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Master Thesis

Board Characteristics and CSR Engagement on Firm
Performance: Evidence from Norwegian Listed Firms

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Abstract

This study investigates the effect of externally observable board characteristics and corporate social responsibility (CSR) on firm performance for Norwegian listed firms. Board regulations have influenced Norwegian listed firms' board structure ever since the gender balance law was implemented in 2008. In 2013, the soft law on CSR reporting affected large firms' relation to CSR engagement. Hence, this research will contribute to the understanding of the effect of these regulations on firm performance. The findings show no statistically significant results for board characteristics on firm performance. These findings indicate that the regulations have been successful in creating an optimal board composition. A positive significant relationship is found between CSR engagement and firm performance. The study further extends previous research by examine the effect of board characteristics on CSR engagement, finding a positive significant relationship on the number of board members and CSR.

1 Detailed Introduction

On a global scale, corporate governance and corporate social responsibility (CSR) has been subjects of debate. The discussion focuses mainly on their relationship to firm performance. Essential for corporate governance and how firms are directed and controlled, are the board of directors (BoD). The purpose of this research is to understand the relationship between externally observable board characteristics, CSR engagement and firm performance. The board characteristics are measured by the number of board members, gender diversity and the board members age. We will also examine the effect of board characteristics on CSR engagement. The study is based on Norwegian listed firms. This is of special interest due to the regulations regarding gender diversity on the BoD, as well as the implementation of the soft law on CSR reporting for large firms. Hence, we aim to analyze the effect of these regulations in relation to firm performance. Our research covers the time period of 2011 – 2017, however limited data on CSR engagement restricts this part of the study to 2017.

Over the years, there has been a noteworthy discussion among researchers on what constitutes as the best practice for corporate governance. Essential in the field of corporate governance is how firms are directed and controlled, and the BoD play a significant role in controlling and monitoring the management (Fama and Jensen, 1983). Previous literature argue that the fundamental concerns in designing an effective board are to (i) align the interests of principals and agents (ii) provide information for monitoring and advice and (iii) foster effective decision-making (Becht et al., 2003 and Hermalin and Weisbach, 2003). However, constructing an aligned, informed and decisive board can be a difficult process. There is little theory and evidence on how the wide range of board mechanisms relate to each other and to firm performance (Becht et al. 2003). This also means that the regulations that currently restrict the variety of board mechanisms, like diversity,[1] are implemented without knowing the impact on the firm´s performance (Bøhren and Strøm, 2008).

During the last decade, two regulations affecting the selection of board members among listed firms have been put into effect. The regulation regarding gender

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[1] The Gender Balance Law (2003)

diversity on the BoD is of special interest for our research. In 2003, the Norwegian government passed the Gender Balance Law (GBL) requiring at least 40% representation of each gender in the BoD. This law has created a substantial difference between listed and non-listed firms since the implementation in 2008. Our data shows a female representation of around 40% for listed firms (Appendix 1) and around 18% for non-listed firms (Appendix 2). This regulation has had a substantial impact on board characteristics and will therefore be central to our paper.

Along with the acceleration of corporate governance issues, one of the most significant and arguable corporate trends of the last decade is the growth of CSR. There are various definitions on the topic, however Friedman (1970) first defines CSR as follows: "Corporate social responsibility is to conduct the business in accordance with shareholders' desires, which generally will be to make as much money as possible while conforming to the basic rules of society, both those embodied in law and those embodied in ethical custom". CSR has been a highly interesting topic regarding whether investments in CSR are value-enhancing, value-destroying or even value-irrelevant. The debate has continued to grow without a clear consensus on its value.

In recent years, CSR has become more visible. In 2013, the Norwegian Accounting Act was implemented, requiring all large firms to report on their environmental and social impact in their annual report or in a public available document.[2] Various ratings, criteria and scores on CSR have been common over the last years. One of the leading accounting firms, PricewaterhouseCoopers (PwC), has conducted a score based on Norwegian firms' reporting on CSR. We consider the CSR reporting to reflect the firm's engagement in CSR, and for our research we use those scores as our measurement for CSR engagement. Hence, we hereby refer to the CSR scores as CSR engagement.

The purpose of this research is to understand the effect of board characteristics

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[2] According to the Norwegian law of accounting § 3-3 c, large firms should outline their actions to integrate human rights, labor rights and social issues, the external environment and the fight against corruption in their business strategies, into their daily operations and with their stakeholders. If the firm does not have guidelines, principles, procedures and standards as mentioned, this shall be disclosed.

and CSR on firm performance in Norwegian listed firms from 2011 to 2017. The analysis is based upon data retrieved from the Centre of Corporate Governance (CCGR), Thomson Reuters Eikon and the report **"PwC Sustainability 100"**. Our research first examines how firm performance relates to the externally observable board characteristics; the number of board members, gender diversity and the board members age. Second, we will analyse the association between CSR engagement and firm performance. Finally, we will analyse the effect of board characteristics on CSR engagement.

Research within the fields of board characteristics, CSR engagement and firm performance is extensive. However, there is limited research addressing the relationship between all three. Jo and Harjoto (2011) studied the relationship of governance and firm value regarding the impact on CSR. With this analysis, they found that CSR engagement positively affects firm performance, while corporate governance attributes play a relatively weaker role. Conducting our research on Norwegian listed firms will be of great value for several reasons. First, to our knowledge this type of analysis has never been conducted on Norwegian listed firms. Second, Norwegian listed firms are of great interest due to the regulation on board characteristics and CSR reporting. We aim to investigate the effect of these regulations in relation to firm performance.

This paper starts by reviewing the previous conducted literature on the topic in section 2. We will further address the theory behind board characteristics, CSR and firm performance in section 3. Section 4 presents the panel data regression models that will be used to investigate the research questions and provides a description of the regression variables. The methodology is described in section 5, and section 6 provides information about the data and the descriptive statistics. Results and discussions are presented in section 7, followed by an explanation of the limitations in section 8. Finally, in section 9, we summarize and conclude.

2 Literature Review

In recent years, several scholars and practitioners have studied the relationship between corporate governance, CSR and firm performance. To our knowledge, no studies have covered these relationships on Norwegian listed firms. However, a few studies have investigated the association to some extent.

Several researchers find a positive relationship between externally observable board characteristics and firm performance (Belkhir (2009); Adams and Mehran (2008); Campbell and Minguez-Vera (2008); Terjesen et al. (2015); Carter et al. (2003)). These papers argue that larger BoD and more women on the BoD have economic benefits. Other studies reveal a negative association, implying that larger BoD, more women on the BoD and older BoD reduces their effectiveness (Guest (2009); Bøhren and Strøm (2010); Adams and Ferreira (2009); Muller et al. (2015); Nakano and Nguyen (2011)).

During the last years, the literature on the relationship between CSR and firm performance has increased significantly. However, the researchers vary in their findings. Several papers reveal a positive association, implying that CSR engagement is value-enhancing (Jo and Harjoto (2011); Ferrell et al. (2016); Servaes and Tamayo (2013); Mishra (2017); Dobrescu et al. (2015)). On the other hand, some papers find an inconclusive, or even negative, relationship between CSR and firm performance (Fisher-Vanden and Thorburn (2011); Brammer et al. (2006)).

Table 1 summarizes the main findings on relevant previous research. The empirical evidence on the relationships between board characteristics, CSR and firm performance are ambiguous and the true association remains unresolved at this point.

Table 1: Board Characteristics, CSR and Firm Performance – A Literature Review

Study	Association	Region	Sample period	Performance Measure
Board Characteristics				
Board Size				
Guest (2009)	Negative	UK	1981 - 2002	Tobin's Q
Belkhir (2009)	Positive	US	1995 - 2002	Tobin's Q
Adams and Mehran (2008)	Positive	US	1986 - 1999	Tobin's Q
Gender Diversity				
Bøhren and Strøm (2010)	Negative	Norway	1989 - 2002	Tobin's Q, ROS, ROA
Campbell and Minguez-Vera (2008)	Positive	Spain	1995 - 2000	Tobin's Q
Adams and Ferreira (2009)	Negative	US	1996 - 2003	Tobin's Q, ROA
Terjesen et al. (2015)	Positive	Global	2010	Tobin's Q, ROA
Carter et al. (2003)	Positive	US	1997	Tobin's Q
Board Members Age				
Muller et al. (2015)	Negative	South Africa	2000-2013	Stock Returns
Nakano and Nguyen (2011)	Negative	Japan	2007	Tobin's Q
CSR				
Jo and Harjoto (2011)	Positive	US	1993 - 2004	Tobin's Q
Fisher-Vanden and Thorburn (2011)	Inconclusive	US	1993 - 2008	Stock Returns
Ferrell et al. (2016)	Positive under certain conditions	Global	1999 - 2011	Tobin's Q
Mishra (2017)	Positive	US	1991 - 2006	Tobin's Q
Servaes and Tamayo (2013)	Positive under certain conditions	US	1991-2005	Tobin's Q
Dobrescu et al. (2015)	Positive	US	2008-2011	Tobin's Q
Brammer et al. (2006)	Negative	UK	2002-2004	Stock Returns

This table shows a review of previous literature on board characteristics and CSR, and their effect on firm performance. We report the name of the researchers, the association between the characteristics/CSR on firm performance, region of the data sample, the sample period and the measure for firm performance.

As the previous research reveal inconclusive results, we find it interesting to identify the main drivers behind the relationships. Possible explanations for each association will further be addressed.

Board size is likely to affect firm performance in several ways. Larger boards bring a variation of expertise, knowledge and independence that enhance the boards' functions. Hence, a positive relationship between board size and firm performance may be explained by improved board functions such as monitoring

and advising. However, it could be that larger boards experience coordination costs and free rider problems, which may affect firm performance negatively (Guest, 2009).

Various researchers find a linear relationship between gender diversity and firm performance. However, as previous results are ambiguous we suspect that the association could be non-linear. Joecks et al. (2013) find that the relationship is U-shaped, arguing that the number of women on the BoD must reach 30% in order to positively affect firm performance. Hence, previous studies are likely to identify a negative association with homogeneous boards. As researchers reveal inconclusive results on the topic, it could be that gender diversity systematically vary across countries and thus relevant associations could differ.

Few previous studies have investigated the relationship between the board members age and firm performance. Vo and Phan (2013) argue that boards with higher average age are more experienced compared to boards with younger age average, which may positively affect firm performance. However, the majority of researchers reveal a negative association. It could be that their analyses are based on an insufficient sample of firms, inappropriate number of control variables or even neglected the issue of board endogeneity.

CSR has been a highly source of debate, whether CSR is positively, insignificantly or even negatively related to firm performance. Servaes and Tamayo (2013) find that CSR and firm performance are positively related, but only under certain conditions. They argue that the relationship is positive for firms with high customer awareness, and negative or insignificant for firms with low customer awareness. Further, several researchers argue that the association depends on the initiatives of the management. As researchers reveal inconclusive results on the association, one explanation may affiliate the variation of measurement methods. The use of incomparable measurement methods provides inconsistent results and thus varying conclusions. In addition, there is an ongoing issue in the study of CSR to establish causality. It could be that CSR has a positive effect on firm performance, but it could also be that firms with higher performance have more free cash flow to allocate to CSR initiatives. More recent studies have tried to address causality concerns, such as Fisher-Vanden and

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Thorburn (2011), without finding any significant relation between CSR and firm performance.

The fields of corporate governance, CSR and firm performance have received a great deal of attention over the years. Limited empirical research is conducted on the association between all three components and the true association between board characteristics, CSR and firm performance appear to be complex. Our study will complement previous research by providing a comprehensive analysis on Norwegian listed firms and examining the effect of regulations on the board composition and CSR reporting.

3 Theoretical Framework

This paper examines the association between board characteristics, CSR engagement and firm performance in Norwegian listed firms. Board characteristics is explained by the number of board members, measured by the total number of directors on boards, gender diversity, measured by the proportion of women on boards, and board members age, measured by the average age on boards. The theoretical framework is based on the aspects of corporate governance, agency theory, gender diversity and CSR. The theories suggest several factors that can be expected to affect the composition of the BoD and the choice of CSR engagement. Finally, we will explain the theory behind the use of Tobin's Q as a measure for performance.

3.1 Corporate Governance

Corporate governance is defined as the method in which suppliers of finance to corporations guarantee themselves a return on their investments (Shleifer & Vishny, 1997). Cadbury (1992) also states the importance of how firms are directed and controlled. Moreover, Fama and Jensen (1983) argue that the BoD play a significant role in controlling and monitoring management. Also, in the corporate governance literature, the BoD has been of considerable interest (Zahra and Pearce, 1989; Daily et al., 1996; Daily et al., 2003).

3.1.1 Agency Theory

Agency theory asserts the relationship between principals (the owners of the firm) and agents (the top management). Agency theory posits that this relationship may be subject to inefficiencies to the extent that both parties are assumed to act in their own self-interest which may be unaligned, causing agency problems (Jensen & Meckling, 1976).

The BoD play an important role in order to overcome agency problems between the top management and shareholders (Adams & Ferreira, 2009). To ensure that the daily operations of a firm are in line with the shareholders´ best interests, the board are most often elected by its shareholders.[3] There are three common properties of a good corporate board; aligned, informed and decisive. With these properties, the BoD shall reduce potential agency conflicts, have enough information to provide good monitoring and advise, and be able to make decisions effectively. Hence, the board of directors can reduce agency problems through extensive monitoring, increased incentive alignment and active decision-making (Adams & Ferreira, 2009).

Agency problems can appear through non-value-maximizing investment choices (Shleifer and Vishny, 1989). Agency theories view of CSR considers CSR as an agency problem and a waste of corporate resources (Ferrell et al., 2016). Ferrell et al. (2016) further finds that firms with strong corporate governance and thus suffer less from agency problems, engage more in CSR.

3.1.2 Gender Diversity on Boards

Board diversity can be defined as the heterogeneity of the composition of the board. It can be interpreted by taking the directors ethnicity, educational background, professional qualifications and gender into account. Among these characteristics, gender diversity has been a highly discussed topic, especially over the last years. Women represent a highly percentage of the Norwegian workforce, but when it comes to the gender balance on the BoD the history has proven to

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[3] According to the Norwegian law of public limited firms §6-4, employees can also have the right to choose representatives on the board under some circumstances.

show remarkably lower statistics. Norway however, has been among the top countries when it comes to gender diversity and results show that this is correlated with the implementation of gender quotas on boards.

3.1.3 Statutory Gender Diversity on Boards

Norway was the first country to mandate gender balance in the BoD. The GBL was announced by the Parliament of Norway in 2002, passed in 2003, and implemented in 2006 with an implementation period of two years, ending in January 2008 (Bøhren & Staubo, 2014). The GBL requires at least 40%[4] representation of each gender on the BoD in all listed firms (Allmennaksjeloven, 2003). The legislation has increased the share of women on boards from almost zero to just above 40%. As of 2017, 40.62% of the directors in listed firms are women, on average. In comparison, non-listed firms, which are not affected by the quota, only have a 19.76% female representation on the BoD.

3.2 Corporate Social Responsibility

Alongside the growth of corporate governance, one of the most significant corporate initiatives over the past years is the growth CSR. CSR has been a highly source of debate regarding whether CSR activities are positively related to firm performance. Many empirical studies indicate that CSR is associated with well-performing firms (Jo and Harjoto (2011); Ferrell et al. (2016)).

Even though there has been a number of previous literature on CSR, we find no unified theory behind CSR engagement. However, we find at least two alternative explanations behind its existence. The first is based on agency theory and the over-investment hypothesis. CSR engagement is considered as a principal-agent relation between managers and shareholders. Barnea and Rubin (2010) argue that aligned insiders have an interest in overinvesting in CSR in order to obtain private benefits, for example in the form of a good reputation, at a cost to shareholders. An improving reputation can eventually lead to overconfidence, as the top management are likely to enjoy greater career opportunities and greater

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[4] According to the Norwegian law of public limited firms §6-11a (1), the quota of 40% representation of each gender only applies for firms with nine or more members of the board. Boards with two-three, fire-five or six-eight members must have a gender representation of one, at least two or at least three, respectively. These restrictions imply that the quota varies between 33% and 50%.

negotiation power. There is some evidence of over-investment by overconfident CEOs (Malmendier and Tate, 2005). The second explanation is the conflict-resolution hypothesis based on stakeholder theory, arguing that the role of the firm is to maintain the interest of other non-investing stakeholders as well. According to the conflict-resolution hypothesis, CSR should be positively related to effective governance mechanisms if managers combine it together with CSR engagement to avoid conflicts between stakeholders.

3.2.1 Statutory Reporting of Corporate Social Responsibility

In 2013, Norway implemented a soft law regarding firms' reporting of CSR. Large enterprises are required to report on their CSR activities in their annual report or in public available documents. According to the Norwegian Accounting Act §3-3 c, large enterprises shall outline their actions on integrating human rights, labour rights and social issues, the external environment and the fight against corruption in their business strategies, into their daily operations and with their stakeholders.[5]

3.3 Firm Performance

As our measure for firm performance, we use industry-adjusted Tobin's Q. Tobin's Q is a frequently used measure of firm performance on listed firms, considering if the value of a firm's stocks is greater than the cost of replacing the firm's assets. The neoclassical theory of corporate investment assumes that the managers seek to maximize the market value of the outstanding common shares. A new investment should only be undertaken if it increases the value of the shares. If the predicted value of the investment exceeds the cost, then the firm's shares will appreciate to the benefit of their shareholders. Hence, the market will value the project more than the proceeds used to pay for it. If new debt or equity are issued to raise cash, the prospectus leads to an increase of share price. The rate of investment and thus the speed at which investors wish to increase the capital stock, should then be related to Tobin's Q, the value of capital relative to its replacement cost (Tobin and Brainard, 1976).

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[5] If enterprises do not have the guidelines, principles and procedures as mentioned by the Norwegian Accounting Act §3-3c, this shall be disclosed.

4 Research Question and Model Estimation

4.1 Research Question

The research question will limit our research to the already mentioned field of study. The main objective is to understand the relationship between externally observable board characteristics, CSR engagement and firm performance. In addition, we will investigate the effect of board characteristics on CSR engagement. Hence, we have three main research questions:

1) *Does board characteristics affect firm performance?*
2) *Does CSR engagement affect firm performance?*
3) *Does board characteristics affect CSR engagement?*

4.2 Regression Models

Our research covers the time period of 2011 – 2017, however limited data on CSR engagement restricts this part of the study to 2017. Based on two different data sets, we have divided the research into two parts and constructed six regression models.

To identify a relation between board characteristics and firm performance, we construct the following multiple regression models. Firm performance is the dependent variable for firm i in time t. Board characteristics are the independent variables, measured by the number of board members, gender diversity and the board members age. The control variables are growth, firm size, firm age and leverage. All variables will be explained in detail in the next section.

(1) $ADJTQ_{it}$
$= \alpha + \beta_1 BoardCharacteristics_{it} + \beta_2 Growth_{it} + \beta_3 FirmSize_{it} + \beta_4 FirmAge_{it} + \beta_5 Leverage_{it} + \varepsilon_{it}$

The following multiple regression models will be complemented by data from "PwC Sustainability 100" and are constructed to identify (i) the effect of CSR engagement and board characteristics on firm performance (ii) the effect of CSR engagement on firm performance. Firm performance is the dependent variable for firm i in time t. Measures of board characteristics, CSR and control variables are

the independent variables in our regression model. The control variables are firm size and leverage. Firm age and growth are removed due to a large number of missing observations. Several of the independent variables are highly correlated and including all variables in the model could lead to multicollinearity. To examine the presence of multicollinearity we calculate the variance inflation factor (VIF) for each independent variable. The values are found to be within acceptable levels. However, a strong significant correlation (0.637) between the board size and CSR engagement cause the results to deviate. CSR and BoardSize may measure similar aspects of firm performance, and thus we choose to remove board size from regression (2) and (4).

(2) $ADJTQ_{it}$

$= \alpha + \beta_1 CSR_{it} + \beta_2 FemaleFraction_{it} + \beta_3 DirectorsMeanAge_{it} + \beta_4 FirmSize_{it} + \beta_5 Leverage_{it} + \varepsilon_{it}$

(3) $ADJTQ_{it}$

$= \alpha + \beta_1 CSR_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \varepsilon_{it}$

As an extension of the above regressions we construct the following multiple regression models. We aim to identify (i) the effect of board characteristics and firm performance on CSR engagement and (ii) the effect of firm performance on CSR engagement.

(4) CSR_{it}

$= \alpha + \beta_1 ADJTQ_{it} + \beta_2 FemaleFraction_{it} + \beta_3 DirectorsMeanAge_{it} + \beta_4 FirmSize_{it} + \beta_5 Leverage_{it} + \varepsilon_{it}$

(5) CSR_{it}

$= \alpha + \beta_1 ADJTQ_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \varepsilon_{it}$

Finally, we will conduct a comprehensive multiple regression on how board characteristics and control variables affect CSR engagement. As firm performance is excluded from this model, we are able to retain values that were unobserved in the previous section. Thus, Model (6) is based on a larger dataset. BoardSize is included in the model as no significant abnormal correlation is found with CSR.

(6) CSR

$$= \alpha + \beta_1 BoardCharacteristics_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \varepsilon_{it}$$

4.3 Measure of Firm Performance

In our research, we use industry adjusted Tobin's Q (ADJTQ), a financial market-based measure of firm performance. We calculate Tobin's Q (TQ) as the sum of total assets less the book value of equity plus the market value of equity, divided by total assets. In order to neutralize the industry effects on Tobin's Q, we take the natural log of the firm's Tobin's Q and divide it by the median Tobin's Q, estimated by the firm's industry.

4.4 Measure of CSR

CSR engagement (CSR) is measured according to PwC's standards and based on public information such as annual reports. The firms are rated between 0-5 based on (1) whether the firms mention CSR in their annual reports, (2) qualitative ambition communicated, (3) quantitative KPI's reported, (4) quantitative objectives for future results are given, or (5) if CSR is integrated into their business strategies. A score of 5 indicates complete integration of CSR, whereas a score of 0 indicates no CSR reporting. Various methods concerning ratings, criteria and scores on CSR engagement may cause our results to deviate from previous findings. According to Margolis and Walsh (2003), 120 studies have been conducted between 1971 and 2001 investigating the relationship between CSR engagement and firm performance, and the results are largely inconclusive. However, Jo and Harjoto (2011) indicate that CSR engagement enhances firm value. In addition, Margolis and Walsh (2003) found a generally positive association between CSR engagement and financial performance. Hence, we expect a positive association.

4.5 Proxies for Board Characteristics

To measure board characteristics, we use the number of board members, gender diversity and the board members age.

4.5.1 Number of Board Members

Board size (BoardSize) is explained by the total number of directors on the board at year-end. Our sample consists of no boards comprising less than three directors. Guest (2009) found that board size has a strong negative impact on profitability, Tobin's Q and stock returns. His evidence supports the argument that problems of poor communication and decision-making undermine the effectiveness of large boards. On the other hand, Pfeffer and Salancik (2003) suggest that the higher the number of directors, the higher financial performance. Several studies have been conducted to examine the relationship between board size and firm performance, however no consistent empirical evidence has yet been found (Hermalin and Weisbach, 2003). Due to unclear results, we have no specific expectations of the board-performance relationship.

4.5.2 Gender Diversity

To measure the level of gender diversity (FemaleFraction) we use the percentage of women on the BoD. The percentage is calculated by taking the number of female directors over the total board size. Previous research regarding gender diversity on boards and firm performance uncover conflicting results. Terjesen et al. (2015) found that firms with more female directors have higher firm performance measured by Tobin's Q. In contrast, Cherian et al. (2018) found that board gender diversity tends to diminish market performance, measured by Tobin's Q. On the other hand, Marinnova et al. (2015) found no significant relationship. Hence, we have no particular expectation of the direction of the relationship. However, the relationship is likely to be affected by regulations and thus the effect could already be accounted for.

$$(6) \ FemaleFraction_{it} = \frac{Female \ Directors_{it}}{Total \ Board \ Size_{it}}$$

4.5.3 Board Members Age

The directors mean age (DirectorsMeanAge) is the average age of the BoD for each firm in our sample period. According to Horváth and Spirollari (2012), younger members are probably willing to bear more risk and to undertake major structural changes to improve firm´s future prospects. Muller et al. (2015) found

that boards with a younger average age has a positive association with improved financial performance. A positive relationship is therefore expected.

4.6 Firm-specific control variables

In line with previous research, we have identified a number of firm-specific factors that are likely to affect firm performance. To account for these effects we include the following control variables.

4.6.1 Growth

Growth (Growth) is measured as the total sales of the current year minus total sales of the previous year divided by total sale of the previous year. Mak and Kusnadi (2005) argued that sales growth is positively related to firm performance. Thus, we expect a positive relationship.

$$(7)\ Growth_{it} = \frac{Sales_{it} - Sales_{it-1}}{Sales_{it-1}}$$

4.6.2 Firm Size

Firm size (FirmSize) is measured through the book value of total assets (Tosi et al., 2000). The natural logarithm of total assets is then used to measure firm size to smooth the high variability of the variables. Majamdar (1997) states that there is a positive relation between firm size and firm performance, while McConnell and Servaes (1990) argue that firm size is expected to be negatively associated with Tobin's Q. Thus, no specific association is expected.

4.6.3 Firm Age

Firm age (FirmAge) is an essential corporate governance measure in relation to valuation and is therefore included as a control variable (Morck, Shleifer, & Vishny, 1988). Firm age is measured by the number of years since the firm was established. Our sample of firms are in different life cycle stages, hence we have no specific expectation concerning the relationship.

4.6.4 Leverage

Leverage (Leverage) is measured by total liabilities divided by total assets. Grossman and Hart (1982) and Jensen (1986) found that leverage serves as a positive signal for firm value. On the other hand, Mule and Mukras (2015) argued that financial leverage is an important negative predictor of financial performance measured in terms of Tobin's Q. Due to unclear results we have no specific expectation of leverage on firm performance.

$$(8) \ Leverage_{it} = \frac{Total \ liabilities_{it}}{Total \ assets_{it}}$$

5 Methodology

The data set is cleansed and restructured in MATLAB and further analysed using STATA. We use six regression models to test our research questions. To estimate the relationship between board characteristics and firm performance, we use a panel data model analysis. This model is powerful in controlling for potential endogeneity problems caused by unobservable heterogeneity (Campbell & Mínguez-Vera, 2008). To obtain consistent estimates of the parameter coefficients, we test for firm- and time fixed effects (Campbell & Mínguez-Vera, 2008; Himmelberg, Hubbard & Palia, 1999). Moreover, Wooldridge (2010) states that panel data regression models are appropriate for data sets containing multiple firms across multiple time periods. The number of time periods available differs between the firms in our sample, hence our data set is considered an unbalanced panel (Arellano & Bond, 1991). When estimating the relationship between CSR engagement, board characteristics and firm performance we use a linear regression model (OLS).

5.1 Panel Data Model Analysis

5.1.1 Firm Fixed Effects

Firm fixed effects can be estimated if the sources of unobserved heterogeneity vary across entities, but are constant over time. The coefficient estimates are driven by the variation within each firm over time.

To test whether a fixed effects model or a random effects model is appropriate for our regression models, we perform a Hausman test. The Hausman test identifies if there is a correlation between the unobservable heterogeneity and the explanatory variables in the model. In order to decide which model to use, we observe which hypothesis that is significant. The null hypothesis implies that the random effects model is appropriate, while the alternative hypothesis implies that the fixed effects model is appropriate. We obtain a large p-value and reject the alternative hypothesis that there is correlation between the unobservable heterogeneity and the explanatory variables (Appendix 3). Thus, random effects are appropriate.

5.1.2 Time Fixed Effects

Time fixed effects control for omitted variables that are constant across firms, but vary over time, e.g. the model control for factors affecting Tobin's Q. Our data set consists of observations over a 6-year period, and there are likely to be fluctuations in the economy and business environment affecting all firm's profitability in the sample. Time fixed effects consider macro shocks such as interest rate fluctuations, tax rate changes and legislative changes. In an economic sense, time fixed effects consider macro shocks that are mutual to all firms in the panel. Some firms in our sample are likely to be affected by the financial crisis (2007 – 2008) or the drop in oil price (2014 – 2015) by lower profitability. To test whether we should include time fixed effects in our panel data model, we include a dummy variable for each year in the regression. Moreover, we test whether the dummy coefficients for all years are jointly equal to zero. The results are not significant and time fixed effects should not be included (Appendix 4).

5.1.3 Robust Standard Errors

Tobin's Q for a specific firm is likely to be correlated over time, while firms within the same industry is assumed to be correlated. To neutralize the effect of specific industries on Tobin's Q we use the industry-adjusted Tobin's Q. However, ignoring within-group correlation of the observations could lead to inaccurate results and artificially low standard errors, misleadingly narrow confidence intervals and thus low p-values and large t-statistics (Cameron & Miller, 2015). By ignoring within-group correlation the chance of committing

type 1 errors increases, indicating an over-rejection of the null hypothesis and obtain misleading significance. Hence, we cluster standard errors on firm level.

6 Data and Descriptive Statistics

6.1 Data

The data used in our research is retrieved from the Centre for Corporate Governance (CCGR), Thomson Reuters Eikon and PwC during February 2019. We have decided to restrict our dataset to a period of 7 years (2010 – 2017) to ensure significant statistical results for our sample. The unbalanced panel of data consists of 2,243,278 observations obtained from listed and non-listed Norwegian firms. After adjusting the data sample to only listed firms, the number of observations is 1,421. Missing values are removed from the data sample. The financial performance indicators are winsorized at the 1% and 99% tails. This is done in order to reduce the effect of possible spurious outliers. In contrast with Norwegian non-listed firms, Norwegian listed firms are required to use the international accounting standards (IFRS) and thus firms within all industries are comparable and included in our sample.[6] In 2010 listed firms were required by regulations to have at least three board members, hence we require the number of board members to at least three. After these adjustments, our dataset consists of 973 observations. The growth variable is based on observations from previous years and thus our data sample consists of 820 observations (2011 – 2017) when the growth variable is included.

6.1.1 Firm Performance Measurement Adjustments

To measure firm performance, we use industry-adjusted Tobin's Q and Tobin's Q. In line with previous research, the advantage of using industry-adjusted Tobin's Q is that it neutralizes the effect of specific industries on Tobin's Q (Jo and Harjoto, 2011). Thus, industry-adjusted Tobin's Q is the preferred firm performance measure among scholars. However, to make sure all associations are considered in our research, both industry-adjusted Tobin's Q and Tobin's Q are included in our dataset and tested. All tests conducted on the performance measurements show

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[6] According to www.regnskapsstiftelsen.no

fairly similar results and hence we choose to only include industry-adjusted Tobin's Q in our model. Results on Tobin's Q will therefore not be reported.

6.2 Descriptive Statistics

6.2.1 Characteristics of Firm Performance and Board Characteristics Per Year

Table 2 shows the number of listed firms, the average firm performance, the number of board members, gender diversity and the board members age of the firms in our data sample over the period from 2010 to 2017. The number of listed firms has slightly increased every year, except from 2017, which is caused by missing observations in our data sample. The average gender diversity on boards has been stable around 40%, which is a direct cause of the GBL. Furthermore, we see that the number of board members and board members age has been stable over the years.

Table 2: Characteristics of Listed Norwegian Firms per Year

Year	Number of Firms	ADJTQ	CSR	BoardSize	FemaleFraction	DirectorsMeanAge
2010	113	0.172		6.681	40.44%	52.515
2011	116	0.106		6.647	41.32%	52.734
2012	117	0.149		6.632	41.16%	53.196
2013	120	0.163		6.483	41.28%	53.442
2014	131	0.138		6.382	41.10%	53.256
2015	137	0.144		6.431	41.61%	53.376
2016	143	0.167		6.399	42.28%	53.603
2017	96*	0.179	1.534	6.406	40.71%	53.431

Table 2 displays the number of Norwegian listed firms per year, the average ADJTQ, the average BoardSize, the average FemaleFraction and the average DirectorsMeanAge per year. *the number of firms is 40 when CSR is included due to restricted data availability.

6.2.2 Summary Statistics

Table 3 shows the mean, standard deviation, median, minimum, maximum value and the number of observations of the two dependent variables, the independent variables and the firm specific control variables.

Table 3: Summary Statistics

	Mean	Std. Dev.	Median	Min.	Max.	No. Of Obs.
Dependent Variables						
ADJTQ	0.153	0.302	0.051	0.367	1.263	973.000
CSR	1.534	0.141	1.625	0.000	3.187	40
Independent Variables						
BoardSize	6.503	1.924	6.000	3.000	11.000	973.000
FemaleFraction	0.413	0.081	0.400	0.000	0.800	973.000
DirectorsMeanAge	53.208	4.334	53.333	40.750	70.200	973.000
Firm Specific Control Variables						
Growth	6.841	127.884	0.000	-9.824	3159.600	820.000
FirmSize	19.636	6.640	21.230	0.000	27.439	973.000
FirmAge	43.117	46.017	24.000	3.000	196	973.000
Leverage	0.465	0.351	0.464	0.000	3.798	973.000

Table 3 displays a summary of statistics for the dependent variable, the independent variables and the firm specific control variables for Norwegian listed firms. Shown in column 2 – 6 are the mean value, standard deviation, the median, the minimum and the maximum values. The number of observations is presented in column 7. The data sample presented in the table is based on listed Norwegian firms in the period from 2011 to 2017.

6.2.3 Correlation

Table 4 presents the Pearson correlation matrix for board characteristics, Tobin's Q and the control variables on the data sample from 2011 to 2017. None of the board characteristics are significantly correlated with industry-adjusted Tobin's Q. This indicates that the measures are optimal, arguably because of the regulations, and thus have no effect on firm performance. Further, we find that BoardSize is positively and significantly correlated (0.228) with FirmAge. Therefore, older firms seem to have a higher number of directors on their boards. FirmSize and FirmAge are positively and significantly correlated (0.08 and 0.122) with BoardMembersAge. This means that larger and older firms have older board members on average. FirmAge is negatively and significantly correlated (-0.189) with ADJTQ, indicating that younger firms have stronger firm performance. Additionally, we observe a negatively significantly correlation (-0.092) between FirmSize and ADJTQ. This is consistent with previous research, referred to as a size discount, meaning that larger firms are relatively less valuable than smaller firms (Hou, 2018). We also find that Leverage is negatively and significantly correlated with ADJTQ. This implies that as firms use more financial leverage, financial performance declines, which is consistent with previous studies (Deesomsak, Paudyal & Pescetto, 2004; Gleason, Mathur, & Mathur, 2000).

Table 5 presents the Pearson correlation matrix for CSR, board characteristics, Tobin's Q and the control variables on Norwegian listed firms in 2017. We find that CSR is positively and significantly correlated (0.46) with ADJTQ. Consistent with Hou (2018), our results indicate that firms with higher CSR engagement have stronger firm performance. BoardSize is also positively and significantly correlated (0.538) with ADJTQ, indicating that firms with larger boards have a stronger firm performance. FemaleFraction is negatively and significantly correlated (-0.503) with ADJTQ. This indicates that firms with a higher number of women on their board experience weaker firm performance.

Due to high and significant correlation between BoardSize and CSR (0.637), a second regression model is estimated without BoardSize as explained in section 4.

Table 4: Pearson's Correlation Matrix – Firm Performance and Board Characteristics (2011-2017)

	ADJTQ	BoardSize	FemaleFraction	DirectorsMeanAge	Growth	FirmSize	FirmAge	Leverage
ADJTQ	1.000							
BoardSize	-0.035	1.000						
FemaleFraction	0.006	-0.026	1.000					
DirectorsMeanAge	-0.008	-0.010	-0.022	1.000				
Growth	-0.016	0.012	0.007	-0.012	1.000			
FirmSize	-0.092*	0.3154	0.042	0.080*	0.023	1.000		
FirmAge	-0.189*	0.228*	-0.0367	0.122*	-0.025	0.234*	1.000	
Leverage	-0.098*	0.271*	0.020	0.030	0.005	0.522*	0.335*	1.000

This table presents the Pearson's correlation coefficients for the dependent, independent and control variables of Norwegian listed firms in the period from 2011 to 2017. Significance at the 5% level of lower is indicated by *. See Appendix 5 for variable definitions.

Table 5: Pearson's Correlation Matrix – Firm Performance, CSR and Board Characteristics (2017)

	ADJTQ	CSR	BoardSize	FemaleFraction	DirectorsMeanAge	FirmSize	Leverage
ADJTQ	1						
CSR	0.460*	1					
BoardSize	0.538*	0.637*	1				
FemaleFraction	-0.503*	-0.219	0.012	1			
DirectorsMeanAge	-0.208	-0.048	-0.013	0.077	1		
FirmSize	-0.259	0.288	0.168	0.304	0.233	1	
Leverage	-0.064	0.085	0.150	0.157	0.098	0.698*	1

This table presents the Pearson's correlation coefficients for the dependent, independent and control variables of Norwegian listed firms in 2017. Significance at the 5% level of lower is indicated by *. See Appendix 5 for variable definitions.

7 Results and Discussion

In this section, we will present the results of our regression models. Furthermore, we will discuss the results considering our own estimates as well as a comparison to previous research. This section is divided into three parts. In the first part, we will analyse the relationship between board characteristics and firm performance from 2011 to 2017. In the second part, we will examine the relationship between CSR engagement and firm performance based on data from 2017. In the final part, we analyse the effect of board characteristics on CSR engagement.

7.1 Board Characteristics and Firm Performance

Table 6 presents the main results from the panel data regressions. Column 2 indicates the predicted direction of the relationship, column 3 – 5 displays the estimated coefficients for regression (1).

Table 6: Main Results – Board Characteristics and Firm Performance

Independent Variables	Prediction	ADJTQ		
BoardSize	+/-	-0.005		
		(0.009)		
FemaleFraction	+/-		-0.056	
			(0.170)	
DirectorsMeanAge	+			0.000
				(0.003)
Growth	+	-0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.000)
FirmSize	+/-	0.002	0.002	0.002
		(0.004)	(0.004)	(0.004)
FirmAge	+/-	-0.001***	-0.001***	-0.001***
		(0.000)	(0.000)	(0.000)
Leverage	+/-	0.033	0.031	0.031
		(0.069)	(0.069)	(0.069)
Constant		0.171**	0.168*	0.144
		(0.080)	(0.098)	(0.150)
Random Effects		Yes	Yes	Yes
Adjusted R^2		0.023	0.023	0.024
Number of Observations		820	820	820

Table 6 displays the estimated coefficients of the board characteristics measures and the control variables. Column 2 presents the predicted signs of the coefficients. The coefficient estimates and standard errors (in parenthesis) are reported for each regression and measure of board characteristics. The significance levels are 1%, 5% and 10%, and the significance level are represented by ***, ** and *, respectively. The time period is from 2011 to 2017. ADJTQ is winsorized at the 1% and 99% tails. Robust standard errors are clustered at firm level. The variables are defined in Appendix 5.

7.1.1 Main Results

The results show that the number of board members, gender diversity and board members age are not significantly related to firm performance for the time period 2011-2017. The results are found to be robust to the different measures of board characteristics and alternative estimation techniques. One possible concern is that the results can be driven by one calendar year, and thus we analyse the data set on a year-by-year basis. We find that the results are robust to a breakdown by calendar year (Appendix 6). Furthermore, we suspect that the regulations on corporate boards may have been successful in creating an optimal board composition, as the findings show no statistically significant results.

7.1.2 The Effect of Board Regulations

Previous research has addressed the concern about board regulations in relation to firm performance (Bøhren and Strøm, 2008). One of the most significant board regulations in Norway is the GBL, which has been highly debated since the implementation in 2008. The economic argument in favour of women on boards refer to the high number of highly-educated women,[7] the increasingly number of women making career in private sector jobs, diversity as a factor for more valuable decision-making and the loss of talent when such a small number of women reach board positions. The economic arguments against the gender quota is that the regulations imply that it will not be the best individuals in board positions, or that board composition will be sub-optimal when regulated by outside authorities.

We find that none of the measures for board characteristics are significant. Since our data set are from 2011 to 2017, which is after the implementation of the GBL, we suspect that the regulation has been successful in creating an optimal board composition. It could be that firms have had time to find the most qualified female directors since the implementation of the GBL, and that female directors have had time to gain valuable experience. Therefore, corporate boards are likely to have a more optimal and efficient board composition, which reduces the effect imposed by the GBL. Hence, we find no significant effect on firm performance. It would

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[7] According to Statistics Norway (SSB), (2017-2018), 60.4% of women have completed education and credits at universities and colleges in Norway, compared to 39.6% men.

be interesting for further research to analyse the effect before and after the quota was implemented.

To further examine the relationship between board characteristics and firm performance, two additional analysis were conducted. The first analysis considers old versus young firms; firms that have operated for more than 15 years versus firms that have operated less than or equal to 15 years. The results were similar and thus are unreported. The second analysis considers large versus small board; boards larger than six members versus firms with boards less than or equal to six members. No valuable results were found and is therefore not reported.

7.2 Corporate Social Responsibility

The main results from our regression models concerning the relations between CSR engagement, board characteristics and firm performance are presented in table 7. Column 2 and 3 presents the estimated coefficients. As explained in section 4, BoardSize is excluded from the models due to high correlation with CSR.

Table 7: Main Results - CSR Engagement and Board Characteristics on Firm Performance (2017)

Independent Variables	ADJTQ	
	Model (1)	Model (2)
CSR	0.138**	0.167***
	(0.052)	(0.048)
FemaleFraction	-0.938	
	(0.662)	
DirectorsMeanAge	-0.003	
	(0.009)	
FirmSize	-0.013	-0.017**
	(0.007)	(0.006)
Leverage	0.247	0.298
	(0.199)	(0.196)
Constant	0.661	0.112
	(0.543)	(0.102)
Adjusted R^2	0.361	0.357
Number of Observations	23	23

This table presents the estimated coefficients of CSR engagement, board characteristics and control variables. For each measure, we report the coefficient estimates, the standard errors (in parenthesis) and the significance level where 1%, 5% and 10% significance level are denoted by ***, ** and * respectively. Model (1) includes CSR, all relevant board characteristics and control variables. Model (2) excludes board characteristics to solely investigate the relationship between CSR and ADJTQ. The data sample consists of Norwegian listed firms in 2017. ADJTQ is winsorized at the 1% and 99% tails. The variables are defined in Appendix 5.

Table 8: Regression Results - Firm Performance and Board Characteristics on CSR Engagement for 2017

Independent Variables	CSR	
	Model (3)	Model (4)
ADJTQ	2.124**	2.320***
	(0.798)	(0.668)
FemaleFraction	-1.244	
	(0.662)	
DirectorsMeanAge	-0.011	
	(0.034)	
FirmSize	-0.068	0.065**
	(0.025)	(0.023)
Leverage	-1.129	-1.111
	(0.767)	(0.730)
Constant	1.398	0.342
	(2.192)	(0.385)
Adjusted R^2	0.306	0.369
Number of Observations	23	23

This table presents the estimated coefficients of firm performance, board characteristics and the control variables. For each measure, we report the coefficient estimates, the standard errors (in parenthesis) and the significance level where 1%, 5% and 10% significance level are denoted by ***, ** and * respectively. Model (3) includes firm performance, all relevant board characteristics and control variables. Model (4) excludes board characteristics to solely investigate the relationship between ADJTQ and CSR. The data sample consists of Norwegian listed firms in 2017. ADJTQ is winsorized at the 1% and 99% tails. The variables are defined in Appendix 5.

7.2.1 Main Results

The results indicate that there is a positive relationship between CSR engagement and firm performance in 2017. Table 7 displays two regression models on the association between CSR engagement and firm performance. The number of board members, BoardSize, is excluded from these regression models due to high significant correlation (0.637) with CSR. Including both variables in the models cause the results to deviate. Model (1) examines the relationship between CSR engagement, board characteristic and control variables on firm performance, while Model (2) excludes board characteristics. Table 8 presents two regression models on the relationship between firm performance and CSR engagement. Model (3) includes firm performance, board characteristics and control variables on CSR engagement, while Model (4) excludes board characteristics. The regression results are found to be robust, after controlling for the likelihood of multicolliniarity. The estimated coefficients remain stable when different measures of board characteristics are included, thus no sign of omitted variable bias support the robustness of our regression results. Previous research argue that determinants of board characteristics are likely to affect CSR engagement. Thus, we will further analyze this relationship. Listed Norwegian firms are obligated to follow the Norwegian soft law on CSR reporting and experience certain

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expectations from society that non-listed firms do not. Hence, we suspect that the listing status affects a firm's CSR engagement, which will be examined further.

7.2.2 The Effect of Regulations on CSR Reporting
To examine the effect of regulations on CSR reporting, we study the relationship between board characteristics, CSR engagement and firm performance. The data sample is from 2017, which is after the implementation of the soft law on CSR reporting in 2013. Hence, we aim to investigate the effect related to the implementation of the CSR reporting regulation and firm performance. Model (1) examines the effect of board characteristics, CSR engagement and firm performance, while Model (2) solely examines the effect of CSR engagement on firm performance.

In line with our prediction, CSR shows a positive significant effect on firm performance. In Model (1) the relationship is significant at a 5% level, where one percentage change in CSR engagement increases the firm performance by 0.138 (ceteris paribus). In Model (2) the relationship is significant at a 1% level, where one percentage change in CSR engagement increases firm performance by 0.167 (ceteris paribus). A positive significant relationship between CSR engagement and firm performance indicates that regulation still affects the association between CSR engagement and firm performance. It could be that firms are motivated to invest in CSR due to obligations a firm has to the society. Maignan and Ferrell (2004) argue that several firms embrace CSR engagement as a means of promoting socially responsible actions, policies and effectively responding to stakeholder demands. Dowell et al. (2000) find that firms engaging in CSR activities at a minimum requirement also gain higher market values than firms not engaging in CSR. In addition, firms may use CSR engagement as moral capital, which could act as insurance during demanding times. Consequently, firms that engage in CSR seek to enhance firm performance through future reciprocity from stakeholders.

In Model (2), FirmSize shows a negative significant effect on firm performance at a 5% level, which is consistent with research conducted by Eilert et al. (2013). It could be that larger firms find it difficult to replace the motive of profit maximization with managerial utility maximization (Maja and Josipa, 2012).

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Moreover, larger firms may experience increased coordination requirement, which make the managerial task problematic resulting in inefficiency and thereby lower firm performance. However, as FirmSize does not show a significant relationship with firm performance in Model (1), firm size may not be an important component to consider in this case.

Model (3) further examines the effect of board characteristics and firm performance on CSR engagement, while Model (4) solely examines the effect of firm performance on CSR engagement. The results show that firm performance has a positive significant effect on CSR engagement. In Model (3) the relationship is significant at a 5% level, where one percentage change in firm performance increases CSR engagement by 2.124 (ceteris paribus). In Model (4) the relationship is significant at a 1% level, where one percentage change in firm performance increases CSR engagement by 2.320 (ceteris paribus). The positive association between board characteristics, firm performance and CSR is supported by Turban and Greening (1997). They argue that firms with higher sustainability performance and reporting are likely to attract the best quality of employees. These firms are likely to attract additional qualified applicants, which could lead to a competitive advantage compared to other firms. This implies that firms with higher CSR engagement tend to have higher firm performance as they attract both human and capital resources. Hence, we find CSR engagement as a driver for financial performance.

As presented in Model (4), we find a positive significant relationship at a 5% level between FirmSize and CSR. Thus, larger firms are likely to invest more in CSR. Adams and Hardwick (1998) and McElroy and Siegfred (1985) support our findings, by stating that firm size can affect strategic motivation and thereby having a positive effect on CSR engagement. Larger firms tend to have greater social influence, given the scale of their activities, and one could justify that the social responsibility falls on them. However, as FirmSize does not show a significant relationship with CSR in Model (3), firm size may not contribute in a meaningful way to the predictive ability of the regression models. Additionally, in model (3) we find that gender diversity on the BoD does not appear to affect the decision-making of the board related to CSR engagement. The result is supported

by Babania et al. (2013), which found no significance and meaningful difference between men and women in CSR engagement.

7.2.3 CSR Engagement on Listed vs Non-Listed Firms

The soft law on CSR reporting only applies for large enterprises. According to the Norwegian Accounting act § 1-5, listed firms (ASA) are counted as large enterprises, and thus regulated by the soft law on CSR reporting. Our data set on CSR engagement consists of the 100 largest Norwegian firms' score on CSR reporting. The sample consists of 40 listed firms and 60 non-listed firms. By examining the score for CSR engagement between listed and non-listed firms, we can observe if the soft law has had any effect.

We find that listed firms have a superior reporting on CSR relative non-listed firms. Listed firms has an average score of 1.5, compared to a score of 1.3 for non-listed (Appendix 7). These findings show that the soft law on CSR reporting has been successful in that listed firms engage more in CSR.

However, it is important to keep in mind that not reporting on CSR does not necessarily mean that the firm has weaker CSR engagement. It could be that listed firms are more concerned about sharing their CSR engagement than non-listed firms, probably due to reputational concerns, and/or that they have more structured communication processes. We note that the non-listed firms also have been required to report on CSR in their BoD report. However, the majority have barely addressed the issue, which have been accepted by accounting and reporting agencies (Ditlev-Simenson et al., 2015).

7.2.4 The Effect of Board Characteristics on Corporate Social Responsibility

Many researchers and practitioners have discussed the relationship between CSR and firm performance, but few have addressed the relationship between CSR and board characteristics. In this section, we aim to extend previous research by analysing the effect of board characteristics on CSR engagement. The data set is retrieved from "PwC Sustainability 100", similar to the section above. However, in this section we analyse 29 firms since we do not include firm performance that were missing for some firms in the previous section.

Table 9 present the results from linear regression model six. The results show that the number of board members has a positive significant effect on CSR engagement at the 1% level, where one percentage change in the number of board members increases CSR engagement by 0.235 (ceteris paribus). The association between gender diversity and board members age on CSR engagement is insignificant.

Table 9: Regression Results - Board Characteristics on CSR

	CSR
Independent Variables	
BoardSize	0.235***
	(0.081)
FemaleFraction	-2.778
	(2.525)
DirectorsMeanAge	-0.006
	(0.032)
FirmSize	0.057
	(0.271)
Leverage	0.000
	(0.000)
Constant	0.485
	(2.644)
Adjusted R^2	0.224
Number of Firms	29

This table presents the estimated coefficients for the board characteristics and the control variables. For each measure, we report the coefficient estimates, the standard errors (in parenthesis) and the significance level where 1%, 5% and 10% significance level are denoted by ***, ** and * respectively. The data sample consists of Norwegian listed firms in 2017. The variables are defined in Appendix 5.

The positive relationship between the number of board members and CSR engagement is supported by previous studies (Nitim and Soobaroyen, 2013; Anum et al., 2012). Gender diversity, as one aspect of board diversity, has gained a significant importance in corporate governance literature. It is argued that diverse boards have better understanding of complex issues, such as CSR, as compared to homogenous boards (Carter et al, 2003). However, our results show no significant relationship between gender diversity and CSR engagement. We note that this research is not free from limitations. The data set consists of only 29 firms, and thus the results can be further validated by analysing data from a higher number of firms. Similar to the previous section, the data set is based on available information. CSR engagement that is not evident from published information can thus be left out of the study leading to biased results.

7.3 Robustness

In order to ensure robustness of our results, we choose three measures for board characteristics, which in turn are implemented in the relevant regression models. Throughout our research, the findings on each proxy remain consistent and yield the same results, which increases the validity of our findings. To strengthen the robustness of the regression models, we include random effects and all control variables we find relevant. Moreover, we carefully evaluate the correlation matrixes and calculate the VIF score for each independent variable in order to eliminated the existence of multicollinearity. The VIF values are within acceptable levels. However, in regression model (2) and (4) a strong correlation between BoardSize and CSR is found, and thus we choose to remove the board size variable from the regressions. These variables could involve some degree of redundancy and thereby lead to multicolliniearity if both variables are included. To ensure optimal results the regression models use clustered standard errors on firm level. We also ran an additional analysis yielding supporting results for each year of our total time frame.

7.4 Endogeneity

According to Adams and Ferreira (2009), endogeneity concerns arise due to omitted unobservable firm characteristics. Omitted variables cause correlation between firm performance and the residual term in our model. To deal with the endogeneity issue we include several control variables in our regression models. To address the endogeneity issue concerning the panel data regression, we also include random effects. By implementing these methods, we are able to address the endogeneity issue to some degree.

8 Limitations

The sample size of Norwegian listed firms is relatively small, reducing the statistical power of the results. Moreover, restricted data on CSR engagement conducted on listed firms strictly limits the number of observations, which could produce biased results. We have not addressed the issue of endogeneity completely. According to Hou (2018) an issue of endogeneity is addressed in the main relationship between CSR engagement and firm performance. The endogeneity issue concerns causality and simultaneity, which implies that firm

performance is likely to affect the level of CSR engagement, and that the level of CSR engagement is likely to impact a firms' financial performance. If this endogeneity problem is not considered in the estimation procedure, an OLS estimation will produce biased parameter estimates. Hence, Hou (2018) suggests to perform a two-stage least squares (2SLS) regression, which is an extension of the OLS method. However, as we do not find an appropriate instrument that correlates with the CSR variable, and is uncorrelated with firm performance, we cannot proceed with the 2SLS regression. Due to these limitations, we may not be able to uncover the true relationship between firm performance and the explanatory variables, and the relationship between CSR and the explanatory variables.

9 Conclusion

This paper investigates the relationship between board characteristics, CSR and firm performance on Norwegian listed firms. Central to our research is the effect of the GBL and the soft law on CSR reporting. The paper consists of two parts; (i) board characteristics and firm performance and (ii) CSR engagement and firm performance.

We analyzed the relationship between firm performance and board characteristics using an unbalanced panel data regression model with random effects. By controlling for endogeneity, the results reveal that there was no significant relationship between board characteristics and firm performance in the time period from 2011 to 2017. Hence, the effect of the GBL implementation is found to be successful in creating an optimal board composition. Further, the results show that the average board size in Norway is homogeneous. The results are robust to different measures of board characteristics, breakdown of the sample by calendar year, VIF calculation and inclusion of random effects.

We further analyze the relationship between CSR engagement and firm performance. Previous empirical findings are contradictory, although most studies find a positive significant relation between the two. To analyze the relationship we used two multiple regression models based on data from 2017. We found a

positive significant relationship between CSR engagement and firm performance. The results indicate that the regulation on CSR reporting still affects the firms' level of CSR engagement. In addition, we found that gender diversity on the BoD does not appear to affect the decision making of the board related to CSR engagement. Further, our findings show that the number of board members has a positive significant effect on CSR engagement, which is consistent with previous studies. Moreover, we find that listed firms have a superior CSR engagement relative to non-listed firms. This indicate that the implementation of soft law on CSR reporting has been successful in that listed firms engage more in CSR.

In recent years, several scholars and practitioners have studied the relationship between corporate governance, CSR and firm performance. However, little research has been done on these relationships in Norway. Our paper contributes to the literature on the relationship between board characteristics, CSR engagement and firm performance in the Norwegian market. We also provide insights on soft law and regulations in terms of CSR and gender diversity.

A major challenge in this line of study is related to endogeneity. We address the issue of causality and simultaneity and the impact it may have on our results. However, we do not provide any proof on the existence nor corrections on endogeneity, which may lead to biased results. In addition, limited access on data regarding CSR engagement may draw conclusions based on a sample not fully representing the population. There are various methods concerning ratings, criteria and scores on CSR engagement, which may cause our results to deviate from previous findings. It would be interesting to further investigate the relationship between board characteristics, CSR engagement and firm performance over a longer time period. Thus, further research could investigate the relationship before and after the GBL implementation and the soft law on CSR reporting. In addition, it would be interesting for further research to examine the effect of gender diversity on the BoD and CSR engagement in non-listed firms where fewer regulations apply.

10 References

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11 Appendices

Appendix 1: Gender diversity in listed firms from 2010 to 2017

Average Female Fraction on Boards in Listed Firms from 2010 to 2017
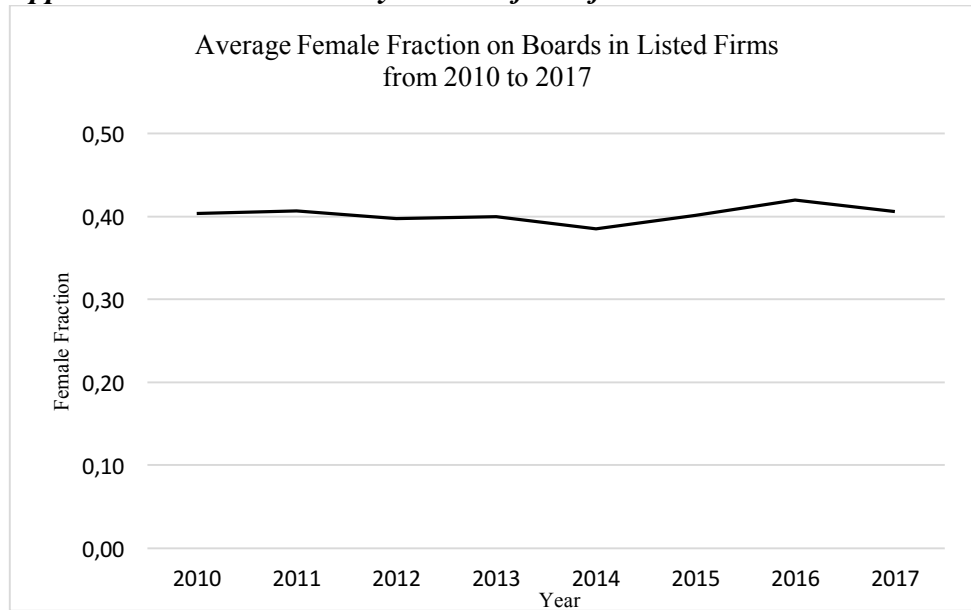
Appendix 2: Gender diversity in non-listed firms from 2010 to 2017

Average Female Fraction on Boards in Non-listed Firms from 2010 to 2017
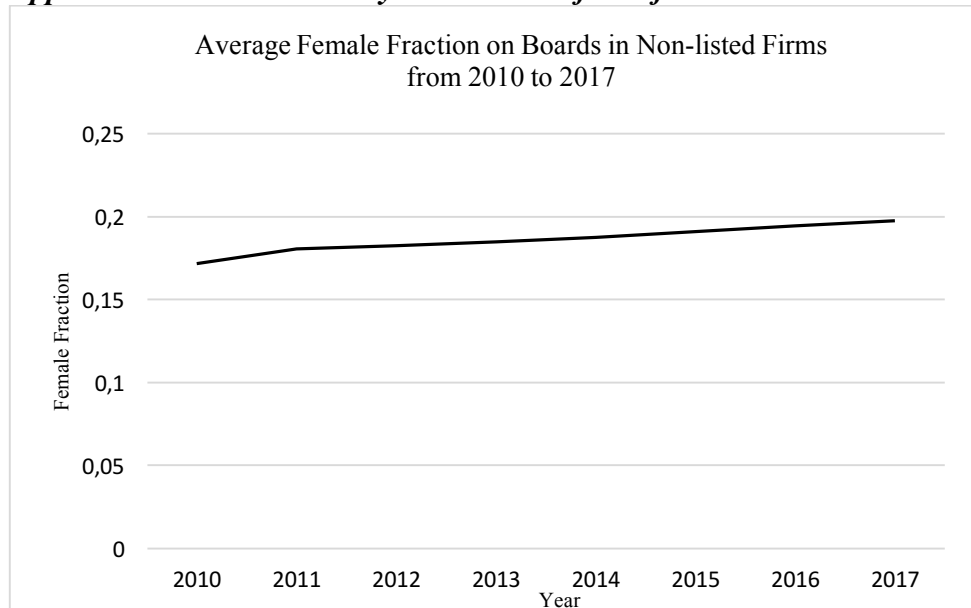
Appendix 3: The Hausman Test for Fixed Versus Random Effects

Board Characteristic	Model (1)	Model (2)	Model (1)	Model (2)	Model (1)	Model (2)
BoardSize	0.465	0.495				
FemaleFraction			0.606	0.602		
DirectorsMeanAge					0.960	0.959

This table reports the p-values from the Hausman test for fixed versus random effects. Fixed effects should be included if the p-value is less than or equal to 0.05. The results show that random effects should be included in both models for all board characteristics measures.

Appendix 4: Test for Time Effects

Board Characteristic	Model (1)	Model (2)	Model (1)	Model (2)	Model (1)	Model (2)
BoardSize	0.443	0.471				
FemaleFraction			0.508	0.507		
DirectorsMeanAge					0.791	0.800

This table reports the p-values from the test for time fixed effects. Time fixed effects should be included if the p-value is less than or equal to 0.05. The results show that time fixed effects should not be included in either of the two models.

Appendix 5: Empirical Variables

Variable	Definition
Dependent Variable	
TQ	The sum of total assets less the book value of equity plus the market value of equity, divided by total assets
ADJTQ	The natural log of the firm's Tobin's Q divided by the median Tobin's Q estimated by the firm's industry
Indipendent Variables	
BoardSize	The total number of directors on the board at year-end
FemaleFraction	The fraction of female directors among the board of directors
DirectorsMeanAge	The average age of the board of directors
Firm Specific Control Variables	
Growth	The total sales of the current year minus total sales of the previous year divided by total sale of previous year
FirmSize	The natural logarithm of the book value of total assets
FirmAge	The number of years since the firm was founded
Leverage	The total liabilities divided by total assets

The table defines the variables that are used in the empirical analysis.

Appendix 6: Regression Models by Calendar Year

				ADJTQ				
	2010	2011	2012	2013	2014	2015	2016	2017
Independent Variables								
BoardSize	0.004	0.019	-0.008	0.011	0.006	0.032*	0.017	0.015
	(0.016)	(0.018)	(0.016)	(0.014)	(0.015)	(0.017)	(0.017)	(0.017)
FemaleFraction	-0.024	-0.046	-0.178	-0.062	-0.513	0.517	0.613	0.169
	(0.322)	(0.324)	(0.393)	(0.350)	(0.369)	(0.388)	(0.381)	(0.485)
DirectorsMeanAge	0.006	0.005	0.005	0.001	0.000	0.000	-0.004	-0.005
	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)
Growth		-0.005	-0.000	0.071	0.003**	0.041***	0.009***	0.000
		(0.003)	(0.000)	(0.049)	(0.001)	(0.016)	(0.003)	(0.000)
FirmSize	-0.053***	-0.054***	0.001	-0.005	0.003	0.011**	0.001	-0.007
	(0.014)	(0.016)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)	(0.006)
FirmAge	-0.001**	-0.001*	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Leverage	0.152**	0.119	-0.260**	-0.161	-0.097	-0.340**	0.180	0.024
	(0.059)	(0.078)	(0.120)	(0.108)	(0.106)	(0.136)	(0.124)	(0.128)
Constant	1.061***	0.883**	0.167	0.240	0.296	-0.327	0.103	0.450
	(0.406)	(0.427)	(0.396)	(0.375)	(0.387)	(0.437)	(0.447)	(0.437)
Adjusted R^2	0.215	0.112	0.066	0.064	0.028	0.091	0.070	-0.004
Number of Observations	113	109	115	120	119	130	137	90

Appendix 7: Mean CSR score for Listed and Non-Listed Firms

	Mean
Listed firms	1.534
Non-listed firms	1.290

This table reports the mean CSR score for listed and non-listed firms. The CSR score is measured by PwC's reports on the hundred largest firms in Norway, 40 listed and 60 non-listed firms.