Board Composition and Firm Value

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Abstract

This paper explores the relation between firm value and the composition of Board of Directors. Using a panel data set consisting of a sample of Swedish firms listed on the Stockholm Stock Exchange during the 2000–2020, we find that the fraction of female directors is positively related to firm value. We also document that firms with busy boards are negatively related to firm value. We document that stock ownership concentration by the chairperson and the CEO is positively related to firm value and profitability. The proposal from regulators to introduce mandated board gender balancing, as well as introduce limits of the number of appointments by directors should be aware of the empirical insights from our study.

1. Introduction

How to compose the board of directors (BoD) in a firm should be a first-order decision for shareholders as directors have various skills and can provide valuable advice and support to management in particular strategic actions. In addition, the BoD have an important monitoring function. The separation of ownership and control in primarily publicly listed firms with dispersed ownership can cause agency costs because of information asymmetry when management act in their own interests rather than with a focus on shareholder wealth. To mitigate potential agency costs, Jensen and Meckling (1976) suggest two mechanisms: the monitoring alignment and the incentive alignment. By appointing and increasing the number of independent directors with weak links to the Chief Executive Officer (CEO), information asymmetry between managers and shareholders can be reduced (the monitoring alignment). By providing various forms of stock ownership incentives to the managers, the goal is to push them to act in the interest of the firm's shareholders (the incentive alignment). Dicks (2012) claims that these two mechanisms are mutual substitutes and hence if remuneration and incentives to the CEO increase, monitoring by the BoD become less important. A recent topic discussed in a European context is the legislation to force gender diversity into corporate board rooms. If the outcome of such legislation is the appointment of less experienced directors, this may negatively impact the overall quality of the board. Nevertheless, presence of female directors can also reduce the network for male investors ("old boys"; see Croson and Gneezy, 2009; Adams and Funk, 2012; and Sila et al; 2016).

Prior literature on board characteristics has largely focused on board size (Yermack 1996; Raheja, 2005), gender diversity (Adams and Ferreira, 2009; Adams and Funck, 2012), busy board members (Ferris et al., 2003; Fitch and Shivdasani, 2006), the monitoring effect from institutional investors (Jiang and Liu, 2021; Agha and Hossain, 2021) and the impact of committees (Adams et al., 2021). The diversity and experience of BoDs, whether related to

gender, ethnicity, education or industry experience, can improve the quality of decision-making in a firm, for example, in projects related to an acquisition, can be fruitful and enhance firm value. However, if the BoD is associated with a high degree of heterogeneity, there is also a risk of greater conflicts and different opinions as well as more time-consuming board meetings.

Agency theory is based on the principal (the shareholders) and the agent (firm managers), where the latter can act in their own interest rather than that of the shareholders, and thereby cause agency costs (Fama and Jensen, 1983). These costs can be mitigated by active monitoring from the BoDs and institutional investors with large stockholdings. The monitoring function role, at a reasonable level, is thus pivotal to good corporate governance. Prior literature also highlights the risk for over-monitoring as it can harm the firm (Adams et al., 2010).

The CEO has the overall responsibility of managing the firm in the interest of its shareholders. The relation between the CEO and BoD is important, as the former can initiate a close relationship with the latter, which then can reduce the risk that the CEO will be replaced following bad firm performance. Adams and Ferreira (2009) show that a higher level of board diversity, specifically with female directors, is followed by a higher level of independence. Thus, a heterogenous BoD, represented by different specialists, is more likely to raise critical questions and take a stand against proposals from the management and the CEO.

Nonetheless, the evidence of stock ownership by the CEO and directors and links to corporate events have received less attention; to the best of our knowledge, only an early study by Kesner (1987) has investigated this issue. Stock ownership by directors and changes in their holdings are important, as their holdings, frequently reported in media, can

counterbalance short-term incentives by firm management. Also, different directors view and act in firms differently. For instance, high stock ownership in the firm represented by the chairperson and the CEO is congruent with a long-term view and can give rise to different perspectives from other directors. Stock holdings by the chairperson and the CEO should also be valuable information to investors. The size of the directors' overall holding, the size of holdings and changes in holdings where the director has a seat should also be of interest.

In the present paper we focus on a detailed analysis of directors' characteristics and their stock holdings in the firm they represent. We also provide evidence of the size of their holdings and if a firm can be classified as being busy by its directors. This is a topic which has received less attention in the literature related to a company's BoD. Our paper complements the mixed results from prior research (which has used different methodologies, definitions and sample periods) related to the corporate governance literature on BoDs and extends our insights by a detailed analysis of the directors in firms listed on the Stockholm Stock Exchange (SSE) in Sweden. There are several reasons why we study Swedish firms. First, our knowledge of directors and firm performance in Sweden is limited. Second, there are no mandatory rules related to the gender aspect in the BoD and even if new rules will be introduced, it is unclear if they will add value to the firm and enhance shareholder value as prior literature report mixed results. In addition, the Swedish market for female directors is limited. Moreover, the combination of the CEO to also be the chairperson is not common in Sweden. Third, detailed data on directors and their stock holdings are available. Fourth, the common corporate governance view of independent directors, as is common in the U.S., is not applicable in Sweden as each director is elected at the annual general meeting (AGM) by the shareholders. Taken together, these governance settings have motivated us to focus on features related to board size, frequency of busy directors, gender aspects of directors, age and stock ownership in the firm they represent, and their overall stock holdings.

The empirical findings of our study confirm that the proportion of female directors has increased significantly over the sample period and that female directors are younger than male directors. On average, the directors hold 4% of the total number of outstanding firms where they have a seat. Surprisingly, we find that 42% of chairpersons' overall portfolio value is invested in the firm which he/she chairs. For the CEO, concentration of stock ownership is higher, 76.1%. We also find that in firms with female directors, the board size is larger. In a multivariate setting, we find that the proportion of female directors is positively related to firm value. Busy boards are associated with lower firm value and is consistent with prior studies. Stock ownership by the BoDs is positively related to firm value. Stock ownership concentration in a firm is higher for the CEO than for the chairperson.

The rest of the paper is organized as follows: in Section 2, we present the relevant literature that provides a background for our paper; in Section 3, we provide details of our data and methodology; in Section 4 we present our results.; Section 5 concludes.

2. Literature review

Prior literature has documented mixed results of the relationship between firm value and corporate governance-related variables. In general, there is also a shortage of studies related to board characteristics and stock holdings by directors, possibly explained by a lack of publicly available financial databases. It has been shown that board monitoring and CEO incentives are substitutes and that firms with a low (high) monitoring have higher (lower) CEO remuneration schemes (Hartzell and Starks, 2003). Although most prior studies focus on CEO and director pay (Edmans et al., 2021), few studies focus on stock ownership by the directors. Most of the BoDs in firms listed on the SSE have remuneration committees where member are directors. However, there is a risk that this can act in the interest of management

rather than shareholders. From a Swedish perspective, it is also common that the remuneration committees are made up of directors.

3. Sample and variable construction

In this section we describe our sample selection methods and present descriptive statistics for the variables used in the analysis. We use data from three different sources which we later merge.

3.1 Sample

The first dataset shows the ultimate stock ownership in publicly listed Swedish firms, obtained from the central securities registrar in Sweden, Euroclear Sweden. Our sample covers all firms listed on the SSE from 2000 to 2021. We impose two filters: first, the firm's listing must be on the official lists on the SSE; second, we exclude firms where the primary listing is not the SSE. Each firm listed on the SSE has a unique organization number, which is also used by Euroclear Sweden to monitor stock holdings. Compared to many other countries, the ownership data do not face any regulatory thresholds, in other words, an investor holding just one stock in a firm is registered. Euroclear Sweden groups investors into one of three classes: (i) domestic institutional, (ii) foreign and (iii) individual (retail). One additional feature of these data is that (excluding foreign investors) each investor with a long position in a stock has a unique identification number. Specifically, for each domestic institutional investor, we have information of the identification number attached to each holding and therefore we can identify all stock holdings and compute the overall portfolio value. For individual investors, we have access to the unique social security number which discloses birth year and gender. Further, as for domestic institutional investors, the overall portfolio for each individual can be identified. For foreign investors, information is less

detailed as the holdings in general are recorded through a custodian. Taken together, by using these detailed data, we are in a position to identify the ultimate stock holdings in a firm and also the overall holding across all firms listed on the SSE.

We exclude all observations with a total reported stock ownership greater than 95% and we only consider ordinary common stocks. Following this screening, our final sample consists of 6,313 firm-year observations in 366 firms from 2000 to 2021.

3.2. Data on boards of directors

The second dataset is obtained from the Swedish Companies Registration Office (Bolagsverket). From this source we identify characteristics and compositions of BoDs, information of each director, social security number and board position. In our analysis, we focus on the overall composition of the BoDs, the chairperson and the CEO. As this dataset also includes the director's social security number, we are in a position to compute the proportion of female directors and clearly identify if a director can be classified as being busy. We exclude employee representatives and deputy members of the BoD.

Although Sweden is part of the European Union (EU), there are no mandatory quota rules which specify a gender balance and hence the directive 2006/54/EU has not been introduced; this contrasts the rule of gender balance in Norway (which is not a member of the EU).

3.3. Financial data

The third dataset includes stock prices and accounting data from Eikon Refinitiv. We calculate firm-specific variables following prior literature. Appendix A provides a description of all variables used in our paper.

3.4. Stock ownership by directors and variable construction

Following the classification of investors from Euroclear Sweden and the Swedish Companies Registration Office, we first aggregate all holdings by the directors in a specific firm and divide this by the total number of outstanding stocks in each firm. We exclude treasury stocks (those reacquired by the firm through an open market share repurchase program) and preference stocks. This fraction provides us with information of stock ownership by directors. We repeat this computation for the chairperson and the CEO, and calculate the value of their holdings (number of shares (#) times stock price), respectively, and standardize this value to the director's overall portfolio value. This value is zero if the person does not have stockholdings and 1 if the entire portfolio is invested in the firm. Thus, this metric provides us with information of the importance of the holding in a specific firm. In the paper we compute the concentration of stock ownership in firm *i* for the chairperson and the CEO, denoted as *SOC_C* and *SOC_CEO* respectively as follows:

$$= \frac{\#-shares_i \times stockprice}{\sum_{i=1}^{j} \#shares_i \times stockprice} \quad (1)$$

Figure 1 displays the time series of the aforementioned metrics for the period 2000 to 2021. In our sample we have a total of 2,660 firm year observations for the chairperson and 1,634 for the CEO. As clearly seen in the figure, we see that *SOC_CEO* is higher than for the chairperson. The mean fraction for the overall period is 0.420 and 0.761 for the chairperson and the CEO respectively. Although we do not report it, the median metric is 3x higher for the CEO. We attribute the higher fraction of stock ownership by the CEO to various forms of stock ownership programs (note, however, that our metric excludes options).

We also examine directors who are "busy", in other words, have several assignments. As the Swedish corporate governance system in general has independent directors, we classify a director as busy if he or she sits on at least three different boards, following prior literature.

3.4. Busy directors, stock ownership and preferences

With data from the Swedish Companies Registration Office we can identify stock holdings for all directors and for busy directors. For example, at the end of 2020, the director Johan Forssell, who is also the CEO of Investor, was director in four companies listed on the SSE and hence is classified as a busy director. The total portfolio value of stock holdings for Johan Forssell at the end of 2020 was SEK 54,852,003 and the largest holding was in Investor, which represented 91.35% of his total portfolio value (thus, *SOC_CEO* = 0.9135 with respect to this firm).

3.4.1. Multivariate analysis and variables used

One advantage when using panel data is that we can control for unobservable heterogeneity that can affect the dependent variable and, specifically, if the dependent and independent variables are correlated, will cause biased coefficients. To address this problem, we use fixed-effects to control for unobserved heterogeneity that is constant for each firm over time, but not across firms. Our study spans the 21-year period 2000 to 2020. To control for potential time effects over the period, we use time-fixed effects. Thus, the estimated time-fixed effects control for factors (such as economic shocks, new legislation, tax changes, etc.) which will affect all firms. Our dependent variable is correlated over time for a specific firm but should be uncorrelated across sample firms and years. Thus, ignoring within-group correlation of the observations can result in low standard errors and large *t*-statistics. In our models, we cluster standard errors for each company. A simple Hausman's test shows that a fixed effects model is appropriate.

We follow prior studies and measure the financial performance of a firm by using a standardized market value (Tobin's Q), market-to-book ratio (M/B) and profitability, return on assets, (ROA). We use three different models where the dependent variable is Tobin's Q, M/B or ROA. Tobin's Q is computed by summing the market capitalization of equity (stock

price times number of outstanding shares) and book value of total debt, and standardized to book value of assets. M/B is market value of equity standardized to book value of equity. ROA is netprofit divided by assets. As controls, we use characteristics related to the BoD, directors, and stock ownership (and concentration) by directors. One important variable is the proportion of female members, measured as the number of females on the board divided by total number of directors on the board (excluding employee representatives and deputy members). We also control for busy board members and follow prior literature and define a director as busy if he or she holds three or more seats (Fich and Shivdasani, 2006). One important and new variable we use is stock ownership of the director's holding. In addition we use *SOC_C* and *SOC_CEO* as previously defined.

As control variables, for a firm we use firm size, leverage, leverage and total institutional stock ownership (SO_I) and also holdings by the largest investors (Top-1). In the multivariate analysis, we use fixed effects and time variables to control for heterogeneity across firms.

3.5. Additional contribution to the literature

Our primary contribution is to shed light on the relationship between firm value and stock holdings by directors using detailed data. We advance the literature in several ways. First, by including stock ownership by directors in the firm they represent and also the fraction of their overall portfolio in the company they represent, we are able to quantify the strength of each director across firms. Second, nearly all prior empirical studies on busy directors use data from the U.S., where busy members are related to the number of outside directors. In Sweden, the composition of the BoD is not related to whether a director is classified as an outsider. In addition, the chairperson in Swedish firms is generally not the CEO. Finally, we construct a broad sample of almost 400 firms from a variety of industries over the period 2000 to 2020, using more than 6,000 firm-year observations. We highlight the importance of

whether a mandatory gender rule should be implemented in Sweden and if such a rule enhances firm value.

3.6. Descriptive statistics

Table 1 reports the summary statistics representing a total of 6,313 firm-year observations in 366 different firms. As reported in column 1, last row, the equally weighted mean market capitalization value across all years is SEKm 19,813, which is significantly higher than the median value reported in column 2 and thus indicates a heavily skewed distribution. Columns 3 and 4 show that the size of the boards is fairly stable with a range between six and seven directors, which is lower than the figures reported by Adams et al. (2021) for U.S. firms between 1996 and 2010.

4. Empirical analyses and results

This section reports the results of our analysis on board characteristics and stock ownership by directors. First, we discuss the variables used and then we describe the properties of our sample across firms with busy vs. non-busy directors. Finally, we conduct a multivariate analysis where we relate firm value to board as well as firm-specific variables.

Table 2 shows the distribution of several variables related to board characteristics. The mean (median) board size is 6.39 (6), which is lower than the mean size of U.S. boards (9.11), as reported by Adams et al. (2021). On average, 27.2% of our sample firms can be classified having a busy board. We also find that the mean age for Swedish directors is lower than for U.S. directors. Interestingly, we also find that female directors are younger than

males. The mean difference, 16.7 years, is statistically significant at the 1% level using a *t*-test (not reported). The mean (median) age for the CEO is 57 (56) years.

As late as in March 2022, the European Union (EU) presented a proposal with a recommendation that firms should have a gender approach to their BoD. Specifically, they stated that 40% of the active board should be represented by females. As can be seen in Figure 2, the proportion of female directors has increased, from 6.2% in 2000 to 34.3% at the end of 2021. Although we do not show the median value, it is interesting to note that in the last five years, a third of directors are female. The mean (median) proportion of female directors on boards is 21.9% (20.0%), which is roughly 10 percentage points higher than levels for the overall sample period.

We also exploit our unique data on stock ownership for directors. As reported, ownership by the BoDs averages 4.4% of outstanding shares in a firm, whereas the median value is much lower (0.4%). For the chairperson, we find that he/she holds 24.8% of outstanding shares. For the CEO, mean is lower, representing 15.2%. Of the remaining variables presented, we find that *SO_C* has a mean (median) value of 42.0% (9%) and is lower than the mean (median) value for the CEO, 76.1% (59.1%). Overall, the analysis produced several results of note. The composition of Swedish firms, on average, is represented by six directors and that female directors are younger than male directors. In addition, one of five firms listed on the SSE have female directors. With respect to the monitoring function of directors, we find that the holdings of the chairperson are higher than those of the CEO. However, when we examine metrics related to concentration, we find that the CEO has more invested in his/her firm than the chairperson. A possible explanation for this is stock-incentive programs for the CEO in various forms.

We then examine whether board characteristics and stock ownership in firms with at least one female director are different from firms without female directors, and if there is a difference between firms with and without busy directors. In Panel A of Table 3, we present the results between firms with and without female directors. The first three columns show statistics for firms with at least one female directors and columns 4-6 show statistics in firms without female directors. The last column shows the *p*-value and the probability that the mean difference is significantly different from zero. The reported *p*-values are less than 0.01 and therefore the null hypothesis can be rejected. Specifically, we find that the board size, age of directors and holdings by chairperson are higher in firms with at least one female director. We also see that stock ownership by directors is lower in firms with a female director (3.57%) than in firms without female directors (7.18%). The mean difference is also statistically significant at the 1% level. Stock ownership by chairperson is higher in firms with a female director, which contrasts with stock ownership by CEO in firms without female directors.

Although there is no clear definition of a busy board director, we follow prior literature (Fich and Shivdasani, 2006; Core et al., 2003) and define a busy director as a director who sits on the BoD of three or more publicly listed firms. Recall also that in Sweden, there is no system with outside directors and no recommendation of number of seats a director can have. Panel B shows that in firms with a busy board, the number of directors is higher. We also see that the mean age of directors is higher. Interestingly, we do not see any difference between the groups in the proportion of female directors. However, focusing on stock ownership, we see differences: for instance, on busy boards, stock ownership by directors is 24% compared to 29.5% in firms without busy board directors, which is statistically significant at the 1% level. Stock ownership by chairperson is also significantly higher in firms without busy

directors (50.3% and 26.8%, respectively). In a similar spirit, we see that holdings by CEO are higher in firms without busy directors.

4.1. Baseline regression results

We first report the correlation matrix for the primary variables. As reported in Table 4, in general, the Pearson correlation coefficients are low and hence multicollinearity should not be an issue. Note, however, that although the coefficients are low, the proportion of busy directors is negatively correlated with the proportion of female directors. In addition, we see that firm size and holdings by institutional investors are positively correlated.

We further examine the of firm value and corporate governance, as well as firm specific variables, using panel regressions. Specifically, we regress Tobins's Q, market-to-book ratio and profitability on a set of independent variables. The regression results, using Tobins's Q as dependent variable, are reported in Table 5 with Newey-West (1980) heteroskedasticity-robust *p*-values in parentheses below estimated coefficients and also using fixed firm and year effects. The dependent variable in the ordinary least square (OLS) panel regressions is Tobin's Q and variables related to board characteristics is reported in model (1). In model (2) we add firm characteristics and in model (3) we include various corporate governance variables.

The estimated coefficient on the proportion of female directors, 0.295, in model (1) is positive but statistically insignificant (*p*-value = 0.238) whereas it is positive, and statistically significant at the 10% level in model (2). In model (3), the coefficient is positive and significant at the 10% level. The estimated coefficients on the binary variable Busy board, are negative in all specifications and significant in the first two models, and is, in general, supportive of prior literature. In addition, we find in model (2) a positive and highly significant relation between frim vale and board since. We also see in the last column, that

stock ownership by the BoDs is positive related to firm value and significant (coefficient = 0.189 and *p*-value = 0.097). In general, we find weak evidence that the gender is associated with firm value. The impact of busy board members is negatively related to firm value whereas the size of the board is positively related. Also, stock ownership by the directors is positively related to firm value.

To further understand our findings, we analyze the impact of our control variables on the market-to-book ratio as reported in Table 6. As reported in in the first two columns, we find that the fraction of female directors is negatively, and statistically significant at the 5% level, related to the M/B ratio. As in Table 5, we also find that busy board members will reduce the M/B for a firm whereas the size of the board will improve the M/B. Interestingly, we also find that stock ownership by the BoD is positively, and highly statistically related to the M/B. Also, in this table we report that both coefficients related to stock ownership by the chairperson and the CEO, *SOC_C* and *SOC_CEO*, are positive and significant (at the 10% and 1% level respectively).

As an additional test, we repeat our baseline analysis using profitability, *ROA*, as the dependent variable. This is particularly important as we in this analysis focus on profitability rather than firm value. The results in Table 7 are quantitatively similar to those presented in Table 5 and 6. In the first two models, we find that the fraction of female directors is positively related to profitability. The association between profitability and busy boards are unclear as we only obtain a significant coefficient (at the 5% level) in model (3). Also, as reported, the board size is not related to profitability. Holdings by the BoDs is, however, positively associated with profitability and also significant at the 1% level. Further, we document a strong positive association between profitability and *SOC_CEO*. Interestingly, we also find that stock ownership by the largest shareholder (*Top-1*) is negatively related to profitability and also statistically significant at the 1% level.

To summarize, based on a large sample of firms listed on the SSE from 2000 to 2021 together with detailed data on stock ownership in firms and board composition, we document that female directors have a positive impact on firm value. We also find that busy directors in a board is detrimental to firm value. Contrary to prior studies, we find that board size is positively related to firm value. We also document that concentration of his/her overall portfolio value is positively related to firm value and in particular to profitability. As in the previous table, our data support the view that larger boards enhance firm value. Our metrics related to stock ownership by directors indicate a positive and statistically significant relationship. In particular, aggregate holdings by the directors enhance firm value (estimated coefficient is 1.905 with a *p*-value of 0.008).

We then check how our baseline models relate to a firm's profitability using the ROA as the dependent variable (Table 7). The coefficients on the proportion of female directors are significantly positive in specification (1) and (2), which suggests that females on the board increase profitability. We also find that the binary variable on busy boards is insignificant in the first two models and hence is not related to profitability. However, there is an exception in model (3) when we add stock ownership by directors. In this case, the estimated coefficient on busy boards is positive and significant at the 10% level (*p*-value = 0.058). When we add stock ownership for the aggregate holdings by the directors, the chairperson and the CEO, all estimated coefficients are statistically significant. Estimated coefficients on holdings by the board and the CEO are both positive and significant at the 1% level.

5. Conclusion

While considerable literature has examined BsoD from different perspectives such as gender, age, ethnicity, education and busyness, we know relatively little about stock holdings by directors in firms and holdings in the firm they represent. The primary objective of this

study was to examine the impact of characteristics of directors on the financial performance of Swedish listed firms. With access to detailed ownership data for each director and detailed information on board composition, we contribute to the literature in several ways. We posit that stock ownership by directors, both levels and concentration of holdings, have an important monitoring role. We propose that there is a positive relationship between holdings by BsoD and firm value. We also find that this relationship is stronger for the chairperson and the CEO. We further find that the age is insignificantly related to firm performance. Finally, we find an inverse relationship between firm performance and busyness of boards.

Our research setting and our detailed data provide new insights related to the growing corporate governance literature. There are some limitations in the current version of the paper, which we will overcome. First, the Swedish system, with its dual series of shares (stocks with different voting power) is noteworthy. Second, our data should allow us to explore changes in BsoD; specifically, we are interested to see if female directors replace male directors following the proposal of a gender quota from the EU. Third, it would be useful to assess links between the BoD and the size of specific institutional investors. Finally, to highlight the levels of remuneration, it would be interesting to examine compensation to the CEO and BoD in firms with and without remuneration committees.

Appendix. Definitions of variables

The paper is based on two data sources. Board characteristics is obtained from the Swedish Companies Registration Office for all sample firms. Detailed information on stock ownership is from the Central Securities Registrar in Sweden, *Euroclear Sweden*.

Board characteristics

Fraction of female directors	Number of female directors divided by total number of Directors
Fraction of busy board members	Fraction of the board's directors that hold at least three board seats in a firm listed on the SSE
Age of directors	Mean age of directors at the end of the fiscal year
Age of the CEO	Mean age of the CEO at the end of the fiscal year
Board size	Number of directors on the board (excluding employee Representatives). Expressed in natural logarithm.
Stock ownership by the BoD	Total number of shares held by directors divided by outstanding shares at the end of fiscal year excluding treasury stocks.
Stock ownership by the chairperson	Number of shares held divided by aggregate number of shares held by all directors
Stock ownership by the CEO	Number of shares held divided by aggregate number of Shares held by all directors
Stock concentration by the Chairperson (SOC_C)	Market value of shares held in the firm by the chairperson divided by his/her total portfolio value of stocks
Stock ownership by the	

CEO (SOC_CEO)	Market value of shares held in the firm by the CEO divided by his/her total portfolio value of stocks
Firm characteristics	
Tobin's Q	Market value of equity plus total assets minus book value of equity, all divided by total assets. Market value of equity is calculated by multiplying the year-end closing stock price by the number of outstanding shares.
Size	Natural log of total assets
Leverage	Book value of total debt to total assets
ROA	Return on assets, EBIT/total assets
Top-1	Holdings by the largest shareholder

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Figure 1 Stock ownership concentration (SOC)

This figure displays the mean fraction of stocks hold in the firm where the director holds a position as a fraction of the directors' total portfolio value. Stock holdings are computed at the end of each calendar year from 2000 to 2019. The sample includes all chairperson and chief executive officer (CEO) in firms listed on the Stockholm Stock Exchange. In the figure we report the fractions as SOC_C and SOC_CEO respectively. The composition is computed at the end of each fiscal year with data obtained from the Swedish Companies Registration Office (Bolagsverket) and Euroclear Sweden.

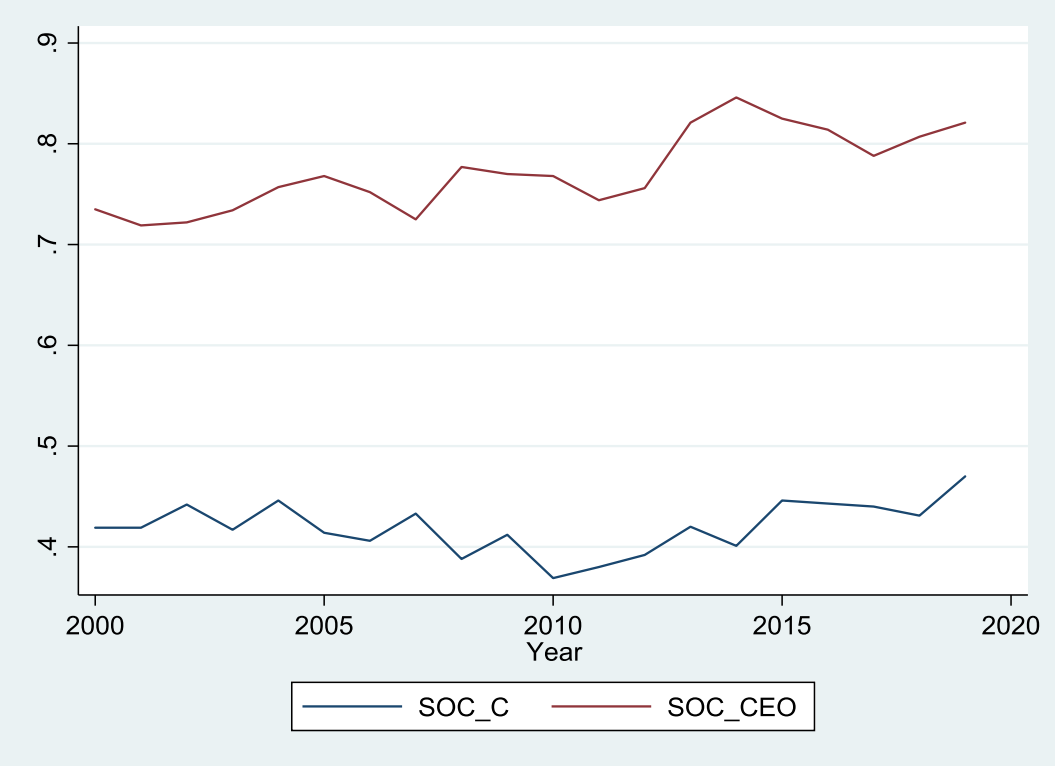

Figure 2 Percentage of female directors

This figure displays the mean percentage of female directors in companies listed on the Stockholm Stock Exchange in Sweden between 2000 and 2021. Only ordinary directors are included and we also exclude directors representing unions. The composition is computed at the end of each fiscal year with data obtained from the Swedish Companies Registration Office (Bolagsverket).

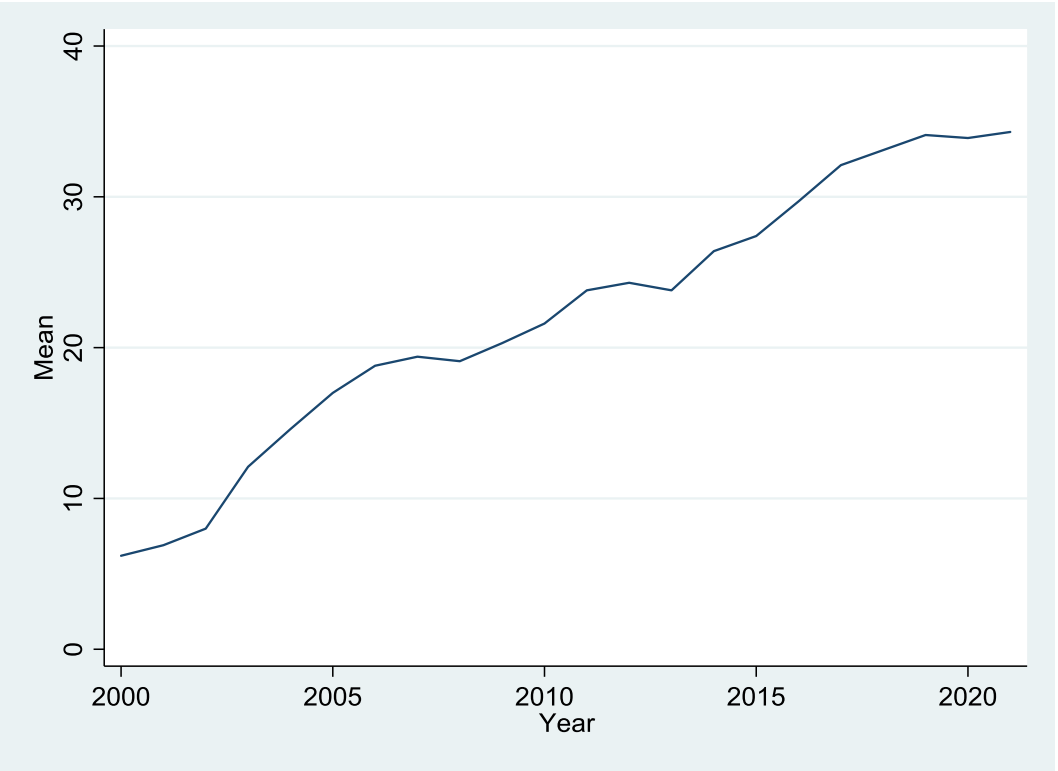

Table 1 Sample description

This table presents statistics by year for the full sample between 2000 and 2021 for our sample. We calculate the market capitalization value as the total number outstanding shares multiplied by stock price at the end of each calendar year. Board size is the number of directors.

	Firm and board characteristics				
Year	Mean market capitalization (SEKm)	Median market capitalization (SEKm)	Mean board size	Median board size	*n*
2000	14,201	1,281	6.82	7	240
2001	10,944	826	6.83	7	224
2002	7,254	453	6.78	7	193
2003	9,472	747	6.70	7	267
2004	11,237	906	6.58	6	242
2005	14,497	1,507	6.52	7	237
2006	16,683	1,760	6.44	6	249
2007	15,025	1,439	6.41	6	250
2008	8,303	675	6.37	6	255
2009	13,027	1,075	6.35	7	230
2010	16,429	1,336	6.46	7	228
2011	13,351	1,131	6.43	7	236
2012	15,025	942	6.31	7	229
2013	18,290	1,407	6.30	7	230
2014	19,831	1,512	6.31	7	231
2015	20,645	2,440	6.27	7	248
2016	20,479	3,130	6.11	7	276
2017	20,473	3,051	6.21	7	283
2018	18,254	2,781	6.12	7	288
2019	23,170	3,461	6.06	7	271
2020	26,696	5,023	5.93	7	278
2021	36,598	6,390	6.03	7	253
Total	19,813	1,967	6.38	6.82	6,313

Table 2 Boards and directors characteristics between 2000 to 2021

This table shows descriptive statistics for boards, directors, and stock ownership for firms listed on the Stockholm Stock Exchange between 2000 and 2021. Across firms, we show the mean, standard deviation (S.D.), the 25^{th}, 50^{th} (median), and the 75^{th} percentiles. N is the number of firm-year observations. Stock ownership by directors is the aggregated number of shares held by directors divided by common stock outstanding (excluding treasury shares). Stock ownership by the chair and the CEO shows stockholdings by the individual, respectively, divided by total number of shares held by all directors. All ownership data come from

the central securities registrar in Sweden, *Euroclear Sweden*, which by law monitors the ultimate stockholdings in all publicly held firms. The sample excludes financial firms and firms with a dividend yield above 15%.

Variable	Mean	S.D.	P25	Median	P75	*n*
Board size	6.39	2.23	5	6	8	5,678
Busy board	0.272	0.445	0	0	1	5,220
Age (all)	54.23	4.39	52	55	57	5,678
Age (females)	38.33	23.34	0	49	55	5,678
Age (males)	54.86	7.16	52	55	59	5,678
Age (CEO)	57.00	9.13	44	56	62	5,678
Fraction of female directors	0.219	0.182	0	0.200	0.333	5,172
Stock ownership by directors	0.044	0.098	0	0.004	0.033	5,172
Stock ownership by the chair	0.248	0.339	0	0.027	0.465	5,172
Stock ownership by the CEO	0.152	0.293	0	0	0.121	5,172
SOC_C	0.420	0.359	0.090	0.300	0.772	2,660
SOC_CEO	0.761	0.291	0.591	0.900	0.995	1,634

Table 3 Univariate analysis

This table provides a comparison of the characteristics of directors. In Panel A we report characteristics in firms with at least one female director and firms with no female director, and in Panel B we report results for firms with and without busy directors. Data on directors

is obtained from the Swedish Companies Registration Office. We report and compare the differences in mean characteristics using the two-tailed *t*-test assuming unequal variance.

Panel A: Gender aspects in Boards

	Firms with at least one female director			Firms with no female directors			Difference	
	Mean	SD	*n*	Mean	SD	*n*	Mean	*p*-value
Board size	6.84	2.07	4,187	5.25	2.09	1,447	1.59	0.000
Age directors	54.61	12.2	5,055	53.16	10.0	1,447	1.45	0.000
Stock ownership by directors (%)	3.57	8.62	3,985	7.18	12.69	1,168	–3.61	0.000
Stock ownership by Chairperson (%)	25.54	33.81	3,985	20.26	34.12	1,168	5.28	0.004
Stock ownership by CEO (%)	13.47	27.11	3,985	21.56	35.12	1,168	–8.09	0.000

Panel B: Firms with and without busy directors

	Firms with busy directors			Firms without busy directors			Difference	
	Mean	SD	*n*	Mean	SD	*n*	Mean	*p*-value
Board size	8.11	2.28	1,420	7.15	2.10	3,149	0.96	0.000
Age directors	57.04	10.2	1,420	58.09	9.92	3,149	–1.05	0.001
Fraction of female directors	0.212	0.147	1,420	0.213	0.156	3,149	–0.001	0.151
Stock ownership by directors (%)	24.0	27.3	1,357	29.5	32.4	2,848	–5.5	0.000
Stock ownership by Chairperson (%)	26.8	28.1	938	50.3	37.0	1,722	–23.5	0.000
Stock ownership by CEO (%)	73.6	29.2	742	78.2	28.8	892	–4.6	0.003

Table 4 The correlation matrix among variables used in the study

	Female	Busy	Tobin's	M/B	ROA	LEV	SIZE	SO-	SO-	SO-	SO-

			Q					Inst.	Ch.	CEO	BoD
Female	1.00										
Busy	–0.01	1.00									
Tobin's Q	0.06	–0.11	1.00								
M/B	0.04	–0.06	0.49	1.00							
ROA	0.16	0.04	–0.00	0.02	1.00						
LEV	0.05	0.06	–0.26	–0.09	0.07	1.00					
SIZE	0.27	0.22	–0.23	–0.10	0.28	0.24	1.00				
SO-Inst.	0.21	0.12	–0.06	–0.00	0.16	–0.04	0.51	1.00			
SO-Ch.	–0.05	–0.31	0.12	0.10	0.01	–0.03	–0.10	–0.17	1.00		
SO-CEO	0.03	–0.08	0.09	0.07	0.02	–0.02	–0.03	–0.12	0.13	1.00	
SO-BoD	–0.08	–0.08	0.09	0.04	0.03	–0.10	–0.10	–0.24	0.15	0.15	1.00

Table 5 The effect of board and ownership characteristics on firm value

This table examines how board, firm and ownership characteristics affects firm value using Tobin's Q. Model (1) presents OLS regression results for the sample where the dependent variable is Tobin's Q and the

independent variables are board characteristics. Variable definitions are provided in the Appendix A. In model (2) we have added firm specific variable and in model (3) we include various measures of stock ownership. All regressions include fixed firm and year effects. Below the estimated coefficients we present associated *p*-values based on robust firm-clustered standard errors (Newey-West standard errors). ***, **, and * indicate significance at the 1%, 5% and 10% level, respectively.

	Dependent variable: Tobin's Q		
	(1)	(2)	(3)
Fraction of female directors	0.295 (0.238)	0.473* (0.096)	0.379* (0.060)
Busy board (D)	–0.130* (0.071)	–0.108** (0.030)	–0.093 (0.213)
Ln (Board size)		0.516*** (0.000)	0.006 (0.875)
Stock ownership by the BoD			0.189* (0.097)
SOC_C			0.034 (0.745)
SOC_CEO			0.037 (0.718)
Ln (Size)		–0.207*** (0.000)	–0.056** (0.032)
Market-to-book		0.069 (0.198)	0.298** (0.013)
ROA		0.555** (0.039)	0.152 (0.660)
Leverage		–0.868*** (0.000)	–1.230*** (0.001)
SO_I		–0.727*** (0.004)	
Top-1		0.663*** (0.001)	0.114 (0.751)
Fixed effects	Yes	Yes	Yes
Number of observations	4,190	3,230	3,230
Adjusted R^2	0.015	0.247	0.642

Table 6 The effect of board and ownership characteristics on firm value

This table examines how board, firm and ownership characteristics affects firm value using Tobin's Q. Model (1) presents OLS regression results for the sample where the dependent variable is Tobin's Q and the independent variables are board characteristics. Variable definitions are provided in the Appendix A. In model (2) we have added firm specific variable and in model (3) we include various measures of stock ownership. All regressions include fixed firm and year effects. Below the estimated coefficients we present associated *p*-values based on robust firm-clustered standard errors (Newey-West standard errors). ***, **, and * indicate significance at the 1%, 5% and 10% level, respectively.

	Dependent variable: Market-to-book ratio		
	(1)	(2)	(3)
Fraction of female directors	–1.599** (0.036)	–2.460** (0.014)	0.927 (0.285)
Busy board (D)	–0.749*** (0.000)	–0.675** (0.020)	–0.021 (0.632)
Ln (Board size)		1.195* (0.086)	1.372* (0.095)
Stock ownership by the BoD			1.905*** (0.008)
SOC_C			0.977* (0.097)
SOC_CEO			0.736*** (0.004)
Ln (Size)		–0.353*** (0.002)	–0.370*** (0.003)
Market-to-book		0.069 (0.198)	0.298** (0.013)
Leverage		–0.337 (0.810)	1.161 (0.510)
SO_I		–0.727*** (0.004)	
Top-1		2.329* (0.078)	4.516*** (0.002)
Fixed effects	Yes	Yes	Yes
Number of observations	4,190	3,230	3,230
Adjusted R^2	0.005	0.019	0.138

Table 7 The effect of board and ownership characteristics on profitability

This table examines how board, firm and ownership characteristics affects firm value using the Market-to-book ratio. Model (1) presents OLS regression results for the sample where the dependent variable is Tobin's Q and the independent variables are board characteristics. Variable definitions are provided in the Appendix A. In model (2) we have added firm specific variable and in model (3) we include various measures of stock ownership. All regressions include fixed firm and year effects. Below the estimated coefficients we present associated *p*-values based on robust firm-clustered standard errors (Newey-West standard errors). ***, **, and * indicate significance at the 1%, 5% and 10% level, respectively.

	Dependent variable: Return on Assets (ROA)		
	(1)	(2)	(3)
Fraction of female directors	0.239*** (0.000)	0.127** (0.046)	0.019 (0.551)
Busy board (D)	0.011 (0.311)	–0.001 (0.861)	0.017* (0.058)
Ln (Board size)		–0.026 (0.522)	–0.041 (0.358)
Stock ownership by the BoD			1.905*** (0.008)
SOC_C			0.977* (0.097)
SOC_CEO			0.736*** (0.004)
Ln (Size)		0.051*** (0.000)	0.036*** (0.003)
Market-to-book		0.001 (0.381)	0.031 (0.240)
Leverage		–0.122* (0.100)	0.026 (0.222)
SO_I		0.100* (0.066)	
Top-1		–0.090* (0.057)	–0.061*** (0.002)
Fixed effects	Yes	Yes	Yes
Number of observations	4,424	3,229	3,229
Adjusted R^2	0.027	0.094	0.138