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# A study on CEO organizational identification, the propensity to be acquired, and bid premiums

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**Abstract**

We examine whether the propensity to be acquired is lower for companies with CEOs who identify strongly with their organization compared to those that do not, while further distinguishing if this effect is amplified by the CEO also being a board member. Additionally, the study examines if the bid premium accepted is higher for CEOs with high organizational identification relative to other CEOs. To investigate this, we use industry and year fixed effects regression models on an unbalanced panel dataset consisting of Swedish public companies and transactions between 2002 and 2017. To measure organizational identification, we construct a composite score of three publicly available CEO characteristics based on the psychology and accounting literature. We propose and find that the likelihood of being acquired is lower, and the bid premium higher, for CEOs with high organizational identification relative to other CEOs. The findings are consistent with previous research that demonstrate the impact of organizational identification on CEO behaviour, albeit the research question examined in this study is to our best knowledge unprecedented.

**Tutor:** Milda Tylaite
**Keywords:** Organizational identification, M&A, Agency problems, Corporate governance, Golden parachutes

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# 1 Introduction

## 1.1 Background

The most frequent rationale behind M&A transactions is that synergies can be created as a result of two separate entities merging into one. These synergies are reflected in the acquisition price and consequently in the bid premium, which represents the difference between the current equity value of the enterprise and the share price that the acquirer is willing to purchase the company for. This bid premium generates value for the shareholders of the target company, since the value of their shares are now valued at a higher price compared to the share price prior to the acquisition. From 1990–2012, for the 6,418 public US target firms with available data, the median bid premium was 36%, implying that M&A transactions on average generate substantial shareholder value for the target shareholders (Jenter and Lewellen, 2015).

The CEO plays an important role in the decision-making processes of the firm, and hence are necessary agents in M&A events. While the Swedish Corporate Governance Code (2016) states that strategic decisions should be decided by the board of directors, the CEO's position in the organizational hierarchy still allows for influential impact on these key events of the corporation's future. More than half of new CEO's of S&P 500 companies engage in M&A during the first two years in office and is the second most common strategic move to pursue after management reshuffling, highlighting the CEOs influence in M&A processes (McKinsey, 2017). Moreover, as the core public representative of the company, their opinions and response to takeover bids affect the outcome. CEOs can propose recommendations to the board and are involved in the initiation and negotiation of the deals themselves (Graham et al., 2015).

While beneficial to the shareholders, M&A introduces private costs to many target CEOs when their firms are acquired. The literature supports 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 (Agrawal and Walking, 1994). If incentive pay does not fully compensate CEOs for their private costs, firms' takeover decisions can be distorted (Jenter and Lewellen, 2015). To mitigate these issues, golden parachutes and other types of compensation packages have been implemented as a part of corporate governance. However, there is still uncertainty towards the extent that these currently eliminate the M&A agency problem that arises between the inherent conflict of maximising shareholder value as opposed to maximising self-gain for the CEO (Fiss et al., 2012; Jenter and Lewellen, 2015). Compensation schemes are often a function of firm size and growth,

and lack in considering performance or value-creation (Hartzell et al., 2004; Jensen and Murphy, 2010). A similar tendency is displayed when studying the literature on agency problems in M&A and why CEOs may engage in value-destroying activities, where previous literature has predominantly targeted firm characteristics such as poorly structured compensation packages, excessive free cash flow, and weak corporate governance as factors with explanatory value (Jensen, 1986; Harford, 1999; Bertrand and Mullainathan, 2003; Masulis et al., 2007).

Jenter and Lewellen (2015) redirects the focus from firm characteristics to CEO characteristics, and addresses the age of the CEO as a mitigating component to agency problems in M&As. They find that the propensity to be acquired is impacted by the CEO's age, finding strong evidence that there is a substantial spike in M&A activity when CEOs are near retirement-age, and that the likelihood of achieving a successful takeover bid – i.e. the transaction is completed – is sharply higher within this age interval. This is due to the private costs of the CEO near or in retirement-age is lower than for its younger counterpart. The authors conclude that better corporate governance is associated with accounting for CEO age.

CEO characteristics are further elaborated upon in neighbouring research areas that explore organizational identification (OI). OI is defined as the degree to which an employee identifies with her organization and has its roots in the psychology literature that argues that individuals have an inner desire to maintain and advance their self-esteem (Cole and Bruch, 2006; Leary, 2007). Moreover, OI can influence the behaviour of the CEO and since she is arguably the most influential agent in corporate practices, the potential for CEO OI to influence firm decisions is likely to be greater than for other executives or employees (Akerlof and Kranton, 2000; Boivie et al., 2011). Accordingly, CEOs that experience high OI increase their own utility by taking actions that they deem to be in the best interest of the firm, and faces disutility when taking short-sighted and opportunistic actions (Heinle et al., 2012). Both empirical and theoretical studies have found evidence to suggest that OI is associated with reduced agency costs, as the disutility or emotional costs associated with self-interested behaviour incentivises actions more in line with shareholder interest. However, as OI increases, the individual increasingly considers themselves as an interchangeable representative of the firm and their self-perception becomes depersonalised (Dutton et al., 1994; Turner, 1985). Applying this to an M&A setting may indicate that divesting a business is linked to divesting part of themselves. As a CEO with high OI is characterised by designing and shaping key elements such as the company's goal and mission, strategic priorities,

and capital structure (Aldrich, 1999); and since OI stems from feelings of belonging and continuity (Albert and Whetten, 1985; Ashforth and Mael, 1989), we thus expect that the total private costs for CEOs of different OI levels will differ when being acquired. When comparing an arbitrary high OI target CEO with its lower OI counterpart in a takeover event, the additional emotional cost that the high OI CEO experiences is, all else equal, higher than the lower OI CEO. This leads to our expectation that the private costs in total are higher for the high OI CEO, which should impact CEOs that identify strongly with their firm to refrain from divesting unless faced with sufficient financial motives to cover this additional cost incurred.

OI brings an interesting element to the research, by focusing more in-depth on certain CEO characteristics as influential mechanisms in corporate practices, but has not yet been applied to the M&A literature. This thesis intends to broaden OI's areas of application and study CEO OI in an M&A setting. Targeting OI as a composite score of three key variables, rather than looking at separate stand-alone characteristics, allows for a more comprehensive analysis of the underlying characteristics that may impact corporate practices in critical events such as M&A.

To examine the relationship between target CEO OI, the propensity to be acquired, and the associated bid premium, we use an unbalanced panel dataset consisting of Swedish public companies, CEOs, and transactions during the time period 2002–2017. We then follow the core methodology of Abernathy et al. (2019) and construct a quantitative measure of OI based on (1) whether the CEO is the founder, (2) CEO tenure, and (3) whether the CEO is internally promoted. We continue by performing logit regressions on the likelihood of being acquired and multivariate OLS regressions on the bid premiums of the completed acquisitions. The study found conclusive evidence to support that the likelihood to be acquired is lower for CEOs with high OI compared to other CEOs on a 5% significance level. The implied probability of a high OI CEO's company being acquired was approximately half the probability of a lower OI CEO's. This result also held for robustness tests. When we test if the likelihood to be acquired is lower for high OI CEOs that are also board members, we found no clear evidence in support of the main independent variable during the examined time period. Furthermore, the multivariate OLS regressions testing for differences in bid premiums found evidence to support that the accepted bid premiums are higher for CEOs with high OI relative to lower OI CEOs on a 5% significance level. The implied bid premiums accepted by CEOs with high OI were close to twice as high compared to other CEOs, and these results sustained throughout the robustness tests.

## 1.2 Purpose

The purpose of our study is to investigate whether a company's propensity to be acquired and the bid premium associated is impacted by CEO characteristics that have been found in the psychology and accounting literature to capture organizational identification. The results of our study are of interest to numerous company stakeholders, including the board of directors and the investors, all of whom actively seek to maximise shareholder value through incentivising reduced principal-agent interest discrepancies. Knowledge of how OI impacts M&A outcomes can be translated into actions and incentives that better sustain shareholder value. From a broader view, the results are also of interest to everyone who seeks to develop their understanding of the link between psychology and M&A. The study aims to address the following research question:

*How does CEO organizational identification impact a company's propensity to be acquired and the accepted bid premium in the case of a takeover?*

## 1.3 Contribution

Our study contributes to the existing literature and sheds additional light on explaining the agency problem in M&A by looking further into CEO characteristics, which OI is intended to act as a proxy for. To the best of our knowledge, no previous research has set out to link organizational identification with M&A outcomes, which is why we intend to address this gap. Our research provides new insight into this topic, as we demonstrate the impact CEO organizational identification has on the likelihood to be acquired and the bid premium accepted. Furthermore, our thesis extends the implications of the findings to the corporate governance literature by contributing with the notion that severance packages can be designed to account for the effect of organizational identification on M&A outcomes in order to actively try to incentivise behaviour aligned with increased shareholder value. By using a unique proxy for OI, introduced in the accounting literature by Abernathy et al. (2019), we also open up new pathways to explore and advance the quantitative measuring of psychology-rooted aspects that impact decision-making in today's corporate landscape.

## 1.4 Delimitation

The study is limited to Swedish public companies and M&A transactions during the time period 2002–2017, including observations from 2001 due to the use of lagged variables in the models

employed. Acquiring firms are not limited to Swedish domicile or type of buyer, which allows e.g. cross-border financial sponsor acquisitions to be part of the sample.

The psychology and accounting literature researching CEO characteristics in a business context show differing results across US and non-US markets, which raises the need to conduct studies on several geo-cultural areas to be able to draw homogenous conclusions. As a result of these cross-country differences, we limit our geographical scope to Sweden.

Our research has limited OIs' constituents to three as opposed to the six variables used by Abernathy et al. (2019), due to availability of data on CEO characteristics for Swedish public companies. However, the variables we include still capture the richer elements of the OI score and thus follows the underlying methodology and construct intended by the original authors.

### 1.5 Disposition

The study consists of eight sections. Section 2 contains a review of previous literature and theories followed by the development of the hypotheses tested in our study. Section 3 explains the method for constructing the OI score, applied models, and variables used in the study. Section 4 contains a description of the data sample, along with presenting the descriptive statistics. Sections 5 and 6 present the results and the analysis, respectively. Finally, section 7 presents the conclusion, followed by the suggestions for future research in section 8.

## 2 Theory and literature review

### 2.1 Related literature

This section describes the previous literature and research on which we base our study. The literature described below provides an overview of the three key field of studies that have driven the development of our hypotheses, namely corporate decision-making and CEO characteristics, corporate governance and reward incentives related to agency problems in M&A, and organizational identification and the emotional costs of divesting. Lastly, we introduce the hypotheses of our study.

#### 2.1.1 Corporate decision-making and CEO characteristics

Numerous research papers have explored CEO characteristics and traits as a means to explain the processes and outcomes of corporate decision-making. A common trait is CEO overconfidence, which regularly distorts shareholder value through overinvestments, overestimating returns of

projects, overpaying for target companies, and engaging in value-destroying mergers or acquisitions (Malmendier and Tate, 2005; Brown and Sarma, 2007; Malmendier and Tate, 2008). Moreover, certain managerial styles affect corporate practices and impact many factors such as interest coverage ratios and financial leverage, dividend payout, and acquisition decisions (Bertrand and Schoar, 2003). In regards to acquisition decisions, the CEO influences this for example by publicly showing or not showing willingness to be acquired (Graham et al., 2015). Furthermore, Graham et al. (2013) finds evidence that these CEO characteristics and accordingly their impact on corporate decisions varies significantly amongst US and non-US CEOs, which motivates further research in corporate decision-making and CEO characteristics in different corporate environments. Our study aims to address this by targeting Sweden specifically.

Sweden's corporate environment differs primarily in three areas compared to the US, namely in regards to ownership structure, corporate governance, and compensation packages. It is common for Swedish companies to be owned, controlled, or consistently influenced by financial sponsors, investment firms, and family foundations (Henrekson and Jakobsson, 2003; 2011), in turn arguing for a reduced CEO influence in corporate decisions in Swedish settings. Continuing, the corporate governance legislation differs between the US and Sweden largely due to the Swedish Corporate Governance Code (2016) that states that a Swedish CEO cannot be chairman of the board of the same company, which conversely is a frequent occurrence in the US (Brickley et al., 1997). Hence, we can expect a reduced influence regarding e.g. final takeover decisions coming from Swedish CEOs. Finally, the compensation of Swedish CEOs in terms of severance packages as a means to direct incentives is less frequently used than for the US counterparts (Sandström and Wernhoff, 2009; Bebchuk et al., 2014). These differences in turn highlight the relevance of conducting studies on the Swedish market to be able to draw homogenous conclusions across different corporate environments.

Jenter and Lewellen (2015) specifically targets the age of the CEO as a characteristic and links it to M&A-activity and the likelihood of acquisitions. In doing this for the US market between 1989 and 2007, they find evidence that the propensity of a company being acquired spikes when the target CEO is in retirement-age. The reason for this is that the private costs of e.g. foregone income and career opportunities of a retirement-age CEO is lower than its younger counterpart, and severance packages often do not take this factor into account. Their study acts as one of the theoretical foundations for our thesis, though we have chosen to focus on CEO characteristics that

have been found to explain feelings of continuity, ownership, and belonging for the CEO vis-à-vis the organization. Jenter and Lewellen's study was replicated and the findings reaffirmed by Mattsson and Rosengren (2017), and moreover, Yim (2013) suggest a similar relationship between age and propensity of takeover but from the perspective of the acquirer. However, by extending the analysis and focus on several CEO characteristics, rather than one, when looking at M&A-transactions, our thesis contributes to the prevailing literature that seeks to link corporate decision-making to CEO characteristics.

### 2.1.2 Corporate governance and reward incentives related to agency problems in M&A

The inherent conflict between agents and principals in corporate practices has long been known as the agency problem. The theory states that asymmetric information along with misaligned interests between the agent (e.g. the CEO) and the principal (e.g. the shareholders and board members) drive the agent to undermine the responsibility and duty that her role imposes. A common example is a CEO acting in self-interest by maximising her own utility at the expense of shareholders (Eisenhardt, 1989). To mitigate the agency problem, several actions and incentives have been introduced in corporate practices to remove the principal-agent interest discrepancy. Financial incentives such as severance packages, stock options, bonuses, and golden parachutes are commonly used for this purpose (Fiss et al., 2012).

Relating to M&A-transactions, prior literature have documented that on average, target companies experience a surge in stock price post-announcement of the deal, whilst acquiring companies generally experience little or no positive share price impact post-announcement. Additionally, it is common for M&A-transactions to actually be value-destroying for the acquiring company, measured by a drop in share price ex-post (Andrade et al., 2001; Moeller et al., 2005). However, Harford and Li (2007) find evidence to support that CEOs of acquiring firms are still better off financially in 75% of value-destroying mergers. One cause of this is that the incentive schemes can be poorly designed in today's corporate environment, where CEO pay often is solely a function of firm size, which drives CEO preferences to running larger companies due to the increased pay and prestige that is associated (Yim, 2013). When looking at both the acquiring and target CEO, similar issues with corporate governance arise, since golden parachutes and other schemes designed to incentivise balanced principal-agent relationships are a function of firm size and growth, and lack in considering performance or value-creation (Hartzell et al., 2004; Jensen and Murphy, 2010). This is further the case when studying the literature on why CEOs engage in

value-destroying activities, where firm-specific characteristics such as poorly structured compensation packages, excessive free cash flow, and weak corporate governance are factors with explanatory power.

The management accounting literature suggests that CEOs' characteristics are significant predictors of their decision-making (Abernethy and Wallis, 2019). Jenter and Lewellen (2015) incorporates this to an M&A setting and concludes that better corporate governance is associated with accounting for CEO age, thus shifting the focus to CEO characteristics. Mattson and Rosengren (2017) reaffirm these findings, concluding that CEO age should to a greater extent influence the design of compensation schemes. Additionally, they find that the retirement-age effect is amplified when the CEO is also a board member, due to the additional influence this position entails since the board is ultimately responsible for all strategic decisions and thus also has the final say in accepting or declining takeover bids.

Concluding this research area, corporate governance is an important component in mitigating agency problems in M&A and has led our thesis to specifically look at how the corporate governance literature can be further developed.

### 2.1.3 Organizational identification and the emotional costs of divesting

The degree to which an employee identifies with her organization is defined as organizational identification (OI), and is a phenomenon rooted in the psychology literature that argues that individuals have an inner desire to maintain and advance their self-esteem (Cole and Bruch, 2006; Leary, 2007). Since the CEO is arguably the most influential agent in corporate practices, the potential for CEO OI to influence firm decisions is likely to be greater than for other executives or employees (Boivie et al., 2011). As individuals, be it a CEO or other agent, increasingly identify with their firm, they also achieve greater satisfaction protecting and contributing to the firm's positive perception toward external parties, even if the actions may incur private economic costs to the individual (Cornelissen et al., 2007; Dutton et al., 1994).

Both empirical and theoretical studies have found evidence to suggest that OI is associated with reduced agency costs in certain settings since the disutility or emotional costs associated with self-interested behaviour incentivises actions that generally are aligned with the interest of shareholders. This is shown theoretically by Heinle et al. (2012), who find that OI provides strong incentives for agents to make decisions that appreciates and are beneficial to firm value. Moreover, an empirical study by Boivie et al. (2011) concludes that CEO self-interested behaviour in

compensation schemes, such as pay unrelated to performance and demanding certain perks, is effectively reduced as a function of CEO OI. This is further strengthened by a recent study on the topic which supports that agents with higher OI are less likely to engage in financial reporting methods that are opportunistic in their intent, since they are deemed by the same agent to be detrimental to firm value (Abernathy et al., 2017). Still, as OI increases, the individual increasingly considers themselves as an interchangeable representative of the firm and their self-perception becomes depersonalised (Dutton et al., 1994; Turner, 1985). When applying these findings to an M&A setting, these distinct and critical events may be interpreted as unique since they would indicate that divesting a business is linked to divesting part of themselves. This emotional connection stems from the fact that a CEO with high OI is characterised by having designed and shaped key elements such as the company's goal and mission, strategic priorities, organizational structure, target market, and capital structure (Aldrich, 1999); which develops feelings of belonging, distinctiveness, and continuity (Albert and Whetten, 1985; Ashforth and Mael, 1989).

Another important theoretical foundation for our thesis when developing the OI scores for our sample is the study by Abernathy et al. (2019). The authors were the first in the accounting literature to measure OI with archival proxies, of which these proxies were extensively tested for robustness and validity in its ability to capture the underlying construct by focusing on discriminant, predictive, convergent, and nomological validity in accordance with the suggestions of Netemeyer et al. (2003). CEO-level variables that would reflect a greater likelihood of CEOs identifying and associating more positively with their organization included whether the CEO is also the founder, the tenure of her position, if the CEO has been internally promoted, if the CEO has formerly been a department manager, the number of positions she has held prior, and the equity stake she owns in the company. We believe that by building upon their method to measure OI quantitatively, we can contribute to the literature on M&A, agency problems, and corporate governance with the findings of the psychology literature, ultimately broadening the applicability of OI to extend to these fields.

## 2.2 Hypotheses development

Our hypotheses are derived from the aforementioned literature, and there are three underlying arguments that drive our three hypotheses:

(1) The CEO of a company is one of the most important decision-makers in corporate practices, which also applies to M&A decisions. Firstly, the CEO is a key influencer in the period

leading up to a bid, for example by taking public stances on the bid itself, and secondly she provides recommendations to the board and leads negotiations once a bid has been made.

(2) Since the board of directors are the ultimately responsible in company decisions, a CEO with board membership should have additional influence in regards to her capabilities to enforce strategic decisions that are aligned with her own opinion, regardless of self-interested intent or not.

(3) Both theoretical and empirical research on CEO characteristics and corporate decision-making has found evidence to support that OI influences CEO behaviour, ultimately seeing herself as interchangeable with the company and the company as part of her identity. Extending the implications of these findings, the CEO characteristics that constitute OI should accordingly influence the behaviour of the CEO in the process leading up to a bid and the period after a bid has been made. Since OI greatly influences private costs for the CEOs by adding an emotional cost component, one can expect that CEOs who identify strongly with their firm are less eager to divest their business, ceteris paribus, and thus would require a higher bid premium to do so. Conversely, acquisitions should occur more frequently for CEOs with a lower OI since the total private costs consist primarily of economical cost, and not emotional cost to the same extent, which on average should result in a lower bid premium sufficing.

In conclusion, we expect to see the likelihood of being acquired to decline for target CEOs with high OI, an inverse relationship that we expect to be amplified for CEOs that hold a board seat as well. Finally, as CEO OI increases and the propensity to be acquired decreases, financial incentives such as bid premiums are necessary to push down OIs importance in the decision-making process. The implication of this is that we expect that in order for a CEO with high OI to divest their company, they would require a relatively higher bid premium than a CEO with lower OI to do so.

Formally stated, our three null hypotheses are:

*$H_0$1: The likelihood of being acquired is equal for firms with CEOs with high OI, relative to firms with CEOs with non-high OI.*

*$H_0$2: The likelihood of being acquired is equal for firms with CEOs with high OI who are also board members, relative to all other CEOs.*

*$H_0$3: The bid premium is equal for target firms with CEOs with high OI, as for target firms with CEOs with non-high OI.*

# 3 Methodology

This section provides a detailed description of the applied technique to construct the OI score. Furthermore, the regression models used to test our hypotheses are presented as well as descriptions of the dependent and independent variables.

## 3.1 Constructing the OI score

### 3.1.1 Principal component analysis

The principal component analysis (PCA) is a technique for reducing the dimensions of a dataset while retaining the greatest amount of information. If a dataset includes a large number of variables, PCA can be applied to reduce the number of variables to a few principal components, referred to as factors in our thesis. This creates a model that increases the interpretability as we now have fewer dimensions while minimising the information loss. The first factor is constructed by creating a "best fitting" line from the dataset containing the different variables. This best fitting line is the one that minimises the average squared distance from each observation to the line. The next best fitting line is the one being perpendicular to the first. This is repeated as many times as there are variables, creating an equal amount of factors as there are variables. The first factor captures most of the information, since it is the best fitting line, and close to no information is captured in the last one as it is the worst fitting line among the components created. The factors that contain the least amount of observations are excluded and determined based on the factor's eigenvalue. The eigenvalue describes how much variance there is in the data in the direction of the relevant factor. The rule of thumb is to exclude the factors with an eigenvalue below 1, since these are considered to contain an insufficient amount of information.

### 3.1.2 OI score

The OI score is developed using the same two-step procedure as Abernathy et al. (2019). The first step is to standardise the variables and use PCA to find the two factors with eigenvalues above 1. The second step is to sum the two factors using their respective proportion of the explained value as weights.

The score is based on the three variables $FOUNDER$, $TENURE$ and $INSIDER$. $FOUNDER$ denotes whether the CEO is the founder of the company, $TENURE$ represents the amount of years the CEO has been in office, and $INSIDER$ denotes whether the CEO has been internally promoted to the position as CEO. $FOUNDER$ and $INSIDER$ are thus binary variables, while $TENURE$ is a

continuous variable. Before the dimension with an eigenvalue below 1 is excluded, the variables are standardised. If the variables were not standardised, $TENURE$ would have far greater impact on the factors since this variable can undertake values all the way up to 17 while the other two variables only assume the value 1 or 0. The implication of the standardising is that the $FOUNDER$ variable is having a significantly greater impact on the factors than $INSIDER$ even though both are binary, since CEOs that are founders are less frequent in the sample than internally promoted CEOs. The standardised value of not being a founder is $-0.32$ while the standardised value of being founder is 3.1. The same value for insiders are $-0.7$ and 1.6. The value of not being a founder is closer to zero than not being internally promoted, and being a founder is further away from zero than the value of being internally promoted.

The PCA score generates three factors with three different values for each observation. The third factor with an eigenvalue below 1 is excluded. The variables $FOUNDER$ and $TENURE$ significantly load on the first factor while $INSIDER$ significantly loads on the second one, as displayed in Table 1. The selected characteristics capture both the bottom-up and top-down development of a CEOs OI, which is linked to OI developed as a result of progression in the organisational hierarchy and OI developed as being part of the strategic or decision-making body of the organization, respectively (Ashforth and Mael, 1989; Cornelissen et al., 2007; Whetten and Mackey, 2002). An example of the bottom-up development of OI is when the CEO is internally promoted since, in the process of progressing through the organization, these CEOs must outperform their peers to prove their capability and value which ultimately facilitates stronger feelings of continuity and self-esteem. Additionally, they will throughout this process have gained more opportunities to develop relationships and acquire the trust of other members of the organization (Ashfort and Mael, 1989; Cole and Bruch, 2006). $TENURE$ and $FOUNDER$ are examples of top-down variables, and develops as a result of consistently holding a leading position and being a part of the upper echelons of the organization; thus being able to shape the strategy and bear the responsibility of the corporate outcome.

The second step to create the score is to further reduce the number of dimensions from two to one, since we want to create an index that capture the OI phenomena. This reduction of dimensions is done by multiplying $Factor\ 1$ and $Factor\ 2$ with their respective proportion of the explained variance and adding them to create an OI score for each observation. The proportion is shown in the table below. The total explained variance is 73.7%, and the weight for $factor\ 1$ is calculated

as $0.382/0.737 = 0.518$, while the weight for $Factor\ 2$ is $0.355/0.737 = 0.482$. The final OI formula then takes the form of: $OI\ score = 0.518$ x $Factor\ 1 + 0.482$ x $Factor\ 2$, where each factor represents a unique value for each observation, depending on the CEO at the point in time.

**Table 1: Components derived from the PCA and variable loadings**

| Component | Eigen value | Proportion | Cumulative |
|---|---|---|---|
| Factor 1 | 1.1460 | 0.3820 | 0.3820 |
| Factor 2 | 1.0649 | 0.3550 | 0.7370 |
| Factor 3 | 0.7891 | 0.2630 | 1.0000 |

| Variable | Factor 1 | Factor 2 |
|---|---|---|
| *FOUNDER* | 0.7244 | 0.2925 |
| *TENURE* | 0.6861 | -0.2744 |
| *INSIDER* | 0.0674 | 0.8712 |

Once an OI score is created for each observation, we sort all observations and their respective scores in ascending order, from smallest OI score to largest, and divide them into percentile. The 20% smallest OI scores are part of $Quintile\ 1$, 20%–40% belong to $Quintile\ 2$, 40%–60% represent $Quintile\ 3$, 60%–80% is denoted as $Quintile\ 4$, and finally 80%–100% represents $Quintile\ 5$. The variable name for $Quintile\ 5$ is $High\ OI$ throughout the study, while all other quintiles in combination are commonly referred to as "non-high OI". We are creating five groups of OI score in order to capture the CEOs with clearly high OI. The alternative would be to create fewer groups and capture a broader range of CEOs in each.

## 3.2 Description of applied models

### 3.2.1 Logit model

The logit model is applied because the dependent variable is binomial. The logit model excludes assumptions concerning normal distribution, linearity, and homoscedasticity due to its non-linear nature. The underlying assumptions are instead that the data is gathered from a random sample of observations. Moreover, the dependent variable is dichotomous and has an uncertain association with the independent variables, which in turn are not correlated nor have multicollinearity (Christensen, 1990).

According to Woolridge (2012) there are two advantages of using the logit instead of the linear model. First, the fitted probabilities cannot be less than zero or greater than one, and second, a normal distribution is often a condition for linear regressions.

The variables for our first regression take the following form:

$$P(Acquired_{it} \mid x) = L(\beta_0 + \beta_1 High\ OI_{it} + \beta_2 Board\ member_{it} + \beta_3 Gender_{it} + \beta_4 Log(Assets)_{it} + \beta_5 Firm\ age_{it} + \beta_6 Equity\ ratio_{it} + \beta_7 ROA_{it} + fe_{kt} + \varepsilon_{it}) \quad \text{(i)}$$

Where $L$ denotes that it is a logit function, $Acquired$ is a dependent dummy variable and $High\ OI$ is the independent dummy variable of interest in the first regression, indicating whether the CEO has a high OI or not. Regarding the control variables, $Board\ member$ is a dummy variable demonstrating whether or not the CEO is a member of the board, $Gender$ is a dummy variable to indicate if the CEO is female or male, $Log(Assets)$ is the natural logarithm of the company's total assets, $Firm\ age$ is the number of years the firm has been registered at the Swedish Companies Registration Office (Sw: Bolagsverket), $Equity\ ratio$ is the ratio between equity and assets, and $ROA$ is the return on assets. The subscripts $i$ and $t$ correspond to firm $i$ in year $t$, and $\varepsilon$ is the error term. We also control for fixed effects ($fe$) by industry $k$ and year $t$, further discussed in section 5.2. Standard errors are clustered by firm. The natural logarithm of assets is used instead of total assets in order to account for the positively skewed distribution of total assets (see Appendix 7), and since we expect that asset-heavy companies experience diminishing effects of adding additional assets. Further definitions, explanations, and motivations behind the choice of our dependent and independent variables are provided in section 3.3 and Appendix 8.

We then perform a more detailed investigation where we continue to separate our OI score into several quintiles to get a broader view of the results and their implications, while also controlling for fixed effects. This should nuance the regression to see if there is difference among other OI quintiles as well. The regression then turns into:

$$P(Acquired_{it} \mid x) = L\big(\beta_0 + \beta_j OI\ quintile_{ijt} + \beta_6 Board\ member_{it} + \beta_7 Gender_{it} + \beta_8 Log(Assets)_{it} + \beta_9 Firm\ age_{it} + \beta_{10} Equity\ ratio_{it} + \beta_{11} ROA_{it} + fe_{kt} + \varepsilon_{it}\big) \quad \text{(ii)}$$

In this regression, the $OI\ quintile$ dummies are instead the most relevant independent variables, and indicates what OI quintile 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 $t$. The subscripts $i$, and $t$ correspond to firm $i$ in year $t$, while the subscript $j$ denotes OI quintiles 1–5. Standard errors are clustered by firm.

### 3.2.2 Multivariate linear ordinary least squares model

When testing our third hypothesis, our dependent variable $Bid\ premium$ is a continuous variable rather than a dummy variable which motivates the use of a multivariate linear OLS model. The $OI\ quintile$ dummies are once more our independent variables of interest, while we still control for the same CEO and firm characteristics as well as fixed effects for industry and year, similar to the former regression. Standard errors are clustered by firm.

$$Bid\ premium_{it} = \beta_0 + \beta_1 High\ OI_{it} + \beta_2 Board\ member_{it} + \beta_3 Gender_{it} + \beta_4 Log(Assets)_{it} + \beta_5 Firm\ age_{it} + \beta_6 Equity\ ratio_{it} + \beta_7 ROA_{it} + fe_{kt} + \varepsilon_{it} \quad \text{(iii)}$$

$$Bid\ premium_{it} = \beta_0 + \beta_j OI\ quintile_{ijt} + \beta_6 Board\ member_{it} + \beta_7 Gender_{it} + \beta_8 Log(Assets)_{it} + \beta_9 Firm\ age_{it} + \beta_{10} Equity\ ratio_{it} + \beta_{11} ROA_{it} + fe_{kt} + \varepsilon_{it} \quad \text{(iv)}$$

## 3.3 Variables

### 3.3.1 Dependent variables

$Acquired$ – The dummy variable Acquired is a dependent variable in the regressions, with 1 for companies being acquired during a certain observation, and 0 otherwise. The following three acquisition criteria have been used to limit potentially misguiding M&A rationale and data: (1) the transaction must have a completion date, (2) the target company must be a Swedish public company upon the completion date, and finally (3) the acquiring firm must own more than 50% of the target company after the acquisition, and cannot hold a majority ownership position prior. We include transactions with undisclosed deal values because of the total assets of the target company still being sufficient to imply a deal value above or at this threshold, see section 4.2 for a description of how we limit our observations based on assets.

$Bid\ premium$ – The continuous variable Bid premium indicates the premium paid for the acquired company, expressed in percentage (%). Defined as $\frac{Final\ bid\ price\ per\ share}{Closing\ price\ per\ share_{t-1}}$, where $t-1$ is the share price of the target company one month prior.

### 3.3.2 Main independent variables

$High\ OI$ – High OI refers to CEOs with an OI score in the top 20% of the sample. OI is a composite score based on weighing the three variables $FOUNDER$, $TENURE$ and $INSIDER$ through applying PCA. See section 3.1 for the method and construction of the OI score. Whether the CEO

is a founder or not, and whether the CEO was internally promoted are both dummy variables. The CEO tenure is denoted in number of years. The high OI coefficient should be negative for the dependent dichotomous variable $Acquired$ and conversely positive for the dependent continuous variable $Bid\ premium$, given that the results mirror the hypotheses. This stems from the expectation that CEOs with high OI are less prone to divest their business, and if they divest their business in spite of this, there needs to be enough financial incentives – a more than sufficient bid premium – in order to do so.

$OI\ quintile$ – The OI quintile is simply an extension and categorisation of the OI score based on their relative score. There are five quintiles, of which each one represents 20% of the distribution. Quintile 1 represents the 20% lowest OI score, while quintile 5 – $High\ OI$ – represents the top 20%. The coefficient of these quintiles when using $High\ OI$ as a comparable base should be positive when testing the first and second hypothesis, and negative for our third hypothesis test, since acquisitions are expected to be more frequent and bid premiums lower for all quintiles relative to the high OI quintile.

$High\ OI$ x $Board\ member$ – This dummy variable is constructed for the purpose of testing our second hypothesis and returns the value 1 if a CEO with high OI is also a board member. The coefficient for this variable should be negative for the dependent variable $Acquired$. Moreover, we expect the implied probability of being acquired to be significantly lower relative to $High\ OI$ in order to conclude that high OI in conjunction with a board seat conveys an amplifying effect. In addition, we expect that the implied probability is even higher for non-board member CEOs part of the lower OI quintiles compared to all other CEOs, to be able to determine an amplifying effect in both directions.

### 3.3.3 Control variables

$Board\ member$ – Board member is a dummy variable with 1 for CEOs that are board members in the same company, and 0 otherwise. Since the board of directors is the decision-making body in a company and thus responsible for determining outcomes of M&A negotiations and other strategic decisions, we suspect that a CEO with board membership has additional power in regards to the negotiation and decision-making process of M&A transactions. According to the findings of Mattsson and Rosengren (2017), this variable amplifies the retirement-age effect. Similarly, we expect that a CEO that is also a board member should amplify the OI score of a given CEO in both

directions, i.e. a CEO with a high OI would use the additional influence of being a board member to hinder a takeover, while a CEO with lower OI would use the additional influence to actualise an exit.

$Gender$ – Gender is a dummy variable with 1 for CEOs that are female, and 0 for CEOs that are male. Previous studies have documented that there is a clear difference in M&A outcomes between male and female executives, which includes impact on bid premiums and takeover activity and propensity from an acquirer perspective (Levi et. al, 2008; Huang and Kisgen, 2012; Levi et al., 2014). Though previous literature fails to conclude the impact target CEO gender has on M&A outcomes, we still expect this variable to have an impact on the propensity to be acquired and the bid premium involved.

$Assets$ – Assets are defined as the balance sheet total measured in book value. Aligned with Jenter and Lewellen (2015), assets are also controlled for in our regressions. Assets act as a proxy for firm size and is a driver of valuation for companies, implying impact on M&A propensity and bid premiums as well. Alexandidris et al. (2013) has shown that larger firms, i.e. larger balance sheet companies, tend to receive lower takeover premiums than smaller firms. To account for the skewness of the distribution in total assets, we use the natural logarithm of assets in our regressions instead, further described in Appendix 7.

$Firm\ age$ – Defined as the number of years the firm has been registered at the Swedish Companies Registration Office (Sw: Bolagsverket). Firm age has been found to affect exits through M&A, where the probability of an exit decreases with firm age and is thus negatively correlated (Cefis and Marsili, 2012; Audretsch, 1991; Sarkar et al., 2006).

$Equity\ ratio$ – Defined as the ratio between total equity and total assets, measured in book value. This ratio is a proxy for how levered a company is, and hence impacts the deal value – the purchase price paid – for a given equity valuation. We choose to include equity ratio as a control variable since research has found it impacts M&A outcomes (Mattsson and Rosengren, 2017).

$ROA$ – Return on assets, calculated as EBIT / Total assets, measured in book value. ROA is the most widely used accounting ratio in the M&A literature (Thanos and Papadakis, 2012), and is used in the regressions performed by Jenter and Lewellen (2015), why we choose to include it as well.

# 4 Empirical data

## 4.1 Data collection process

To test our hypotheses, we integrated three separate datasets traced from several different sources to obtain data for the relevant variables used in the regressions. The first and primary source, which has been common to all control variables in the regressions, have been historical organizational and financial data on Swedish companies obtained from the Serrano-database at the Swedish House of Finance. The second dataset contained the CEO-related data that ultimately measured CEO OI, and were obtained from the same source as the aforementioned. The datasets were limited to include all public companies in Sweden over the relevant time period. Since the definition for a public company is not restricted to publicly listed firms (Bolagsverket, 2019), i.e. their shares do not have to be offered on a public stock exchange, the amount of observations were greater than if we would only include publicly listed firms. Lastly, M&A data for Swedish public target companies were collected through Mergermarket, Factset, and SDC Platinum. These sources were manually crosschecked between each other as well as complemented with transaction related company filings and news reports to get as complete and reliable a dataset as possible.

## 4.2 Sample construction

We initiated the sample construction by merging the various datasets described in section 4.1 by linking them through their unique organizational number and observation year. We continued by removing all observations of companies that were not public companies along with the observations that did not have complete CEO data. Since our study is reliant on panel data, the data that was needed for our sample was the organizational number of the company, the observation year, the industry the firm operates in, the registration date of the firm, EBIT, total liabilities, and total assets. Lastly, the CEO data that was needed was the gender of the CEO, the dates the CEO took and left office, the date each CEO joined the firm, and whether the CEO is board member or not. The CEO start date and registration date of the firm is compared to see if the CEO is also the founder. CEOs that have a total time in office less than half a year are excluded from the dataset since these in some cases are interim CEOs. The data generated when merging the CEO data with the data on public companies contained more CEO-years than firm-years. Since data is needed from both sources in order to test our hypothesis, we exclude the ones that miss data from any of the sources.

We choose to exclude observation with total assets below SEK 100m in order to exclude micro-cap transactions that have been found to be less likely, relative to larger companies, to implement severance packages for executives (Frydman and Jenter, 2010). Since we argue that financial incentives like these influence CEOs with lower OI more than CEOs with high OI, it is useful to increase the frequency of financial incentives being present in the sample.

Our M&A dataset contained the following data: the organizational number of the target company so that we could link it to the aforementioned dataset; the deal value of the transaction; the announcement date of the transaction; the final bid premium accepted by the target company; the acquirer's ownership stake prior to the transaction (%); and finally the ownership stake acquired (%). We choose the announcement date rather than the completion date as the relevant point in time to link to our dataset since we believe that the CEO in the period following up to the announcement date is also the CEO that has been responsible for negotiations and has been the agent of influence throughout the transaction process.

After careful consideration we chose to exclude observations prior to 2001 since the financial data from the Serrano-database prior to this date was insufficient, thus hindering a consistent and uniform analysis over the studied period. However, since our regressions include lagged variables, i.e. include observations from $t-1$, the time period will accordingly be 2002–2017, which represents 16 years of data. Using the average business cycle of 5 years (Hassler et. al, 1992), this time period would represent roughly three to four business cycles, which makes for a comprehensive and sufficient dataset.

**Table 2: Sample construction procedure**

| | **Observations** |
|---|---|
| Total number of firm years for all Swedish firms for the period 2001–2017 | 11,285,261 |
| Firm years for private companies | -11,241,960 |
| Firms with missing CEO data | -12,281 |
| Firms with assets below SEK 100m | -16,492 |
| Firms with missing data points on other regression variables | -3,653 |
| **Matched sample in number of firm year-observations** | **10,875** |
| **With acquisitions** | **167** |

## 4.3 Descriptive statistics

Table 3 displays descriptive statistics for the final panel dataset that we used to perform our analyses on, see Table 2 in section 4.2 for details on sample construction. The OI score is presented in absolute terms and the panels are divided into two subsamples, namely CEOs that hold a board member position, and those that do not. Examining the main sample in Table 3 Panel A, we note that CEOs that are board members are more long-tenured than non-board members, and have been in office c. 25% longer. Regardless of CEO board membership, the sample shows that the average firm is 33.1 years old and the average CEO holds her position for 3.4 years. In regards to total assets, the average is SEK 10.6bn with a median of around 820m, which affects the standard deviation accordingly. Another notable statistic is that only 9% of CEOs are founders and 31% of CEOs have been internally promoted.

Table 3, Panel B, is based on the same sample but shows only descriptive statistics for the acquired target companies. In total there are 167 transactions that follow the set criteria, of which 131 have disclosed bid premiums. As can be seen by comparing the panels in Table 3, the means of the OI constituent variables and accordingly the OI score are lower for the target companies. This is aligned with our expectation and first hypothesis, but will furthermore be tested for statistical significance in section 5.1. Moreover, the amount of CEOs that are also board members is lower for the target companies compared to the main sample, 48% and 55% respectively. Lastly, the sample's average bid premium is 28%, and is higher for the non-board member subsample.

**Table 3: Descriptive statistics for the final panel dataset with absolute OI score**

Panel A: Main sample

| | All observations = 10,875 | | | Board member (CEOBM=1) = 5,977 | | | Non-board member (CEOBM=0) = 4,898 | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variables** | **Mean** | **Median** | **Std** | **Mean** | **Median** | **Std** | **Mean** | **Median** | **Std** |
| *OI Score* | 0.00 | -0.39 | 0.74 | 0.07 | -0.29 | 0.75 | -0.08 | -0.44 | 0.73 |
| *INSIDER* | 0.31 | 0.00 | 0.46 | 0.34 | 0.00 | 0.47 | 0.27 | 0.00 | 0.44 |
| *FOUNDER* | 0.09 | 0.00 | 0.29 | 0.10 | 0.00 | 0.30 | 0.08 | 0.00 | 0.28 |
| *TENURE* | 3.44 | 2.00 | 3.25 | 3.78 | 3.00 | 3.49 | 3.03 | 2.00 | 2.89 |
| *CEO age* | 50.36 | 51.00 | 7.59 | 50.96 | 51.00 | 7.71 | 49.62 | 50.00 | 7.39 |
| *CEOBM* | 0.55 | 1.00 | 0.50 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Gender* | 0.16 | 0.00 | 0.37 | 0.13 | 0.00 | 0.33 | 0.20 | 0.00 | 0.40 |
| *Firm age* | 33.12 | 21.00 | 30.80 | 36.36 | 23.00 | 32.62 | 29.16 | 19.00 | 27.91 |
| *ROA* | 0.01 | 0.00 | 0.16 | 0.01 | 0.00 | 0.14 | 0.00 | 0.00 | 0.18 |
| *Total assets* | 10,600,000 | 819,800 | 48,800,000 | 12,400,000 | 989,767 | 54,100,000 | 8,467,316 | 679,432 | 41,300,000 |
| *Equity ratio* | 0.51 | 0.49 | 0.32 | 0.48 | 0.44 | 0.33 | 0.54 | 0.54 | 0.30 |

Panel B: Target companies

| | All observations = 167<br>Obs. with bid premiums = 131 | | | Board member (CEOBM=1) = 87<br>Obs. with bid premiums = 56 | | | Non-board member (CEOBM=0) = 80<br>Obs. with bid premiums = 75 | | |
|---|---|---|---|---|---|---|---|---|---|
| **Variables** | **Mean** | **Median** | **Std** | **Mean** | **Median** | **Std** | **Mean** | **Median** | **Std** |
| *OI Score* | -0.20 | -0.44 | 0.60 | -0.20 | -0.44 | 0.53 | -0.19 | -0.44 | 0.65 |
| *INSIDER* | 0.24 | 0.00 | 0.43 | 0.25 | 0.00 | 0.44 | 0.23 | 0.00 | 0.42 |
| *FOUNDER* | 0.04 | 0.00 | 0.19 | 0.03 | 0.00 | 0.16 | 0.05 | 0.00 | 0.21 |
| *TENURE* | 2.88 | 2.00 | 2.68 | 3.01 | 2.00 | 2.85 | 2.76 | 2.00 | 2.52 |
| *CEO age* | 50.64 | 51.00 | 7.39 | 51.41 | 52.50 | 7.78 | 49.93 | 51.00 | 6.98 |
| *CEOBM* | 0.48 | 0.00 | 0.50 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Gender* | 0.16 | 0.00 | 0.36 | 0.09 | 0.00 | 0.28 | 0.22 | 0.00 | 0.42 |
| *Firm age* | 29.53 | 19.00 | 27.39 | 33.59 | 23.00 | 29.31 | 25.79 | 18.00 | 25.08 |
| *ROA* | -0.01 | -0.01 | 0.24 | 0.03 | -0.01 | 0.29 | -0.04 | -0.01 | 0.17 |
| *Total assets* | 3,829,232 | 750,086 | 9,358,723 | 4,612,416 | 1,314,961 | 7,844,467 | 3,109,062 | 518,300 | 10,600,000 |
| *Equity ratio* | 0.57 | 0.58 | 0.29 | 0.56 | 0.54 | 0.30 | 0.59 | 0.59 | 0.28 |
| *Bid premium* | 0.28 | 0.26 | 0.38 | 0.24 | 0.24 | 0.19 | 0.32 | 0.28 | 0.47 |

As shown in Table 4, the descriptive statistics are split between subsamples of OI scores. In line with the methodology of Abernathy et al. (2019), the OI score is relative in its intended interpretation as its constituents can vary based on the researcher's availability of data and cross-cultural differences. In Panel A, we divided the OI score into five equally large quintiles where "0–20%" is the first and bottom quintile and conversely "80–100%" is throughout the thesis referred to as "high OI". The OI score's mean and median follows this distinction accordingly. Among the high OI segment, 63% of CEOs have climbed the organizational ladder and been internally promoted. Since $FOUNDER$ is weighted relatively greater in its contribution to the OI score, as described in section 3.1, we note from Table 4 Panel A that all CEOs that are founders are part of the high OI segment, but only 37% of high OI CEOs are founders. Moreover, the mean for internally promoted CEOs is higher in quintile 4 than in quintile 5 which confirms the relative greater weight of $FOUNDER$ compared to $INSIDER$. It can also be derived from the table that CEO tenure is higher in quintile 3 (5.53) compared to quintile 4 (3.45). Furthermore, $INSIDER$ only has values in quintiles 4 and 5, which confirms that CEOs with internal promotion is weighted relatively greater than $TENURE$. Quintiles 1–3 are solely impacted by the tenure of the CEO since all internally promoted and founders are captured in quintiles 4 and 5. The CEO tenure is almost 5.3 years for high OI CEOs compared to the bottom OI segment who have an average tenure of 0.6 years, i.e. took office relatively recently. For the high OI segment, CEOs are more frequently board members in conjunction with their executive position, and in this segment the CEOs' company tends to be relatively younger and smaller than for other subsamples.

When focusing on the target companies presented in Panel B, the statistics are more or less similar but with noteworthy differences related to ROA and total assets. There is a declining trend in ROA for the sample, where CEOs with high OI that have divested their company have experienced worse operating performance prior to the sale than lower OI CEOs. Total assets also suffers a decline as OI progresses from low to high. In addition, Panel B shows descriptive statistics for bid premiums, which follows the expected direction of our hypothesis, namely that the bid premium should increase for CEOs with high OI in order to convince the CEO to work in favor of the transaction. Finally, an observation-wise remark is that the least amount of observed transactions is found at the upper OI score, 17 transactions as opposed to 48 for the low OI segment, and the same trend is observed regarding observations with bid premiums.

**Table 4: Descriptive statistics for the final panel dataset with quintiles for OI score**

Panel A: Main sample

| | All observations = 10,875 | | | | | All observations = 10,875 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | **Means** | | | | | **Medians** | | |
| **Variables** | **0–20%** | **20–40%** | **40–60%** | **60–80%** | **80–100%** | **0–20%** | **20–40%** | **40–60%** | **60–80%** | **80–100%** |
| *OI Score* | -0.61 | -0.53 | -0.36 | 0.32 | 1.18 | -0.59 | -0.54 | -0.39 | 0.39 | 0.90 |
| *INSIDER* | 0.00 | 0.00 | 0.00 | 0.80 | 0.63 | 0.00 | 0.00 | 0.00 | 1.00 | 1.00 |
| *FOUNDER* | 0.00 | 0.00 | 0.00 | 0.00 | 0.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *TENURE* | 0.63 | 2.25 | 5.53 | 3.45 | 5.34 | 1.00 | 2.00 | 5.00 | 1.00 | 5.00 |
| *CEO age* | 48.08 | 49.41 | 51.96 | 50.89 | 51.46 | 48.00 | 50.00 | 53.00 | 51.00 | 52.00 |
| *CEOBM* | 0.45 | 0.50 | 0.56 | 0.64 | 0.60 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| *Gender* | 0.22 | 0.18 | 0.12 | 0.15 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Firm age* | 33.56 | 32.95 | 38.87 | 37.44 | 22.77 | 21.00 | 20.00 | 25.00 | 25.00 | 12.00 |
| *ROA* | -0.01 | 0.01 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Total assets* | 8,692,667 | 8,944,424 | 10,700,000 | 15,600,000 | 9,146,162 | 695,047 | 823,374 | 995,902 | 991,282 | 678,414 |
| *Equity ratio* | 0.52 | 0.51 | 0.50 | 0.49 | 0.51 | 0.52 | 0.50 | 0.47 | 0.46 | 0.47 |

Panel B: Target companies

| | All observations = 167 | | | | | All observations = 167 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N = 48 | N = 29 | N = 46 | N = 27 | N = 17 | N = 48 | N = 29 | N = 46 | N = 27 | N = 17 |
| | | | **Means** | | | | | **Medians** | | |
| **Variables** | **0–20%** | **20–40%** | **40–60%** | **60–80%** | **80–100%** | **0–20%** | **20–40%** | **40–60%** | **60–80%** | **80–100%** |
| *OI Score* | -0.61 | -0.52 | -0.37 | 0.36 | 1.11 | -0.59 | -0.54 | -0.39 | 0.39 | 0.70 |
| *INSIDER* | 0.00 | 0.00 | 0.00 | 0.93 | 0.71 | 0.00 | 0.00 | 0.00 | 1.00 | 1.00 |
| *FOUNDER* | 0.00 | 0.00 | 0.00 | 0.00 | 0.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *TENURE* | 0.60 | 2.41 | 5.39 | 1.81 | 5.00 | 1.00 | 2.00 | 5.00 | 1.00 | 4.00 |
| *CEO age* | 48.13 | 49.69 | 54.07 | 49.67 | 51.65 | 49.00 | 50.00 | 55.00 | 50.00 | 51.00 |
| *CEOBM* | 0.48 | 0.41 | 0.48 | 0.63 | 0.35 | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 |
| *Gender* | 0.25 | 0.17 | 0.07 | 0.15 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| *Firm age* | 29.56 | 32.76 | 34.17 | 23.59 | 20.76 | 17.50 | 22.00 | 22.50 | 16.00 | 18.00 |
| *ROA* | 0.04 | 0.00 | -0.03 | -0.04 | -0.06 | -0.01 | 0.00 | -0.01 | -0.02 | -0.02 |
| *Total assets* | 5,594,510 | 4,094,906 | 3,325,456 | 2,747,984 | 1,472,141 | 861,968 | 437,954 | 684,468 | 760,461 | 1,021,993 |
| *Equity ratio* | 0.60 | 0.54 | 0.58 | 0.53 | 0.59 | 0.63 | 0.49 | 0.53 | 0.59 | 0.58 |
| *Bid premium* | 0.18 | 0.20 | 0.24 | 0.26 | 0.51 | 0.18 | 0.25 | 0.27 | 0.25 | 0.44 |
| N (Bid premium) | 37 | 22 | 38 | 19 | 15 | 37 | 22 | 38 | 19 | 15 |

# 5 Empirical results

In this section we test and present the results of our three hypotheses by applying the logit model to perform regressions for the first and second hypothesis, presented in section 5.1.1 and 5.1.2 respectively, and we apply a multivariate OLS regression to test our third hypothesis in section 5.1.3. As displayed in the separate columns of the regression tables of this section, we perform the regressions several times to account for fixed effects in year and industry as well as distinguish the relationship between each OI quintile. Robustness and fixed effects are separately elaborated upon in section 5.2.

## 5.1 Regression results

### 5.1.1 CEOs with high OI and the likelihood to be acquired

Using the models specified in section 3.1.2, we test if the propensity to be acquired is equal for companies with high OI CEOs compared to other types of CEOs. Furthermore, we separate the OI score into five distinctive quintiles and use quintile 5 referred to $High\ OI$ as our comparable base to study how the coefficients of the other OI quintiles are related to the high OI quintile. This methodology allows us to compare not only the high OI CEOs in relation to non-high OI CEOs, but also relative to the each individual CEO OI quintile.

We conducted five different regressions and the results from the regressions are presented in separate columns in Table 5.A. The dependent variable for all regressions is $Acquired$ and the control variables are $Board\ member$, $Gender$, $Log(Assets)$, $Firm\ age$, $Equity\ ratio$, and $ROA$. In the first (1) regression, the independent variable of interest is $High\ OI$ and thus we only compare high OI CEOs with non-high OI CEOs, i.e. all other quintiles than the top 20%. Moreover, this regression accounts for fixed effects in industry and year and clusters standard errors by firm. The coefficient for the high OI dummy variable was negative and statistically significant at the 5% level and with a z-score of -2.22, which implies that we find support against our null hypothesis.

Regressions (2), (3), (4), and (5) uses instead $OI\ quintile$ as the key independent variable, while using High OI as a comparable base. We find that all the coefficients are positive relative to the high OI quintile, indicating that the coefficient for the high OI quintile is negative relative to the other segments, though there is ambiguity in terms of significance. The relationship between $High\ OI$ and quintile 3 and quintile 1, respectively, is highly statistically significant at the 1% level (except for regression (5) when looking at quintile 1). This indicates that for the quintiles

with more acquisition observations, i.e. quintile 1 and 3, we see significant difference from the high OI quintile in terms of acquisition propensity.

The implications of this is twofold, namely that the propensity to be acquired is lower for firms with high OI, and that this also holds when comparing to the quintiles in the extreme and mid end of the observation distribution.

Though the control variables have a fairly clear pattern in its coefficient direction, only equity ratio is statistically significant in its contribution to explain the likelihood of acquisition. Equity ratio is significant across all regressions at the 10% level. The results of the control variables and their deviation from the expected coefficient will be further commented on in section 6.2.4.

**Table 5.A: Logit regressions – The effect of CEO OI on the likelihood of being acquired**

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Variables** | **Main sample** | **Main sample (No FE)** | **Main sample (Year FE)** | **Main sample (Industry FE)** | **Main sample (Year & Ind. FE)** |
| *Quintile 1* | | 1.04*** | 0.83*** | 0.95*** | 0.75** |
| | | (3.3) | (2.55) | (2.94) | (2.26) |
| *Quintile 2* | | 0.56* | 0.41 | 0.48 | 0.36 |
| | | (1.72) | (1.22) | (1.47) | (1.03) |
| *Quintile 3* | | 1.11*** | 0.99*** | 1.04*** | 0.94*** |
| | | (3.49) | (3.02) | (3.26) | (2.87) |
| *Quintile 4* | | 0.56* | 0.50 | 0.52 | 0.46 |
| | | (1.69) | (1.49) | (1.56) | (1.37) |
| *Quintile 5 (High OI)* | -0.65** | -Comparable base- | -Comparable base- | -Comparable base- | -Comparable base- |
| | (-2.22) | | | | |
| *Board member* | -0.26 | -0.18 | -0.27 | -0.17 | -0.25 |
| | (-1.54) | (-1.03) | (-1.55) | (-0.99) | (-1.46) |
| *Gender* | -0.02 | -0.13 | -0.02 | -0.11 | -0.01 |
| | (-0.09) | (-0.57) | (-0.1) | (-0.47) | (-0.03) |
| *Log(Assets)* | 0.01 | -0.03 | -0.04 | 0.02 | 0.02 |
| | (0.22) | (-0.63) | (-0.66) | (0.29) | (0.26) |
| *Firm age* | 0.00 | 0.00 | 0.00 | -0.01 | -0.01 |
| | (-1.37) | (-1.26) | (-1.2) | (-1.51) | (-1.46) |
| *Equity ratio* | 0.55* | 0.55* | 0.56* | 0.55* | 0.56* |
| | (1.77) | (1.88) | (1.87) | (1.79) | (1.79) |
| *ROA* | -0.24 | -0.27 | -0.27 | -0.23 | -0.24 |
| | (-0.68) | (-0.71) | (-0.69) | (-0.65) | (-0.68) |
| Constant | -4.09*** | -4.74*** | -4.07*** | -5.5*** | -4.88*** |
| | (-3.25) | (-5.29) | (-4.12) | (-4.69) | (-3.86) |
| Observations | 10,875 | 10,875 | 10,875 | 10,875 | 10,875 |
| Industry FE | Yes | No | No | Yes | Yes |
| Year FE | Yes | No | Yes | No | Yes |

Notes: This table present the results for five logit regressions with the binary variable Acquired as dependent (1 for acquired, 0 otherwise). Column (1) is a regression on the main sample using High OI as the main independent variable and comparing with all other OI scores. The regression includes industry and year fixed effects, and consists of 10,875 CEO-years and 167 acquisitions. In column (2)–(5) we compare all OI quintiles using High OI as the comparable base in the logit model, while including and excluding fixed effects. In all regressions, standard errors are clustered by firm. All variables are defined in section 3.3 and described in detail in Appendix 8. Z-scores are presented in parentheses below the coefficients. *, **, and *** indicate the significance of the coefficients at levels of 0.1, 0.05, and 0.01, respectively.

We continue by computing the implied probabilities of being acquired for each of the OI quintiles, by setting all OI quintile dummies equal to 0 apart from the OI quintile being tested and holding all the control variables at their means. As can be seen in Table 5.B, a consistent pattern for the sample is that the implied probability is notably lower for the high OI quintile, common to all regressions including or excluding fixed effects in industry and/or year. As can be seen from column (1), when comparing high OI with non-high OI CEOs, there is almost twice the probability of a non-high OI CEO's company being acquired (1.02% and 1.96%, respectively). We see a similar pattern among the quintiles as previously, namely that the low and mid OI groups are the most notable, as they imply the highest probability of being acquired out of all quintiles.

**Table 5.B: Implied probability of a company being acquired given certain OI**

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Variables** | **Main sample** | **Main sample (No FE)** | **Main sample (Year FE)** | **Main sample (Industry FE)** | **Main sample (Year&Ind. FE)** |
| *Quintile 1* | | 0.0158 | 0.0238 | 0.0132 | 0.0194 |
| *Quintile 2* | | 0.0098 | 0.0157 | 0.0083 | 0.0130 |
| *Quintile 3* | | 0.0170 | 0.0281 | 0.0145 | 0.0235 |
| *Quintile 4* | | 0.0098 | 0.0171 | 0.0086 | 0.0145 |
| *Quintile 5 (High OI)* | 0.0102 | 0.0056 | 0.0104 | 0.0051 | 0.0091 |
| *Non-high OI* | 0.0196 | | | | |
| Observations | 10,875 | 10,875 | 10,875 | 10,875 | 10,875 |

Notes: This table presents the implied probability of a company with a certain CEO OI being successfully acquired. The implied probabilities are calculated from the logit models in Table 5.A by holding all OI dummy variables at 0, except for the OI quintile being tested, and by holding the independent variables at their means. Probabilities are denoted in numbers.

### 5.1.2 CEOs with high OI who are also board members and the likelihood to be acquired

Following the same methodology and applying the same regression models as for testing our first hypothesis, we now construct a new variable called $High\ OI$ x $Board\ member$ and perform a test to see if the effect a CEO with high OI has on the likelihood of being acquired is amplified if the CEO is also a member of the board. This new variable is also a dummy variable, but only returns the value 1 if the CEO is part of the high OI quintile and is a board member. Ultimately, when testing the second hypothesis, this new variable is tested against all other CEOs, namely high OI CEOs that are not board members, non-high OI CEOs that are board members, and non-high OI CEOs that are not board members. Regression (1) in Table 6.A is the same as in Table 5.A, and is purposely displayed as a benchmarking tool. The second (2) regression shows the results of the

new variable, and the third (3) and fourth (4) show the main sample split up between CEOs that are board members and those that are not, using high OI as the comparable base.

The second (2) regression led to the conclusion that the main independent variable, i.e. $High\ OI$ x $Board\ member$, was not statistically significant and thus our second null hypothesis cannot be rejected at any meaningful level of significance. However, when comparing column (3) and (4), it displays that the difference in the likelihood of being acquired is larger between the high OI CEOs and the other OI quintiles, when the CEO also has board membership. Still, the significance levels prevent us from drawing broader conclusions. These findings will be further discussed in section 6.2.1. Lastly, we find similar results for the control variables as in Table 5.A.

**Table 6.A: Logit regressions – High OI and board member CEOs on acquisition likelihood**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| **Variables** | **Main sample** | **High OI and board member** | **Board member (CEOBM=1)** | **Non-board member (CEOBM=0)** |
| *Quintile 1* | | | 1.36** | 0.26 |
| | | | (2.40) | (0.66) |
| *Quintile 2* | | | 0.40 | 0.24 |
| | | | (0.66) | (0.58) |
| *Quintile 3* | | | 1.08* | 0.78* |
| | | | (1.90) | (1.95) |
| *Quintile 4* | | | 0.82 | 0.13 |
| | | | (1.47) | (0.30) |
| *Quintile 5 (High OI)* | -0.65** | -0.30 | -Comparable base- | -Comparable base- |
| | (-2.22) | (-0.89) | | |
| *Board member* | -0.26 | -0.17 | | |
| | (-1.54) | (-0.98) | | |
| *High OI x Board member* | | -0.80 | | |
| | | (-1.34) | | |
| *Gender* | -0.02 | -0.02 | -0.41 | 0.21 |
| | (-0.09) | (-0.10) | (-1.04) | (0.69) |
| *Log(Assets)* | 0.01 | 0.01 | 0.11 | -0.13 |
| | (0.22) | (0.20) | (1.52) | (-1.46) |
| *Firm age* | 0.00 | 0.00 | -0.01 | 0.00 |
| | (-1.37) | (-1.38) | (-2.21) | (-0.05) |
| *Equity ratio* | 0.55* | 0.54* | 0.83* | 0.17 |
| | (1.77) | (1.72) | (1.93) | (0.35) |
| *ROA* | -0.24 | -0.25 | 1.09 | -0.50* |
| | (-0.68) | (-0.70) | (1.18) | (-1.89) |
| Constant | -4.09*** | -4.10*** | -6.94*** | -2.51*** |
| | (-3.25) | (-3.26) | (-4.54) | (-1.39) |
| Observations | 10,875 | 10,875 | 5,884 | 4,854 |
| Industry FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |

Notes: This table present the results for four logit regressions with the binary variable Acquired as dependent (1 for acquired, 0 otherwise). Column (1) is a regression on the main sample using High OI as the main independent variable and comparing with all other OI scores. The main sample consists of 10,875 CEO-years and 167 acquisitions. In column (2) we instead use the variable High OI x Board member as the main independent variable and compare with all other OI scores. In column (3)–(4) we compare all OI quintiles using High OI x Board member as the comparable base. All regressions include industry and year fixed effects, and standard errors are clustered by firm. All variables are defined in section 3.3 and described in detail in Appendix 8. Z-scores are presented in parentheses below the coefficients. *, **, and *** indicate the significance of the coefficients at levels of 0.1, 0.05, and 0.01, respectively.

As displayed in Table 6.B, the predicted likelihood of being acquired is almost half if a CEO is part of the high OI quintile as well as a board member, compared to the main sample in column (1), where CEOs with high OI, regardless of board membership, is presented. This indicates that for the sample, the board membership strengthens the directional features of high OI, though we cannot find any conclusive evidence. Explanations and interpretations of these findings will be elaborated on in section 6.2.1. Another noteworthy remark, though insignificant, from studying column (3) and (4), is that CEOs with high OI that are board members are less likely to have their companies acquired than non-board members, since the probability is almost a percentage point lower, i.e. almost a third of the implied probability. The tables presented in this section all indicate that the sample behaves in the expected direction, i.e. that high OI and board membership in conjunction appears to lower the propensity to be acquired.

**Table 6.B: Implied probability of acquisition given a high OI and board member CEO**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| **Variables** | **Main sample** | **n.a.** | **Board member (CEOBM=1)** | **Non-board member (CEOBM=0)** |
| *Quantile 1* | | | 0.0190 | 0.0182 |
| *Quantile 2* | | | 0.0073 | 0.0178 |
| *Quantile 3* | | | 0.0144 | 0.0305 |
| *Quantile 4* | | | 0.0111 | 0.0160 |
| *Quantile 5 (High OI)* | 0.0102 | | 0.0049 | 0.0140 |
| *Non-high OI* | 0.0196 | | | |
| Observations | 10,875 | | 5,884 | 4,854 |

Notes: This table presents the implied probability of a company with a certain CEO OI being successfully acquired. The sample is split into two subsamples: CEOs with board membership and CEOs without. Column (1) in this table is the same as column (1) in Table 5.B. The implied probabilities are calculated from the logit models in Table 6.A by holding all OI dummy variables at 0, except for the OI quantile being tested, and by holding the independent variables at their means. Probabilities are denoted in numbers.

### 5.1.3 CEOs with high OI and bid premium

To test our third and final hypothesis our dependent variable is instead the continuous variable $Bid\ premium$, while the independent variable of interest is $High\ OI$ in the first (1) regression and $OI\ quintile$ in the second (2) regression. To perform this test, we use a multivariate ordinary least squares regression, and run the regression two times. The same control variables are used for these regressions as in the logit regressions, though we choose to include industry and year fixed effects for all regressions. This is done to substantiate the results, as we believe bid

premiums are more sensitive to supply and demand conditions and economic cyclically than acquisitions in general are (why we choose to present the logit regressions disregarding fixed effects in conjunction with the others). The purpose of running these regressions is to see if high OI CEOs distinguishes themselves from other levels of OI scores in terms of the bid premiums accepted when being acquired. The results are presented in Table 7.A.

In the main sample in regression (1), the high OI variable displays a positive coefficient, aligned with expectations, and is also statistically significant at the 5% level (z-score is 2.55). The control variables, fairly similar to earlier regressions, are not significant on any meaningful level. This implies that we can reject our null hypothesis at this significance level, and accordingly find support that high OI CEOs receive larger bid premiums than non-high OI CEOs. Moreover, we find significant result when comparing amongst the OI quintiles, all of whom have negative coefficients relative to the high OI quintiles, suggesting that the bid premium accepted is lower for all other quintiles at various statistically significant levels.

**Table 7.A: Multivariate OLS regression – The effect of CEO OI on bid premiums**

| | (1) | (2) |
|---|---|---|
| **Variables** | **Main sample** | **Main sample** |
| *Quintile 1* | | -0.28** |
| | | (-2.33) |
| *Quintile 2* | | -0.35*** |
| | | (-3.02) |
| *Quintile 3* | | -0.23* |
| | | (-1.88) |
| *Quintile 4* | | -0.21* |
| | | (-1.69) |
| *Quintile 5 (High OI)* | 0.26** | -Comparable base- |
| | (2.55) | |
| *Board member* | -0.02 | -0.04 |
| | (-0.33) | (-0.48) |
| *Gender* | 0.17 | 0.18 |
| | (1.59) | (1.56) |
| *Log(Assets)* | -0.01 | -0.02 |
| | (-0.58) | (-0.64) |
| *Firm age* | 0.00 | 0.00 |
| | (0.30) | (0.38) |
| *Equity ratio* | -0.01 | -0.02 |
| | (-0.08) | (-0.16) |
| *ROA* | -0.10 | -0.07 |
| | (-0.91) | (-0.65) |
| Constant | 0.90 | 1.20* |
| | (1.25) | (1.69) |
| Observations | 131 | 131 |
| Industry FE | Yes | Yes |
| Year FE | Yes | Yes |
| R-squared | 0.30 | 0.37 |
| Adj. R-squared | 0.04 | 0.03 |

Notes: This table present the results for two multivariate OLS regressions with the continuous variable Bid premium as dependent. Column (1) is a regression on the main sample using High OI as the main independent variable and comparing with all other OI scores. The regression includes industry and year fixed effects, and consists of 131 acquisitions with disclosed bid premiums. In column (2) we compare all OI quintiles using High OI as the comparable base, also including industry and year fixed effects. In all regressions, standard errors are clustered by firm. All variables are defined in section 3.3 and described in detail in Appendix 8. T-statistics are presented in parentheses below the coefficients. *, **, and *** indicate the significance of the coefficients at levels of 0.1, 0.05, and 0.01, respectively.

Table 7.B represents the implied bid premium split between the OI quintiles. The common trend is the substantially higher bid premium accepted by high OI CEOs. In regression (1), the implied bid premium for high OI CEOs is compared to the bid premium of non-high OI CEOs. The implied bid premium for High OI is 51.73%, more than double compared to non-high OI CEOs (25.36%). In column (2), the implied bid premium for all five quintiles are analysed; excluding quintile 1, there is a clear increase in bid premiums progressing through the quintiles.

**Table 7.B: Multivariate OLS regression – Implied bid premiums for different OI quintiles**

| | (1) | (2) |
|---|---|---|
| **Variables** | **Main sample** | **Main sample** |
| *Quintile 1* | | 0.2395 |
| *Quintile 2* | | 0.1646 |
| *Quintile 3* | | 0.2923 |
| *Quintile 4* | | 0.3053 |
| *Quintile 5 (High OI)* | 0.5173 | 0.5187 |
| *Non-high OI* | 0.2536 | |
| Observations | 131 | 131 |

Notes: This table presents the implied bid premiums of successful acquisitions based on OI quintiles. Column (1) in this table compares the High OI quintile to all non-high OI quintiles, while column (2) shows the implied bid premium of each OI quintile. The implied bid premiums are calculated from the regression model in Table 7.A by holding all OI dummy variables at 0, except for the OI quintile being tested, and by holding the independent variables at their means. Bid premiums are denoted in numbers.

## 5.2 Fixed effects, robustness tests, and multicollinearity

Throughout the testing of our hypotheses, both industry and year fixed effects are included and excluded to examine the potential impact on the results. The fixed effects control for average differences between the dummies. The industry dummies are included to account for shifting M&A activity between different sectors. The year fixed effects are included to mitigate the differences in M&A activity between the years. This reduces the heterogeneity from omitted variable bias.

The robustness of the models is evaluated by doing a robustness test, see Appendix 3 for robustness using the dependent variable $Acquired$, and Appendix 5 for the dependent variable $Bid\ premium$. A regression is rune initially without control variables and then by adding them one by one to check for variable bias between the added control variable and the main independent variable. The coefficients of our variable $High\ OI$ is constantly high, signaling low omitted variable bias.

To examine the relationship between our independent variables, we perform a multicollinearity test. Multicollinearity arise when two or more independent variables are highly correlated with each other. The presence of multicollinearity does not necessarily make the model invalid, but may distort the results as it becomes difficult distinguish each variable's contribution to the explanatory value of the model (Farrar and Glauber, 1967). The results are

displayed in Appendix 4. The variance inflation factors (VIF) is a measure to detect the multicollinearity in the model, where a value of 1 implies that the variable is not correlated with the other independent variables. In general, values under ten are deemed acceptable (Woolridge, 2012) though it arguably still depends on the data and study (O'Brien, 2007). Still, as can be seen from the results in the table, the VIF values are very close to 1 (the highest value being 1.10), so we regard the effect from multicollinearity to be not significant enough to impact the results of our study.

# 6 Analysis

In this section we analyse the results of the regressions. We begin by analysing the research methodology of our study followed by an analysis of the results, which includes a discussion of the hypotheses, the fixed effects and robustness measures, as well as the control variables.

## 6.1 Research method

### 6.1.1 Data selection

As described in section 4.2, the selection of data and construction of our sample has ultimately led to the removal of several observation that potentially could have affected relevant data and thus the significance of the study. Much of the reduction of observation were a consequence of merging several datasets of which comprehensive data is difficult to acquire on the Swedish market, which are primarily M&A and CEO-specific data. However, this process of merging removed much of the outlier observations that would otherwise be removed or winsorized, since firms with e.g. 0 employees or missing financial data are not prevalent when the sample constitutes public companies with CEO data. Additionally, our exclusion of micro-cap transactions and micro-cap companies with total assets below SEK 100m further removed outliers formerly prevalent, but at the expense of imposing a risk that that the sample might not capture the entire reality of what we intended to measure. It is plausible that among the removed data, there are certain tendencies or patterns in the CEO and M&A data that could influence the results of our study. This would consequently imply that our sample is not random, and a likely selection bias permeates the study. Still, the relatively large number of observations coupled with the long time period of 2002–2017 included in our sample, moderately limits this risk. Furthermore, when comparing the data after the adjustments with the data prior to ditto, we noted a negligible impact on the descriptive

statistics. To further limit the risk of studying a non-random sample, the study could have been extended to encompass all the Nordic countries, but this was deemed outside the delimitation of the study due to availability of data. Targeting Sweden in particular also ensured the CEO and firm-specific data was collected from a known and respected source, Serrano, who in turn collect most of the data from Statistics Sweden (Sw: Statistiska Centralbyrån) and the Swedish Companies Registration Office (Sw: Bolagsverket). Concerning the M&A data in our sample and the sources it was traced from, our choice of geographical delimitation also allowed for reliable manual cross-checking, which would have served more difficult given a larger dataset.

### 6.1.2 Issues related to measuring organizational identification

Abernathy et al. (2019) is the first study in the accounting literature to measure OI with archival proxies, meaning they investigate the effects of social psychological variables by using quantitative measures of CEO behaviour instead of collecting data from individual surveys. We include three out of six variables suggested by the authors, as the excluded variables are not automatically collected nor required to be disclosed for companies on the Swedish market[1]. The exclusion of certain variables that contribute to CEO OI impacts the validity of our scores negatively. However, since the variables we included still capture both the top-down and bottom-up development of OI, as described in section 3.1.2, the score is still aligned with the underlying construct intended by the authors.

The authors extensively tested their score for validity by focusing on discriminant, predictive, convergent, and nomological validity in accordance with the suggestions of Netemeyer et al. (2003). The discriminant validity is controlled for by performing multivariate analyses on whether there is a relation between OI and CEO excessive pay, since a strong positive relationship would indicate that the OI score might instead capture CEO power. They find no significance for a relationship of this kind. The predictive validity is tested by examining the association between OI and the likelihood of financial statements being restated, as CEOs with high OI will suffer disutility by engaging in the financial misconduct that financial restatements can be associated with. They find that there is a significant negative relationship between the two, suggesting that CEOs with high OI have a lower tendency to misreport. The convergent validity is controlled for since they find that high OI CEOs to greater extent uses the word “we” and other first-person plural pronouns

[1] CEO equity ownership in the company is often reported on annual reports and can thus be manually collected, but due to our 10,875 observations, this was deemed outside the scope of our study due to time restrictions.

in conference calls relative to CEOs with lower OI. The use of first-person singular pronouns would indicate tendencies towards self-attribution (Gecas, 1982; Shamir et al., 1993). Lastly, nomological validity is tested by replicating Lange et al. (2015), who in contrast measure CEO OI through a survey, and find largely consistent results. The OI score developed in our study excluded these types of validity tests due to lack of available data. However, since comprehensive validity tests have been performed in previous research on the same OI constituents as we use, we expect the potential validity discrepancies to be negligible.

The weighting of the variables are done using principal component analysis, further described in section 3.1.2, and mirrors the method of Abernathy et al. (2019). Nevertheless, the issue with weighting the variables using PCA is that the procedure attempts to capture as much of the variance as possible. This means that a variable is having a far greater impact on the factors if the variance is large compared to the variance of the other variables. For example, since it was a rarer occurrence for CEOs to be founders than for them to be internally promoted, the founder variable had a greater impact on the score, which in certain circumstances could present difficulties if the variance would contradict the literature. Fortunately, this weighting was the one we intended and expected to see. Hence, to use PCA in this context is problematic as the differences in variance between the variables do not necessarily represent the desired weights of the variables, given that the literature finds certain CEO characteristics to exhibit organizational identification to a greater extent than others. Lastly, the arbitrary apportioning into OI quintiles might fail to capture the most relevant or similar OI clusters. A more sophisticated method could potentially include apportioning the OI scores into natural clusters. However, to be able to enhance the interpretation and understanding of the results, we chose to categorize it using five equal-sized segments.

## 6.2 Analysis of results

### 6.2.1 Hypotheses 1 and 2

In the regression using our main sample and the dependent variable $Acquired$, the main independent variable $High\ OI$ had a coefficient of -0.65 and a z-score of -2.22, leading us to reject our null hypothesis on a 5% significance level. The evidence thus suggests that the likelihood of being acquired is lower for CEOs with high OI relative to non-high OI CEOs. As can be seen in our results, the implied probability of the company being acquired when the CEO has high OI is 1.02% and conversely 1.96% for a non-high OI CEO, which indicates that there is a significant

difference in the likelihood of a takeover for CEOs of this quintile. When taking all tests into consideration that use $High\ OI$ as the comparable base and compares it to other OI quintiles, this decline in implied probability is also significant relative to the quintiles in the opposite extreme end and mean of the distribution. This further supports the rejection of the null hypothesis as there is also difference in respect to other OI quintiles, though there is ambiguity as to the second and fourth quintiles that are in between the two extreme ends and mean of distribution. Potential explanations to this are the lower number of acquisition observations in these quintiles, as well as the arbitrary apportioning into five quintiles each representing 20% of the OI score distribution, further discussed in section 6.1.2.

Our study and the findings are, to the best of our knowledge, unique. This makes a viable comparison of the findings alongside other studies difficult to conduct. Moreover, the lack of significance in regards to the control variables (except for equity ratio) hinders us to make any broader conclusions about their consistency with the previous literature. The results of the control variables are discussed in greater detail in section 6.2.4.

The robustness test we used for the main sample regression was performed by adding the control variables one by one to check for omitted variable bias. The results are shown in Appendix 3. The interpretation of the results from this robustness test is that no significant difference was found for the main independent variable $High\ OI$ on a 5% level, and the coefficients and z-scores remained on approximately the same levels throughout the process of adding variables. Furthermore, we test for multicollinearity. As can be seen from the results in Appendix 4, the VIF values are close to 1, so we regard the effect from multicollinearity to be not significant enough to impact the results of our study.

$High\ OI$ x $Board\ member$, the main independent variable used to test our second hypothesis, instead had a coefficient of -0.80 and z-score -1.34, implying that the null hypothesis cannot be rejected at any meaningful level of significance. The hypothesis that a CEO with high OI and board membership should further decrease the likelihood of being acquired consequently cannot be confirmed. A potential reason for this might derive from the issue regarding the number of observations that fulfil the set criteria for the dummy variable to take on the value of 1, i.e. being both a CEO with high OI as well as a board member.

### 6.2.3 Hypothesis 3

We hypothesised that high OI CEOs on average receive a higher bid premium than non-high OI CEOs, in order to convince the high OI CEO to sell the company it identifies with and is attached to. In the main sample regression with the dependent variable $Bid\ premium$, our main independent variable of interest $High\ OI$ had a coefficient of 0.26 and a t-statistics of 2.55, and we can reject our null hypothesis on a 5% significance level. We can thus conclude that a significant difference in bid premiums exist. The implied bid premium is 51.73% and 25.36% for a high and non-high OI CEO, respectively, indicating that the bid premium on average is almost twice as high for the high OI CEOs. However, this could also have an alternative explanation, namely that high OI CEOs are better at negotiating bid premiums. As a result of these CEOs often being founders or more long-tenured, we can expect they have possibly developed better insight and knowledge of the company's capabilities and value. Still, since we found evidence to support that the propensity of being acquired is around 50% lower for high OI CEOs relative to non-high OI CEOs, it is improbable that this is largely due to experience-based negotiating power. Hence, we rather expect the bid premiums to be higher as a result of the increased emotional costs of divesting for high OI CEOs, which leads them to reject lower bids to a higher extent than non-high OI CEOs. When comparing the high OI quintile to all other quintiles irrespective of the CEO being a board member, we find reaffirming results, namely that there also exist a significant difference among the quintiles. Moreover, the coefficients of all other OI quintiles point in the expected direction and at levels of significance less than 10%. Another notable finding is that the second quintile experiences the lowest bid premium in the sample. Similar to the results of the first and second hypothesis testing, we expect this to stem from the low and varying amount of observations in each quintile as well as the arbitrary division of the groups into quintiles. Concluding, the implications of the findings are twofold, namely that high OI CEOs receive and accept larger bid premiums than non-high OI CEOs, and that this finding persist when comparing against each individual quintile as well.

Comparable to testing our other hypotheses, the control variables lack significance, making it difficult to draw parallels to previous literature. To test the validity of the model we conduct a robustness test similar to the previously performed. The results presented in Appendix 5 show consistent results for the main independent variable $High\ OI$ relative to the dependent variable on

a 5% level, and the coefficients and z-scores remained on approximately the same levels throughout the process of adding variables.

### 6.2.4 Control variables

The $Board\ member$ variable had a negative coefficient, z-score, and t-statistics throughout the tests of the various hypotheses, though the results were not significant on any meaningful level. This hinders us from drawing any broader conclusions regarding this variable relative to our dependent variables. Though used as a control variable in the M&A literature, its impact is still quite ambiguous, as it does not have an impact in itself, but instead acts as an amplifying variable for a given CEO characteristic (Mattsson and Rosengren, 2017). Hence, the literature supports that its explanatory value is only prevalent when combined with other CEO characteristics, and not as a stand-alone variable. Our expectation was that the variable would amplify the effect of OI as it would convey additional influence for a CEO. However, no statistical significance was found.

The $Gender$ variable had a negative coefficient and z-score throughout the tests using $Acquired$ as the dependent variable, though the results were not significant on any meaningful level. In testing our third hypothesis, Gender had a t-statistics of 1.59 with a positive coefficient, but due to the lack of significance, it is hard to draw any broader conclusions regarding female CEOs in our study. Previous studies have documented that there is a clear difference in M&A outcomes between male and female executives, which includes impact on bid premiums and takeover propensity from an acquirer perspective (Levi et al., 2008; Huang and Kisgen, 2012; Levi et al., 2014). Furthermore, Levi et al. (2014) highlights that female acquiring CEOs pay smaller bid premiums and are less prone to pursue acquisitions. Their findings thus indicate opposite coefficients compared to ours, which we expected to see when looking at the opposite party – target female CEOs. However, since previous literature fails to conclude the impact target CEO gender has on M&A outcomes, no further expectations were set for this control variable, and it was included rather as a result of its use throughout the M&A literature.

The $Log(Assets)$ variable had close to nil coefficients, z-score, and t-statistics throughout the tests of the various hypotheses, and the results were not significant on any meaningful level, which is consistent with the findings of Mattson and Rosengren (2017). Assets are commonly included in the M&A literature as an independent variable (Jenter and Lewellen, 2015; Alexandidris et al., 2013), why it was included as a control variable in our regressions as well.

The $Firm\ age$ variable had a nil coefficient, negative z-score of c. -1.40 in our main sample logit regressions, and slightly positive t-statistics for the main sample OLS regression, though the results were not significant on any meaningful level. Firm age has been found to be an important determinant of choosing to divest your business through M&A, where the probability decreases with firm age (Cefis and Marsili, 2012; Audretsch, 1991; Sarkar et al., 2006).

The $Equity\ ratio$ variable had a positive z-score of 1.77 and was significant on a 10% level in our main sample regressions, testing our first hypothesis. Similar results were found when testing the second hypothesis. These results support that acquirers tend to purchase companies with less leverage. Furthermore, the coefficient and t-statistics for equity ratio using $Bid\ premium$ as our dependent variable were slightly negative, but the results were not significant on any meaningful level. The results are thus in line with Mattson and Rosengren (2017).

The $ROA$ variable had negative coefficient, z-score, and t-statistics throughout the tests of the various hypotheses, though the results were not significant on any meaningful level. ROA is the most widely used accounting ratio in the M&A literature (Thanos and Papadakis, 2012), and is used in the regressions performed by Jenter and Lewellen (2015). The M&A literature investigating the same dependent variables as the ones used in our study find no significant results in ROA's explanatory power, and face close to nil coefficients, similar to our results. It is worth noting that the definition of ROA tend to vary among various studies, why a different measure of this variable might have impacted the results.

# 7 Conclusion

The conducted study aims to investigate how target CEO organizational identification impacts a company's propensity to be acquired and the bid premium associated with a successful takeover. In order to address the research question, we have performed logit regressions on the likelihood of being acquired and conducted multivariate OLS regressions on the bid premiums of the completed acquisitions. Evidence was found that supports our first hypothesis, suggesting that the likelihood to be acquired is lower for CEOs with high OI compared to CEOs that identify with their organizations to a lesser extent. These results were statistically significant on a 5% level and further held for robustness tests. The logit regressions conducted to test if the likelihood to be acquired is higher for CEOs with high OI that are also board members found no significant results for the main independent variable during the examined time period. Since this particular research question

has not been studied before, the results of this test cannot be fully compared to other studies; leading us to conclude that board membership does not amplify the formerly discovered effects that a high OI CEO has on the propensity to be acquired. The multivariate OLS regressions concerning the bid premium for CEOs with high OI provides evidence to support that indeed the bid premiums received and accepted are higher for CEOs with high OI. Moreover, the results from these regressions were significant at the 5% level and the results sustained throughout the robustness tests.

The topics of M&A, corporate governance, and agency problems in corporate practices are deeply researched areas, where solutions to improve operations and decision-making are regularly presented. However, to the best of our knowledge, the particular research topic that seeks to link organizational identification to M&A outcomes has not yet been examined. The subject of our study is of particular interest to the board of directors and shareholders, whom actively seek to maximise shareholder value through incentivising reduced agency costs. Furthermore, this is especially interesting as the current literature on organizational identification consistently find support for high OI as a positive influence on businesses, arguing for the importance of OI as a means to run well-performing companies. In contrast to this, our findings suggest there are downsides of CEOs strongly identifying with their organizations in the context of M&A, as acquisitions on average are value-creating for target shareholders. Understanding how CEO organizational identification shape outcomes in M&A helps with identifying potential solutions to incentivise actions in line with increased shareholder value. These potential solutions include more sophisticated design of severance packages and golden parachutes related to takeovers in order to compensate for the increased emotional cost that is linked with a high OI CEO letting go of her company compared to a non-high OI CEO, holding all else equal.

# 8 Further research

In the process of developing and performing our study, several interesting ideas for further research have unfolded. It would be of interest to perform the study in other developed countries that share socio-economic and cultural similarities with Sweden, preferably starting in the Nordic region. This would allow for more generalised comments on the topic, insightful comparisons between the countries, and positively contribute to more comprehensive data used for analysis. However, this would impose challenges and require sophisticated methods in order to locate potential

country-specific characteristics in corporate environments, CEO behaviour, or preferences that might bias the results when conducting a cross-country study rooted in psychology and M&A. Furthermore, by lifting the restrictions in asset size to encompass micro-cap companies and transactions, it would be interesting to see how CEO characteristics and M&A outcomes are affected. The evidence supports that e.g. firm age influences M&A events (Cefis and Marsili, 2012; Audretsch, 1991; Sarkar et al., 2006), so one example of a potential divergence in the results when including these companies might stem from differences in firm age, which might also affect the likelihood of the CEO being a founder.

We acknowledge the limitations of the quantitatively measured OI in our study. Since organizational identification is novel to the accounting literature, much of its validity and ability to capture the true reality of CEO behaviour and preferences could be further improved. Firstly, by including more variables with explanatory power, such as those suggested by Abernathy et al. (2019), the OI score can refined. Some suggestions include accounting for the CEO equity ownership, which might contribute to greater identification with the company, along with considering the number of functional roles the CEO had held prior to their current position, and whether the CEO had formerly been a department manager in the firm or not. Secondly, including CEO characteristics that might have a strong negative influence on OI, such as certain CEO characteristics or events in a CEOs lifetime that might deteriorate positive identification, would further nuance the score. Lastly, by incorporating the findings of Jenter and Lewellen (2015) into a study on M&A and CEO OI, one can give rise to improving the corporate governance literature, as their findings on the link between retirement age and M&A outcomes also gives suggestions on how to better design corporate governance to sustain shareholder value.

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# Appendix

## Appendix 1: Definitions

*OI*: Abbreviation of organizational identification. Organizational identification is a measure of the extent to which an individual identifies with her organization. Our study focuses on the organizational identification of the CEO, and measures this quantitatively by creating a composite of score of three variables: (1) whether the CEO is the founder, (2) CEO tenure, and (3) whether the CEO is internally promoted. These variables are weighed using principal component analysis, consistent with the method used by Abernathy et al. (2019).

*High OI*: Refers to the highest scoring OI percentile of CEOs, namely the top 81%–100% of the distribution in OI scores.

*Main sample*: Refers to the final panel dataset used for regressing our various hypotheses. The main sample consist of 10,875 CEO-years, wherein 167 CEO-years of these have been subject to an acquisition of which 131 observations have disclosed bid premiums.

*Public company*: A public company (Sw: Publikt aktiebolag) is a company that is allowed advertise to the public about the possibility to buy or subscribe shares in the company. However, the definition is not restricted to publicly listed firms, i.e. their shares do not have to be offered on a public stock exchange. A public company has to have a minimum of SEK 500,000 in equity and have a board of directors consisting of at least three elected board members of which one chairman of the board must be appointed. A managing director must also be appointed. The managing director can be a board member but not chair of the board.

*CEO-year*: Refers to an observation in our dataset. Its definition is interchangeable with firm-year since in events of mid-year CEO-turnovers, we chose to select the CEO that remained in office for longer than six months as the CEO for that particular observation, thus preventing duplicate CEO-year observations. CEO-years are used as a term throughout our paper to increase the interpretability of our observation for the reader, as our main focus is to study the CEO in our panel dataset.

*Emotional cost:* A term introduced by us to capture and describe the effect of OI on individuals found in the literature, such as feelings of belonging, continuity, distinctiveness; developing a notion of being an interchangeable representative of the company and evolving a depersonalized self-perception. All these feelings in combination contribute to an increased emotional cost of losing control over the business, which ultimately shapes the outcomes of M&A given that you are an agent of influence (e.g. a CEO) in these kinds of events.

*Golden parachute:* Refers to an agreement between the employee and the company (usually a CEO or other executive that is part of the upper echelons of the organization) specifying that the employee will receive certain benefits if the employment is terminated, where most definitions infer employment termination due to a takeover or merger.

**Appendix 2: Derivation of golden parachutes that account for organizational identification**

Below we derive the formula for golden parachute for a CEO with high OI compared to a non-high OI CEO. The personal cost for the target CEO in the event of a takeover is the following:

$$Personal\ cost\ = (Income \times T - GP - (T - t) * Income(new)) * P + EC$$

$Income$ is the current and future money the CEO will earn if she keeps the job. $T$ is the number of years left to retirement. $GP$ is the golden parachute she receives if losing the job after a takeover. $t$ is the number of years it takes for the CEO to find a new job if she loses the old job. $Income(new)$ is the amount of money she will earn at the new job. $EC$ is the emotional cost for the CEO associated with selling the firm.

To derive the difference in golden parachute for a CEO with High OI ($H$) and non-high OI ($NH$), we first show the two equations for personal cost:

$$Personal\ cost\ CEO\ High\ OI\ = (Income \times T_P - GP_H - (T_P - t) * Income(new)) * P + EC_H$$

$$Personal\ cost\ CEO\ Non\ High\ OI\ = (Income \times T_P - GP_{NH} - (T_P - t) * Income(new)) * P + EC_{NH}$$

From the definition of OI we get: $EC_H > EC_{NH}$, meaning the emotional cost for a High OI of letting go of its firm is higher than for a non-high CEO.

We want the personal cost for a high OI to equal the personal cost of non-high OI, hence:

$(Income \times T_P - GP - (T_P - t) * Income(new)) * P + EC_H = (Income \times T_P - GP - (T_P - t) * Income(new)) * P + EC_{NH}$

We assume all variables except the dependent $GP$ and the independent $EC$ are constant, which we argue are fair assumptions since to our best knowledge high OI CEOs do not differ significantly in age compared to non-high ones. Furthermore, we assume they receive the same salary as non-high OI CEOs, and the chances of getting a new job if they are fired is also the same. Solving for the difference in golden parachutes:

$$GP_H - GP_{NH} = \frac{EC_{H\_}EC_{NH}}{P}$$

We know from before that $EC_H > EC_{NH}$ which must give us that $GP_H > GP_{NH}$
Worth noticing is that we do not say anything about how large the difference in golden parachute should be between High and non-high CEOs, but only that the emotional cost difference should be compensated with the golden parachute since it otherwise presents an agency problem.

## Appendix 3: Robustness test for the logit model by adding variables

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| **Variables** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| *High OI* | -0.63** | -0.59** | -0.59** | -0.61** | -0.65** | -0.65** | -0.65** |
| | (-2.18) | (-2.06) | (-2.06) | (-2.10) | (-2.21) | (-2.21) | (-2.21) |
| *Board member* | | -0.31* | -0.31* | -0.29* | -0.27 | -0.25 | -0.25 |
| | | (-1.87) | (-1.87) | (-1.73) | (-1.59) | (-1.49) | (-1.48) |
| *Gender* | | | 0.01 | 0.01 | 0.00 | -0.02 | -0.02 |
| | | | 0.05 | 0.04 | 0.01 | (-0.07) | (-0.07) |
| *Log(Assets)* | | | | 0.00* | 0.00 | 0.00 | 0.00 |
| | | | | (-1.81) | (-1.61) | (-1.51) | (-1.51) |
| *Firm age* | | | | | 0.00 | -0.00 | 0.00 |
| | | | | | (-1.16) | (-1.02) | (-0.99) |
| *Equity ratio* | | | | | | 0.50* | 0.48 |
| | | | | | | -1.67 | (-1.63) |
| *ROA* | | | | | | | -0.24 |
| | | | | | | | (-0.69) |
| *Constant* | -4.1*** | -3.94*** | -3.94*** | -3.8*** | -3.64*** | -3.82*** | -3.84*** |
| | (-5.54) | (-5.24) | (-5.25) | (-5.00) | (-4.62) | (-4.83) | (-4.84) |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *Observations* | 10,875 | 10,875 | 10,875 | 10,875 | 10,875 | 10,875 | 10,875 |

Notes: This table presents the robustness test performed on the logit regressions using the dependent variable $Acquired$. The robustness is tested by adding variables one by one. All regressions control for industry and year fixed effects and clusters standard errors by firm. All variables are defined in section 3.3 and described in detail in Appendix 8. Z-scores are presented in parentheses below the coefficients. *, **, and *** indicate the significance of the coefficients at levels of 0.1, 0.05, and 0.01, respectively.

## Appendix 4: Multicollinearity test

| | (1) | (2) |
|---|---|---|
| **Variables** | **VIF** | **R-squared** |
| *High OI* | 1.04 | 0.04 |
| *Board member* | 1.04 | 0.03 |
| *Female* | 1.02 | 0.02 |
| *Log(Assets)* | 1.05 | 0.05 |
| *Firm age* | 1.10 | 0.09 |
| *Equity ratio* | 1.05 | 0.05 |
| *ROA* | 1.02 | 0.02 |

Notes: This table presents the results of the multicollinearity test performed on all independent variables used in the logit regression in Table 5.A, column (1), and the multivariate OLS regressions in Table 7.A, column (1). The VIF-values are calculated by regressing a given variable stated above with regards to all other variables presented in the table. The R-squared value is in turn needed to calculate the VIF. The rule of thumb is that VIF-values above 10 indicate high multicollinearity, while values close to 1 indicates a low multicollinearity.

## Appendix 5: Robustness test for the OLS model by adding variables

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| **Variables** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| *High OI* | 0.22** | 0.22** | 0.26*** | 0.26*** | 0.25*** | 0.25** | 0.25** |
| | (2.18) | (2.08) | (2.66) | (2.62) | (2.58) | (2.52) | (2.49) |
| *Board member* | | 0.00 | 0.02 | 0.02 | 0.01 | 0.06 | 0.06 |
| | | (-0.06) | (0.35) | (0.28) | (0.21) | (0.63) | (0.75) |
| *Gender* | | | 0.21 | 0.21 | 0.20 | 0.20 | 0.20 |
| | | | (1.34) | (1.33) | (1.36) | (1.42) | -1.40 |
| *Assets* | | | | 0.00 | 0.00 | 0.01 | 0.01 |
| | | | | (0.14) | (0.20) | (0.26) | (0.28) |
| *Firm age* | | | | | 0.00 | 0.00 | 0.00 |
| | | | | | (-0.27) | (-0.26) | (-0.25) |
| *Equity ratio* | | | | | | 0.12 | 0.12 |
| | | | | | | (0.70) | (0.67) |
| *ROA* | | | | | | | -0.04 |
| | | | | | | | (-0.19) |
| Constant | 0.21*** | 0.21** | 0.07 | 0.03 | 0.03 | -0.13 | -0.14 |
| | (2.66) | (2.32) | (0.35) | (0.1) | (0.07) | (-0.29) | (-0.31) |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 10,875 | 10,875 | 10,875 | 10,875 | 10,875 | 10,875 | 10,875 |

Notes: This table presents the robustness test performed on the multivariate OLS regressions using the dependent variable *Bid premium*. The robustness is tested by adding variables one by one. All regressions control for industry and year fixed effects and clusters standard errors by firm. All variables are defined in section 3.3 and described in detail in Appendix 8. Z-scores are presented in parentheses below the coefficients. *, **, and *** indicate the significance of the coefficients at levels of 0.1, 0.05, and 0.01, respectively.

## Appendix 6: Descriptive statistics categorized by industries

| Variables | Energy & Environment | Materials | Industrial goods | Construction industry | Shopping goods | Convenience goods |
|---|---|---|---|---|---|---|
| *INSIDER* | 0.36 | 0.32 | 0.26 | 0.44 | 0.25 | 0.38 |
| *FOUNDER* | 0.06 | 0.06 | 0.04 | 0.07 | 0.07 | 0.02 |
| *TENURE* | 3.38 | 2.94 | 3.97 | 3.59 | 3.45 | 3.43 |
| *OI Score* | -0.05 | -0.13 | 0.03 | -0.01 | -0.01 | -0.10 |
| *CEO age* | 53.04 | 52.61 | 52.41 | 52.29 | 49.03 | 50.41 |
| *CEOBM* | 0.37 | 0.55 | 0.66 | 0.58 | 0.53 | 0.54 |
| *Gender* | 0.16 | 0.10 | 0.13 | 0.12 | 0.12 | 0.11 |
| *Firm age* | 53.81 | 52.05 | 44.32 | 35.64 | 31.48 | 45.38 |
| *ROA* | 0.02 | 0.00 | 0.01 | 0.03 | 0.03 | 0.04 |
| *Total assets* | 18,400,000 | 15,100,000 | 7,066,521 | 3,469,009 | 2,188,294 | 5,966,802 |
| *Equity ratio* | 0.34 | 0.53 | 0.51 | 0.42 | 0.45 | 0.41 |

| Variables | Health & Education | Finance & Real estate | IT & Electronics | Telecom & Media | Corporate services | Other |
|---|---|---|---|---|---|---|
| *INSIDER* | 0.27 | 0.33 | 0.27 | 0.27 | 0.34 | 0.23 |
| *FOUNDER* | 0.07 | 0.13 | 0.08 | 0.09 | 0.14 | 0.08 |
| *TENURE* | 3.35 | 3.59 | 3.44 | 3.02 | 3.35 | 2.67 |
| *OI Score* | -0.04 | 0.08 | -0.01 | -0.06 | 0.05 | -0.13 |
| *CEO age* | 50.78 | 50.19 | 48.74 | 46.79 | 49.72 | 49.41 |
| *CEOBM* | 0.45 | 0.61 | 0.47 | 0.43 | 0.53 | 0.51 |
| *Gender* | 0.22 | 0.16 | 0.12 | 0.14 | 0.17 | 0.27 |
| *Firm age* | 25.69 | 33.37 | 24.02 | 19.73 | 25.88 | 27.97 |
| *ROA* | -0.05 | 0.02 | 0.01 | 0.02 | 0.00 | -0.02 |
| *Total assets* | 8,821,051 | 24,300,000 | 4,233,994 | 15,500,000 | 2,990,759 | 2,179,758 |
| *Equity ratio* | 0.66 | 0.45 | 0.58 | 0.54 | 0.54 | 0.60 |

Notes: This table displays the mean values for the variables displayed in the descriptive statistics, see Table 4, categorized by the different industries included in our final panel dataset. The differences among the industries are accounted for in the regressions by including industry fixed effects.

## Appendix 7: Logarithm of total assets

The figures below represent the rationale behind and effect of using the natural logarithm of assets in the regressions as opposed to total assets. The histograms are based on the main sample, 10,875 CEO-years, used in the regressions. The natural logarithm of assets is closer to normal distribution, which better fit our regression models.

**Figure 7.i**

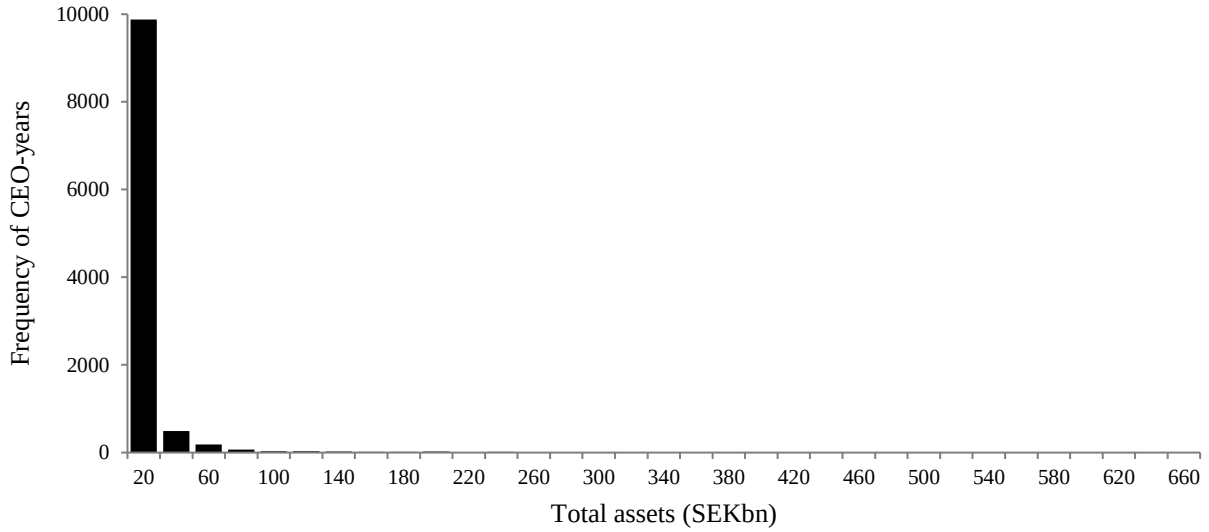
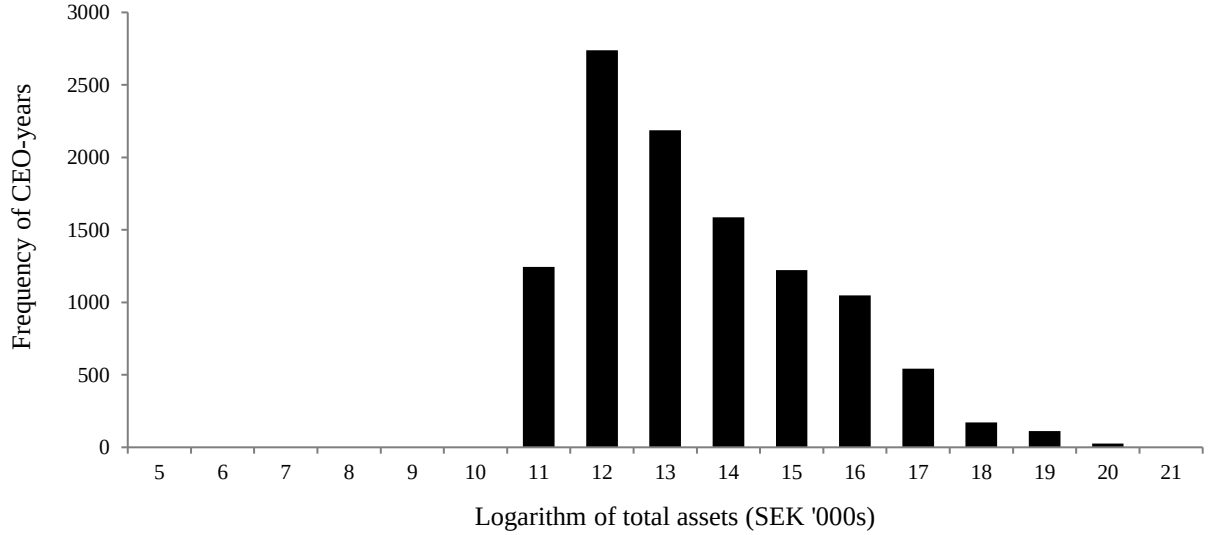



**Figure 7.ii**



## Appendix 8: Variables

| Variables | Description | Source |
|---|---|---|
| FOUNDER | Dummy variable 1 if the CEO was the founder of the firm, 0 if not. Calculated by comparing if TENURE is the same or approximately equal to the firm age. A deviation of one year is regarded acceptable given the data is presented in terms of CEO-years, hence not differentiating between months, weeks or days. FOUNDER is a discrete variable that assumes the CEO start date to be the 1st of January in the particular observation year | Serrano/Bisnode |
| TENURE | The number of years the CEO has held the position. Calculated by subtracting the number the current date with the date she entered the position. TENURE is a discrete variable that assumes the CEO start date to be the 1st of January in the particular observation year | Serrano/Bisnode |
| INSIDER | Dummy variable that takes the value of 1 if the CEO was internally promoted to her position, and 0 otherwise. Calculated by comparing the date the CEO joined the firm (regardless of position) with the start date of her position as CEO, and renders 1 if discrepancies arise. Similar to FOUNDER and TENURE, assumes 1st of January for the observation year | Serrano/Bisnode |
| OI | Composite score based on weighing the three variables FOUNDER, TENURE, INSIDER according to the outcome of the PCA. A high OI score is associated with greater organizational identification, and a low OI score is associated with lower organizational identification | Serrano/Bisnode |
| Acquired | The dummy variable Acquired is a dependent variable in the regressions. 1 for being acquired during a certain observation year, 0 otherwise | Mergermarket, Factset, SDC Platinum |
| Bid premium | The continuous variable Bid premium indicates the premium paid for the acquired company, expressed in percentage (%). Defined as “final bid price per share / Closing price t-1”, where t-1 is the share price of the target company one month prior | Mergermarket, Factset, SDC Platinum |
| CEOBM | Dummy variable with 1 for CEOs that are board members in the same company, and 0 otherwise | Serrano/Bisnode |
| Gender | Dummy variable with 1 for CEOs that are female, and 0 otherwise | Serrano/Bisnode |
| Firm age | The number of years the firm has been registered at the Swedish Companies Registration Office. Firm age is a discrete variable that assumes the registration date is the 1st of January in the particular observation year | Serrano/Bisnode |
| ROA | Return on assets, calculated as EBIT/ Total assets. Closing balance for assets is used, and EBIT accordingly as per end of the following fiscal year. ROA thus has a lagging variable as one of its constituents | Serrano/Bisnode |
| Total assets | Total assets refers to the total capitalization of the company, denoted in book value and in thousands of SEK (unless specified otherwise). It is a lagging variable, since it represents the closing balance of the prior fiscal year (i.e. the beginning balance of the current fiscal year) | Serrano/Bisnode |
| Equity ratio | Defined as the ratio between total equity and total assets, measured in book value. Equity and assets are both referring to the closing balance for the fiscal year. Equity ratio is then matched with the following fiscal year, so that equity ratio becomes a lagging variable | Serrano/Bisnode |
| Year dummies | To control for year fixed effects, year dummies are included certain regressions. Each year during the period 2002-2017 is a dummy variable with a 1 if the variable matches the observation year and a 0 otherwise | Serrano/Bisnode |
| Industry dummies | To control for industry fixed effects, industry dummies are included certain regressions. Each year during the period 2002-2017 is a dummy variable with a 1 if the variable matches the observation industry and a 0 otherwise | Serrano/Bisnode |