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The relationship between board tenure and firm performance and the moderating effect of CSR

A study on Swedish listed firms

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Abstract

We investigate whether average board tenure influences firm performance in Swedish listed firms during the period 2007-2019. We hypothesize that the trade-off between knowledge accumulation and loss of independence over the tenure motivates an inverted U-shaped association. We find no evidence of a curvilinear association between average board tenure and firm performance. Our findings may potentially be attributed to the contextual differences arising from the Swedish market. In addition, not isolating the hypothesized effect on outside directors and a skewed dataset towards larger firms might complicate the interpretation of our results. Moreover, we hypothesize that the relationship between board tenure and firm performance is positively moderated by Corporate Social Responsibility (CSR) performance, since high-performing CSR firms may have a stronger ethical culture at the board level. However, our results do not support our hypothesis. The lack of significance may potentially arise from the difficulty of disentangling the theoretical mechanism of an ethical firm culture using CSR.

Tutor: Irina Gazizova

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1 Introduction

Over recent years, there have been calls for establishing board tenure limits on each director in both academic literature and by legislators and business journalists. The Institutional Shareholder Services (ISS) affirms that “a tenure of more than nine years is considered to potentially compromise a director’s independence.” While Swedish legislation does not classify independence based on board tenure, a few countries are beginning to implement stricter protocol. In France and Spain, directors serving more than nine years lose formal independence, and in the United Kingdom the threshold is nine years (Pozen & Hamacher, 2015). This paper aims to assess the warranty of these calls for term limits by examining the effects of board tenure on firm value.

Prior research provides conflicting evidence on whether longer board tenure is destructive or constructive for a firm. On the one hand, a longer board tenure is destructive, since directors become “entrenched” after a certain threshold of years due to loss of independence (e.g., Huang & Hilary, 2018; Veltorp, 2018; Clements et al., 2018). Specifically, these entrenched directors may be complacent in their role and reluctant to change, conserving the status-quo of the firm (Thatcher & Cooper, 2010; Veltorp, 2018). The literature also suggests that senior directors could become too closely aligned with management due to social ties (Fracassi & Tate, 2012). Overall, the entrenchment hypothesis makes clear that overly-senior directors may become submissive to management and rely on biased opinions of the firm’s practices and not act as independent monitors of the shareholders’ interests. On the other hand, the other viewpoint named the expertise hypothesis argues that a board acquires more knowledge about the firm’s operations, the specific industry that it operates in and the history of the company as the board tenure increases. This has been shown to be associated with a higher value of the firm (e.g., Livnat et al., 2021), consequently contradicting the entrenchment hypothesis. A line of previous studies on the topic treat these two perspectives as independent hypotheses and not interconnected ideas (e.g., Vafeas, 2003; Byrd et al., 2010; Clements et al., 2018). Hence this predicts either a positive or negative association between board tenure and firm performance outcomes. Not surprisingly, these diametrically conflicting viewpoints have produced mixed results where some evidence supports the entrenchment hypothesis and other supports the expertise hypothesis.

Instead of treating the views of entrenchment and expertise as two independent concepts, we integrate the two and examine the interactive effect. In another group of recent studies, this is done

by utilizing a squared form of board tenure as an explanatory variable (e.g., Huang & Hilary, 2018). We hypothesize an inverted U-shaped association, with the positive effects of expertise dominating in the early tenure and a negative effect of entrenchment explaining the negative association for higher levels of board tenure (illustration provided in Appendix 1). Ultimately, the aim of this paper is to investigate the following research question:

Can the average board tenure influence the firm performance of Swedish listed firms in a curvilinear way?

In addition, research on CSR gives a theoretical background of integrating ethical expectations of business into a rational economic context (Kim et al., 2012). For example, Jones (1995) concludes that CSR firms are likely to have a corporate morality with sentiments of honesty to professional commitments. We hypothesize that in the context of the board of directors, ethical behavior alleviates the proposed loss of board efficiency due to entrenchment. Thus, the second hypothesis is the following:

Can CSR performance moderate the relationship between average board tenure and firm performance in Swedish listed firms?

To investigate the relationship between board tenure and firm performance along with the moderating effect of CSR, we use multivariate ordinary least squares (OLS) regressions. Our findings do not support that a curvilinear relationship between board tenure and firm performance prevails. Similarly, our data does not provide evidence that CSR has a positive moderating effect on the aforementioned relationship.

1.1 Contribution

This study contributes to the literature in several ways. First, the aim of this paper is to contribute to the body of literature that links firm performance to certain board characteristics. Prior research has demonstrated that the board of directors are related to performance outcomes of the firm (Malmendier et al., 2011; Celikyurt et al., 2012). Our thesis adds to this line of research by examining not only the effect of a director's tenure on an individual level, but on an aggregate level in relation to other directors on the board. To the best of our knowledge, our study is the first to utilize a curvilinear regression model to test the relationship between average board tenure and

firm performance in a Swedish setting. This is particularly interesting given that the majority of recent papers testing a U-shaped association have been on U.S or Anglo-American data (e.g., Huang & Hilary, 2018; Veltorp, 2018; Clements et al., 2018). The Swedish setting has a higher relative share of non-executive directors (Brunninge et al., 2007), employee representatives (Thorsell & Cornelius, 2009), and global top standards for board transparency (Lekvall, 2009), which we expect may have an impact on the underlying mechanisms of board efficiency.

Second, this paper contributes to the assessment of the recent trend in legal thresholds on the maximum length of board tenure. The hypothesized inverted U-shaped association between board tenure and firm performance would suggest an optimum level of board tenure. With our results we aim to contribute to the current discussion on whether firms should be imposed with a legal limit on board tenure.

Third, a limited number of studies examining the effect of corporate governance mechanisms take into account how corporate governance and CSR practices together affect firm performance. To the best of our knowledge, only one study that examines the moderating effect of CSR on the relationship between board characteristics and firm performance has been conducted (Jiang et al., 2020). We therefore aim to fill this research gap with this study.

1.2 Delimitations

The paper is limited to Swedish public companies listed on Nasdaq Stockholm Stock Exchange during the period 2007-2019, including observations from 2006 due to the use of lagged variables in the models employed. This timespan enables us to attain the largest number of firm year observations for our key independent variable average board tenure. We chose to limit our study to the Swedish market due to differences in regulations and accounting requirements for countries outside of Sweden. Our study is hence limited when comparing the results to other countries, since our findings may not necessarily be applicable to other markets. A further reason for the decision to limit our study to Nasdaq Stockholm is due to the stricter rules that public companies are obliged to comply with compared to private firms and firms listed on OTC markets.

Moreover, our study includes nine control variables (when testing H_{1I}), as opposed to the 23 control variables used in previous research by Huang & Hilary (2018), which further limits our research. The limitation of control variables is due to the lack of data availability. However, the variables included in our models still capture the most affluent parts and our study therefore follows the underlying methodology used in prior research by Huang and Hilary (2018).

1.3 Assumptions

According to Huang & Hilary (2018), a key assumption to meaningfully estimate the model is that firms do not systematically optimize their board tenure. A reason for this could be that the organization does not have any indication of what the optimal board tenure is. Further, even if this optimal tenure is known, it will not be possible to immediately reach it. For example, it might not be practical to terminate directors after the optimal tenure has been reached. Likewise, it may not be possible to retain directors with extensive knowledge when the board tenure is relatively low. Social norms, ownership configurations and agency problems are some other factors that may lead firms to retain directors beyond what is deemed optimal (Kuhnen, 2007).

1.4 Disposition

The study consists of eight sections. In section 2 we discuss theories and review previous research, followed by the development of our hypotheses. Section 3 presents the sample construction, while section 4 discusses research design, the applied methodology and the variables. This is followed by section 5 that presents the empirical results. Finally, we discuss our findings in section 6, provide suggestions for further research in section 7 and conclude the study in section 8.

2 Theory and literature review

This section presents the previous literature and theories upon which we base our study. First, we present several studies regarding the relation between board tenure and firm performance in order to provide an understanding of the consistencies and discrepancies that prevail in the literature. Second, we introduce literature on the moderating effect of CSR on the aforementioned relationship between board tenure and financial performance. Finally, we conclude the section with the development and presentation of our hypotheses.

2.1 Board tenure and firm performance

The board of directors serves an important role in a corporation as it is meant to perform the critical functions of monitoring and advising top management. Numerous studies show that directors' capabilities have been positively linked to firm performance (e.g., Malmendier et al., 2011; Celikyurt, 2014). However, the optimal length of board tenure remains a contradictory question among scholars. Several prior studies examining board effectiveness focus on differences in board characteristics rather than the specific effect of board tenure on the board's advising and monitoring capabilities (e.g., Yermack, 1996; Adams & Ferreira, 2009).

Nevertheless, this report examines how the tenure of the board of directors reflects the tradeoff between expertise and entrenchment. Specifically, we investigate how board tenure impacts the financial performance of the firm. Previous literature on the topic demonstrates two conflicting views as to if board tenure increases or decreases board effectiveness. Examining prior literature on the field of study, we divide prior research into three sections as follows: (1) results supporting the entrenchment hypothesis, (2) results supporting the expertise hypothesis and (3) an interactive effect between the two previous viewpoints, producing an inverted U-shaped function between board tenure and financial performance.

2.1.1 The entrenchment hypothesis

On the one hand, the entrenchment hypothesis argues that as the tenure of the board members increases, the directors will become less reliable as independent monitors of the firm. The legislative definition of independence varies according to jurisdiction. In Sweden, an independent board member is a board member who is not in a position of dependence in relation to the company or in relation to major shareholders. The practical classification is highly firm-specific and carried out by the auditor, following the Swedish Code of Corporate Governance (Lekvall, 2009).

The entrenchment hypothesis offers a more dynamic understanding of board independence than the legal definition. Rather than take on a static definition, the entrenchment hypothesis predicts that the inability to independently monitor and advise the firm becomes more pronounced as the tenure of the director increases. This process is typically referred to as “entrenchment” (Clements et al., 2018). Those who advocate this view commonly put forward two main arguments. First,

entrenched directors are viewed as more opposed to change and more inclined to maintain the current status-quo of the firm, even when objective information suggests otherwise. Specifically, since they have a long tenure, these individuals may become satisfied with their fixed opinions and see no reason for change (Clements et al., 2018). Second, seasoned directors may have more established relationships with the firm's management, which can reduce board independence. These relationships are often referred to as social ties. With regards to board tenure, results indicate that these social ties are more likely to be formed between the CEO and directors with a longer tenure, which negatively affects independence (Fracassi & Tate, 2012). Instead of evaluating management based on impartiality, the board members' normative expectations may then be governed by mutual caring and trust (Thatcher & Cooper, 2010). Social ties can therefore drive the board to interpret the actions of the CEO and top management more favorably, where ineffective monitoring is a consequence (Fracassi & Tate, 2012).

Furthermore, the importance of board independence and the issue of social ties also becomes evident when studying the board through the agency theory. Through this view, the director's task is to generate shareholder value by reinforcing the interest of the shareholders and not to accept self-serving actions by the CEO and top management. However, research has shown that the board of directors are not ideal agents and potentially are impacted by the same principal-agent issues they were appointed to address (eg., Fama, 1980). Therefore, the agency theory applied to the setting of boards prescribes that the board should be made up of directors that are not entrenched, since they are more likely to impartially monitor and discipline the CEO and the top management (Fama, 1980).

The literature that advocates the entrenchment hypothesis illustrates that the relationship between board entrenchment and firm value is negative (Huang & Hilary, 2018), given the inability to efficiently carry out the supervisory duties (illustration provided in Appendix 1).

2.1.2 The expertise hypothesis

On the other hand, the expertise hypothesis argues that while a board with a shorter tenure may be less biased and more impartial, it may have an incomplete view of the company's operations and history, which could reduce the effectiveness of its monitoring and advising capabilities. A board acquires more knowledge about the firm's operations, the specific industry that it operates within

and the history of the company as the board tenure increases. This has been shown to be associated with a higher value of the firm (e.g., Huang & Hilary, 2018; Veltorp, 2018; Livnat et al., 2021). Contradicting the entrenchment hypothesis, previous research by Bebchuck et al. (2010) argues that senior board members are more likely to decide against the company CEO. In addition, McIntosh et al. (2014) argue that more senior board members are likely to better monitor and supervise a CEO given a mutual relationship of trust and understanding. These notions - that a longer tenure of the director facilitates supervision - stand in conflict with the arguments raised by the entrenchment hypothesis. Specifically, social ties can under the expertise hypothesis be considered as valuable firm-specific knowledge, acting as a catalyst and not an obstacle for efficient monitoring.

There are several prior studies that provide empirical results in favor of the expertise hypothesis. For example, Dou et al. (2015) note that the recent trend in term limits on board directors may be problematic since directors with more than 15 years on the board tend to attend more meetings and undertake more projects. Moreover, Beasley (1996) found that longer board tenure is associated with a lower risk of fraud investigations of the firm. Hence indicating that expertise stemming from a longer tenure of the directors is valuable for the company. This implies a positive relationship between the expertise and firm performance (illustration provided in Appendix 1).

2.1.3 A nonlinear relationship

Examining these two conflicting views, Huang & Hilary (2018) found that board tenure exhibits an inverted U-shaped relationship with firm performance. These results are aligned with the view that a board's knowledge accumulation is positively associated with the value of a firm up until a certain optimal level is reached. After this optimum, the negative effects of increased entrenchment on firm performance dominates, because of lower board independence. This would explain the conflicting results proposed by the entrenchment and expertise hypotheses, where the implied association between firm performance and board tenure is either positive or negative. This conclusion is similar to prior studies on audit tenure, where audit tenure has been found to be associated with higher audit quality up to a certain threshold of years, after which the quality was lowered (e.g., Chi & Huang, 2005). To summarize, the interacting positive and negative effects of board tenure on firm performance as suggested by the two aforementioned viewpoints, would

explain why a quadratic form of board tenure provides better explanatory power rather than a linear form.

2.2 The moderating effect of corporate social responsibility

2.2.1 Corporate Social Responsibility

Over the past decades, the importance of Corporate Social Responsibility (CSR) has increased significantly amongst scholars and when discussing the future of business. There is no unambiguous definition of Corporate Social Responsibility. However, the definition provided by Carroll (1991) is widely accepted and used. We adopt the definition by Carroll (1991), who defines Corporate Social Responsibility as, “the social responsibility of business encompasses the economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time”. The definition suggests that firms that engage in socially responsible activities should strive to make profit, be ethical, obey the law and be good corporate citizens. A number of studies have used stakeholder theory when addressing firms’ incentives to engage with CSR activities. The stakeholder theory argues that firms should protect the interest of all the firm's stakeholders, suggesting that organizations are open systems that affect and can be affected by internal as well as external agents (Ortas et al., 2017).

2.2.2 Ethical aspect of Corporate Social Responsibility

Garringa & Melé (2004) categorize CSR theories into four subsets: (1) ethical theories, (2) political theories, (3) integrative theories and (4) instrumental theories. Ethical, political and integrative theories of CSR all advocate that firms have a motivation to favor honesty, impartiality and authenticity throughout the organization. In particular, ethical theories of CSR (e.g., Carroll, 1991; Jones, 1995; Phillips et al., 2003) argue that a firm should view social responsibility as an ethical obligation. These theories are underpinned by a principle “to do the right thing” or “the need to contribute to the common good by doing what is ethically correct”. Consequently, in line with the stakeholder theory, this recommends a high-performing CSR organization to focus efforts to satisfy the legitimate interest of all relevant stakeholders following a moral principle.

This moral principle is elaborated further by Jones (1995), who provides a theoretical framework that integrates economic theory and business ethics. Jones (1995) concludes that business ethics

on an individual level is expressed by people who (1) are honest, (2) have personal integrity, (3) do not lie, cheat, or steal, and (4) honor their commitments. People who have these sentiments are desirable business partners since they will not require costly monitoring processes in any principal-agent relationship. Jones (1995) further argues that corporate morality is an analog of individual morality - the same benefits available to ethical individuals should also be available to ethical corporations. These firms are in demand in situations that require agents who do not need expensive monitoring, do not misrepresent the value of their resources and team members who do not shirk on collective effort. Since these firms are high in demand, there is a moral imperative for managers to “do the right thing” (Jones, 1995).

Numerous research has examined the relationship between the ethical view of CSR and firm performance outcomes. For example, Kim et al. (2012) examined the effect of ethical implications of CSR on financial reporting. Their results indicate that firms that engage in socially responsible activities, are less likely to engage in earnings management. Their results are consistent with the view that ethical concerns are driving the managers to behave in a more responsible manner. This supports the idea that firms that engage in socially responsible activities tend to have a high standard of moral behavior and a more ethical corporate culture.

2.2.3 CSR and board independence

Board independence is recommended by regulators to properly monitor the managers in a principal-agent context (Pascual-Fuster, 2020). As established, prior research recognizes that directors may lose their independence as their tenure becomes too long, resulting in board entrenchment. As another explanatory variable, CSR performance has been shown to be positively associated with board independence (Ahmad et al., 2017). For example, Harjoto and Jo (2011) found that CSR is positively correlated with board independence. Under the stakeholder theory, the firms with higher CSR performance are more likely to consider other agendas and interests than those of managers and the majority of shareholders (Ortas et al., 2017), thus exhibiting a higher degree of independence.

2.3 Hypotheses development

When constructing our first hypothesis regarding the relationship between board tenure and firm performance, we consider the conflicting views on the optimal level of board tenure. Evidently,

empirical results both support the entrenchment hypothesis and the expertise hypothesis, prescribing a shorter versus longer tenure vis-à-vis firm and director performance outcomes. Nevertheless, a line of more recent studies seems to find that a curvilinear relationship is more significant than the two binary options of either positive or negative association between tenure and performance outcomes. In particular, we consider the results found by both Huang & Hilary (2018) and Veltrop (2018). Each of these two papers finds statistical significance when including a squared form of the board tenure variable and with a negative coefficient, finding empirical evidence for an inverted U-shaped relationship between board tenure and firm performance. This curvilinear relationship could be interpreted as that for low levels of board tenure, the incremental expertise gained from more experience has a net positive effect on performance outcomes, but for higher levels of tenure the loss of independence due to entrenchment leads to a net negative effect, all else equal. Hence, this leads us to hypothesize:

H₁₁: *There is an inverted U-shaped relationship between board tenure and firm performance*

Given that a firm has a high level of CSR performance, we would expect that same firm to have an ethical culture, encompassing equality and fairness in the organization (Kim et al., 2012). Since CSR falls under the mandate of the board (Fassin and Gosselin, 2011), this prediction also holds for the board of directors. We would therefore expect the board of directors of a high-performing CSR firm to be more ethical compared to a low-performing CSR firm. Following the corporate morality framework by Jones (1995), this ethical aspect will incentivize directors of CSR firms to “do the right thing.” For the board, we argue that this specifically entails acting according to the principal-agent issues the directors were appointed to address - i.e. monitor the interest of the shareholders and other stakeholders with legitimate interests. This would alleviate the proposed loss of impartiality due to social ties or personal reluctance to change as a result of increased tenure (Thatcher & Cooper, 2010; Fracassi & Tate, 2012). Following the logic of the entrenchment hypothesis, this leads to a positive effect on independence, hence improving the monitoring efficiency and as a result decreasing the level of entrenchment. As we have established, lower entrenchment would positively influence firm performance. We therefore find it reasonable to hypothesize that CSR performance has a positive moderating impact on the relationship between board tenure and firm performance, *ceteris paribus*.

As noted, the dichotomy between expertise and entrenchment effects in the literature on board tenure would together explain a curvilinear relationship. However, we argue that CSR practices only have an impact on the latter of these two components. This is because a high ethical standard produced by good CSR practices would only impact the independence of the board members positively, hence alleviating entrenchment, since the firm-specific knowledge is reasonably not driven by ethical concerns. In summary, we expect CSR performance to serve as a proxy for the ethicalness of firm culture. This would mitigate board entrenchment and therefore positively impact firm performance. Thus, our second hypothesis is as follows:

H₂1: *CSR performance has a positive moderating impact on the relationship between board tenure and firm performance*

3 Empirical data

A more detailed account of the method for selecting the sample used in our empirical tests is given in this section, followed by an overview of the collection of our data.

3.1 Sample selection

Table 1 summarizes our sample selection process. The starting point of our sample is companies listed on Nasdaq Stockholm Stock Exchange during the period 2007-2019. This yields an initial sample of 325 firms, which we gradually reduce through a selection process of two criteria that all firms must meet. First, we exclude all firms that are not Swedish group companies. The second criteria we adjust for is the availability of board data. This reduces our sample by 171 unique firms. After the adjustments, the final sample consists of an unbalanced panel dataset with 147 Swedish listed firms and a total of 905 firm year observations. Examining our second hypothesis, our sample is further reduced due to scarce data availability for CSR performance, leaving total of 156 firm year observations.

The exclusion of firms with missing board data makes our sample biased and skewed towards larger firms. As seen in Appendix 2, the exclusion of firms that do not report board data tilts our sample towards larger firms, since the average firm size in our sample increases from 7.8 to 10.5. Hence, the results and conclusions that we make based on our data will be biased towards the largest Swedish firms listed on Nasdaq Stockholm during our specific period.

Table 1. Sample selection

	# of firm year observations	# of firms
Within delimitation*	4,875	325
Not a Swedish group company	-105	-7
Unavailable board data	-3,865	-171
Final sample main regression	905	147
Unavailable CSR data	-749	-105
Final sample - moderating effect of CSR	156	42

**Companies listed on Nasdaq Stockholm during the period 2007-2019*

3.2 Data collection

We obtain all the desired data from the Thomson Reuters database Eikon Refinitiv. The specified time-period used in all our regressions is 2007-2019, however, we obtained data for the period 2006-2019, due to the use of lagged variables in our models.

4 Methodology

The following part of this paper moves on to describe in greater detail the applied methodology, which includes a description of the dependent and the independent variables followed by a presentation of the regression models employed to test our hypotheses.

4.1 Research design

The first hypothesis of this study is that firm value depends on the quality of monitoring and decision-making capabilities by the board of directors in a curvilinear manner. Thus, the study is designed to examine if there is a statistically significant impact of board tenure on firm performance in Swedish listed companies. We use a quantitative research method by applying a multiple variable regression analysis with ordinary least squares (OLS), following prior research by Huang and Hilary (2018) - regressing a set of explanatory variables against an estimate of firm performance (*TOBIN*). Using a panel dataset for the period 2007-2019, we conduct a within-firm analysis as opposed to a cross-sectional analysis. Furthermore, a set of control variables associated with past firm performance and board characteristics are included since scholars argue that these have an impact on firm performance (e.g., Cheng, 2008; Huang & Hilary, 2018; Yermack, 1996).

4.2 Variables

In the following section, the variables included in all our regression models are specified and discussed with regards to their expected relationship with the dependent variable, in line with earlier studies. All independent variables are lagged with 1 year, in order to examine if they can predict *TOBIN* in the next period. All continuous variables are winsorized at the top and bottom 1 percent of their distributions.

4.2.1 Dependent variable

TOBIN - The continuous variable *TOBIN* is the dependent variable in our first regression. *TOBIN* or Tobin's Q is commonly used in the context of research on corporate governance as a measure of firm performance (eg., Coles et al., 2008; Yermack et al., 1996; Huang & Hilary, 2018). The ratio measure was introduced in 1966 by economist Nicolas Kaldor (1908-1986), who defined *TOBIN* as the ratio between a firm's market value divided by the replacement costs of its assets. Since the replacement value of a company's asset is hard to estimate, other definitions are commonly used. Following Huang & Hilary (2018), we define *TOBIN* in the following way:

$$TOBIN_{i,t} = \frac{MVE_{i,t} + BVA_{i,t} - BVE_{i,t} - DEFTAX_{i,t}}{BVA_{i,t}}$$

Where $MVE_{i,t}$ is the market value of equity, $BVA_{i,t}$ is the book value of assets, $BVE_{i,t}$ is the book value of common equity and $DEFTAX_{i,t}$ is deferred taxes. The dependent variable is measured for each company at the close of the fiscal year in the period 2007-2019. In terms of financial performance, a higher ratio indicates that a firm is earning at a higher rate than its replacement costs, suggesting a stronger performance.

4.2.2 Key independent variables

BOARDTEN - One of our two main independent variables in the first equation is average board tenure. We measure board tenure as the average board tenure of all directors assigned to the board during the specific fiscal year. More specifically, we measure *BOARDTEN* for all directors on an aggregate level to capture the trade-off between entrenchment and the knowledge accumulation over the years. Consistent with the approach of Huang & Hilary (2018), we measure board tenure as the average number of years each board member has been on the board. We predict the sign of *BOARDTEN* to be positive based on prior research.

SQ.BOARDTEN - To control for potential nonlinearity in the relation between board tenure and firm performance, we include a quadratic form of *BOARDTEN* in our first regression model. The quadratic term of *BOARDTEN* allows our model to capture the potential curvature in the relationship between board tenure and firm performance. Specifically, a negative coefficient for the *SQ.BOARDTEN* is expected since it would generate a concave or inverted U-shaped relationship, following prior research (e.g., Huang and Hilary, 2018).

4.2.3 Control variables

To account for additional factors that may influence *TOBIN* or *BOARDTEN*, we include several control variables in our model. A description of all control variables included in our study is provided in this section. After carefully reviewing what previous research on corporate governance and firm performance have found to provide explanatory power, together with an assessment of data availability, we have included a set of eleven control variables listed below.

STD.BOARDTEN - *STD.BOARDTEN* is calculated as the standard deviation in the board tenure for each firm year observation. This variable is included since some prior studies have used metrics measuring tenure dispersion rather than average tenure length to capture the effect of board tenure on firm performance (e.g., Wahid, 2012). Consequently, to control for the dispersion of tenure within a board, we include the standard deviation of average board tenure in all our regressions, following Huang & Hilary (2018). In line with Wahid (2012) and Huang & Hilary (2018), we predict a positive coefficient, following the author's conclusion that a wider distribution of tenure may stimulate intra-group learning within the board.

CEOCHAIR - CEO chairman duality is a dummy variable that equals 1 if the CEO is simultaneously a member of the board or if the chairman of the board previously has been the CEO of the company, and 0 otherwise. We argue that the coefficient for *CEOCHAIR* will be negative, following prior research by Huang & Hilary (2018).

BOARDSIZE - *BOARDSIZE* is defined as the total number of board members seated on the board at the end of the fiscal year. This variable is included since it accounts for a board characteristic

which has been shown to predict financial performance of the company (Yermack, 1996; Huang & Hilary, 2018; Clements et al., 2018). We argue that the coefficient for *BOARDSIZE* is negatively related to the dependent variable, based on research by the aforementioned authors. A smaller board is expected to be more prone to entrenchment, since directors are more likely to socially identify with the firm if they are a member of a small board of directors (Clements et al., 2018).

LAGROA - Return on assets reflects the company's past accounting performance and its profitability. A firm's profitability has a significant impact on the market value of the company and is a widely used measure amongst scholars (Cheng, 2008; Erhard et al., 2003; Yermack, 1996). We thus include return on assets in our model and expect a positive coefficient. The variable is defined as EBIT divided by total assets, measured in book value at the start of each fiscal year. In line with previous research, we use a one-year lagged ROA as a control measure (Huang & Hilary, 2018).

RETURN - *RETURN* is included in our model and accounts for firm-level characteristics that are likely to be associated with the valuation and performance of the firm. *RETURN* is defined as the stock return, thus the change in stock price including any relevant dividend for the last fiscal year. Aligned with Huang & Hilary (2018), we calculate the stock return as log of one plus the stock return over the last year. The authors above have shown that *RETURN* is a predictor of firm performance, suggesting a positive coefficient sign.

LEV - *LEV* is leverage, which is defined as short-term debt plus long-term debt divided by total assets at the beginning of period t . It is included in the model since it is likely to be associated with the performance and valuation of a firm. Previous research has found a negative relationship between firm performance and leverage, thus we expect the coefficient for *LEV* to be negative (Huang & Hilary, 2018; Clements et al., 2018).

FIRMSIZE - *FIRMSIZE* is defined as the natural logarithm of total assets. Scholars argue that firm size is related to profitability and that small firms tend to have lower earnings on assets than big firms (Fama & French, 1993). At the same time, other results have indicated a negative association between firm size and firm performance (Huang & Hilary, 2018). We therefore include *FIRMSIZE*

as a control to adjust for these cross-sectional differences but are ambivalent of the expected sign of the variable.

GW - Goodwill is scaled over total assets. Previous research (Veltorp, 2018; Huang & Hilary, 2018) has found a negative association between goodwill and the dependent variable, hence we argue that the coefficient for goodwill should be negative.

CAPEX - Capital expenditures is defined as the amount used to improve or invest in long term assets. It has been argued that a firm's investment opportunities depend positively on firm value. While many different proxies for investment opportunities exist, we use capital expenditures scaled by total assets following earlier papers by Yermack (1996) and Huang & Hilary (2018). Therefore, we expect a positive sign of the coefficient on capital expenditures in our model.

CSRscore - *CSRscore* is the measure of a firm's level of CSR performance. The CSR score reflects a company's practices to communicate that it integrates the economic (financial), social and environmental dimensions into its day-to-day decision-making process, following the definition by Eikon Refinitiv. The maximum *CSRscore* a firm can obtain is 100 and the minimum score is 0. In line with prior research examining the effect of CSR on board characteristics (e.g., Harjoto, Laksmana et al., 2015), we expect the coefficient for *CSRscore* to be positive.

dummyHIGHCSR - The *dummyHIGHCSR* is a dummy variable generated to test our second hypothesis using the median split sample method. It equals 1 if the specific firm has a *CSRscore* above the median *CSRscore*, and 0 otherwise.

Firm and year fixed effects - Firm fixed effects are included in the model in order to alleviate concerns that the results are attributed to specific firm characteristics. Similarly, we include year fixed effects to mitigate time-invariant characteristics or common macroeconomic shocks to address concerns that general time trends drive our results. This implies that we test for within-panel analysis, hence making comparisons over a given period while holding the firm constant.

4.3 Description of applied models

4.3.1 Main regression model

To investigate our first hypothesis, H_1I , regarding whether there is an inverted U-shaped relationship between board tenure and financial performance we estimate an ordinary least squares regression. In our model, *TOBIN* is the dependent variable and *BOARDTEN* and *SQ.BOARDTEN* are the two main independent variables, which is in line with previous research (e.g., Huang & Hilary, 2018; Clements et al., 2018). The inclusion of both *BOARDTEN* and a polynomial term of *BOARDTEN* allows a linear regression model to attain a curved shape. This is desirable when investigating H_1I . Since *BOARDTEN* and not the beta coefficient is squared, the model still qualifies as a linear model. This makes it straightforward to model curves without having to apply comparatively more complex non-linear models (Aiken & West, 1991). We also include a set of control variables, as described in section 4.2.3. Additionally, all continuous variables in our model are winsorized at the top and bottom 1 percent of their distributions to eliminate concerns that outliers might complicate the interpretation of our results. Moreover, to alleviate endogeneity concerns, all independent variables employed in the model are lagged with one year, $t-1$, in order to investigate if the independent variables can predict *TOBIN* in the following period t . The following regression model is used to test our first hypothesis:

$$\begin{aligned} TOBIN_{i,t} = & \beta_0 + \beta_1 BOARDTEN_{i,t-1} + \beta_2 SQ.BOARDTEN_{i,t-1} + \beta_3 STD.BOARDTEN_{i,t-1} + \\ & \beta_4 CEOchair_{i,t-1} + \beta_5 BOARDSIZE_{i,t-1} + \beta_6 LAGROA_{i,t-1} + \beta_7 RETURN_{i,t-1} + \beta_8 LEV_{i,t-1} + \\ & \beta_9 FIRMSIZE_{i,t-1} + \beta_{10} GW_{i,t-1} + \beta_{11} CAPEX_{i,t-1} + FFE_i + YFE_t + \varepsilon_{i,t} \end{aligned} \quad (Eq. 1)$$

Where $TOBIN_{i,t}$ equals the firm value, i indexes firms and t indexes time. β_0 is the constant, FFE_i and YFE_t are firm and year fixed effects and $\varepsilon_{i,t}$ is the error term.

4.3.2 Regression model examining moderation of CSR

To test our second hypothesis, H_2I , regarding CSR performance and its positive impact on the relationship between board tenure and firm performance, we modify the first specification to incorporate CSR performance. Examining the moderating effect on the strength and the direction of the relationship between the dependent and the independent variable in a quadratic regression requires the inclusion of two interaction terms (Dawson, 2014). Accordingly, the CSR performance measure is included as an independent variable and by multiplying it with both

BOARDTEN and *SQ.BOARDTEN*, generating two interaction terms. The research model used to investigate the potential moderating effect of CSR using interaction terms is the following:

$$\begin{aligned} TOBIN_{i,t} = & \beta_0 + \beta_1 BOARDTEN_{i,t-1} + \beta_2 SQ.BOARDTEN_{i,t-1} + \beta_3 STD.BOARDTEN_{i,t-1} + \\ & \beta_4 CSRscore_{i,t-1} + \beta_5 BOARDTENCSSRscore_{i,t-1} + \beta_6 SQ.BOARDTENCSSRscore_{i,t-1} + \Gamma'X_{i,t-1} + \\ & FFE_i + YFE_t + \varepsilon_{i,t} \end{aligned} \quad (Eq. 2)$$

Where $TOBIN_{i,t}$ equals firm value, i indexes firms and t indexes time. $BOARDTEN_{i,t-1}$ and $SQ.BOARDTEN_{i,t-1}$ are average board tenure and the quadratic form of average board tenure, respectively. The first interaction term is $BOARDTENCSSRscore_{i,t-1}$, where $BOARDTEN_{i,t-1}$ is multiplied by the independent variable $CSRscore_{i,t-1}$. Similarly, the second interaction term is $SQ.BOARDTENCSSRscore_{i,t-1}$ where $SQ.BOARDTEN_{i,t-1}$ is multiplied by $CSRscore_{i,t-1}$. Furthermore, $\Gamma'X_{i,t-1}$ is a vector of all control variables included in the main regression described in section 4.3.1. FFE_i and YFE_t are firm and year fixed effects and $\varepsilon_{i,t}$ is the error term.

The interpretation of a moderating effect on a curvilinear relationship is more complex than the interpretation of a moderating effect on a linear relationship. Specifically, when examining the results of a moderating effect on a curvilinear relationship, the coefficients of the interaction terms are interpreted in isolation, hence not taking the other control variables into consideration (Dawson, 2014). Due to this complexity, we decide to further investigate the potential moderating effect of CSR performance on the relationship between board tenure and firm performance by running a median split sample regression. The median split sample test creates a categorical variable which interacts with each independent variable in the model to create two subsamples. Specifically, we transform the continuous variable $CSRscore$ into a categorical variable by creating the dummy variable *dummyHIGHCSR*. Any observation below the median value of $CSRscore$ is categorized into the subsample “Low CSR performance”. Likewise, observations over the median are categorized into the subsample “High CSR performance”. We then run our main regression on each subsample and compare the magnitude of *BOARDTEN* and *SQ.BOARDTEN* across the two subsamples.

5 Empirical results and analysis

In this section, we firstly discuss our sample and proceed with testing H_1I followed by the testing of H_2I . We then alter the conditions of our model and examine if the results are robust. Finally, the section is concluded by a summary of our findings.

5.1 Descriptive statistics

Table 2 reports summary statistics for the final panel dataset that we use to test the two hypotheses of the study. The dependent variable *TOBIN* is to a large extent in line with previous research, however, we observe that the standard deviation of *TOBIN* is comparably high, suggesting a wider spread of financial performance than Huang & Hilary (2018) and Spencer & Stuart (2012). Further examining the sample, we note that *BOARDTEN* is on average approximately seven years, following both Huang & Hilary (2018) and Spencer & Stuart (2011). Regarding the control variables, most are in line with previous papers, suggesting that our sample is representative of earlier research. However, some variables exhibit deviations. The average level of *LEV* is 47.2%, which is significantly higher than previous research. Furthermore, the average *BOARDSIZE* in our sample is marginally higher than for U.S. firms, 9.7 compared to 9.3 (Huang & Hilary, 2018). In addition to this, we observe that the average and median *FIRMSIZE* in our sample is rather high compared to previous studies in the U.S. setting. The higher value of *FIRMSIZE* in our data could potentially reflect the fact that we also obtain a higher average value for *BOARDSIZE*, compared to prior studies, since a larger firm often requires a larger board. This is somewhat contradictory because Swedish firms on average are smaller than U.S. firms. However, these statistics may reflect that our sample is skewed towards larger firms, which might explain the deviation from prior studies.

Table 2. Descriptive statistics

Variables	N	Mean	Std. Dev.	25th	Median	75th
<i>TOBIN</i>	905	1.924	1.711	1.068	1.421	2.037
<i>ROA</i>	902	5.848	9.515	2.782	5.542	9.191
<i>BOARDTEN</i>	905	6.882	2.625	4.981	6.438	8.55
<i>SQ. BOARDTEN</i>	905	54.239	41.195	24.808	41.441	73.103
<i>STD. BOARDTEN</i>	905	3.74	2.23	2.42	3.86	5.73

(Continued)

Table 2 - Continued

<i>CEOCHAIR</i>	905	.15	.358	0	0	0
<i>BOARDSIZE</i>	905	9.735	2.65	7	10	12
<i>LAGROA</i>	863	.062	.101	.03	.059	.095
<i>RETURN</i>	903	.11	.367	-.064	.143	.327
<i>LEV</i>	847	.472	.174	.381	.49	.592
<i>FIRMSIZE</i>	905	10.474	1.523	9.564	10.512	11.321
<i>GW</i>	905	.152	.17	.001	.08	.284
<i>CAPEX</i>	905	.032	.039	.005	.021	.041
<i>CSRscore</i>	156	49.457	31.913	23.188	51.744	77.907
<i>dummyHIGHCSR</i>	156	0.5	.502	0	0.5	1

This table provides the descriptive statistics for all variables included in the study. All continuous variables are winsorized at the top and bottom 1 percent of their distributions. ROA is multiplied by 100.

5.2 Pearson correlation matrix

Table 3 provides the Pearson correlation coefficients for the variables included in the analysis. We expect our control variables to be significantly correlated with the dependent variable, indicating that they provide explanatory power to the model. As noted in section 4.3.1, the following three variations of average board tenure are included in the main regression model: (1) *BOARDTEN*, (2) *SQ.BOARDTEN* and (3) *STD.BOARDTEN*. Naturally, we expect these to be highly correlated, however, we do not expect the other control variables to be highly correlated with each other. High correlation between independent variables would indicate that the model suffers from multicollinearity.

The results are overall in line with our predictions. However, we notice that neither *BOARDTEN* nor *SQ.BOARDTEN*, our two main independent variables, are significantly correlated with the dependent variable *TOBIN*. This note will be important when testing our model and interpreting the regression results in section 5.3. Furthermore, all control variables except *GW*, *CAPEX* and *CSRscore* are significantly correlated with the dependent variable. Additionally, the preliminary analysis of our results implies that *GW* and *CAPEX* does not provide explanatory power with regard to firm performance. As we anticipated, the three variations of average board tenure are highly correlated with each other. The correlation between these variables are over 0.8, which indicates that the model potentially suffers from multicollinearity (Cote et al., 2004; Farrar & Glauber,

1967). The implications of these findings will be discussed in detail in section 5.4. Furthermore, our control variables are generally not highly correlated with each other, which supports our predictions.

Table 3. A. Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) <i>TOBIN</i>	1.000						
(2) <i>BOARDTEN</i>	0.049	1.000					
(3) <i>SQ.BOARDTEN</i>	0.048	0.976***	1.000				
(4) <i>STD.BOARDTEN</i>	0.073**	0.978***	0.957***	1.000			
(5) <i>ROA</i>	0.224***	0.143***	0.138***	0.142***	1.000		
(6) <i>CEOCHAIR</i>	0.057*	0.153***	0.141***	0.155***	-0.037	1.000	
(7) <i>BOARDSIZE</i>	-0.154***	0.013	-0.009	-0.009	0.010	-0.014	1.000
(8) <i>LAGROA</i>	0.177***	0.120***	0.121***	0.129***	0.583***	-0.030	0.008
(9) <i>RETURN</i>	0.162***	0.063*	0.062*	0.070**	0.212***	-0.027	-0.060*
(10) <i>LEV</i>	-0.099***	-0.130***	-0.138***	-0.133***	-0.116***	0.051	0.061*
(11) <i>FIRMSIZE</i>	-0.434***	0.110***	0.089***	0.084**	-0.009	0.013	0.455***
(12) <i>GW</i>	-0.044	-0.090***	-0.096***	-0.101***	-0.048	0.006	-0.089***
(13) <i>CAPEX</i>	0.042	-0.053*	-0.061*	-0.061*	0.048	0.143***	0.030
(14) <i>CSRscore</i>	0.037	-0.055	-0.014	-0.054	-0.052	-0.011	0.049

Table 3. B. Correlation matrix continued

Variables	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(8) <i>LAGROA</i>	1.000						
(9) <i>RETURN</i>	0.250***	1.000					
(10) <i>LEV</i>	-0.078**	-0.070**	1.000				
(11) <i>FIRMSIZE</i>	-0.021	0.011	-0.034	1.000			
(12) <i>GW</i>	-0.026	-0.106***	0.151***	-0.213***	1.000		
(13) <i>CAPEX</i>	0.048	0.011	0.109***	-0.091***	-0.119***	1.000	
(14) <i>CSRscore</i>	0.021	-0.031	0.100	0.232***	-0.033	0.076	1.000

*This table shows the correlation for all the variables included in the study, where a correlation of +1.00 implies a perfect positive linear correlation, and a correlation of -1.00, a perfect negative linear correlation. *, **, and *** indicate the significance of the coefficients at levels of 0.1, 0.05, and 0.01, respectively. All continuous variables are winsorized at the top and bottom 1 percent of their distributions.*

5.3 Regression results

5.3.1 Test of the relationship between Average Board Tenure and Firm Performance

Table 5 provides the results from the curvilinear regression analysis examining the first hypothesis. The results do not support a significant relationship between *TOBIN*, *BOARDTEN* and *SQ.BOARDTEN*. This contradicts findings prior studies utilizing the same analysis (e.g., Livnat et al., 2020; Huang & Hilary, 2018). Since neither the original term of board tenure nor the quadratic term of board tenure are significant, we cannot confirm that there is a non-linear relationship between the variables of interest. This implies that our first null hypothesis cannot be rejected and indicates that there is no evidence in our data of an inverted U-shaped relationship between the dependent variable and our two main independent variables. Regarding the sign of the coefficients, the hypothesized inverted U-shaped relationship would imply a positive coefficient of *BOARDTEN* and a negative coefficient of *SQ.BOARDTEN*. Although non-significant results, this holds in column 3, but when firm fixed effects and year fixed effects are included, the coefficient of the squared term is positive instead of negative. If the squared coefficient is positive, this suggests that the shape of the association is U-shaped rather than inversely U-shaped. However, as mentioned above, these findings are not significant and we cannot draw any conclusions.

All in all, our results do not support the view that the average level of board tenure within Swedish listed firms during the period 2007-2019 are either positively or negatively associated with firm performance. Our data does not support that the hypothesized two interactive effects of the expertise hypothesis and the contradictory entrenchment hypothesis create a curvilinear function with a potential optimum level of board tenure.

Significance of control variables can provide validation for the regression model itself. When adding firm and year fixed effects, *CEOCHAIR*, *LAGROA* and *FIRMSIZE* are all significant at the 5%, 1%, and 1% level respectively. The sign for *LAGROA* is positive and hence in line with our expectations. However, the sign for *CEOCHAIR* is also positive, which is the opposite of our expectations and previous research (Huang & Hilary, 2018). Furthermore, our control variable *FIRMSIZE* is significant at a 1% level with a negative sign, in line with previous research by Huang & Hilary (2018). Moreover, we found that *BOARDSIZE* is significant at the 1% level when we test

across firms and across years, however, the same relationship could not be established when testing within firms and over the years using fixed effects.

As seen in column 1 and 2 in table 5, we present the results from two univariate analyses. First we include only the dependent variable and *BOARDTEN* in the model, and in the second, we also include *SQ.BOARDTEN*. The reason for excluding the control variables is to attempt to secure the explanatory power from the main variables alone. The result in column 1 indicates that *BOARDTEN* provides explanatory power to the model since it is significant at a 1% level. As previously noted in section 5.2, the correlation between *TOBIN* and *BOARDTEN* is not significant, hence the results from column 1 contradict our findings in table 3. However, when including both explanatory variables, the significance is lost and we cannot draw any conclusions about the contribution of the variables in the model.

Following Huang & Hilary (2018), to provide a graphical interpretation of our results, we regress *TOBIN* on the control variables (excluding *BOARDTEN* and *SQ.BOARDTEN*) and plot the residual by using a locally weighted polynomial curve (i.e. LOWESS). The plot is found in Appendix 3, with the residual *TOBIN* on the y-axis and board tenure on the x-axis. While this plot does not provide any distribution of the data points, nor any conclusions about the significance of the variables in our model, it does indicate that the value of residual *TOBIN* increases gradually, reaching a maximum of approximately 14 years. This is higher than previous research, where the maximum has been found to be around 8 years (Huang & Hilary, 2018).

Table 5. Regression results

Variables	Expected sign	(1) TOBIN	(2) TOBIN	(3) TOBIN	(4) TOBIN	(5) TOBIN
<i>BOARDTEN</i>	+	0.0748*** (0.000)	0.0633 (0.513)	0.0709 (0.575)	0.0329 (0.660)	-0.0693 (0.573)
<i>SQ.BOARDTEN</i>	-		0.000751 (0.903)	-0.00631 (0.279)	0.00435 (0.256)	0.00344 (0.368)
<i>STD.BOARDTEN</i>	+			0.295 (0.213)	-0.0953 (0.432)	0.179 (0.480)
<i>CEOCHAIR</i>	-			0.0596 (0.673)	0.155 (0.119)	0.203** (0.036)

(Continued)

Table 5 - Continued

<i>BOARDSIZE</i>	-			0.0760*** (0.000)	0.00298 (0.882)	-0.00158 (0.936)
<i>LAGROA</i>	+			2.118*** (0.000)	0.860** (0.016)	1.128*** (0.000)
<i>RETURN</i>	+			0.0944 (0.493)	-0.0587 (0.381)	0.117 (0.173)
<i>LEV</i>	-			-0.0599 (0.841)	-0.875** (0.009)	-0.566 (0.088)
<i>FIRMSIZE</i>	+/-			-0.579*** (0.000)	-0.161** (0.048)	-0.384*** (0.000)
<i>GW</i>	-			-0.639* (0.037)	-0.0219 (0.959)	0.383 (0.358)
<i>CAPEX</i>	+			0.675 (0.594)	-0.930 (0.370)	-1.444 (0.159)
Constant		1.271*** (0.000)	1.310*** (0.000)	6.924*** (0.000)	3.394*** (0.000)	6.076*** (0.000)
Nr of obs.		756	756	707	707	707
Adj. R-sq		0.016	0.015	0.225	0.839	0.852
Year fixed effects		NO	NO	NO	NO	YES
Firm fixed effects		NO	NO	NO	YES	YES

*Note: This table presents the results for five regressions of our main model. Column (1) is an univariate analysis of the dependent variable and BOARDTEN. Column (2) is an analysis including both BOARDTEN and SQ.BOARDTEN. Column (3)-(5) are our main regression including all variables, testing for differences when including firm fixed effects and year fixed effects. The coefficients are the beta estimates, and p-values are reported in parentheses. All continuous variables are winsorized at the top and bottom 1 percent of their distributions. *, **, and *** indicate the significance of the coefficients at levels of 0.1, 0.05, and 0.01, respectively.*

5.3.2 Regression results of the moderating effect of CSR - interaction terms

In table 6 column 1, we test for the direct effect of CSR performance. The results indicate that CSR has a direct positive significant impact on the dependent variable at a 1% significance level. However, the significance is lost when controlling for firm and year fixed effects, as seen in column 2. These results indicate that across firms, increasing values of CSR performance are associated with increasing values of *TOBIN*, but a similar relationship between these variables cannot be established within firms when controlling for fixed effects.

When analyzing the moderating effect on a curvilinear relationship, we investigate both the direction and the strength of the moderation. Regarding the direction, it is essential to include two interaction terms and interpret these in isolation (Dawson, 2014). We therefore include one

interaction term for the original form of board tenure and CSR score ($BOARDTEN*CSRscore$) and one for the quadratic form of board tenure and CSR score ($SQ.BOARDTEN*CSRscore$). To further examine the strength of the moderation, we conduct an F-test (Dawson, 2014). The results regarding (1) the direction and (2) the strength of the moderating effect are elaborated on and presented below.

First, the sign of the coefficient of the second interaction term, $SQ.BOARDTEN*CSRscore$ (β_5), tells us the direction of the moderating effect (Dawson, 2014), specifically in what direction $CSRscore$ moderates the curvilinear portion of the relationship between $TOBIN$ and $BOARDTEN$. Since we hypothesize a positive moderating effect of CSR performance, we predict the sign for $SQ.BOARDTEN*CSRscore$ to be positive (Dawson, 2014). However, since the coefficient β_5 is not statistically significant, we cannot conclude in what direction $CSRscore$ moderates the curvilinear portion of the relationship between $TOBIN$ and $BOARDTEN$.

Second, in order to examine the strength of the moderating effect of $CSRscore$, we jointly test the coefficients for $BOARDTEN*CSRscore$ (β_4) and $SQ.BOARDTEN*CSRscore$ (β_5). Specifically, we conduct an F-test between the regression models (the complete model and the restricted model without the interaction terms, $BOARDTEN*CSRscore$ and $SQ.BOARDTEN*CSRscore$). The F-test compares the predictive power of the restricted model with the predictive power of the unrestricted model (Dawson, 2014). The results of the F-test are presented in table 7 and we find that the F-test is significant at the 1% significance level. This indicates that the strength of the relationship between firm performance and average board tenure is moderated by the value of $CSRscore$, in line with our predictions.

Table 6. Regression results for the moderating effect of CSR using interaction terms

Variables	(1) TOBIN	(2) TOBIN	(3) TOBIN	(4) TOBIN	(5) TOBIN
<i>CSRscore</i>	0.0111*** (0.001)	-0.00194 (0.493)	0.0165 (0.531)	0.00801 (0.738)	0.0136 (0.588)
<i>BOARDTEN*CSRscore</i>			-0.00453 (0.480)	-0.00171 (0.758)	-0.00418 (0.478)
<i>SQ.BOARDTEN*CSRscore</i>			0.000454 (0.206)	0.000178 (0.569)	0.000280 (0.406)

(Continued)

Table 6 – Continued

<i>BOARDTEN</i>	0.141 (0.573)	0.168 (0.459)	0.263 (0.499)	0.147 (0.639)	0.435 (0.283)
<i>SQ. BOARDTEN</i>	0.00280 (0.796)	-0.00402 (0.610)	-0.0199 (0.352)	-0.00888 (0.641)	-0.0201 (0.324)
<i>STD.BOARDTEN</i>	-0.428 (0.338)	-0.181 (0.709)	-0.167 (0.697)	-0.161 (0.567)	-0.259 (0.606)
<i>CEOCHAIR</i>	1.316** (0.006)	0.0682 (0.898)	1.676*** (0.000)	0.554 (0.522)	0.745 (0.402)
<i>BOARDSIZE</i>	0.116** (0.004)	-0.0463 (0.337)	0.0964** (0.014)	-0.0212 (0.605)	-0.0364 (0.465)
<i>LAGROA</i>	5.892*** (0.000)	-0.567 (0.488)	4.798*** (0.000)	-0.717 (0.421)	-0.531 (0.533)
<i>RETURN</i>	0.201 (0.522)	-0.0284 (0.889)	0.304 (0.305)	-0.333 (0.082)	-0.0227 (0.913)
<i>LEV</i>	1.253** (0.025)	-3.682*** (0.001)	0.712 (0.202)	-1.726 (0.060)	-3.391** (0.004)
<i>FIRMSIZE</i>	-0.306*** (0.000)	-0.771** (0.004)	-0.269*** (0.001)	-0.297 (0.233)	-0.829** (0.003)
<i>GW</i>	-0.461 (0.544)	2.098 (0.057)	0.0109 (0.989)	2.232* (0.048)	2.121 (0.057)
<i>CAPEX</i>	-5.607 (0.081)	-3.915 (0.371)	-5.141 (0.106)	-0.202 (0.964)	-3.795 (0.405)
Constant	1.477 (0.373)	10.46*** (0.000)	1.937 (0.321)	4.970 (0.079)	9.842** (0.002)
Nr of obs.	99	99	99	99	99
Adj. R-sq	0.408	0.888	0.481	0.857	0.885
Year fixed effects	NO	YES	NO	NO	YES
Firm fixed effects	NO	YES	NO	YES	YES

*Note: Column (1) provides the result for the direct effects of CSR. Column (2) is the same as Column (1), including fixed effects. Column (3)-(5) provides the result for testing the moderating effect including the interaction terms independently, with firm- and year fixed effects, separately and jointly. The coefficients are the beta estimates, and p-values are reported in parentheses. All continuous variables are winsorized at the top and bottom 1 percent of their distributions. *, **, and *** indicate the significance of the coefficients at levels of 0.1, 0.05, and 0.01, respectively.*

Table 7. Result for F-test

- (1) $BOARDTEN * CSRscore = SQ. BOARDTEN * CSRscore = 0$
 - (2) $BOARDTEN * CSRscore = 0$
- F (2, 84) = 7.05
Prob > F = 0.0015

Relating our findings to our second hypothesis, we hypothesize that the relationship between average board tenure and firm performance is positively moderated by CSR performance. As noted

above, our data provides evidence that the strength of this relationship is moderated by *CSRscore*. However, we cannot draw any conclusions on the form or direction of this effect. Since we specifically hypothesize that there is a positive moderating effect, our results do not provide enough evidence to reject our second null hypothesis.

5.3.3 Regression results of the moderating effect of CSR - median split samples

Next, we carry out a median split sample test, this approach is an alternative to the test carried out in section 5.3.2. The moderating effect is evaluated by comparing the magnitude of the coefficients of the independent variables of interest. Since we hypothesize a positive moderating effect of *CSRscore* on the relationship between average board tenure and firm performance in H_2I , we want to observe higher statistically significant values of the coefficients for *BOARDTEN* and *SQ.BOARDTEN* for the observations in the “High CSR performance” group. As noted by Ayala (1983), comparing the coefficients for the same predictors across two separate regressions is incorrect without testing for the significance of the difference. Therefore, to draw conclusions about the relative magnitude in the value of the coefficients, we include the p-value for the difference. Specifically, we test the null hypothesis that both coefficients are the same against the alternative.

Table 8 provides the regression results from the median split sample analysis. Neither of the results from the two regressions are significant and the p-values of the difference in coefficients are likewise non-significant. Hence, the results from the median split sample regression do not provide evidence that CSR is moderating the relationship between board tenure and firm performance. We note that some caution must be made regarding the fit of the median split sample approach in relation to our data and model specifications. First, Aiken & West (1991) declare that when conducting a median split sample analysis on a continuous variable, valuable information is thrown away, reducing the power of the statistical test. This makes it harder to detect significant effects even though they may actually prevail (Cohen, 1983). Thus, examining an interaction effect of any magnitude, a substantially larger sample of firm year observations will be required when the median split sample approach is used (Aiken and West, 1991). Given that we have a relatively small sample, this effect may be especially pronounced. Second, Iacobucci et al. (2015) further conclude median splits can result in type I errors when the independent variables are highly

correlated. With the presence of multicollinearity in our model (section 5.5.1), this might be evident in our median split sample results.

However, regarding the robustness of these results, we still conclude that the median split sample method validates that our original test in section 5.3.2 is reliable, since the results still do not offer support to reject our second null hypothesis.

Table 8. Regression results for the moderating effect of CSR using split samples

Variables	High CSR performance		Low CSR performance		Test of Difference in Coefficients <i>p</i> -values
	(1)	TOBIN	(2)	TOBIN	
<i>BOARDTEN</i>	0.00590 (0.987)	-0.415 (0.247)	-0.421 (0.131)	0.0619 (0.703)	0.2721
<i>SQ.BOARDTEN</i>	0.00493 (0.730)	0.00308 (0.726)	0.0225 (0.055)	-0.00793 (0.394)	0.2684
<i>STD.BOARDTEN</i>	0.176 (0.732)	0.720 (0.296)	-0.188 (0.696)	0.360 (0.218)	
<i>CEOCHAIR</i>	3.743*** (0.000)	0 (.)	-0.270 (0.680)	-0.123 (0.561)	
<i>BOARDSIZE</i>	0.0815 (0.244)	0.0365 (0.688)	0.0822 (0.052)	-0.00800 (0.813)	
<i>LAGROA</i>	3.554 (0.075)	-0.628 (0.270)	3.854 (0.137)	-3.047 (0.144)	
<i>RETURN</i>	-0.481 (0.378)	-0.939 (0.080)	0.519 (0.181)	0.0225 (0.930)	
<i>LEV</i>	1.790** (0.036)	-1.685 (0.151)	-1.196 (0.203)	-4.701*** (0.000)	
<i>FIRMSIZE</i>	-0.133 (0.278)	2.096 (0.156)	-0.263* (0.024)	-0.145 (0.279)	
<i>GW</i>	1.620 (0.324)	2.875 (0.089)	0.580 (0.675)	1.223 (0.788)	
<i>CAPEX</i>	-5.423 (0.194)	-6.262 (0.070)	11.54** (0.021)	-2.880 (0.157)	
Constant	1.099 (0.586)	-18.69 (0.207)	5.262* (0.017)	5.156*** (0.000)	
Nr of obs.	49	49	50	50	
Adj. R-sq	0.655	0.858	0.573	0.941	
Year fixed effects	NO	YES	NO	YES	
Firm fixed effects	NO	YES	NO	YES	

Note: Column (1) provides the regression result for the high performing CSR firms. Column (2) is consistent with Column (1), with inclusion of fixed effects. Column (3) provides the regression results for the low performing CSR firms and Column (4) includes fixed effects. The last column compares the difference in coefficients across the two subsamples using *p*-values. The coefficients are the beta estimates, and *p*-values are reported in parentheses. *, **, and *** indicate the significance of the coefficients at levels of 0.1, 0.05, and 0.01, respectively.

5.4 Goodness-of-fit

Additionally, we study the goodness-of-fit in our models using adjusted R-squared. We consider adjusted R-squared when examining our model rather than R-squared, since adjusted R-squared adjusts the statistics based on the number of independent variables included. We observe that our regression models for investigating both H_1I and H_2I have adjusted R-squared values over 0.8 when controlling for firm and year fixed effects. This suggests that over 80% of the variation in our output variable is explained by the input variables. However, due to the lack of significance in our explanatory variables, obtaining as high levels of adjusted R-squared as we do is not statistically accurate. This suggests that errors in our model persist.

5.5 Additional analysis

In section 5.3 we find that there is no evidence in our data that a quadratic relationship between board tenure and firm performance prevails. Likewise, we do not find that CSR has a positive moderating effect on the relationship between the dependent variable *TOBIN* and the independent variables *BOARDTEN* and *SQ.BOARDTEN*. We want to validate these findings further by conducting several robustness tests.

5.5.1 Testing for multicollinearity and heteroskedasticity

In table 3, we observe that our three variables *BOARDTEN*, *SQ.BOARDTEN* and *STD.BOARDTEN* are highly correlated with values of over 0.9. Consequently, we examine the possibility that our research model suffers from multicollinearity. According to Farrar & Glauber (1967) multicollinearity exists when two or more control variables in a multiple regression are highly correlated, which leads to problems when interpreting results from statistical tests. Presence of multicollinearity does not make the model invalid, however, it makes the contribution of an independent variable harder to distinguish. As done in the original model by Huang & Hilary (2018), we include the following three variables in our first regression model: *BOARDTEN*, *SQ.BOARDTEN* and *STD.BOARDTEN*. These three are all interlinked since they are variations of the same variable and are highly correlated, as seen in table 3. In order to account for the potential issue of multicollinearity, a variance of inflation (VIF) test is conducted on the variables in our first regression model (results are presented in Appendix 4). In general, VIF values under 10 are deemed acceptable (Woolridge, 2012). We find that our model suffers from multicollinearity

because the VIF values for our three variations of average board tenure are well above 10. Therefore, we modify our model by removing the variable *STD.BOARDTEN*, the standard deviation of board tenure, and run the main regression again in order to investigate how our results are affected by the multicollinearity.

The regression results, excluding *STD.BOARDTEN*, are tabulated in Appendix 5. We do not find that our main conclusions from section 5.3 change, hence our results do still not provide any evidence that a quadratic relationship between average board tenure and firm performance prevails. We further conduct a second VIF test with the variables included in this regression and tabulate the results in Appendix 6. We still find that our model suffers from multicollinearity due to VIF values over 10, however, there is no possibility of excluding either *BOARDTEN* or *SQ.BOARDTEN* since both of these variables are required in the model to examine H_{11} and H_{21} .

Next, we consider the presence of heteroskedasticity in our model. Heteroskedasticity does not affect the estimation of coefficients, but can result in wrong conclusions about their significance due to biased variances of the error term. One way to mitigate, but not completely eliminate heteroskedasticity, is scaling the independent variables by total assets (Kmenta, 1986), which we have done in the majority of our control variables. To examine whether heteroskedasticity is still an issue in our model, we run a Breusch-Pagan test for heteroskedasticity on both equation 1 and 2. The null hypothesis is homoskedasticity (i.e constant variance in the error terms). The results are presented in Appendix 7, with a resulting p-value for equation 1 of 0.0000 and 0.0133 for equation 2. Hence, we are able to reject the null hypothesis of constant error variances in both equations, implying that heteroskedasticity is present in the model. As a result, we run the OLS regressions in this paper using robust standard errors to reduce the potential problems heteroskedasticity might cause.

5.5.3 ROA as dependent variable

Furthermore, we want to examine if our choice of using *TOBIN* as our measure for firm performance can alter our conclusions about the first hypothesis. To mitigate any concerns that our conclusions are driven by our choice of proxy for firm performance, we re-estimate our first regression with *ROA* instead of *TOBIN* as the dependent variable, holding the other model

specifications constant. The results are presented in Appendix 8 and indicate a significant coefficient for the *BOARDTEN* and the *SQ.BOARDTEN* at the 1% and 5% levels respectively, with the expected signs. However, this significance is lost when including firm- and year fixed effects. Thus, this provides further validation to our findings that the data does not support an inverted U-shaped relationship between board tenure and firm performance when conducting a within-panel analysis. Note that we exclude the variable *STD.BOARDTEN* in this regression due to the previously discussed problem of multicollinearity.

5.5.4 Industry fixed effects

Previous research suggests that industry characteristics can drive commonality in firm valuation (e.g., Bebchuk & Peyer, 2011). To address this question and mitigate concerns that our results are driven by industry specific characteristics, we control for industry fixed effects in our main regression model (results are tabulated in Appendix 9). Consistent with our previous results, the regression including industry fixed effects are insignificant and thus our first null hypothesis cannot be rejected.

5.6 Summary of findings

To summarize, our data does not support H_{1I} - that a curvilinear relationship between board tenure and firm performance prevails. This result is robust when re-estimating the regression with *ROA* as a proxy of firm performance, when controlling for industry fixed effects and when investigating the problem of multicollinearity and heteroscedasticity.

As for H_{2I} , our conclusions regarding the moderating effect of CSR are less straightforward. In our first analysis using interaction terms to examine the moderation of CSR, we find that CSR performance moderates the strength of the relationship between board tenure and firm performance, however, we cannot draw any conclusions about the form or direction of this effect. Given that we specifically hypothesize a positive moderating direction, we conclude that our second null hypothesis cannot be rejected. This conclusion holds when using a median split sample test.

6 Discussion

As demonstrated in the previous section, it is apparent that our data does not support a curvilinear association between average board tenure and firm performance. Our findings suggest that a higher level of board tenure is neither associated with higher or lower firm performance. Additionally, our results indicate that this relationship is not moderated by CSR performance. In this section, we discuss our results and consider any alternative explanations for our findings.

6.1 Data selection

As described in section 4.2, data has been removed within our delimitation (companies listed on Nasdaq Stockholm during the period 2007-2019) for two reasons: (1) the listed firm is not registered in Sweden and (2) the firm has unavailable board data. Our initial panel dataset of 4,875 firm-year observations was reduced by 3,865. The majority of this reduction in our dataset is particularly attributed to the unavailability of board data. As we noted in section 4.2, the missing values are more frequently found for smaller firms. Hence, our results are biased towards larger firms. In addition, the data was winsorized at the 1st and 99th percentile to eliminate any distortion in our results due to the effect of extreme outliers. These reductions may potentially have removed or affected relevant data points and thus impacted the significance of the study.

Our final sample contained an unbalanced panel dataset with 905 firm-year observations over 147 unique firms across the period 2007-2019. This can be analyzed as a relatively small sample size. To increase the dataset, one option could have been to extend the study to cover all the Nordic countries and/or other exchange platforms. This was concluded to be outside the delimitation of this paper because of the legal differences concerning independence and composition of the board of directors between other Nordic countries. We also noted a lack of data availability on tenure length on other exchange platforms. When testing H_2I , we impose a further restriction on the dataset. Specifically, each firm-year observation must be linked to a CSR score to test the moderating impact on the hypothesized relationship between board tenure and firm performance. This significantly reduced the dataset from 905 to 156 firm-year observations. Evidently, not all firms report CSR score. This further exacerbates the issue of an already relatively small sample, as described above. Furthermore, our model utilizes a *CSRscore* variable that aggregates an average performance based on several categories. For our purposes, a CSR score category that

specifically targets corporate governance might have captured the hypothesized effect of ethical directors better. However, due to lack of data availability, this was deemed impossible.

The source of data should have an insignificant effect as it was collected from a reliable database who use the annual reports of firms as data source (Thomson Reuters database Eikon Refinitiv).

6.2 Issues relating to contextual differences

Although minor similarities can be found, overall, the results presented herein fail to support previous research. Nevertheless, the lack of a significant relationship between board tenure and firm performance on Swedish listed firms may have potentially interesting implications. One reason for the lack of support of the stated hypotheses could be due to contextual differences between certain board characteristics. As stated by Ho & Williams (2003), “under different socio-political and economic conditions, governance needs vary.” This highlights the contingency of board performance under different institutional contexts. To the best of our knowledge, all previous studies utilizing a curvilinear model to test the relationship between board tenure and firm performance has been carried out on the English-speaking countries where the Anglo-American governance model is employed (e.g., Huang & Hilary, 2018; Clements et al., 2020; Livnat et al., 2020). Hence, utilizing a similar model in a Swedish context without accounting for contextual differences may be problematic.

In relation to the Anglo-American markets, the Swedish system of corporate governance has been noted to be unique in the way it combines the Anglo-American “shareholder” and European “stakeholder”¹ perspectives (Brunninge et al., 2007; Thorsell & Cornelius, 2009). For example, Sweden has a unitary single board, as in the Anglo-American model, but in contrast allows for employee representation on these boards when firms are of sufficient size. Executive directors are also much less prevalent in the Swedish market (Brunninge et al., 2007). Further, Nordic listed companies have generally been early to implement high standards of transparency towards shareholders and other key stakeholders in their governance systems. In addition, Nordic companies rank among the highest performing in all aspects of disclosure of information (Lekvall,

¹The “European” model of corporate governance constitutes not only a board of directors, but also a supervisory board. Moreover, in a selection of European countries this also includes employee representatives. Therefore, the European model takes a stakeholder perspective – the board of directors are responsible not only to shareholders, but to a broader spectrum of interested parties.

2009). Arguably, employee representatives, a higher relative share of non-executive directors and global top standards for board transparency would all suggest that entrenchment is less prevalent altogether in Sweden than in an Anglo-American context. In our regression, this could therefore suggest that a curvilinear approach is less feasible in Sweden. This is because the negative component of the association (driven by entrenchment) would be harder to identify, suggesting that a linear regression in line with the expertise hypothesis would be more suitable.

6.3 Issues relating to measuring board effectiveness

6.3.1 Board independence

One possible reason behind the unobserved significance is that our model does not make any distinction between the legal definitions of insider and outsider (independent) directors. This is due to the lack of data. Livnat et al. (2020) conclude that it is essential to make a distinction between inside and outside directors, highlighting that various board roles require different attributes. In Sweden, an inside director is by definition either representing the interest of a major shareholder or is dependent towards the firm. For the outside directors, impartial monitoring and independence is demanded. Thus, evaluating the dynamic effects that entrenchment has on independence has mostly been conducted on directors classified as “outside” (eg., Livnat et al., 2020; Huang & Hilary, 2018). This is because inside directors cannot by definition be independent at any point over the tenure. Since the monitoring duties mainly fall on outside directors, independence tells less about the effectiveness of the inside directors (Livnat et al., 2020). This could explain the weak association between squared board tenure and firm performance in our regression, since we do not isolate the regression on outside directors.

6.3.2 Aggregation of board tenure

It is also important to note that our focus is on the effect of tenure on the aggregate board level. However, this aggregation could be problematic since each individual director faces a knowledge-independence tradeoff. In the organizational behavior literature, various results (e.g., Szulanski & Jensen, 2006; van Knippenberg & Schippers, 2007), stress that one effect of group diversity in a certain board characteristic is intra-group learning. For our purposes, this could imply that the diversity in board tenure rather than average board tenure reflect the effect on firm performance. This is because having a widespread in tenure would lead to intra-group learning and hence board

effectiveness. Experienced directors may complement their competencies with less experienced independent directors and vice versa. To mitigate this concern, we controlled for the standard deviation in board tenure among individual directors. However, it could be that the standard deviation is not properly capturing this intra-group learning effect.

6.4 Issues relating to measuring ethical boards

Our theoretical mechanism behind H_{2I} is such that a high ethical culture of the firm will limit the entrenchment of the board and thus improve firm performance. Prior literature has linked CSR performance to an ethical culture (e.g., Jones, 1995; Kim et al., 2012). Hence, we use *CSRscore* as a proxy for ethical culture. However, the viability of *CSRscore* as a proxy in our model may be subject to discussion. As noted by Kim et al. (2012), CSR practices can be linked to the pursuit of self-serving agendas. Hemingway & Maslagan (2004) find that a manager might engage in CSR practices to disguise corporate misconduct. If directors use CSR activities as “window dressing” in the pursuit of other agendas, then they are likely to mislead shareholders and other legitimate stakeholders, rather than effectively monitor their interests. If these predictions hold, the level of entrenchment would not be improved by a high *CSRscore*. In turn this may explain our lack of significance of the interaction term. In line with this, it may be argued that other proxies for measuring an ethical culture would have been more viable in our model. However, as noted by Guo & Chan (2016), given the intangible nature of corporate culture, the quantification of corporate culture remains a difficult empirical exercise. To test the relationship between corporate culture and firm performance, primarily survey- and case-based approaches have been used. This has been more suitable for cross-sectional datasets, as these approaches primarily extract specific cultural traits with current-year performance. While this approach is interesting, it would have not been plausible for this study using a panel dataset.

Finally, the lack of significance could potentially also be explained by the lack of spread in the CSR term. Sweden is considered to be a top-performer with respect to CSR initiatives on a firm-basis (Potter, 2020). Hence, the firms with a relatively low CSR-score in our dataset may be high-performing in other contexts, where prior studies have tested similar interactions. This could imply that our spread in CSR scores is not large enough to statistically conclude any moderating effect.

6.5 Endogeneity concerns

Studying the association between board composition and firm performance may raise endogeneity concerns. As noted by Huang & Hilary (2018), identifying the effect of tenure on firm valuation is empirically challenging because of the endogenous relationship between governance structure and corporate outcome. For instance, despite the large body of research on board independence, there is rather little evidence of any direct link between board independence and measures of financial performance (Shivdasani & Zenner, 2004). A plausible explanation for this limited empirical evidence is the endogeneity of board selection (Rosenstein & Wyatt, 1990). It could for example be problematic to estimate the marginal effect of one single board characteristic if multiple aspects are jointly tested (Huang & Hilary, 2018).

To mitigate these concerns, we have used lead-lag specifications by measuring the dependent variables at year t and all independent variables at $t-1$. However, it may still be that the causal nature is in fact working in the opposite direction - a firm with a low financial performance could potentially not attract new directors to replace existing directors, hence staying longer than the optimal. Conversely, firms with a high financial performance might find it easier to systematically recruit new directors.

We believe that some further extensions of the analysis could have been interesting to mitigate these endogeneity concerns even further. For example, a difference-in-difference approach where the treatment group is exposed to an exogenous shock in board tenure during the period 2007-2019. As suggested by Huang & Hilary (2018), deaths of directors arguably represent an exogenous shock to the average board tenure, which is reasonably uncorrelated with firm performance itself. However, we would only expect a positive effect on firm performance if the post-death average board tenure is closer to the optimal level. While we cannot infer an optimal level on our data given our insignificant results, previous studies have found the optimal level to be around eight years (Huang & Hilary, 2018; Clements et al., 2018). Given an optimal level of board tenure, we would therefore need to specifically examine a treatment group where the post-death average tenure is closer to this optimal. If the post-death average board tenure instead results in a departure from this optimal level, we would predict a lower performance than the control group. *TOBIN* as a measure of performance could favorably be altered since the variable is based

on fiscal year-end figures. This is because a company is likely to adjust for the short-term shock in board tenure before the end of the year, making the effect more difficult to interpretate. Stock returns following the announcement of the death is an interesting alternative, as suggested by Huang & Hilary (2018). In addition, the treatment effect will be seen in multiple time periods since deaths happen non-simultaneously. This will make the test more complex than the traditional difference-in-difference setup (Callaway et al., 2018). With these caveats in mind, we argue that a difference-in-difference approach by studying the effect on firm performance in response to a director's death provides a precise test for the direction of causality. If the observed relationship between tenure and performance reflects an optimal level of board tenure, then any departure from that optimal level will lead to negative firm performance outcomes. This would contradict the reverse causality argument that low firm performance leads to prolonged board tenure.

We compiled a sample of director deaths by manually searching Retriever and company websites for press releases announcing the death of the director in the period 2007-2019. In total, we arrived at a total of 15 deaths in our sample. Arguably, this lack of observations is natural given the already relatively small sample using Swedish firms compared to the Anglo-American dataset utilized by Huang & Hilary (2018). Further, this method assumes that death is perceived as unexpected by the market (Huang & Hilary, 2018). Our lack of observations, coupled with the difficulty of classifying the death as “sudden” rather than “expected”, lead us to conclude that such an analysis would not be possible given the scope of this thesis, but still represents an interesting obstacle to overcome in future research.

7 Suggestions for further research

In this report, we have examined the relationship between board tenure and firm performance, as well as the moderating effect of CSR performance for Swedish listed firms. After discussing the interpretation of our results, we will now suggest certain areas that could serve as suggestions for further research.

We have found no statistical significance between board tenure and firm performance in our data. However, we have used a curvilinear model that has been developed for studies on Anglo-American data. Researchers have noted several contextual differences that sets the Swedish market

apart from the Anglo-American markets. Since these contextual differences may point toward a lower level of entrenchment, it would be interesting to instead study how a linear model more in line with the expertise hypothesis would behave with Swedish data. It may also be interesting to isolate a future study on outside directors, whose efficiency is more driven by independence than inside directors. It may be interesting to control for different variables in our main regression, since national differences in firm performance predictors could mean that other variables should be considered.

In our study, we have used *CSRscore* as a proxy for an ethical culture. However, it may be that CSR practices are a “window dressing” tool to drive self-serving agendas, which would make *CSRscore* a less suitable proxy for an ethical culture at the board level. Although measuring corporate culture is a difficult empirical exercise, it may be interesting to disentangle a more suitable proxy for ethical culture at the board level. A first step might be to utilize a CSR-score that specifically targets corporate governance, rather than an aggregate score over several categories. Further, narrowing down the analysis over different industries might be instructive, since “window dressing” CSR has been found to be especially prevalent in certain industries (Arminen et al., 2018).

Finally, our dataset is limited and is thus a promising area to further develop in future studies. As noted in section 3.1, the data available on both average board tenure and CSR score in the Eikon database are mostly for large, listed Swedish firms, hence our dataset and conclusions are biased towards larger firms. For the *CSRscore* variable, the increased attention to CSR and new legislation toward mandatory disclosure will most likely result in more observations in future studies, thus enabling larger datasets with smaller firms included.

8 Conclusion

This paper investigates whether the average board tenure of Swedish listed firms follows a curvilinear U-shaped association with firm performance. We also examine whether CSR performance moderates this relationship in a positive manner. On the one hand, the entrenchment hypothesis expects that long-tenured directors will be less efficient as independent monitors of the firm. On the other hand, the expertise hypothesis argues that a director will acquire more firm-

specific knowledge as the tenure increases. Utilizing a curvilinear regression model in line with recent papers on the area, we examine whether board tenure follows an inverted U-shaped relationship with board tenure while controlling for a range of firm-performance predictors. We find that our data does not support any curvilinear association between board tenure and firm performance. To the best of our knowledge, this stands in contrast to prior studies utilizing a curvilinear model to test the association between board tenure and firm performance outcomes (e.g., Huang & Hilary, 2018; Veltorp, 2018; Clements et al., 2018). However, we note that there are a limited number of prior studies testing this relationship, suggesting that further research is still needed. We further discuss that the lack of association could be attributed to contextual differences, various measurement difficulties and a small sample size.

Regarding the moderating impact of CSR performance, we hypothesize that ethical behavior, which is reflected by the CSR performance, alleviates the proposed loss of board efficiency due to entrenchment. Therefore, *CSRscore* may positively moderate the relationship between board tenure and firm performance. By interacting *CSRscore* with board tenure, we do not find evidence for any significant moderating effect.

Our study is, to the best of our knowledge, the first to test the curvilinear association between board tenure and firm performance in a Swedish context. Following recent calls for establishing tenure limits on the board of directors, a curvilinear relationship would imply an optimal level of board tenure after a given number of years, after which the effectiveness of the director decreases. This would suggest that tenure limits are an efficient legislative tool and give warranty to this international trend. However, given our insignificant results, we can neither reject nor support the legal limits on board tenure. Nevertheless, we hope that our study sheds light on the additional research needed to assess these claims in a Nordic context.

References

- Adams, R.B. & Ferreira, D. 2007, "A theory of friendly boards", *Journal of Finance*, vol. 62, no. 1, pp. 217-250.
- Ahmad, N.B.J., Afzalur, R. & Jeff, G. 2017, "Board independence and corporate social responsibility (CSR) reporting in Malaysia", *Australasian Accounting, Business and Finance Journal*, vol. 11, no. 2, pp. 61-85.
- Aiken, L. S., & West, S. G. 1991, *Multiple regression: Testing and interpreting interactions*, SAGE, pp. 4-10.
- Arminen H., Puumalainen K., Patari S. & Fellnhofer K. 2018, "Corporate social performance: Inter-industry and international differences", *Journal of Cleaner Production*, vol. 177, pp. 426- 437.
- Ayala, C. 1983, "Comparing Regression Coefficients Across Subsamples", *Sociological Methods & Research*, vol. 12, no. 1, pp. 77-94.
- Beasley, M.S. 1996, "An empirical analysis of the relation between the board of director composition and financial statement fraud", *The Accounting Review*, vol. 71, no. 4, pp. 443-465.
- Bebchuk, L.M., Cremers & U.Peyer. 2011, "The CEO Pay Slice", *Journal of Financial Economics*, vol. 102, no. 1, pp. 199-221.
- Bebchuk, L., Y. Grinstein, & U. Peyer. 2010, "Lucky CEOs and lucky directors". *Journal of Finance*, vol. 65, no. 6, pp. 2362–2401.
- Brunninge, O., Nordqvist, M. & Wiklund, J. 2007, "Corporate governance and strategic change in SMEs: The effects of ownership, board composition and top management teams", *Small Business Economics*, vol. 29, no. 3, pp. 295-308.
- Byrd, J., Cooperman, E.S. & Wolfe, G.A. 2010, "Director tenure and the compensation of bank CEOs", *Managerial Finance*, vol. 36, no. 2, pp. 86-102.
- Callaway, B. & Sant’Anna, P.H.C. 2018, "Difference-in-Differences with Multiple Time Periods and an Application on the Minimum Wage and Employment", *Working paper, Temple University*.
- Carroll, A. 1991, "The pyramid of corporate social responsibility: Toward the moral management of organizational stakeholders", *Business Horizons*, vol. 34, no. 4, pp. 39–48.

- Celikyurt, U., Sevilir, M. & Shivdasani, A. 2014, "Venture capitalists on boards of mature public firms", *Review of Financial Studies*, vol. 27, no. 1, pp. 56-101.
- Cheng, S. 2008, "Board size and the variability of corporate performance", *Journal of Financial Economics*, vol. 87, no. 1, pp. 157-176.
- Clements, C.E., Jessup, R.K., Neill, J.D. & Wertheim, P. 2018, "The relationship between director tenure and director quality", *International journal of disclosure and governance*, vol. 15, no. 3, pp. 142-161.
- Cohen, J., & Cohen, P. 1983, *Applied multiple regression/correlation analyses for the behavioral sciences (2nd ed.)*. Hillsdale. NJ: Lawrence, pp. 192.
- Coles, J.L., Daniel, N.D. & Naveen, L. 2008, "Boards: Does one size fit all?", *Journal of Financial Economics*, vol. 87, no. 2, pp. 329-356
- Cooper, D. & Thatcher, S. 2010, "Identification in organizations: The role of self-concept orientations and identification motives", *Academy of Management Review*, vol. 35, no. 4, pp. 516-538.
- Dawson, J.F. 2014, "Moderation in Management Research: What, Why, When, and How", *Journal of Business and Psychology*, vol. 29, no. 1, pp. 1-19.
- de Villiers, C., Naiker, V. & van Staden, C.J. 2011, "The effect of board characteristics on firm environmental performance", *Journal of Management*, vol. 37, no. 6, pp. 1636-1663.
- Dou, Y., Sahgal, S. & Zhang, E.J. 2015, "Should independent directors have term limits? The role of experience in corporate governance", *Financial Management*, vol. 44, no. 3, pp. 583-621.
- Erhard, N.L., Werbel, J.D. & Shrader, C.B. 2003, "Board of director diversity and firm financial performance", *Corporate Governance: An International Review*, vol. 11, no. 2, pp. 102-111.
- Fama, E. 1980, "Agency Problems and the Theory of Firms", *Journal of Political Economy*, vol. 88, pp. 288-307.
- Fama, E.F. & French, K.R. 1993, "Common risk factors in the returns on stocks and bonds", *Journal of Financial Economics*, vol. 33, no. 1, pp. 3-56.
- Farrar, D.E. & Glauber, R.R. 1967, "Multicollinearity in Regression Analysis: The Problem Revisited", *The Review of Economics and Statistics*, vol. 49, no. 1, pp. 92-107.

- Fassin, Y., & Gosselin, D. 2011, "The collapse of a European bank in the financial crisis: An analysis from stakeholder and ethical perspectives", *Journal of Business Ethics*, vol. 102, no. 2, pp. 169-191.
- Fracassi, C. & Tate, G. 2012, "External networking and internal firm governance", *Journal of Finance*, vol. 67, no. 1, pp. 153-194.
- Garriga, E. & Melé, D. 2004, "Corporate social responsibility theories: Mapping the territory", *Journal of Business Ethics*, vol. 53, no. 1-2, pp. 51-71.
- Grewal, R., Cote, J.A. & Baumgartner, H. 2004, "Multicollinearity and measurement error in structural equation models: Implications for theory testing", *Marketing Science*, vol. 23, no. 4, pp. 519-529+629.
- Guo, Z., Chan, K.C. & Xue, Y. 2016, "The Impact of Corporate Culture Disclosure on Performance: A Quantitative Approach", *Review of Pacific Basin Financial Markets and Policies*, vol. 19, no. 2.
- Harjoto, M., Laksmana, I. and Lee, R., 2015. "Board Diversity and Corporate Social Responsibility." *Journal of Business Ethics*, vol. 132, no. 4, pp. 641-660.
- Hemingway, C.A. & MacLagan, P.W. 2004, "Managers' personal values as drivers of corporate social responsibility", *Journal of Business Ethics*, vol. 50, no. 1, pp. 33-44.
- Ho, C.-. & Williams, S.M. 2003, "International comparative analysis of the association between board structure and the efficiency of value added by a firm from its physical capital and intellectual capital resources", *International Journal of Accounting*, vol. 38, no. 4, pp. 465-491.
- Huang, H. & Chi, W. 2005, "Discretionary Accruals, Audit Firm Tenure and Audit-Partner Tenure: Empirical Evidence from Taiwan", *Journal of Contemporary Accounting and Economics*, vol. 1, no. 1, pp. 95-92.
- Huang, S. & Hilary, G. 2018, "Zombie Board: Board Tenure and Firm Performance", *Journal of Accounting Research*, vol. 56, no. 4, pp. 1285-1329.
- Iacobucci, D., Posavac, S.S., Kardes, F.R., Schneider M.J., Popovich, D.L. 2015, "The median split: Robust, refined and revived", *Journal of Consumer Psychology*, vol. 25, no. 4, pp. 690-704.

- Jiang, L., Cherian, J., Sial, M.S., Wan, P., Filipe, J.A., Mata, M.N. & Chen, X. 2020, "The moderating role of CSR in board gender diversity and firm financial performance: empirical evidence from an emerging economy", *Economic Research-Ekonomska Istrazivanja*.
- Jo, H. & Harjoto, M.A. 2011, "Corporate Governance and Firm Value: The Impact of Corporate Social Responsibility", *Journal of Business Ethics*, vol. 103, no. 3, pp. 351-383.
- Jones, T.M. 1995, "Instrumental stakeholder theory: A synthesis of ethics and economics", *The Academy of Management review*, vol. 20, no. 2, pp. 404-437.
- Katz, D. & McIntosh, L.A. 2014, "Renewed focus on corporate director tenure", *New York Law Journal*.
- Kmenta, J. 1986., "Elements of Econometrics", 2nd edition, *New York, MacMillan Publishing Co., Inc.*
- Kim, Y., Park, M.S. & Wier, B. 2012, "Is earnings quality associated with corporate social responsibility?", *Accounting Review*, vol. 87, no. 3, pp. 761-796.
- Kuhnen, C. 2007, "Social Networks, Corporate Governance and Contracting in the Mutual Fund Industry.", *Working paper, Stanford Graduate School of Business*.
- Livnat, J., Smith, G., Suslava, K. & Tarlie, M. 2021, "Board tenure and firm performance", *Global Finance Journal*, vol. 47.
- Malmendier, U., Tate, G. & Yan, J. 2011, "Overconfidence and Early-Life Experiences: The Effect of Managerial Traits on Corporate Financial Policies", *Journal of Finance*, vol. 66, no. 5, pp. 1687-1733.
- Ortas, E., Álvarez, I., Jaussaud, J. & Garayar, A. 2015, "The impact of institutional and social context on corporate environmental, social and governance performance of companies committed to voluntary corporate social responsibility initiatives", *Journal of Cleaner Production*, vol. 108, pp. 673-684.
- Pascual-Fuster, B. & Crespí-Cladera, R. 2020, "Optimal board independence with gray independent directors", *BRQ Business Research Quarterly*, vol.17, no.1, pp. 1-17.
- Phillips, R., Freeman, R.E. & Wicks, A.C. 2003, "What stakeholder theory is not", *Business Ethics Quarterly*, vol. 13, no. 4, pp. 479-502+596+597+598.

- Rosenstein, S., & J. Whatt. 1990, "Outside Directors, Board Independence and Shareholder Wealth", *Journal of Financial Economics*, vol. 26, pp. 175–191.
- Shivdasani, A. & M. Zenner. 2004, "Best Practices in Corporate Governance: What Two Decades of Research Reveal", *Journal of Applied Corporate Finance*, vol. 16, pp. 29-41.
- Stuart, S. 2012, Spencer Stuart US Board Index, Spencer Stuart, New York, NY
- Szulanski, G. & Jensen, R.J. 2006, "Presumptive adaptation and the effectiveness of knowledge transfer", *Strategic Management Journal*, vol. 27, no. 10, pp. 937-957.
- Thorsell, A. & Cornelius, B. 2009, "Coercion, copy-cats, and colleagues: Staffing the board of the ipo company", *Corporate Ownership and Control*, vol. 7, no. 1 A, pp. 108-119.
- Vafeas, N. 2003, "Length of board tenure and outside director independence", *Journal of Business Finance & Accounting*, vol. 30, no. 7-8, pp. 1043-1064.
- Van Knippenberg, D. & Schippers, M.C. 2007, "Work group diversity", *Annual Review of Psychology*, vol. 58, pp. 515-541.
- Veltrop, D., Molleman, H., Hooghiemstra, R. & van Ees, H. 2018, "The relationship between tenure and outside director task involvement: A social identity perspective", *Journal of management*, vol. 44, no. 2, pp. 445-469.
- Woolridge, J. M. 2012, *Introductory Econometrics: A Modern Approach*. South-Western, Cengage Learning, Mason. pp. 268-278.
- Wahid, A. 2012, "Director Heterogeneity and Its Impact on Board Effectiveness." *Working paper, Harvard University*.
- Yermack, D. 1996, "Higher market valuation of companies with a small board of directors", *Journal of Financial Economics*, vol. 40, no. 2, pp. 185-211.

Online sources

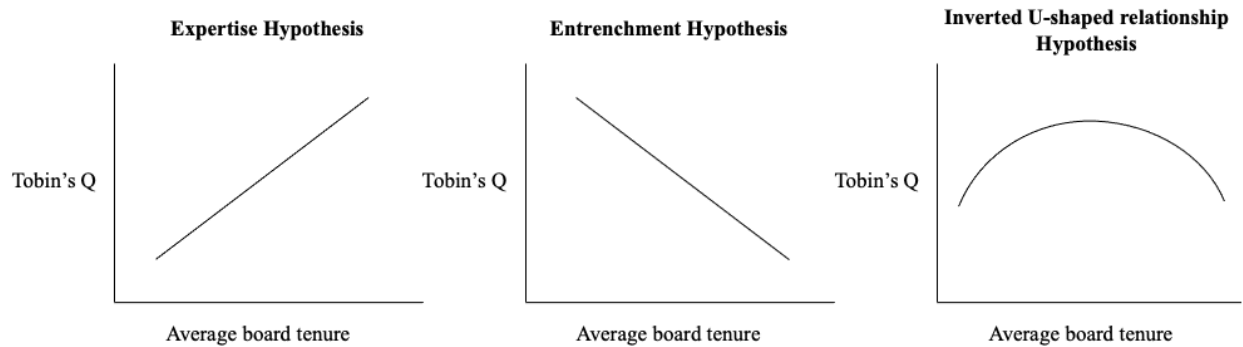
Lekvall, P., Birgisson, H., Leppälä-Nilsson, A., Würthner A., & Sigurdson H. (2009). CORPORATE GOVERNANCE IN THE NORDIC COUNTRIES. Retrieved March 27, 2021, from http://www.bolagsstyrning.se/userfiles/archive/294/nordic_cg_booklet_-_final_print_version_1.pdf

Potter, M. (2020). Are Nordic businesses more sustainability conscious? Retrieved 6 May 2020, from <https://www.neste.us/about-neste/news-inspiration/articles/are-nordic-businesses-moresustainability-conscious>

Pozen, R., & Hamacher, T. (2015). The Trend Towards Board Term Limits Is Based on Faulty Logic. Retrieved April 26, 2021, from <https://www.ft.com/content/b56f462c-0455-11e5-a5c3-00144feabdc0>

Appendix

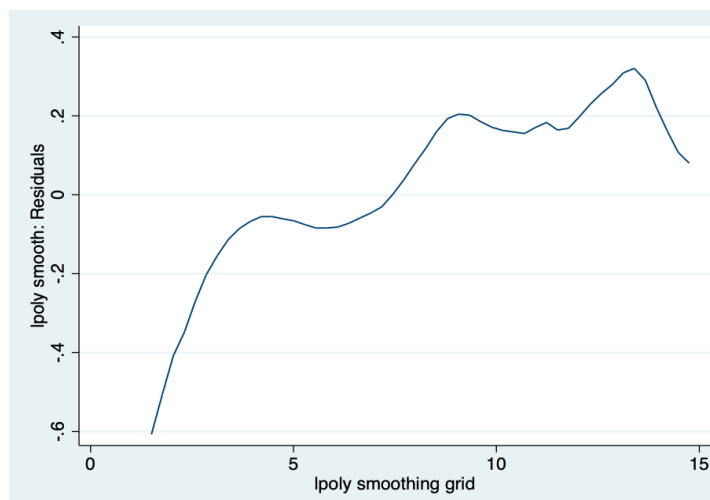
Appendix 1. Illustration of the expertise hypothesis, the entrenchment hypothesis and the inverted U-shaped relationship hypothesis.



Appendix 2. Description of sample distribution when controlling for data availability of board tenure in Swedish listed companies

Sample	Variables	Nr of obs	Mean	Std dev	Median	Min	Max
Full sample	<i>FIRMSIZE</i>	3877	7.80253	2.299078	7.670429	-3.033434	14.95823
	<i>Unique firms</i>	4770	159.5	91.80786	159.5	1	318
Final sample	<i>FIRMSIZE</i>	905	10.50495	1.59361	10.512	5.567581	14.95823
	<i>Unique firms</i>	905	80.91713	43.01614	84	1	147

Appendix 3. This figure plots the residual of *TOBIN* on board tenure. The residual of *TOBIN* is obtained by regressing *TOBIN* on the control variables (excluding *BOARDTEN* and *SQ.BOARDTEN*).



Appendix 4. VIF-test for the main regression

Variables	VIF	1/VIF
<i>BOARDTEN</i>	44.953	.022
<i>SQ.BOARDTEN</i>	23.623	.042
<i>STD.BOARDTEN</i>	23.331	.043
<i>FIRMSIZE</i>	1.274	.785
<i>BOARDSIZE</i>	1.228	.814
<i>GW</i>	1.145	.873
<i>CAPEX</i>	1.116	.896
<i>LAGROA</i>	1.097	.911
<i>CEOCHAIR</i>	1.091	.917
<i>LEV</i>	1.078	.927
<i>RETURN</i>	1.066	.938
Mean VIF	9.182	.

Appendix 5. Regression results excluding *STD.BOARDTEN*

Variables	(1) TOBIN	(2) TOBIN	(3) TOBIN
<i>BOARDTEN</i>	0.180 (0.051)	-0.00134 (0.982)	0.00631 (0.917)
<i>SQ.BOARDTEN</i>	-0.00616 (0.290)	0.00437 (0.254)	0.00307 (0.417)
<i>CEOCHAIR</i>	0.0647 (0.647)	0.153 (0.124)	0.202** (0.037)
<i>BOARDSIZE</i>	0.0753*** (0.000)	0.00467 (0.815)	-0.00224 (0.910)
<i>LAGROA</i>	2.137*** (0.000)	0.847** (0.017)	1.124** (0.002)
<i>RETURN</i>	0.0892 (0.517)	-0.0574 (0.391)	0.116 (0.175)
<i>LEV</i>	-0.0664 (0.824)	-0.894** (0.007)	-0.565 (0.089)
<i>FIRMSIZE</i>	-0.583*** (0.000)	-0.152 (0.060)	-0.393*** (0.000)
<i>GW</i>	-0.661** (0.031)	0.00293 (0.994)	0.379 (0.363)
<i>CAPEX</i>	0.640 (0.613)	-0.911 (0.380)	-1.425 (0.164)
Constant	6.210*** (0.000)	3.520*** (0.000)	5.717*** (0.000)

(Continued)

Appendix 5 – Continued

Nr of obs.	707	707	707
Adj. R-sq	0.224	0.839	0.852
Year fixed effects	NO	NO	YES
Firm fixed effects	NO	YES	YES

*Note: This table provides the regression results excluding the variable STD.BOARDTEN. Column (1) provides the results for testing across firms and across years. Column (2) and (3) provides the result including firm and year fixed effects. The coefficients are the beta estimates, and p-values are reported in parentheses. All continuous variables are winsorized at the top and bottom 1 percent of their distributions. *, **, and *** indicate the significance of the coefficients at levels of 0.1, 0.05, and 0.01, respectively.*

Appendix 6. VIF-test for regression excluding STD.BOARDTEN

Variables	VIF	1/VIF
BOARDTEN	23.618	.042
SQ.BOARDTEN	23.614	.042
STD.BOARDTEN	1.269	.788
FIRMSIZE	1.227	.815
BOARDSIZE	1.141	.876
GW	1.116	.896
CAPEX	1.097	.912
LAGROA	1.09	.917
CEOCHAIR	1.078	.928
LEV	1.065	.939
RETURN		
Mean VIF	9.182	.

Appendix 7. Breusch-Pagan test*Heteroscedasticity in Equation 1*

H₀= Constant covariance, F(11 , 695) = 8.45 Prob > F = 0.0000

Heteroscedasticity in Equation 2

H₀= Constant covariance, F(14 , 84) = 2.22 Prob > F = 0.0133

Appendix 8. Regression results - ROA as dependent variable

Variables	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROA
BOARDTEN	0.00651*** (0.000)	0.0142* (0.015)	0.0156*** (0.000)	0.00668 (0.354)	0.00740 (0.314)
SQ.BOARDTEN		-0.000505 (0.177)	-0.000711** (0.046)	-0.000338 (0.458)	-0.000436 (0.344)

(Continued)

Appendix 8 – Continued

<i>CEOCHAIR</i>			-0.0137 (0.111)	0.00636 (0.591)	0.00821 (0.485)
<i>BOARDSIZE</i>			0.00135 (0.290)	-0.00131 (0.581)	-0.00111 (0.643)
<i>LAGROA</i>			0.385*** (0.000)	-0.0672 (0.112)	-0.0582 (0.176)
<i>RETURN</i>			0.00745 (0.375)	0.0124 (0.119)	0.0322** (0.002)
<i>LEV</i>			0.0111 (0.540)	-0.0557 (0.160)	-0.0244 (0.547)
<i>FIRMSIZE</i>			-0.00264 (0.330)	-0.0173 (0.070)	-0.0253* (0.030)
<i>GW</i>			-0.0418* (0.025)	-0.0833 (0.099)	-0.0676 (0.183)
<i>CAPEX</i>			-0.0187 (0.808)	0.000437 (0.997)	-0.0248 (0.843)
Constant	0.0108 (0.235)	-0.0152 (0.476)	-0.0169 (0.616)	0.267** (0.007)	0.339** (0.003)
Nr of obs.	754	754	706	706	706
Adj. R-sq	0.035	0.036	0.221	0.388	0.408
Year fixed effects	NO	NO	NO	NO	YES
Firm fixed effects	NO	NO	NO	YES	YES

*Note: This table provides the results for the robustness test, using ROA as a dependent variable. Column (1) is an univariate analysis of the dependent variable and BOARDTEN. Column (2) is an analysis including both BOARDTEN and SQ.BOARDTEN. Column (3) presents the regression results. Column (4) and (5) provides the regression result including firm and year fixed effects. The coefficients are the beta estimates, and p-values are reported in parentheses. All continuous variables are winsorized at the top and bottom 1 percent of their distributions. *, **, and *** indicate the significance of the coefficients at levels of 0.1, 0.05, and 0.01, respectively.*

Appendix 9. Regression results controlling for industry fixed effects

	(1)	(2)	(3)	(4)
Variables	TOBIN	TOBIN	TOBIN	TOBIN
<i>BOARDTEN</i>	0.180 (0.051)	0.228* (0.013)	-0.00134 (0.987)	0.00631 (0.939)
<i>SQ.BOARDTEN</i>	-0.00616 (0.290)	-0.00926 (0.114)	0.00437 (0.483)	0.00307 (0.648)
<i>CEOCHAIR</i>	0.0647 (0.647)	0.188 (0.190)	0.153 (0.372)	0.202 (0.345)

(Continued)

Appendix 9 - Continued

<i>BOARDSIZE</i>	0.0753*** (0.000)	0.0515* (0.022)	0.00467 (0.844)	-0.00224 (0.898)
<i>LAGROA</i>	2.137*** (0.000)	1.950*** (0.000)	0.847 (0.052)	1.124 (0.067)
<i>RETURN</i>	0.0892 (0.517)	0.121 (0.373)	-0.0574* (0.035)	0.116 (0.130)
<i>LEV</i>	-0.0664 (0.824)	-0.00129 (0.997)	-0.894 (0.269)	-0.565 (0.537)
<i>FIRMSIZE</i>	-0.583*** (0.000)	-0.588*** (0.000)	-0.152 (0.063)	-0.393 (0.084)
<i>GW</i>	-0.661* (0.031)	-1.054** (0.002)	0.00293 (0.993)	0.379 (0.348)
<i>CAPEX</i>	0.640 (0.613)	-0.113 (0.929)	-0.911 (0.477)	-1.425 (0.176)
Constant	6.210*** (0.000)	6.379*** (0.000)	3.520*** (0.001)	5.717** (0.006)
Nr of obs.	707	707	707	707
Adj. R-sq	0.2244	0.2543	0.8391	0.8518
Industry fixed effects	NO	YES	YES	YES
Year fixed effects	NO	NO	YES	YES
Firm fixed effects	NO	NO	NO	YES

*Note: This table provides results for the robustness test when controlling for industry fixed effects. Colum (1) provides the results without fixed effects. Column (2)-(4) provides the regression result including industry-, firm-, and year fixed effects. The coefficients are the beta estimates, and p-values are reported in parentheses. All continuous variables are winsorized at the top and bottom 1 percent of their distributions. *, **, and *** indicate the significance of the coefficients at levels of 0.1, 0.05, and 0.01, respectively.*