$$

Which looks similar to equation [2], however, $P(\mathbf{x}) = P(y = 1 \mid \boldsymbol{x})$ is now a linear function of our independent and controlling variables. The variables are, nevertheless, the same as in the logit model. The mechanisms of a standard OLS regression hold, but the coefficients of the explanatory variables in the LPM measure the predicted change in the probability of success[21] when the explanatory variables increase by one unit (Woolridge, 2009).

E. The Multivariate Linear OLS Model

When testing hypothesis 3, our dependent variable is *Bid premium*, which is a continuous variable rather than a dichotomous variable. To test hypothesis 3 we therefore use the more common multivariate linear OLS model. *Bid premium* is set as our dependent variable and the *Age cluster* dummies as our independent variables of interest, whilst still controlling for other CEO- and firm characteristics, as well as fixed effects for industry and year. Standard errors are clustered by firm. The model thus takes the form:

$$Bid\ premium_{it} = \beta_0 + \beta_j AgeCluster_{ijt} + \beta_6 Years\ as\ CEO_{it} + \beta_7 Board\ member_{it} + \beta_8 Gender_{it} + \beta_9 Log(Assets)_{it} + \beta_{10} Firm\ age_{it} + \beta_{11} Equity\ ratio_{it} + \beta_{12} Arctan(ROA)_{it} + fe_{kt}\ \varepsilon_{it}, \quad [10]$$

All variables are described in Table I.a (and in more detail in Table A.8).

F. The Age Cluster Variable

In our dataset the CEO age is a discrete variable, updated every year. However, when running our regressions, we decided to split it up into five clusters (dummy variables): (1) ≤40 years old; (2) 41-50 years old; (3) 51-60 years old; (4) 61-65 years old, which is also what we define as retirement-age; and (5) ≥66 years. The reason for splitting up the CEO age variable into five dummy variables was primarily due to the fact that we do not think that the propensity to be acquired will continuously increase with age. For instance, we do not think that a CEO who is 55 years old will differ significantly from a CEO who is 56 years old. However, the difference between someone who is 45 and 55 is more likely to be significant, and we expect the largest difference to be when the CEO is near retirement. To allow for a more comprehensive analysis we make several age clusters for our main regressions, rather than just one dummy variable for CEOs in retirement-age (61-65). Nevertheless, in the regressions where we set the retirement-age cluster as our comparable base we cannot see the z-statistics for that age cluster. Therefore, we start with a regression comparing only the retirement-age cluster to all other age clusters in Table III (column 1). Moreover, in Table III (column 3) we run a logit regression where we include only the retirement-age dummy together with discrete variables for the CEO age and the CEO age squared as linear and quadratic controls to see what impact they have on our results.

[21] I.e. the probability of a company being acquired.

The boundaries for the retirement-age cluster were chosen carefully. The societal and corporate norm in Sweden for all workers in Sweden is to retire at the age of 65, and our data can confirm that this also applies to CEOs in Swedish companies. In Figure 1, there is a clear peak in CEO departures in the ages of 63-65. Therefore, the upper limit was chosen to be 65 years old. In Sweden, one can start to receive the national retirement pension (Swedish: allmän pension) already from the age of 61, which is the motivation behind our choice for the lower limit (61 years old) (Pensionsmyndigheten, 2017). To avoid too many age clusters, which could make it harder to interpret the results, we make the other age clusters wider (10-year span). Jenter and Lewellen use slightly different age clusters, however, we think our clusters make more intuitive sense for the Swedish market and further believe that the results will be comparable nonetheless. Despite, in Table A.1 we use the exact same age clusters as Jenter and Lewellen to compare the results when running a similar regression.

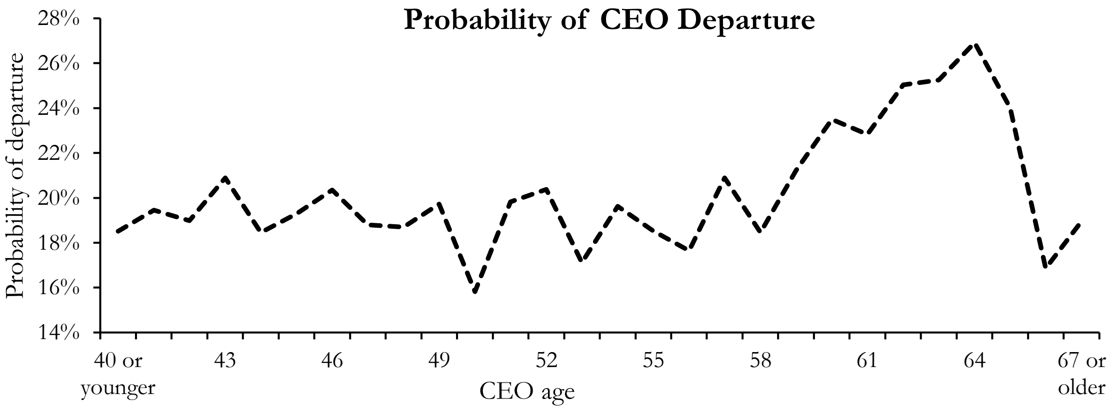

Figure 1: The probability of CEO departure at any given year with regards to CEO age

This graph shows the probability of CEO departure at any given year based on how old the CEO is. The probability is calculated by taking the number of CEO-years for each age when a CEO leaves divided by the number of CEO-years for each age. The data is based on 36,996 CEO-years from 2000 to 2017 for Swedish public companies with data from Bisnode.

G. Fixed Effects and Robustness of the Model

In all our main regression models we control for industry- and year fixed effects to avoid any distortion in the results due to industry- or year specific characteristics. By including fixed effects (group dummies), we are controlling for the average differences across industries and years in any observable or unobservable predictors, thus reducing the threat of heterogeneity from omitted-variable bias.[22] Jenter and Lewellen only include year dummies, and accordingly we also run regressions with only year fixed effects in our replication model (Table A.1). However, given that certain industries might have an unusually high or low merger activity, we firmly believe that it makes sense to also control for industry fixed effects as well. Therefore, our model should be even more robust than previous research. Firm- and CEO fixed effects were considered. However, given the large number of firms and since very few become acquired more than one time in our dataset, we concluded that this did not add any value to the analysis. Additionally, since we do not have access to the full personal identity number[23] for the CEOs we cannot see if a certain CEO later becomes the CEO of another company in our dataset. Consequently, we cannot control for CEO fixed effects in a correct way.

Moreover, it is possible that some industries have extraordinary high or low merger activity during certain years, such as the financial sector in the years leading up to the financial crisis in 2008. Accordingly, we included fixed effects for $Industry \times Year$ (Table A.2) to control for this effect. Though, the results were very similar to the results when only controlling for year and industry fixed effects, but we lost more than a third of our observations and hence we chose to exclude this fixed effect from our main regressions.

Several specifications are made to test the robustness of the achieved results, as suggested by Lu and White (2014) as well as Cameron and Miller (2015). In Table A.3 variables are added and dropped, and in Table A.4 we split up the dataset in two time-periods (2002-2008 and 2009-2016), hence both extending and shrinking the data and variables used. Furthermore, we run the regression without clustering standard errors and with clustered robust standard errors (Table A.2), in addition to our main regression where we cluster standard errors by firm. As mentioned above we also cluster standard errors by both firm and year in the logit2-model (Table A.2), and apply other variants of the logit model to our dataset. The coefficients for our variables do not change in any noteworthy way when doing these tests, and the z-scores for our *Age cluster* dummy variables remain high in all regressions. Therefore, in line with Lu and White (2014), we determine our model and results to be rather robust. Moreover, in Appendix Table A.5 and Table A.6 we test for multicollinearity and correlation among our variables. None of the results from these tests stand out in any conspicuous way.

[22] See Appendix Figures A.3 and A.4 for illustrations of the differences in likelihood of being acquired between industries and across years.
[23] Due to the Personal Records Act (Swedish: Personuppgiftslagen).

V. EMPIRICAL RESULTS

In this section we apply the regression models to our dataset in order to test our hypotheses. The main result is that there exist a difference in the likelihood of being successfully acquired between target CEOs in retirement-age and other age clusters, yet no significant difference can be found between any other age groups. Moreover, this effect is amplified when the target CEO is also a member of the board. Even though statistically insignificant, we note that the predicted bid premium differ quite considerably between the age groups. In this section we use the regular logit model as our base in Tables III and IV, and a linear OLS regression model in Table V. Please see the appendix for the results when we employ the other models described in Section IV. Note that the results do not differ in any significant way.

A. Retirement-aged CEOs and Merger Activity

The results from applying our logit model described in Section IV to our dataset can be seen in Tables III and IV. The dependent variable is the dummy variable *Acquired*[24], and the main variable of interest is the retirement-age dummy (*61-65 ret-age*), and in later regressions the *Age cluster* dummies. In Table III.a, regression (1), we compare only retirement-aged CEOs to non-retirement-aged CEOs in our full sample (pre-adjustments) and only add CEO-specific control variables. In regression (2) we use our main (adjusted) sample and add firm-specific control variables as well as controls for year- and industry fixed effects. Furthermore, in column (3), we add CEO age and CEO age squared as linear and quadratic controls. The coefficients for the retirement-age dummy in all three regressions are positive and statistically significant at the 1% level (z-score=3.04 in regression (2)). This implies that we find strong support against our first null hypothesis. In regression (4)-(6) we instead set the retirement-age cluster as our comparable base and thus no output is shown for this particular cluster in the these regressions. Instead we turn our attention to the other age clusters to see how they differ from the retirement-age cluster. In Table III.a, column (4), we use the main (adjusted) sample described in Section III Table I.b, whilst clustering standard errors by firm but without any controls for fixed effects. In column (5) we control for year fixed effects, and in column (6) we control for both industry- and year fixed effects.[25] However, as discussed in Section IV.G, controls for $Industry \times year$ fixed effects are excluded in our main regressions, but can be found in Table A.2.

The coefficients for the other age clusters in Table III.a (column 4-6) are all negative relative to the retirement-age cluster and highly statistically significant (except for ≥*66*), which implies that

[24] Set to 1 if a firm is successfully acquired, see Section IV for details
[25] See Section IV.G for more details

the coefficient for the retirement-age cluster is positive relative to the other groups and highly statistically significant (z-score=2.11 relative to the age cluster just before retirement-age). The interpretation of this result is that there appears to be a distinct spike in the likelihood of being acquired if the CEO is in retirement-age. Not only when comparing the retirement-age cluster as in column 1-3, but also relative to each individual age cluster (column 4-6). There seem to be no other significant differences between the other age clusters, suggesting that it is indeed a retirement-age effect.

When controlling for CEO age and CEO age squared in regression (3), there is still an increase in probability of being acquired when the CEO is in retirement-age (z-score = 2.82), whilst the linear and quadratic age controls remain statistically insignificant. These linear and quadratic controls work against finding any evidence for a retirement-age effect, and would instead suggest that there are linear or quadratic correlations between CEO age and the propensity to be acquired, rather than a clear spike when the target CEO is in retirement-age. This result strengthens our earlier findings that the likelihood of being acquired is elevated when the target CEO is in the narrow retirement-age cluster. So far we thus find strong evidence in support for our first alternative hypothesis.

The *Board member* variable is negative and highly statistically significant in all regressions in Table III.a. This implies that across all age clusters, the likelihood of being acquired is smaller when the CEO is also a board member. Another interesting finding is that *Equity ratio* is positive and statistically significant in all regressions in Table III.a. This suggest that the less levered a company is (i.e. higher equity-to-debt ratio), the more likely it is to be acquired.

In Table III.b we compute the implied probabilities of a successful takeover for each age cluster. All control variables are held at their means and we set all age cluster equal to 0 except for the age cluster being tested. In column (2), it is notable that the implied probability of a takeover for firms with non-retirement-aged CEOs is 0.92%, whereas the implied probability for a firm with a retirement-aged CEO is 2.02% - more than twice is high. In regression (6), the predicted probability of being acquired seems to increase only slightly for the first three age clusters (*≤40, 41-50* and *51-60*), with the highest being 1.06% for the age cluster just before the retirement-age cluster. However, for the retirement-age cluster the implied probability of being acquired surge by 94% to 2.06%, with high statistical significance (z-score = 2.53). Hence, even though the probability increases with only one percentage point, the implied probability of being acquired nearly doubles. It is also noteworthy, however not statistically significant, that the predicted probability drops sharply to 0.65% in the age cluster right after retirement-age (66 years or older), which further imply that it is a retirement-age effect rather than a consequence of age. There are no other distinct differences between other age clusters, and the results are consistent for all 6 regressions in both Table III.a and III.b. A graphic illustration of the implied probability of being acquired is displayed in Figure 2.

To conclude, we find very strong evidence for an increase in the likelihood of being successfully acquired when the target CEO is in retirement-age, and we thus reject our first null hypothesis with high statistical confidence.[26]

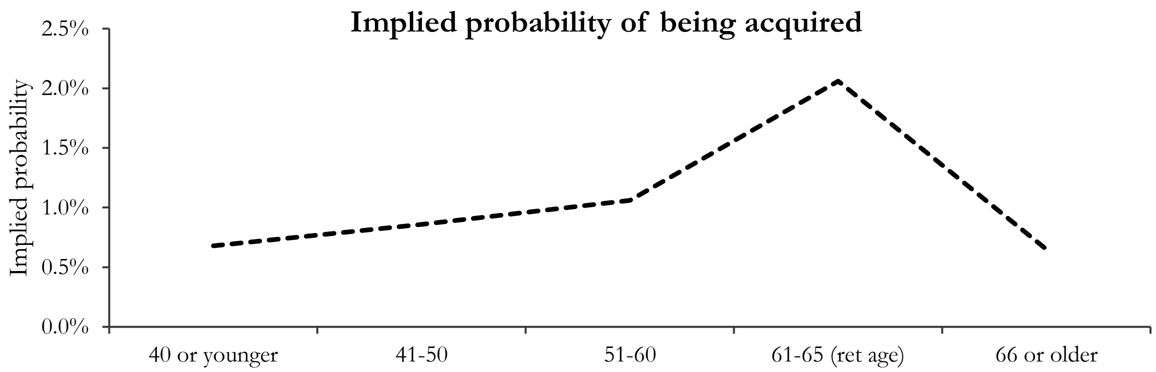

Figure 2: The Implied Probability of Being Acquired Based on Age

The graph displays the findings from Table III.b (column 6). The implied probabilities of being acquired during any given year are based on CEO age when using the main sample explained in Table I.b, when controlling for year- and industry fixed effects. The control variables are held at their means, and all age clusters (except for the age cluster being tested) are set to 0

[26] Please also see the sections about potential biases and alternative explanations where we bring up other arguments for why this retirement-age effect might occur.

Table III.a: Logit Regressions – How Age Affect the Likelihood of Being Acquired

Table III.a consists of six logit regressions with the binary variable *Acquired* (1 for successfully acquired) as dependent. The first regression (1) is based on our full (unadjusted) sample, which consists of 16,592 CEO-years and 176 acquisitions from 2002-2016. The main sample (2) consists of 12,348 CEO-years and 164 acquisitions. In regression (1) and (2), we compare the retirement-age dummy (61-65 years old) to all other age spans. In column 3-6, we split the CEO age into five clusters, with retirement-age (61-65) as the comparable base in the logit model. Z-scores are presented in parentheses below the coefficients. All variables are defined in Table I.a, in Section IV and more detailed in Appendix Table A.8. Standard errors are clustered by firm in all regressions. In column 2 we use the adjusted dataset described in Table I.b and further add more control variables as well as fixed effects for industry and year. In regression (3) we add CEO and CEO aged squared to control for linear and quadratic trends in age. In regression (4) we use our main (adjusted) sample with all age clusters except for the retirement-age cluster as independent variables, but without any controls for fixed effects. In the two rightmost columns we add controls for year- and industry fixed effects (group dummies). Note, however, that we have removed the output for these dummy variables.

(SE clust. by firm)	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Full sample	Main sample	Age and age^2	Main sample (no FE)	Year FE (Main sample)	Year and industry FE (Main sample)
40 or younger				-1.00***	-1.05***	-1.11***
				(-2.68)	(-2.75)	(-2.92)
41-50				-0.76***	-0.79***	-0.88***
				(-2.66)	(-2.76)	(-3.07)
51-60				-0.56**	-0.60**	-0.68**
				(-2.11)	(-2.24)	(-2.53)
61-65 (ret-age)	0.64***	0.79***	0.93***	base	base	base
	(2.58)	(3.04)	(2.82)			
66 or older				-1.37	-1.24	-1.16
				(-1.34)	(-1.21)	(-1.12)
CEO age			0.19			
			(1.56)			
CEO age^2			-0.00			
			(-1.48)			
Years as CEO	0.02	0.04**	0.04*	0.01	0.03	0.03
	(1.45)	(1.97)	(1.78)	(0.40)	(1.62)	(1.64)
Board member	-0.73***	-0.72***	-0.72***	-0.62***	-0.72***	-0.73***
	(-4.69)	(-4.47)	(-4.47)	(-3.77)	(-4.49)	(-4.48)
Gender	0.05	-0.12	-0.12	-0.00	-0.14	-0.11
	(0.22)	(-0.52)	(-0.53)	(-0.01)	(-0.61)	(-0.51)
Firm age		0.00	0.00	0.00	0.00	0.00
		(0.58)	(0.53)	(0.20)	(0.03)	(0.49)
Equity ratio		0.68**	0.70**	0.79***	0.80***	0.69**
		(2.42)	(2.47)	(3.06)	(3.02)	(2.46)
Arctan(ROA)		0.10	0.10	0.13	0.11	0.10
		(0.56)	(0.57)	(0.78)	(0.65)	(0.57)
Log(Assets)		-0.00	-0.01	-0.07*	-0.07	-0.01
		(-0.02)	(-0.20)	(-1.69)	(-1.57)	(-0.27)
Constant	-4.36***	-6.57***	-11.22***	-2.89***	-2.80***	-5.57***
	(-20.87)	(-4.93)	(-3.42)	(-3.97)	(-3.39)	(-3.92)
Observations	16,592	12,348	12,348	12,348	12,348	12,348
Year FE	NO	YES	YES	NO	YES	YES
Industry FE	NO	YES	YES	NO	NO	YES
Industry*Year FE	NO	NO	NO	NO	NO	NO

z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table III.b: Implied Probability of Being Acquired

Table III.b is an extension of Table III.a, displaying the predicted probabilities of a company to be successfully acquired based on age clusters. The implied probabilities of being acquired are calculated from the logit models in Table III.a by holding the independent variables at their means and the dummy variables for the age groups to 0 (except for the age group being tested). Probabilities are presented in actual numbers (i.e. not percentages).

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Full sample	Main sample	Age and age^2	Main sample (no FE)	Year FE (Main sample)	Year & industry FE (Main sample)
40 or younger				0.0085	0.0076	0.0068
41-50				0.0109	0.0097	0.0086
51-60				0.0132	0.0118	0.0106
61-65 (ret-age)	0.0178	0.0202	0.0226	0.0229	0.0213	0.0206
66 or older				0.0059	0.0062	0.0065
Non-retirement age	0.0094	0.0092	0.0091			
Observations	16,592	12,348	12,348	12,348	12,348	12,348

B. Retirement-aged CEOs and Board Membership

In Table IV.a we have applied the same logit regression model to the main sample (adjusted as described in Table I.b), including controls for year- and industry fixed effects and clustering standard errors by firm. But now we also introduce a new variable named *Ret-age*CEOBM* in column 2, which is a dummy variable that equals to 1 if the CEO is both in retirement-age and a member of the board of the company. We thus test if there is an increased likelihood of being acquired when the CEO is both in retirement-age and a board member, relative to retirement-aged CEOs in general. This is also the variable of interest when testing hypothesis 2. Regression (1) in Table IV.a is the same as regression (2) in Table III.a, used as a reference for the other regressions in this table. In columns (3) and (4) we instead split our sample in two, based on if the CEO is also a board member (CEOBM) or not.

The coefficient for *Ret-age*CEOBM* is positive and statistically significant at the 5% level (we perform a one-tailed test, in line with the configuration of our second alternative hypothesis). This implies that there is indeed an increase in the likelihood of being acquired when a retirement-CEO is also a member of the board, relative to retirement-aged CEOs in general. Furthermore, in columns (3) and (4) we note that when running our regression model on our two subsamples, the retirement-age effect is only statistically significant among CEOBMs. The retirement-age effect also seems to be greater for CEOBMs (i.e. larger coefficients) compared to our main regression (column 6 in Table III.a), which is reasonable given the result in regression (2) in Table IV.a. This result is very much in accordance with our second alternative hypothesis. Similar to the result in Table III.a, the coefficient for *Board member* is negative (z-score = -4.78) when adding *Ret-age*CEOBM* in column (2). This indicates that CEOBMs outside the retirement-age span on average are less likely to be acquired.

Table IV.b confirms that the implied probability of a successful takeover is lower in general for companies with CEOBMs relative to firms with CEOs who are not board (columns 3 and 4). We note that, in column (3), the predicted probability of a takeover for a CEOBM in retirement-age is 1.81%, which is 197% higher than for the age cluster with the second highest predicted probability (z-score = 2.77). The last age cluster is omitted due to too few observations, but the implied probabilities of a successful takeover for all other age clusters except for the retirement-age are fairly similar. The results in Table IV.a and IV.b provide evidence that the retirement-age effect is even higher for CEOBMs, and we conclude that we can also reject our second null hypothesis at the 5% significance level.

Table IV.a: Logit Regressions – Likelihood of Being Acquired and Board Membership

Table IV.a presents four logit regressions with the binary variable *Acquired* (1 for successfully acquired) as the dependent variable. The sample consists of 12,348 CEO-years and 164 acquisitions. Regression (1) is the same as regression (2) in Table III.a, and used as a reference for the other regressions in the table. We control for year- and industry fixed effects (dummies), and cluster standard errors by firm in all regressions. All variables are defined in Table I.a, in Section IV, and detailed in Appendix Table A.8. Z-scores are presented in parentheses below the coefficients. In regression (2) we add *Ret-age*CEOBM* as a dummy variable for retirement-aged CEOs who are also board members, to test hypothesis 2. Given our hypothesis, we use a one-tailed test in regression (2). In columns 3 and 4, we split up the main sample based on if the CEO is also a board member or not, and set the retirement-age cluster as the comparable base to the other age groups. The number of observations for the two subsamples do not add up the number of observations for the full sample as some observations are automatically omitted due to too few observations in some of the independent variables. Note that we have removed the output for our fixed effects dummies.

(SE clustered by firm)	(1)	(2)	(3)	(4)
VARIABLES	Main sample	Ret-CEOBM	Board member (CEOBM)	Non-board member
40 or below			-1.43**	-0.65
			(-2.33)	(-1.18)
41-50			-1.10***	-0.48
			(-2.77)	(-1.05)
51-60			-1.20***	-0.08
			(-3.39)	(-0.17)
61-65 (ret-age)	0.79***	0.29		
	(3.04)	(0.67)		
66 or above			omitted	0.39
				(0.37)
Board member (CEOBM)	-0.72***	-0.82***		
	(-4.47)	(-4.78)		
Ret-age*CEOBM		0.88**		
		(1.65)		
Years as CEO	0.04**	0.04**	0.08**	0.00
	(1.97)	(1.98)	(2.34)	(0.02)
Gender	-0.12	-0.11	0.31	-0.26
	(-0.52)	(-0.50)	(0.67)	(-0.99)
Firm age	0.00	0.00	-0.00	0.00
	(0.58)	(0.53)	(-0.40)	(0.96)
Equity ratio	0.68**	0.67***	1.01**	0.47
	(2.42)	(2.37)	(2.35)	(1.30)
Arcran(ROA)	0.10	0.10	-0.01	0.15
	(0.56)	(0.58)	(-0.03)	(0.68)
Log(Assets)	-0.00	-0.00	0.03	-0.05
	(-0.02)	(-0.02)	(0.40)	(-0.84)
Constant	-6.57***	-6.51***	-5.05***	-3.79***
	(-4.93)	(-4.89)	(-2.97)	(-2.60)
Observations	12,348	12,348	6,422	5,388
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Industry*Year FE	NO	NO	NO	NO

z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table IV.b: Implied Probability of Being Acquired and Board Membership

Table IV.b is an extension of Table IV.a, displaying the predicted probabilities of a company to be successfully acquired. Column 1 is the same as column 2 in Table III.b. Columns 3 and 4 shows the implied probability of an acquisition conditional to the age cluster of the CEO, split up based on whether the CEO is also a member of the board or not. The implied probability of being acquired is calculated from the logit model in Table IV.a by holding the independent variables at their means and the dummy variables for the age groups to 0 (except for the age group being tested). Probabilities are presented in actual numbers (i.e. not percentages).

	(1)	(2)	(3)	(4)
VARIABLES	Main sample	n.a.	Board member (CEOBM)	Non-board member
40 or younger			0.0044	0.0103
41-50			0.0061	0.0122
51-60			0.0055	0.0182
61-65 (ret-age)	0.0202		0.0181	0.0195
66 or older			omitted	0.0285
Non-retirement	0.0092			
Observations	12,348		6,422	5,388

C. Target Bid Premium and CEO Age

Next we turn our attention to the bid premiums paid to target companies in our dataset.[27] Table V.a column (1) illustrates that the coefficient for the retirement-age cluster is negative relative to all other age clusters. Furthermore, column (2) shows that the coefficients for each individual age cluster are positive relative to the retirement-age cluster. This suggests that the bid premium received is lower for retirement-aged CEOs in relation to other age clusters, yet not at a statistically significant level. Column (1) in Table V.b further suggest that this is the case, as the implied bid premium is 21.7% for retirement-aged CEOs, compared to 30.8% for non-retirement-aged CEOs. In column 3 we note that the predicted bid premium is 21.6% for retirement-aged CEOs and around 30% for all the three youngest age clusters (no acquisitions with disclosed bid premium in the oldest age cluster). Hence, the predicted bid premiums differ quite a lot between the retirement-age cluster and all other age clusters, but not at any meaningful significance level. Therefore, we cannot draw any statistically significant conclusions from our results. The lack of statistical significance is most likely due to the few observations we have with disclosed bid premiums in each age cluster (100 acquisitions in total).

Regressions (3) and (4) in Table V.a and V.b are run on subsamples based on if the CEO is also a board member or not. They report another interesting – however also not statistically significant – finding. Namely that the difference in predicted bid premiums paid to targets are even larger between the retirement-age cluster and other age clusters (except for the *≤40* cluster) when the CEO is also a member of the board. However, when doing this regression and controlling for

[27] See Table I.c and Table A.8 for details on how the bid premium is computed.

year- and industry fixed effects to a sample of only 39 acquisitions[28] the result becomes very volatile with high standard deviations and statistically insignificant results. Therefore, we fail to reject our third null hypothesis.

Table V.a: OLS Regression – Bid Premiums for Different Age Groups

Table V.a consists of four OLS regressions with B*id premium* (in %) as the continuous dependent variable. The sample contains 100 successful acquisitions with disclosed bid premiums (39 acquisitions when the CEO is also a board member, and 61 without being a board member). In column 1 we only compare the retirement-age cluster to all other age groups. In columns 2-4, CEO age is split into five clusters, with retirement-age (61 to 65) as the comparable base in the regression. Regression (3) and (4) are run on two subsamples, split up based on whether the CEO is also a member of the board or not. All variables are defined in Table I.a, Table I.c, Section IV, and more detailed in Appendix Table A.8. The t-scores are presented in parentheses below the coefficients. All regressions include controls for year- and industry fixed effects, and standard errors are clustered by firm. The age cluster *66 or older* is omitted due to too few observations in this age group. Note that we have removed the output for the fixed effects dummies.

(SE clustered by firm)	(1)	(2)	(3)	(4)
VARIABLES	Main sample		Board member	Non-board member
40 or younger		12.70	-5.73	11.31
		(0.63)	(-0.09)	(0.83)
41-50		8.93	21.62	6.56
		(0.57)	(0.44)	(0.49)
51-60		8.94	23.86	4.48
		(0.52)	(0.55)	(0.32)
61-65 (ret-age)	-9.10			
	(-0.56)			
66 or older		omitted	omitted	omitted
Years as CEO	1.77*	1.78*	4.91	1.05
	(1.71)	(1.81)	(0.90)	(1.16)
Board member	10.26	10.11		
	(0.89)	(0.87)		
Gender	9.63	10.87	36.97	6.30
	(0.75)	(0.73)	(1.19)	(0.50)
Firm age	-0.12	-0.12	0.50	-0.38***
	(-0.82)	(-0.82)	(1.56)	(-3.89)
Equity ratio	-11.18	-10.83	-21.73	-14.28
	(-0.92)	(-0.86)	(-0.28)	(-1.01)
Arctan(ROA)	-18.80	-19.16	-53.30*	-1.36
	(-1.35)	(-1.39)	(-1.97)	(-0.23)
Log(Assets)	-0.99	-0.75	-10.75*	0.38
	(-0.40)	(-0.29)	(-1.92)	(0.14)
Constant	36.44	23.75	129.11	46.60
	(1.10)	(0.74)	(1.67)	(0.87)
Observations	100	100	39	61
R-squared	0.36	0.36	0.90	0.58
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Industry*Year FE	NO	NO	NO	NO

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

[28] We only have 39 acquisitions with disclosed bid premiums in the CEOBM-subsample, see Table I.c.

Table V.b: Implied Bid Premiums for Different Age Groups

Table V.b is an extension of Table V.a, displaying the implied bid premiums (in %) based on different age clusters. In column 1 we only compare the retirement-age cluster to all non-retirement-age clusters. The last two columns reports the implied bid premiums if the CEO is a board member in the same company (CEOBM) or not, based on the same age clusters. The implied bid premium is computed from the regression model in Table V.a by holding the independent variables at their means and the dummy variables for the age groups to 0 (except for the age group being tested). Probabilities are presented in %. The age cluster 66 or older is omitted due to no takeovers with publicly disclosed bid premiums within this age group.

	(1)	(2)	(3)	(4)
VARIABLES	Main sample		Board member	Non-board member
40 or younger		34.3	7.0	34.6
41-50		30.5	34.4	29.8
51-60		30.5	36.6	27.7
61-65 (ret-age)	21.7	21.6	12.7	23.3
66 or older	omitted	omitted	omitted	omitted
Non-retirement	30.8			
Observations	100	100	39	61

VI. POTENTIAL BIASES AND ALTERNATIVE EXPLANATIONS

This section outlines the potential biases in our study, most of which stem from the data construction process, and explores alternative interpretations of the results in Section V.

One potential concern is the omitted-variable bias, which in turn gives rise to several alternative explanations. By including fixed effects for industry and year we have eliminated some of the key sources of omitted-variable bias, namely, unobservable across-industry and across-year differences in acquisition propensity.[29] Nevertheless, we believe there are some important factors that are not included in our model, which could potentially create a bias if our model compensates for the missing factors by over- or underestimating the effect of our other variables. We have divided the potential biases and the ensuing alternative explanations into 4 broad areas: (1) CEO aspects, (2) target firm characteristics, (3) acquiring firm characteristics, and lastly (4) other alternative explanations.

A. CEO Aspects

There are certain CEO characteristics, not related to age, that we believe could have a potential explanatory value. Firstly, if the CEO is also the *founder of the company*, or related to the *founding family*, we believe that due to emotional ties to the company she would on average be less prone to sell, regardless of her age, and this would thus be interesting to control for. Moreover, family-owned firms may have a firmly established succession order (for example that the eldest child shall take

[29] See Appendix Figures A.3 and A.4 for illustrations of the differences in likelihood of being acquired between industries and across years.

over). Though, this would work against the retirement-age effect; if a family-founding CEO is ready to retire at 65 she will not want to sell the company as the next CEO is already selected. However, if these family-founding CEOs on average choose to retire at a later age (because they have strong emotional ties to the company and do not feel the need to retire at 65), this could explain the sharp drop in the implied probability of an acquisition among the oldest age group (≥66).

In like manner, *CEO ownership*, i.e. how many shares the CEO owns in the company could explain the retirement-age effect. It could be that older CEOs have accumulated a greater stock ownership along their careers, and would thus be more inclined to accept value-creating bids than younger CEOs since their interests are more aligned with shareholders. This would mean that it is not the retirement-age factor that is driving the retirement-age effect, but rather some other factor. Other unobserved CEO aspects could be the *previous experience, level of education*, and *size and design of the CEO severance package*. These factors could potentially differ across age groups and in fact be what is driving the retirement-age effect rather than CEO age. However, given the clear spike in implied probability in the retirement-age cluster this seems unlikely, as we would probably see a more gradual increase with age.

B. Target Firm Characteristics

Furthermore, it would be of interest to control for the *ownership structure of the target company*. As described in Section II.A, a disproportionately large part of Swedish public companies is owned or controlled by strong family foundations, investment companies or private equity firms (Henrekson and Jakobsson, 2003; Henrekson and Jakobsson, 2011; Swedish Corporate Governance Code, 2016). If these types of companies are better at controlling the CEO in takeover decisions, and are the ones to actually call the shots, the result may differ. It is also possible that private equity (PE) firms more often hire older and more experienced CEOs to their portfolio companies. Since the turnover of PE portfolio companies are higher relative to "normal" companies, this would have the same effect as the one we propose in this thesis. [30] However, we see this as a rather unlikely scenario.

Additionally, it is possible that CEOs in retirement-age manage worse-performing companies, which in turn make them relatively cheaper and hence more attractive for potential buyers. Thus, it would be valuable to include a better performance measure in the analysis to discount for this phenomenon. We do include *Arctan(ROA)* (and *ROA* in Appendix Table A.1) as a performance measure in our regressions, and the retirement-age effect is still highly statistically significant. However, neither *Arctan(ROA)* nor *ROA* are perfect performance measures. Besides,

[30] The industry standard for private equity companies is to hold a company for 3-7 years before they sell it (Preqin, 2015).

the ROA in our dataset is very volatile and neither of the variables add much to our regressions. Therefore, we believe that additional and/or better performance measures could contribute more as control variables.

Moreover, it would be beneficial to include a control variable for "firm willingness to sell". For example, firms with CEOs in retirement-age that also have difficulties finding a replacement may want to merge with another firm in order to solve the "succession-problem". In a wider context, this would mean that the retirement-age effect is not driven by the age of the CEO, but rather by the "firm-willingness-to-sell".

C. Acquiring Firm

One factor that could affect our results is if the retirement-age effect is already known by some market participants. Jenter and Lewellen (2015) found that retirement-aged CEOs are targeted more often in the U.S. market. Likewise, another explanation potentially driving the retirement-age effect is that acquirers wait until the CEO is in retirement-age before they make a bid. For example, it is possible that private equity firms, who are familiar with doing acquisitions, would know about the retirement-age effect. Both arguments would strengthen our finding that retirement-aged CEOs are more likely to sell their companies, but it would also exaggerate our results, since they would also receive more bids than CEOs in other age clusters. Thus, it would also be reasonable that the likelihood of being acquired is higher among retirement-aged CEOs. Consequently, controlling for acquirer type could mitigate this bias.

D. Other Alternative Explanations

Another potential bias could arise when we make the adjustments for missing observations, micro-cap companies and micro-cap transactions. It might be that data are more prevalent among a certain type of company and that this type of company is also more likely to have a retirement-aged CEO, and more likely to be acquired. This would imply that we end up with a non-random sample and a likely selection bias.[31] However, after examining the data pre- and post-adjustments, the descriptive statistics are rather similar, and thus we believe the effect of our adjustments should be negligible.

VII. IMPLICATIONS AND CONCLUSIONS

The purpose of this study has been to examine what impact the age of the CEO has on the likelihood of the company being acquired. The spotlight has primarily been directed at retirement-

[31] I.e. since we, in this hypothetical scenario, drop the other types of companies due to lack of data, we might end up with a non-random sample.

aged CEOs, but this thesis also explores the impact a board membership has on the likelihood of being acquired – especially in combination with the CEO being in retirement-age. Lastly, we also investigate whether the pricing of takeover bids differ if the target CEO is in retirement-age.

As seen in our results, the implied probability for a takeover is 2.02% when the CEO is in retirement-age compared to 0.92% for non-retirement-aged CEOs. Hence, there is a clear spike in the likelihood of a company being acquired when the CEO is in retirement-age and we can reject our first null hypothesis at the 1% significance level. We can thus reaffirm the findings of Jenter and Lewellen (2015), and conclude that the retirement-age effect exists also in a Swedish setting, despite the large differences in corporate governance norms, ownership structure and labor market. We can further conclude that the agency problem for target CEOs is reversed to the agency problem that Yim (2013) found for acquiring CEOs.

Prior research has shown that target CEOs on average carry great personal costs when their firms are acquired (Agrawal and Walkling, 1994). Given the existence of the retirement-age effect we argue that severance packages, such as golden parachutes, do not compensate for these personal losses in an efficient manner. Consequently, we suggest that the design of incentive packages should, to a greater extent, take the age of the CEO into consideration, rather than more or less merely focusing on firm size. [32] In Appendix 1.5, we provide a mathematical expression showing that the severance package for an old CEO, ceteris paribus, should be smaller than for a younger CEO. However, it is unclear whether our results imply that retirement-aged CEOs accept value-destroying takeover bids to exploit too-generous severance packages, or that younger CEOs forego value-creating takeovers because it carries larger personal costs than the severance packages compensate for. Likewise, we cannot determine if most golden parachutes are too bounteous for old CEOs, or if they are too small for their younger dittos.[33] Both conclusions would nonetheless imply that target CEOs' self-interest has a substantial influence on companies' M&A-decisions and eventually on shareholder value. Having said that, and bearing in mind the ambiguous results of golden parachutes today (see Section II.C), it is also possible that firms need to turn to non-financial incentives in order to eliminate the essential agency problem in M&As, in line with the motivation crowding theory (Frey and Jegen, 2001).

[32] Hartzell et al. (2004) and Jensen and Murphy (2010), suggest that severance packages are mostly based on firm size.
[33] Please note that the design of golden parachutes is not the primary focus of this thesis and that there might be many other variables affecting the size of the golden parachute. We are simply pointing to the fact that the age of the CEO might be an overlooked factor.

Interestingly, the retirement-age effect is amplified when the CEO is also a member of the board.[34] This is no surprise as the board is the decision-making body in a company and ultimately responsible for all strategic decisions, such as a potential M&A-transaction (Swedish Corporate Governance Code, 2016). Accordingly, a CEOBM[35] should have more influence. Still, the board is also responsible for hiring, firing and compensating the CEO, which begs the question whether a board membership can distort a firm's takeover decisions. Especially since there seem to be no statistically significant retirement-age effect when the CEO is not a member of the board.

Our findings are not clear-cut with regards to bid premiums. Target firms with CEOs in retirement-age receive on average c. 10 percentage points lower predicted bid premiums than firms with non-retirement-aged CEOs, which provides support for our third alternative hypothesis. However, the low number of observations make the volatility exceedingly high and hence we fail to reject our third null hypothesis at any meaningful significance level. Moreover, the difference in predicted bid premiums received is even larger when the CEO is also a board member. This could suggest that when CEOs are in retirement-age and a member of the board they use their influence to sell the company in order to receive a lucrative severance package, whilst curtailing shareholder value. But again, these results cannot be seen as reliable, and when looking at the descriptive statistics (Table II.b) the average bid premiums received are rather similar across all age intervals.

The implications for previous research and practice of this thesis are threefold. First, we reaffirm the findings of Jenter and Lewellen (2015), and argue that the retirement-age effect is present also in a rather different corporate environment. In common finance theory, all CEOs should act the same, namely to maximize shareholder value – regardless of age.[36] Being aware of the retirement-age effect may thus be essential for boards when electing and monitoring CEOs. Second, this thesis broadens the literature on corporate governance by reporting that when CEOs get extended control through a board seat, they will exploit this additional influence with self-serving activities that may possibly be at the expense of shareholder value. Lastly, as mentioned above, we provide suggestions for the design and configuration of severance packages for top-level managers and emphasize the importance of tailoring incentive packages to the person rather than the company. Moreover, in agreement with advocates of the motivation crowding theory, we

[34] The amplified effect stems from the retirement-effect in "both directions". I.e. young CEOs who are unwilling to sell use their influence to hinder a takeover, whilst retirement-aged CEOs who are prone to sell use their influence to actualize it.
[35] Notation for a CEO who is also a member of the board of the same company.
[36] This is according to the "shareholder value theory". Moreover, the Swedish Corporate Governance Code states that companies should be run in the best interest of their owners. We are, however, also aware of the "stakeholder theory".

propose further investigation into the application of non-financial incentives as part of severance packages.

Including more transactions with disclosed bid premium, possibly by investigating a longer time period or by changing the deal criteria[37], would be a first recommendation for future research as that would probably lead to more statistically significant results with regards to bid premiums. An additional idea is to include the structure of the CEOs severance package and stock ownership as control variables in the regression to allow for a more exhaustive analysis of severance packages. We also encourage future studies to take a more comprehensive look at takeovers, corporate governance and age. Further research about the age of the entire board (the Chairman in particular) and management team and the impact it has on the likelihood of the company being acquired would be of high value. Finally, we hope that we can provide direction for future research on severance packages by shifting the attention from firm size towards CEO age and the possibility to include non-financial incentives.

[37] Such as including a wider geographic market (the entire Nordic region for example).

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Bloomberg.

MergerMarket.

SDC Platinum.

Serrano database from the Swedish House of Finance (data acquired from Bisnode).

APPENDIX

Table of Contents

1. DEFINITIONS, CRITERIAS, AND OTHER

1.1 General Definitions

Acquirer / Acquiring CEO:	A company/CEO that purchase/acquire another company.
CEO:	Chief Executive Officer.
CEOBM:	Chief Executive Officer and member of the board of the same company.
CEO-year:	An observation in our data set (see below, Appendix 1.3).
Main sample:	When referring to the main sample throughout the thesis, we refer to the sample with 12,348 observations, explained in Table I.b.
OLS regression:	Ordinary least squares regression.
Retirement-age (ret –age):	Defined by us to be between 61 and 65 years.
Retirement-age effect:	The behavior of a CEO to be more prone to sell a company when in retirement-age.
Target CEO/Company:	A CEO/Company that is acquired by another company.

1.2 Public Company

A public company (Swedish: Publikt aktiebolag) is a company who offers shares on the open market. It means that a public company is allowed to advertise to the public about the possibility to buy or subscribe shares in the company. However, being a public company doesn't mean that the company needs to be present on a public stock exchange (difference between being public and publically listed, source: Bolagsverket). A public company needs at least SEK 500,000 in equity.

1.3 CEO-year

One CEO-year is one observation in our dataset. Our panel is at the CEO-firm-year level, with multiple observations possible at the firm-year level due to mid-year CEO turnover for some companies, some years. A CEO-year thus refers to a CEO at a certain firm, for a certain year, hence one observation. In relation to the more commonly used "firm-year", the CEO-years will generate around 20% more observations for us. In our adjusted dataset we have 12,348 observations with CEO-year, which is 10,021 firm-years. The reasoning behind using CEO-years is because each observation contains information that we need for our analysis.

1.4 Acquisition Criteria

We have used the following four acquisition criteria: (i) the target company must be public, (ii) Swedish (note that the acquirer can be non-Swedish), and (iii) the deal value must exceed €5M. Moreover, (iv) the acquiring company cannot have a majority ownership prior to the transaction and must own at least 50% of the target company after the transaction. We thus exclude all transactions labeled as minority stake purchases, share repurchases, recapitalizations, privatizations and exchange offers. We choose to exclude very small deals (< €5M) as we don't consider those micro-cap transactions to add anything to our analysis. However, we include transactions with undisclosed deal value. The reasoning behind this decision is that there are some transactions that we find strong evidence for that the deal value exceeds €5M (such as large revenue and/or balance sheet) and thus choose to include all transactions that lack deal value (those companies that are small will be removed when selecting companies with assets over SEK100m) – note however that we don't have a bid premium on these transactions. Finally, we only include transactions that have been completed.

1.5 Derivation of the Suggested Difference in Golden Parachute Size

In this section we derive a simple expression for the difference between golden parachutes for young and old (retirement-aged) CEOs. The final expression will demonstrate that CEOs who are closer to retirement should have a smaller golden parachute relative to younger CEOs.

The personal cost for a CEO when the company gets acquired is simplified to the following:

$$Personal\ cost\ CEO = (Wage \times T - GP - (T - t) \times E(New\ wage)) \times p$$

Where *GP* is the golden parachute or any similar severance package that the CEO receives if she loses her job following an acquisition, *Wage* is the current (and assumed to be future) yearly salary if the CEO keeps the same job, *T* is the time left to retirement (in years), *t* is the time it takes to find a new job if fired (in years), *E(New wage)* is the expected wage at a new job and *p* is the probability of losing the job in the wake of a takeover.

To be able to determine what the appropriate relationship between young and old CEOs' golden parachutes is, the cost for both CEOs must be equal. When writing the merger cost for an old and a young CEO, while assuming that *Wage* is the same and the potential time to find a new job *t* is the same, we get:

$$Personal\ cost\ CEO_{old} = (Wage \times T_{old} - GP_{old} - (T_{old} - t) \times E(New\ wage)) \times p$$

$$Personal\ cost\ CEO_{young} = \left(Wage \times T_{young} - GP_{young} - (T_{young} - t) \times E(New\ wage)\right) \times p$$

Where, by definition, $T_{young} > T_{old}$ i.e. that a young CEO has more years until retirement than an old CEO.

Setting $Personal\ cost\ CEO_{old}$ equal to $Personal\ cost\ CEO_{young}$:

$$(Wage \times T_{old} - GP_{old} - (T_{old} - t) \times E(New\ wage)) \times p =$$
$$\left(Wage \times T_{young} - GP_{young} - \left(T_{young} - t\right) \times E(New\ wage)\right) \times p$$

Solving for GP_{old} gives us:

$$GP_{old} =$$
$$GP_{young} - Wage \times T_{young} + Wage \times T_{old} + \left(T_{young} - t\right) \times E(New\ wage) - (T_{old} - t) \times E(New\ wage)$$

$$GP_{old} = GP_{young} - \left(T_{young} - T_{old}\right) \times Wage + \left(T_{young} - T_{old}\right) \times E(New\ wage)$$

Therefore, the difference between the golden parachute for an old CEO and a young CEO is:

$$GP_{old} - GP_{young} = (E(New\ wage) - Wage) \times \left(T_{young} - T_{old}\right)$$

$\left(T_{young} - T_{old}\right)$ will be positive, by definition. Agrawal and Walkling (1994) argues that target CEOs often have a hard time finding a new executive position following a takeover. Therefore, we make the assumption: $E(New\ wage) < Wage$

I.e. the expected new wage will be lower than the current wage of the CEO. This implies that $(E(New\ wage) - Wage)$ will be negative, which means that the relationship $GP_{old} - GP_{young}$ must be negative as well. Thus, the golden parachute for an old CEO, close to retirement age, should be smaller in comparison to her younger ditto in order to equally compensate for the negative effects following a takeover.

Limitations: The formula does not provide the exact difference in golden parachutes. One would need to take the calculated number and multiply it with the probability of being fired after an acquisition *p*, and take the probability of even being acquired at any given year into consideration. Furthermore, to get a more accurate model one would need to discount the future wages and golden parachutes with the appropriate discount rates reflecting the CEO's risk preferences. Nevertheless, this model's purpose is not to put a number on the difference in golden parachutes, but rather to show why age should be an important factor when designing a golden parachute.

1.6 Assumptions of Logistic Regression Models

In general, the logit model is quite insensitive and the assumptions behind it are not very strict. Assumptions about linearity, homoscedasticity, and normal distribution are not needed due to the non-linear nature of the model. The first assumption is to have a random sample of observations. The second assumption is that the dependent variable, Y, is a binary variable and is caused by or associated by the independent variable (X's), and further that the independent variables are not determined by one another (correlation/multicollinearity). Finally, there needs to be uncertainty in the relationship between the dependent and independent variables (Christensen, 1990). It is quite obvious that these assumptions hold, for further tests of multicollinearity please see Tables A.5 and A.6.

2. TABLES

Table A.1: Recreation of Jenter and Lewellen's Logit Model on the Swedish Market

The table consists of 12,611 CEO-years from 2002-2016. The dependent variable is *Acquired* is binary (dummy) with the independent variables defined in Table A.8. The first two column are logit regressions when clustering standard errors by firm. The last two logit regressions (Logit2) are clustering standard errors by firm and year. Both regressions control for year fixed effect. Probabilities of being acquired are calculated with the retirement age dummy set to 1 (or 0 if testing for outside ret-age) with all the other variables set to their means. Z-statistics are displayed in parentheses. Note that Jenter and Lewellen have some additional variables that we cannot add due to lack of data.

	(1)	(2)	(3)	(4)
VARIABLES	Logit		Logit2	
53 or younger		-0.16		-0.16
		(-0.78)		(-0.79)
59-63		-0.16		-0.16
		(-0.50)		(-0.52)
64-66 (ret-age)	0.71***	0.77*	0.71***	0.77*
	(2.70)	(1.71)	(2.61)	(1.86)
67 or older		-0.56		-0.56
		(-0.55)		(-0.58)
Years as CEO	0.04*	0.04**	0.04**	0.04**
	(1.90)	(2.02)	(2.51)	(2.51)
Board member (CEOBM)	-0.74***	-0.73***	-0.74***	-0.73***
	(-4.64)	(-4.56)	(-5.00)	(-4.83)
Log(Assets)	-0.09**	-0.09**	-0.09**	-0.09**
	(-2.16)	(-2.13)	(-2.50)	(-2.55)
Firm age	0.00	0.00	0.00	0.00
	(0.29)	(0.25)	(0.24)	(0.21)
ROA	0.00	0.00	0.00	0.00
	(0.76)	(0.76)	(1.14)	(1.11)
Constant	-2.95***	-2.83***	-2.95***	-2.83***
	(-4.42)	(-4.11)	(-5.48)	(-5.03)
Probability of being acquired ret-age	0.0208		0.0208	
Probability of being acquired outside ret-age	0.0103		0.0103	
Observations	12,611	12,611	12,611	12,611
Year FE	YES	YES	YES	YES
Industry FE	NO	NO	NO	NO

Robust z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A.2: A Mix of Different Regressions

The table consists of six different regressions with data from 2002-2016. Dependent variable is *Acquired* (dummy). The first four regressions are structured after Section IV with the different regressions explained there. All regressions are controlling for industry and year fixed effects, with regression (6) controlling for industry*year fixed effects as well. The first regression is the same as in Table III.a column (6). Variables are defined in Table A.8. Standard errors are clustered by firm in all regressions except for in regression (5), where standard errors are robust, and regression (3) (cannot cluster standard errors with the ReLogit regression).

VARIABLES	(1) Logit	(2) Logit2	(3) ReLogit	(4) LPM	(5) Robust clust. SE	(6) Industry*year
40 or below	-1.11***	-1.11***	-1.09***	-0.02**	-1.11***	-1.10***
	(-2.92)	(-2.95)	(-2.95)	(-2.54)	(-2.98)	(-2.77)
41-50	-0.88***	-0.88***	-0.89***	-0.01**	-0.88***	-0.87***
	(-3.07)	(-2.94)	(-3.16)	(-2.35)	(-3.10)	(-2.91)
51-60	-0.68**	-0.68**	-0.69***	-0.01**	-0.68**	-0.71**
	(-2.53)	(-2.39)	(-2.57)	(-2.00)	(-2.51)	(-2.52)
61-65 (ret-age)	base	base	base	base	base	base
66 or older	-1.16	-1.16	-0.68	-0.01*	-1.16	-1.13
	(-1.12)	(-1.15)	(-0.66)	(-1.83)	(-1.12)	(-1.06)
Years as CEO	0.03	0.03*	0.03*	0.00	0.03	0.03
	(1.64)	(1.94)	(1.65)	(1.44)	(1.62)	(1.49)
Board member	-0.73***	-0.73***	-0.72***	-0.01***	-0.73***	-0.75***
	(-4.48)	(-4.84)	(-4.47)	(-4.35)	(-4.50)	(-4.43)
Gender	-0.11	-0.11	-0.13	-0.00	-0.11	-0.14
	(-0.51)	(-0.53)	(-0.57)	(-0.47)	(-0.51)	(-0.58)
Firm age	0.00	0.00	0.00	0.00	0.00	0.00
	(0.49)	(0.40)	(0.52)	(0.26)	(0.49)	(0.46)
Log(Assets)	-0.01	-0.01	-0.01	-0.00	-0.01	-0.02
	(-0.27)	(-0.29)	(-0.26)	(-0.04)	(-0.29)	(-0.42)
Arctan(ROA)	0.10	0.10	0.09	0.00	0.10	0.08
	(0.57)	(0.82)	(0.58)	(0.60)	(0.61)	(0.45)
Equity ratio	0.69**	0.69**	0.69***	0.01**	0.69***	0.73**
	(2.46)	(2.31)	(2.57)	(2.30)	(2.59)	(2.45)
Constant	-5.57***	-5.57***	-4.96***	0.01	-5.57***	-1.73
	(-3.92)	(-3.87)	(-3.52)	(1.03)	(-3.94)	(-0.96)
Observations	12,348	12,348	12,348	12,348	12,348	7,658
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Industry*Year FE	NO	NO	NO	NO	NO	YES

Robust z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A.3: Robustness Test by Adding Variables

Table A.3 is testing the robustness of our main regression by adding variables one by one, as well as exchanging adjusted variables (LogAssets and arctanROA) with the original variables. The dependent variable is *Acquired* and because of its binary nature, all regressions are logit regressions. Standard errors are clustered by firm and all regressions are controlling for Industry-and Year FE. Variables are defined in Table A.8.

SE clust. by firm	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
VARIABLES	1	2	3	4	5	6	7	8	9	10
40 or younger	-1.04***	-0.98***	-1.08***	-1.08***	-1.07***	-1.10***	-1.12***	-1.11***	-1.11***	-1.11***
	(-2.88)	(-2.66)	(-2.90)	(-2.92)	(-2.87)	(-2.89)	(-2.98)	(-2.92)	(-2.92)	(-2.92)
41-50	-0.84***	-0.79***	-0.87***	-0.87***	-0.87***	-0.88***	-0.88***	-0.88***	-0.88***	-0.88***
	(-3.12)	(-2.86)	(-3.07)	(-3.08)	(-3.05)	(-3.07)	(-3.10)	(-3.06)	(-3.07)	(-3.06)
51-60	-0.65**	-0.62**	-0.67**	-0.67**	-0.68**	-0.68**	-0.67**	-0.68**	-0.68**	-0.68**
	(-2.50)	(-2.36)	(-2.51)	(-2.53)	(-2.53)	(-2.54)	(-2.49)	(-2.52)	(-2.53)	(-2.53)
61-65 (ret-age)	base	base	base	base	base	base	base	base	base	base
66 or older	-1.27	-1.28	-1.17	-1.17	-1.16	-1.17	-1.18	-1.17	-1.16	-1.17
	(-1.23)	(-1.23)	(-1.13)	(-1.13)	(-1.12)	(-1.13)	(-1.14)	(-1.13)	(-1.12)	(-1.13)
Years as CEO		0.02	0.03	0.03*	0.03*	0.03*	0.03*	0.04*	0.03	0.03*
		(0.96)	(1.62)	(1.72)	(1.68)	(1.66)	(1.65)	(1.77)	(1.64)	(1.72)
Board member			-0.73***	-0.73***	-0.74***	-0.74***	-0.73***	-0.73***	-0.73***	-0.73***
			(-4.61)	(-4.60)	(-4.56)	(-4.56)	(-4.51)	(-4.48)	(-4.48)	(-4.48)
Gender				-0.13	-0.13	-0.14	-0.13	-0.11	-0.11	-0.11
				(-0.59)	(-0.59)	(-0.61)	(-0.58)	(-0.48)	(-0.51)	(-0.50)
Firm age					0.00	0.00	0.00	0.00	0.00	0.00
					(0.32)	(0.51)	(1.10)	(0.53)	(0.49)	(0.51)
Log(Assets)						-0.03		-0.01	-0.01	-0.01
						(-0.64)		(-0.16)	(-0.27)	(-0.23)
Total assets							-0.00**			
							(-1.97)			
Equity ratio								0.70**	0.69**	0.69**
								(2.50)	(2.46)	(2.46)
Arctan(ROA)									0.10	
									(0.57)	
ROA										0.00
										(0.63)
Constant	-5.72***	-5.79***	-5.48***	-5.36***	-5.41***	-4.98***	-5.27***	-5.67***	-5.57***	-5.60***
	(-5.22)	(-5.28)	(-4.97)	(-4.81)	(-4.74)	(-3.59)	(-4.60)	(-4.06)	(-3.92)	(-3.96)
Observations	12,348	12,348	12,348	12,348	12,348	12,348	12,348	12,348	12,348	12,348
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Table A.4: Robustness Test by Splitting the Sample: 2002-2008 and 2009-2016

Both regression are logit regressions based on the same main sample. *Acquired* is the independent variable (dummy). The data set is split with the first column representing the years 2002-2008 and the other half 2009-2016. The table's purpose is to robustness test the sample by observing if there are any major differences between the two time periods. Variables are defined in Table A.8. Standard errors are clustered by firm in both regressions.

SE clust. by firm VARIABLES	(1) Pre 2008	(2) Post 2009
40 or younger	-1.15**	-0.96*
	(-2.09)	(-1.72)
41-50	-0.72*	-0.97**
	(-1.70)	(-2.36)
51-60	-0.67	-0.66*
	(-1.64)	(-1.78)
61-65 (ret-age)		
66 or older	omitted	-0.67
		(-0.64)
Years as CEO	0.10***	-0.00
	(2.60)	(-0.01)
Board member	-0.67***	-0.83***
	(-3.12)	(-3.33)
Gender	-0.35	0.13
	(-1.13)	(0.40)
Firm age	-0.00	0.00
	(-0.07)	(1.07)
Log(Assets)	-0.00	-0.06
	(-0.00)	(-0.80)
Arctan(ROA)	0.16	-0.00
	(0.69)	(-0.00)
Equity ratio	0.47	0.96**
	(1.16)	(2.48)
Constant	-4.96***	-2.92**
	(-2.86)	(-2.25)
Observations	4,987	6,845
Year FE	YES	YES
Industry FE	YES	YES
Industry*Year FE	NO	NO

Robust z-statistics in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A.5: Multicollinearity Test

The table contains of multicollinearity tests, one for each variable in the main data set used in the logit regression in Table III.a column (6). VIF-tests are calculated for the variables listed, in correlation with one another. To clarify, the VIF value of 1.13 for *CEO age* is calculated by regressing *CEO age* with regards to all the other variables listed in the table. The R-Squared value of the regression is used to calculate the VIF value. A value close to 1 indicates a low multicollinearity between the variable and the other variables. VIF values above 10 usually needs further investigation due to high multicollinearity.

Variable	VIF	R-Squared
CEO age	1.13	0.1140
Years as CEO	1.15	0.1291
Board Member	1.03	0.0296
Gender	1.03	0.0286
Firm age	1.22	0.1790
Log(Assets)	1.34	0.2521
Equity ratio	1.10	0.0903
Arctan(ROA)	1.07	0.0619

Table A.6: Correlation Matrix among Used Variables

The table displays the correlation between the independent variables listed in the table. Bold numbers indicates when the |correlation| is over 0.2 between two variables. Significance levels are displayed in parenthesis. The difference with Table A.5 is that this investigates correlation between every variable.

	CEO age	Years as CEO	Board member	Gender	Firm age	Log(Assets)	Equity ratio
Years as CEO	**0.2963**						
	(<0.001)						
Board member	0.0804	0.1099					
	(<0.001)	(<0.001)					
Gender	0.048	0.142	0.0711				
	(<0.001)	(<0.001)	(<0.001)				
Firm age	0.1321	0.1033	0.0964	0.022			
	(<0.001)	(<0.001)	(<0.001)	0.0145			
Log(assets)	0.1619	0.0388	0.0652	-0.0195	**0.4001**		
	(<0.001)	(<0.001)	(<0.001)	0.0305	**(<0.001)**		
Equity ratio	-0.0541	-0.0384	-0.0827	-0.0557	-0.0841	**-0.285**	
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	**(<0.001)**	
Arctan(ROA)	0.0657	0.1491	0.0605	0.0486	0.1509	0.1859	-0.0382
	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	(<0.001)	0.0162

Table A.7: Descriptive Statistics for Industries

The table below shows the mean values for the different industries included in the data from Bisnode from 2002-2016 using the main sample explained in Table I.b. The industries are used when controlling for fixed effects in many of the regressions.

	Energy & Environment	Materials	Industrial goods	Construction industry	Shopping goods	Convenience goods
CEO age	52.35	51.87	51.67	51.28	49.15	49.81
Years as CEO	3.59	3.20	4.18	3.44	3.42	4.03
Board member	0.36	0.51	0.65	0.57	0.51	0.49
Gender	0.84	0.90	0.85	0.92	0.90	0.92
Firm age	54.27	51.89	43.46	38.46	30.80	36.84
Equity ratio	0.47	0.57	0.54	0.47	0.53	0.49
ROA	4.96	2.10	7.27	6.80	3.01	6.37
Total assets	18,940	13,261	6,598	3,461	2,079	5,194
	Health & Education	Finance & Real Estate	IT & Electronics	Telecom & Media	Corporate services	Other
CEO age	50.56	49.77	48.10	46.33	49.58	49.16
Years as CEO	3.62	3.75	3.59	3.38	3.27	2.84
Board member	0.44	0.61	0.46	0.38	0.52	0.56
Gender	0.78	0.83	0.87	0.89	0.85	0.77
Firm age	26.58	31.09	23.10	17.33	24.38	24.84
Equity ratio	0.68	0.47	0.60	0.62	0.58	0.63
ROA	-5.12	4.79	2.51	0.17	1.72	-0.73
Total assets	8,148	22,865	3,430	14,017	2,565	2,713

Table A.8: List of Variables

Variable name	**Description**	**Database**
Acquired	The binary (dummy) variable *Acquired* is a dependent variable in the logit regressions. 1 for being acquired during a certain year and 0 otherwise.	SDC Platinum, Bloomberg and MergerMarket
Bid premium	*Bid premium* is a continuous variable indicating the premium paid for the acquired company (%). *Bid premium* is defined as $\frac{Final\ bid\ price\ per\ share}{Closing\ price_{t-1}}$. In the case of a takeover contest (if there are several public bids on the same target) the final bid is used.	SDC Platinum, Bloomberg and MergerMarket
CEO age, Age cluster and ret-age	Age of the CEO is a discrete variable based solely on their birth year and the year of the observation. The age is therefore calculated by subtracting the birth year from the year, resulting in an age that assumes the CEO is born 1st of January. In most regressions the age is clustered into five different age intervals. Ret-age is referred to as the age interval where most CEOs retire (61-65).	Serrano (Bisnode)

Years as CEO	*Years as CEO* is the number of years the CEO has held the position. This is computed as Year-Start year for the CEO; hence the first year is a 0.	Serrano (Bisnode)
Board member	*Board member* is a dummy variable with 1 for CEOs that are board members in the same company and 0 for non-board members.	Serrano (Bisnode)
Gender	*Gender* is a dummy variable for the gender of the CEO; 1 for male and 0 for female.	Serrano (Bisnode)
Firm age	*Firm age* is the number of years a company has been registered at the Swedish Companies Registration Office. Similar to *CEO age*, *Firm age* is a discrete variable where we assume the registration date is the 1st of January of the year they were registered. The registration date at the Swedish Companies Registration Office is hence used as a proxy for firm inception.	Serrano (Bisnode)
Total assets	*Total assets* (SEK) is recorded with the ingoing balance (thousands of SEK, if not specified) for a company. Thus, this can be considered to be a lagging variable.	Serrano (Bisnode)
Log(total assets)	The variable *Total assets* is extremely positively skewed (Figure 1.A) and we argue that the effect of having more assets when a company is already "assets heavy" is diminishing. Therefore, we take the natural logarithm of the value to better fit the regression models. The total assets variable used for the log-function is in thousands of SEK.	Serrano (Bisnode)
Equity ratio	*Equity ratio* is the equity ratio of the company, defined as $\frac{Book\ value\ of\ total\ equity}{Book\ value\ of\ total\ assets}$. The ratio is calculated with the closing balance figures for a fiscal year, but then matched with the following fiscal year in the dataset (hence lagged by one year).	Serrano (Bisnode)
ROA	*ROA* (Return on assets) is a performance ratio (%). It is calculated as $\frac{EBIT}{Total\ assets}$, with the closing balance for total assets (i.e. the figure for the same year as EBIT). *ROA* is matched with the following fiscal year, hence ROA is also a lagging variable.	Serrano (Bisnode)
Arctan(ROA)	Arctangent of *ROA* when dividing *ROA (%)* by 20 before taking arctangent to make the slope of the function flatter. Formula: Variable *Arctan(ROA)* = arctangent(ROA/20). Further reasoning behind this measure in Figure A.2.	Serrano (Bisnode)
Year dummies	To control for year fixed effects, year dummies are included in some of the regressions. Intuitively, every year from 2002 to 2016 is a dummy variable with a 1 if the variable matches the year of the observation and a 0 otherwise.	Serrano (Bisnode)
Industry dummies	To control for industry fixed effects, industry dummies are included in some of the regressions. Intuitively, every industry is a dummy variable with a 1 if the variable matches the industry of the observation and a 0 otherwise. Industries are defined in Table A.7.	Serrano (Bisnode)

3. FIGURES

Figure A.1: Logarithm of Total Assets

The figures below demonstrate the effect of taking the logarithm of total assets (total assets in '000 SEK). The sample consists of 26,574 CEO-years from 2002-2016. Both histograms show the frequency of observations (CEO-years) within each asset interval.

Figure A.1i

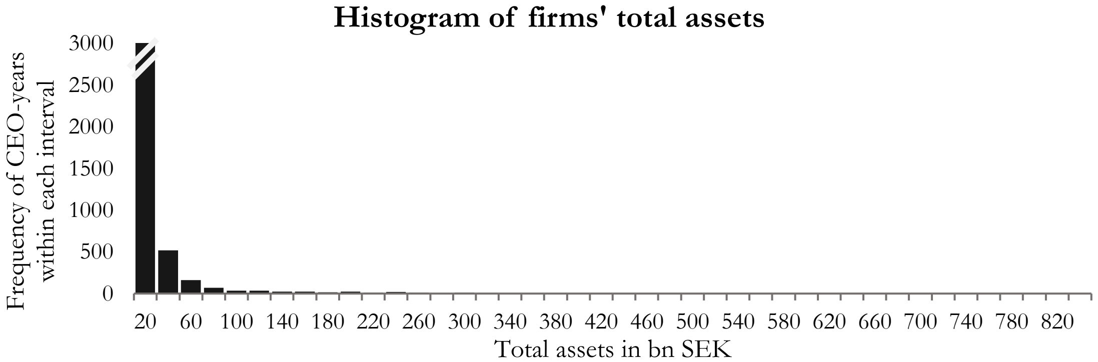


Figure A.1ii

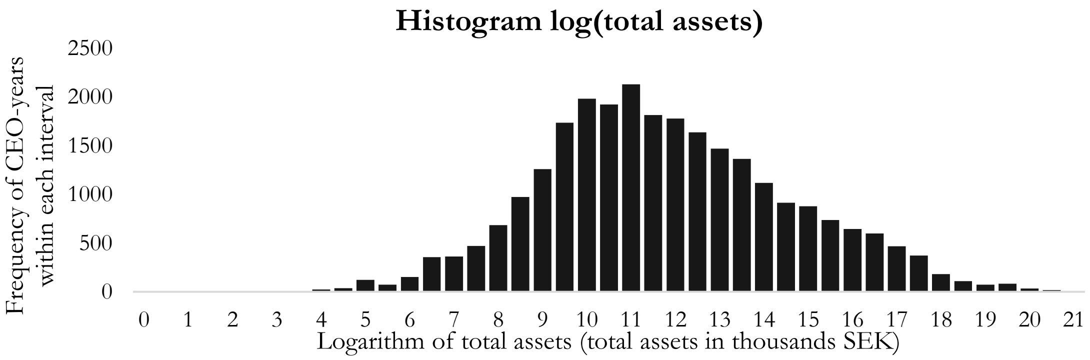


Figure A.2: Arctangent of ROA

Our dataset has several outliers for *ROA*, in both positive and negative directions, in the range -999% to +999%, making it problematic when using the measure in a regression model. The first histogram below illustrates this issue. By taking the arctangent of ROA we reduce the impact of the outliers have on the regression. This procedure is similar to the application of a logarithm to a positive number, but arctangent works for both positive and negative numbers. As seen in the last graph, the arctangent function takes an S-shaped form, with a maximum value of $\frac{\pi}{2}$ (minimum $-\frac{\pi}{2}$). The diminishing effect of having a higher ROA is captured with this formula. We have instead modeled the variable *ArctanROA* so that going from 0% ROA to 20% ROA has roughly the same impact as going from 20% ROA to 100% ROA.

Figure A.2i

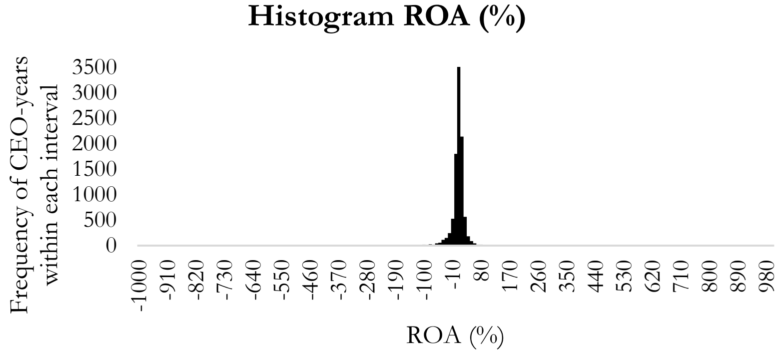
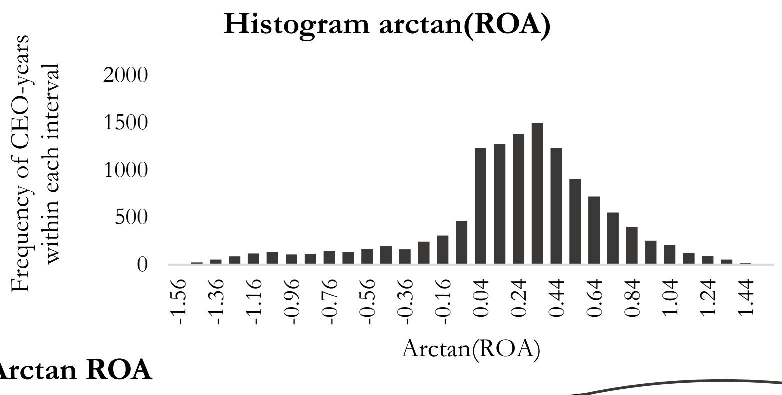


Figure A.2ii



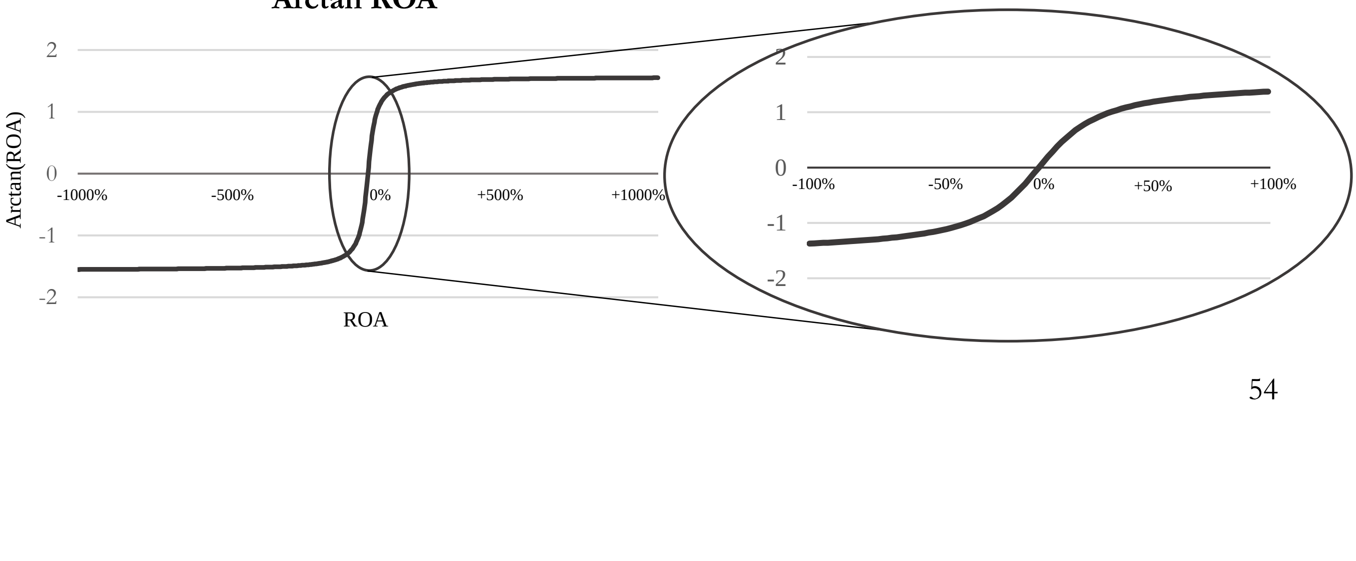


Figure A.2iii

Figure A.3: Across Industry Differences in Probability of Being Acquired

The bar chart contains data from 12,348 CEO-years from 2002-2016. The probabilities are calculated from a logit regression with *Acquired* as the dependent variable. The bars represents the probability of being acquired for each industry defined by Bisnode. Independent variable includes dummy variables for *industry*, *board member, gender* and the variables *Years as CEO, Firm age, Log(Assets), Arctan(ROA)* and *Equity ratio*. The logit regression controls for year fixed effects.

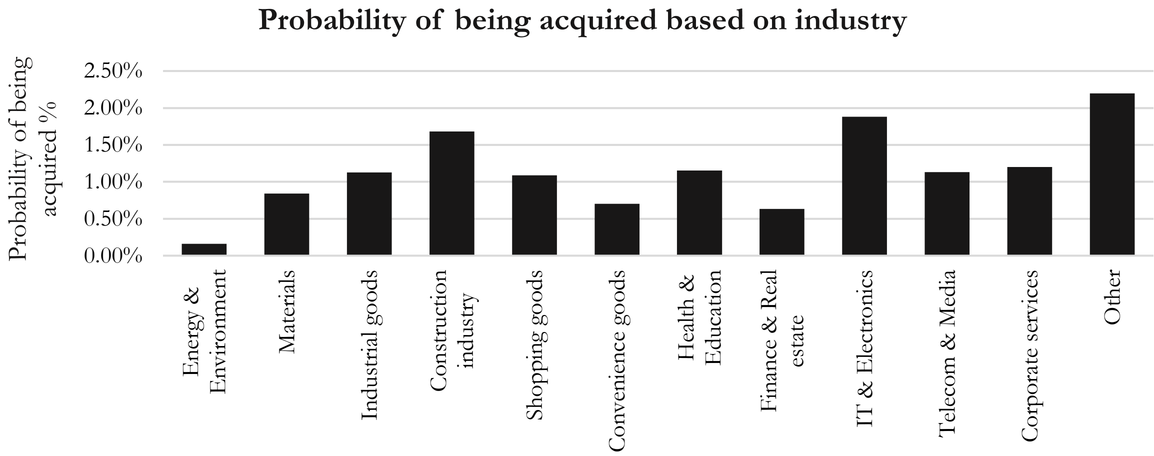


Figure A.4: Across Year Differences in Probability of Being Acquired

The bar chart contains data from 12,348 CEO-years from 2002-2016. The probabilities are calculated from a logit regression with *Acquired* as the dependent variable. Each bar represents the probability of being acquired for each year from 2002-2016. Independent variable include dummy variables for *years*, *board member, gender* and the variables *Years as CEO, Firm age, Log(assets), Arctan(ROA)* and *Equity ratio*. The logit regression controls for industry fixed effects.