The impact of gender diverse boards on firm financial performance in Norway

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Abstract

The gender-diversity of corporate boards is a frequently debated topic in both management practice and academic discourse. In this paper, it is intended to examine the effect of gender diverse boards of directors on firm financial performance in Norway. Norway is a useful sample for this type of study, as the country was one of the first ones to introduce a mandatory gender quota law for female board of director representation in 2008. Using a dataset of 55 Norwegian public limited liability companies listed on Oslo Stock Exchange from 2006 to 2013, a time-series study is employed to analyze the relationship and to further examine if the relation is positively moderated by the number of independent directors, the number of directors holding multiple board seats and the education level of directors. The analysis reveals no significant evidence that firm financial performance is positively impacted by gender diverse boards of directors. For Tobin´s Q, there even is a negative relationship of gender diversity of boards of directors and firm financial performance. Neither is the relationship significantly moderated by independent directors, multiple directorships or education. The results of this paper therefore support the findings of a number of other studies which did not find any significant link between gender diversity of corporate boards and firm performance neither. Practical implications derived from these results are that decision-makers in society and politics need to be aware of the empirical evidence suggesting a non-existing or even negative impact of quota laws for gender diversity of boards of directors on firm financial performance.

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1. INTRODUCTION

The gender diversity of corporate boards is a highly discussed topic all over Europe. As of May 2011, Spain, Norway, Iceland and France have passed laws for quotas regarding female representation on the board of directors; Belgium, the Netherlands and Italy have pending quota laws and in other countries gender quotas for boards are seriously discussed (Ahern & Dittmar, 2012). As recently as March 2015, Germany passed a quota law requiring 30 % of board of directors' seats to be female (Smale & Miller, 2015). While some of the quotas were justified with the purpose of increasing gender equality and developing a "fairer society" (Oie, 2007), it is not clear if the larger proportion of women on corporate boards resulting out of the quotas also leads to better economic results for the companies in those countries. Norway is at the forefront of the quota, as it was the first country to introduce a minimum requirement for female board of director representation in 2003 (Bohren & Staubo, 2014).

The topic of gender diversity on corporate boards is also discussed to a considerable amount in academic literature. A Google Scholar search for "female corporate board directors" in March 2015 gives approximately 108.000 results. In some of the literature, researchers focus on the effect of gender diversity among corporate boards of directors on firm financial performance. Those works yield mixed results, with some authors finding positive effects of diversity on performance (Isidro & Sobral, 2014; Liu, Wie & Xie, 2014) and others observing negative effects (Ahern & Dittmar, 2012; Bohren & Strom, 2010). Furthermore, some works result in gender diversity of boards having no or ambiguous impacts on firm financial performance (Abdullah, Ismail & Nachum, 2015; Rose, 2007). Especially for Norway, there are few scholars up to now which have empirically examined the impact of the quota and the effect of gender diversity of boards of directors on firm financial performance, with those studies all examining the short-term effects until 2009. As Dale-Olsen, Schone and Verner (2013) note: "Future research should look at potential long-term effects of the reform" (p.129).

The goal of this study is to provide an examination of those longer-term effects, to add to the knowledge about the effects of gender diversity of corporate boards of directors on firm financial performance and to further deepen the insight into this topic by addressing the following research question:

What is the effect of gender-diverse boards of directors on firm financial performance in Norway?

The research question can be further divided into the following sub questions:

What is the effect of gender-diverse boards of directors on accounting performance measures of Norwegian public limited companies?

What is the effect of gender-diverse boards of directors on market performance measures of Norwegian public limited companies?

Because gender is naturally not the only characteristic that distinguishes board members from each other and different boards are not homogenous, it is also useful to consider other variables of board composition when examining the link between board gender diversity and firm financial performance (FFP):

Is the relationship between gender diversity of boards and firm financial performance influenced by the number of outside directors?

Is the relationship between gender diversity of boards and firm financial performance influenced by board members having multiple directorships with other companies?

Is the relationship between gender diversity of boards and firm financial performance influenced by the education of board members?

2. LITERATURE REVIEW

The review of the literature about the impact of gender diverse boards of directors on firm financial performance will be structured as follows: First, theoretical perspectives on the question will be discussed; second, previous empirical evidence about the topic will be reviewed. The section concludes with a short overview about Norway´s quota for female board membership, its current corporate governance systems and the up-to-date empirical observations about the consequences of the quota.

2.1 Theoretical perspectives on the effect of gender diverse boards on firm financial performance

The majority of literature about female corporate board members is descriptive and does not explicitly develop a theoretical framework (Terjesen, Sealy & Singh, 2009). However, two main theories have been commonly used in order to account for the impact of board members on a company´s performance (Johnson, Schnatterly & Hill, 2013). Those theories are agency theory, which was developed by Jensen and Meckling in 1976, and resource dependency theory, which was originally proposed by Pfeffer and Salancik in 1978. Even though not specifically developed for this issue, both theories provide useful perspectives on the impact of gender diverse boards of directors on firm performance.

2.1.1 Agency theory

The most influential theory in corporate governance is agency theory (Daily, Dalton & Canella, 2003). It is furthermore the theoretical framework most commonly used for examining the connection between board characteristics and firm value (Carter, Simkins & Simpson, 2003). According to Jensen and Meckling (1976), an agency relationship involves a person (the principal or owner) to engage another person (the agent or manager) to perform a service or activity on behalf of the principal. In agency theory, both persons are seen as rational and as aiming to maximize their personal benefits. This leads to the agent not acting in the best interest of the principal, or expressed in a business context, the managers not performing in the best interest of shareholders. The principal can limit those agency problems by monitoring the actions of the agent (Jensen & Meckling, 1976). Through the lens of agency theory, the most important and value-enhancing role of the board of directors is to control and monitor managers, thereby reducing agency problems between the two parties (Carter et al., 2003). Even though agency theory does not provide a clear-cut prediction about the influence of board characteristics on firm performance (Smith, Smith & Verner, 2006; Carter et al., 2003), it provides a variety of aspects which help to hypothesize about the impact of gender diverse boards on firm financial performance.

Firstly, empirical evidence suggests that female directors are, on average, better monitors (Carter, D`Souza, Simkins & Simpson, 2010; Adams & Ferreira, 2009). Dang, Bender and Scotto (2015) found that female directors are likely to put more effort into monitoring duties than male directors. They furthermore bring a new perspective into complicated issues (Francoeur, Labelle,

Sinclair-Desgagne 2008), ask questions more frequently, provide higher levels of board accountability and are better prepared for meetings (Terjesen et al., 2009). This in turn can help to reduce informational bias in formulating strategies and making decisions (Westphal & Milton, 2000), thereby limiting the risks of moral hazard and adverse selection, two important risks considered in agency theory (Lambert, 2001). Additionally, in firms that have more gender diverse boards, managers are more likely to receive equity-based compensation (Dang et al., 2015), which leads to a better alignment of manager-shareholder interests.

Secondly, in the agency theoretical perspective, board independency is an important characteristic for the board to function in the best interest of the shareholders (Carter et al., 2003). Outside directors who have no business or family relationships with management or important shareholders are seen as behaving more independently than inside directors (Terjesen et al., 2009). When examining female directors in Norway, Nygaard (2011) found that an increase in female directorships equalled an increase in the number of outside directors. This indicates that women board of director members are more likely to be outside directors and therefore more independent, a circumstance partially supported by Terjesen, Couto and Francisco´s (2015) finding that more gender diverse boards are enhancing the board of director´s independence. Singh, Terjesen and Vinnicombe (2008) assess that women inhibit relatively fewer insider director seats, relative to their overall representation on boards of directors.

So, taking an agency theoretical perspective in trying to analyse the link between the gender diversity of boards of directors and firm performance reveals the following outcome: Because women directors are more independent and more active monitors, they will enhance the monitoring and controlling of management activities, which in turn improves the financial performance of the firm.

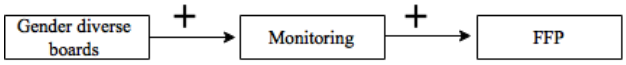

Figure 1. Impact of female directors on FFP in agency theoretical view

2.1.2 Resource dependency theory

Another often used theoretical perspective when examining the impact of gender diverse boards on firm financial performance is resource dependency theory. This theory proposes that firms are open systems that have an interdependent relationship with external entities and constituencies (Pfeffer & Salancik, 1978) and that the success of organizations depends on linkages with those resources and entities (Daily et al. 2003). In resource dependency theory, directors are seen as "boundary spanners of the organization and its environment" (Daily et al., 2003, p. 372). In this view, the value that directors bring to the organization comes from their linkages to external parties (Daily et al., 2003). Pfeffer and Salancik (1978) suggest four types of benefits that come from external linkages of the board: 1) directors provide their information and expertise, 2) they offer certain communication channels with external elements that have importance for the firm, 3) they get support commitments for the company from other organizations or groups, 4) they create legitimacy for the firm in its environment. When applying a resource dependency lens to examine the impact of gender diverse boards of directors on firm financial performance, the following aspects come up:

Firstly, in a resource dependence view, female directors bring different valuable resources to the boards. According to Terjesen et al. (2009), women directors insert knowledge, skills and experiences to their boards that differ from those of their male counterparts. Furthermore, women directors have the ability to create linkages to different parties than men, for example to different customers, suppliers, future employees or suppliers (Hillman, Shropshire & Canella, 2007). Hillman, Canella and Paetzold (2000) extended the resource dependence view on the role of directors by combining theory and empirical findings to develop four different types of directors: Insiders, Business experts, support specialists and community influentials. Using this terminology, Hillman et al. (2007) found that women directors are better community influentials than men. Community influentials are considered to provide expertise of and impact on powerful groups in the community surrounding the business (Hillman et al., 2007). The finding that female directors fill this role better than their male counterparts is supported by the conclusions of Brammer, Millington and Pavelin (2007), who observed a positive reputational effect of female board of director members. As mentioned above, one of the benefits of board linkages described by Pfeffer and Salancik (1978) is the creation of legitimacy for the firm. Building on this particular benefit, Dang et al. (2015) discovered that the appointment of women directors can enhance the legitimacy of the firm. The aforementioned points illustrate that in a resource dependence view, female directors will improve firm performance. This prediction is similar to the one derived through an agency theoretical rationale. Therefore,

H1: *Gender diverse boards of directors will improve firm financial performance of Norwegian public limited companies.*

Figure 2. Hypothesis 1

Hypothesis 1 can be further specified into

H1a: *Gender diverse boards of directors will improve market-based financial performance measures of Norwegian public limited companies.*

H1b: *Gender diverse boards of directors will improve accounting-based financial performance measures of Norwegian public limited companies.*

Secondly, the resource dependency perspective underlines the importance of outside or independent directors, as those directors provide access to resources needed by the firm in order to enhance firm performance and organizational effectiveness (Daily et al., 2003). This proposition is in line with the propositions of an agency theoretical perspective. As mentioned above, female directors are likely to enhance board independence (Singh, Terjesen & Vinnicombe, 2008; Nygaard, 2011; Terjesen et al., 2015). Therefore, the hypothesized positive relationship between gender diverse boards of directors and firm performance might be influenced by the number of outside directors on boards. So,

H2: *The relationship between the gender diversity of boards of directors and firm financial performance is positively moderated by the number of outside directors.*

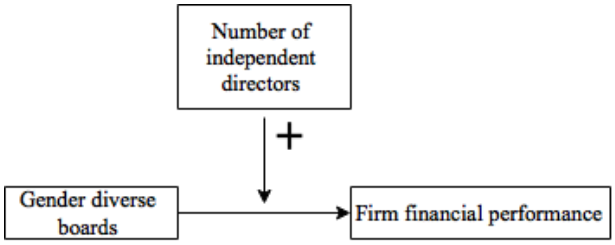

Figure 3. Hypothesis 2

Thirdly, one aspect of the value of directors in a resource dependent view is that they supply the resources of advice, counsel, information and expertise (Pfeffer & Salancik, 1978; Daily et al., 2003). Literature found that female directors are better educated, are more likely to hold advanced degrees (Hillman et al., 2002) and are more likely to hold an MBA degree (Singh et al., 2008). In a study about Canadian female directors, Burke (1997) found that 9 out of 10 were university graduates, indicating a generally high level of education for women directors. Additionally, better educated teams are found to be more innovative (Bantel & Jackson, 1989). Therefore,

H3: *The relationship between the gender diversity of boards of directors and firm financial performance is positively moderated by the level of education.*

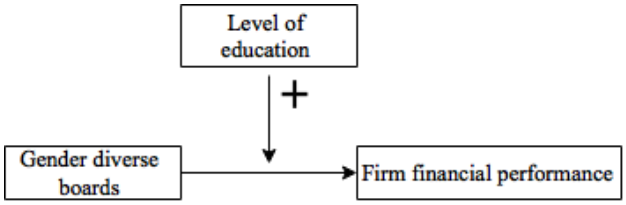

Figure 4. Hypothesis 3

As mentioned above, directors have a boundary-spanning role in the resource dependency perspective (Daily et al., 2003) and two of their most important value-generating functions are to open communication channels to other parties and to get support commitments from important external groups (Pfeffer & Salancik, 1978). Therefore, board interlocks are considered to be valuable to the company by resource dependency theorists. There is empirical support for this assumption (Mizruchi & Stearns, 1988; Pombo & Gutierrez, 2011). Female directors are found to join many boards faster than male directors (Hillman et al., 2002) and were reported to hold relatively more multiple directorships than men (Sealy, Singh & Vinnicombe, 2007). As in the case of Norway some of the existing executives and directors remarked there would not be enough qualified women for the director´s jobs (Criscione, 2002), it might be reasonable to assume that the director seats were distributed among a rather small number of women, creating multiple board interlocks. This "recycling" of a small group of female directors results in them becoming considerably experienced in the role of a director (Terjesen et al., 2009). Therefore,

H4: *The relationship between the gender diversity of boards of directors and firm financial performance is positively moderated by the number of multiple directorships held.*

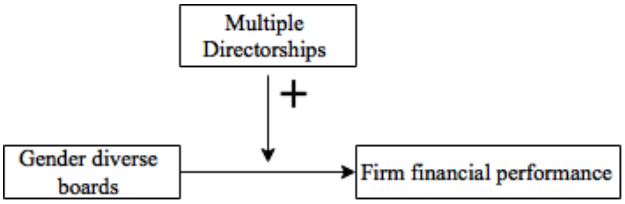

Figure 5. Hypothesis 4

Overall, the different hypothesized relationships about the diversity-performance relationship based on agency theoretical as well as resource dependency theoretical frameworks are the following:

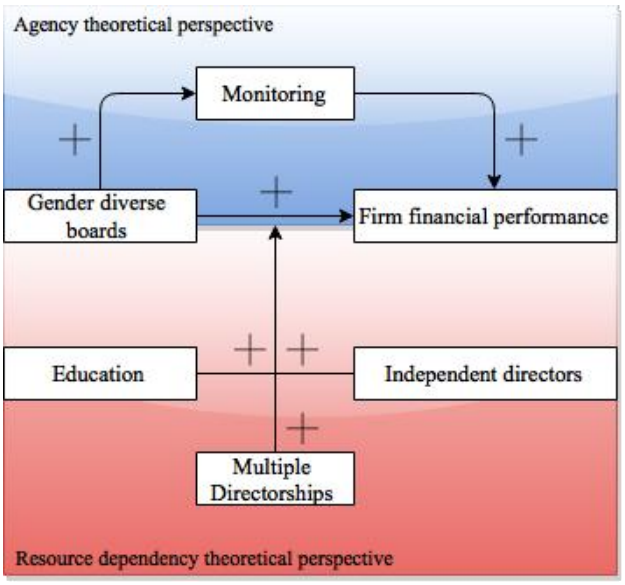

Figure 6. Hypotheses 1-4

2.2 Previous empirical evidence on the effect of gender diverse boards on firm financial performance

Previous attempts to empirically examine the effect of gender diversity of boards of directors on firm performance resulted in mixed conclusions (Simpson, Carter & D´Souza, 2010). Some authors reported a positive effect of diversity of boards of directors on firm performance, others found a negative effect, and further researchers found no relationship or an ambiguous relationship. In the next three sections, each category of results will be further examined.

2.2.1 Positive effects of gender diverse boards on firm financial performance

There is a number of empirical studies examining the effect of gender diverse boards of directors on firm financial performance which result in a positive effect. A noticeable feature about these articles is that they cover different time intervals, performance measures as well as samples or countries.

The earliest studies in consideration are examining samples in the 1990s. Analysing publicly traded Fortune 1000 firms, Carter et. al. (2003) fiound a positive relationship between the proportion of female board directors and firm value measured in Tobin´s Q. This is supported by Erhard, Werbel and Shrader (2003), who observed an increased effectiveness in the monitoring function of gender diverse boards of US companies

as well better firm performance measured in ROA and ROI. Another study drawing on a sample from the 1990s found a positive relation between the percentage of female directors and Tobin´s Q of Spanish firms (Campbell, Minquez-Vera, 2008).

Regarding samples in the 2000s, researchers also examined the board diversity-firm performance link in developing countries. Liu et al. (2014) identified a strong positive effect of female directors on the ROA and ROE of Chinese firms. Mahadeo, Soobaroyen and Hanuman (2012) examined Mauritian companies and discovered a significant positive performance effect of gender diverse boards compared to boards with no female representation. Other works in the 2000s investigating the effect of gender diverse boards on firm performance and finding positive effects include studies in France (Sabatier, 2015) or Spain (Martin-Ugedo & Minquez-Vera, 2014). The study of Martin-Ugedo and Miquez-Vera (2014) additionally examines the aforementioned effect in SMEs, considerably differentiating itself compared to the other studies, whose samples usually include large, publicly traded firms.

Next to single-country studies, literature furthermore entails multi-country studies that result in positive effects of board gender diversity on firm performance, including examinations of a sample of European firms (Isidro & Sobral, 2014) as well as across the world (Terjesen et al., 2015).

2.2.2 Negative effects of gender diverse boards on firm financial performance

Next to results regarding a positive effect, a small part of academic literature on the board gender diversity-firm performance link also reports that increased gender diversity in boards of directors leads to decreases in firm performance. For example Adams and Ferreira (2008) report that even though women directors are found to be more active monitors, in countries with otherwise strong shareholder protection more gender diverse boards may lead to over-monitoring through which firm performance is negatively affected. This finding partially contradicts the agency theoretical perspective on the effect of gender diverse boards on firm performance. The authors go on to propose that in weak shareholder protection circumstances, gender diverse boards might be positive for firm performance (Adams & Ferreira, 2008). However, this proposition is questioned by other studies, which for example found a negative impact of board gender diversity on firm performance in countries with actually weak investor protection (Ujunwa, Okoyeuzu & Nwakoby, 2012; Okike, 2007).

2.2.3 No effects of gender diverse boards on firm financial performance

Besides the clearly positive and clearly negative findings in some studies, a large part of the literature about this topic results in more pronounced effects of gender diversity of boards on firm financial performance. These can be classified into either 1) no effect or relationship at all, or 2) ambiguous effects/effects subject to other factors.

Firstly, there is a variety of studies observing no effect of gender diversity on corporate boards at all. According to Rose (2007) there is no significant link between gender diversity of boards and firm performance measured in Tobin´s Q. This is supported by other studies (Carter et al., 2010). Even though women are more likely to serve on the boards of better-performing companies, studies could not find evidence that gender diverse boards in itself are value-improving (Farrel & Hersch, 2005). Francoeur et al. (2008) examined female participation in both top management and corporate governance of Canadian firms, stating that gender diverse boards create enough value to keep pace with normal stock returns, but not more value than other board forms. Gender diversity of boards furthermore was observed to have no effect on firm financial performance during crisis times (Engelen, van den Berg & van der Laan, 2012).

Secondly, other research about the effect of gender diverse boards of directors on firm performance results in ambiguous effects or relationships. For example in analysing gender diversity of boards in Malaysian companies Abdullah et al. (2015) found that female directors bring economic value, however this is moderated by significant negative market perceptions, leading the market to discount their impact. In examining the relationship between gender diversity of top management boards and the propensity to strategic change, Triana, Miller & Tzrebiatkowski (2013) observed that depending on the situation gender diversity can either impede of propel the company´s ability to react to changes in its environment. The impact of gender diversity on firm financial performance also depends on the measure of firm performance as well as on the measure of the proportion of women on boards (Smith et al., 2006).

So, after summing up the previous empirical evidence about the effect of gender diverse boards on firm financial performance, the question of why different articles come to different results remains. The three most usually reviewed possible reasons for this are time, causality, and critical mass (Lückenrath-Rovers, 2013). According to Lückenrath-Rovers (2013), time refers to the difference between static and dynamic measurements as well as the point in time when the measurements happen. Causality refers to the problem that causality and endogeneity might influence conclusions. Critical mass refers to the problem that a subgroup needs to reach a certain size in order to influence an overall group (Kramer et al., 2006). This paper will confidently circumvent the problems of time and critical mass, as a broader time range will be covered and in the sample the percentage of female board members needs to be at least 40 %, making the number of both genders in the board nearly equal.

2.3 The case of Norway

2.3.1 Norwegian corporate governance and the quota

The Norwegian corporate governance system is characterised by the following aspects: Public limited liability companies in Norway are required to have a board of directors with at least three members, which elects the CEO, who is not allowed to be part of the board of directors (Norwegian Public Limited Liability Companies Act, 2014). The directors should furthermore be elected by the general meeting. Companies with more than 30 employees should also have employee representation on their board of directors (NPLLCA, 2014). A special part of Norwegian corporate governance is that firms with more than 200 employees are required to form a corporate assembly consisting of members voted by shareholders and employees, which shall act as a link between the board of directors and the general meeting. However, the company, employees and unions may agree to relinquish the formation of corporate assembly (NPLLCA, 2014). Additionally, it is recommended in the Norwegian Code of Corporate Governance (2014) that the board of directors should not include executive personnel. Therefore, the Norwegian board structure can be characterized as a two-tier board system even though the separation is not as clear as for example in the German corporate governance system. It is also recommended that a majority of the members of the board of directors are independent from the

company (NCCG, 2014). The legal system in Norway is civil law (Thomsen & Conyon, 2012).

In 2003, the Norwegian Parliament introduced a law which required all public-limited firms to have at least 40 % of female representation on their boards of directors (Ahern & Dittmar, 2012). In 2006 the law changed from voluntary compliance to legal compulsory, and firms that did not comply by January 2008 were threatened with liquidation. In April 2008, all PLCs were complying with the law (Ahern & Dittmar, 2012). According to Ahern & Dittmar (2012), female representation in the boards of directors of Norwegian public limited companies went from 25% in 2006 to slightly more than 40% in 2008.

2.3.2 Empirical evidence on the effect of gender diverse boards of directors on firm financial performance in Norway

The country under consideration in this paper will be Norway. To the best of the author´s knowledge in May 2015, there are only five studies investigating the impact of the quota for greater female board representation directly or indirectly. Of those 5 studies, one is not considering the board gender diversity-firm performance link, but rather evaluating the quota´s impact on board structures of Norwegian PLCs. Herein it is concluded that the quota led to inefficient board structures and that costs of restructuring were high (Bohren & Staubo, 2014). Out of the four further works investigating the link between gender diversity of boards and firm financial performance in Norway, one identified a positive effect, one identified no effect and two observed negative effects.

Nygaard (2011), studying the impact of the mandating of the quota at the end of 2005, found that for firms with low information asymmetry, the quota had beneficial, value-creating effects. Furthermore, firm performance measured in ROA for these companies from 2004 to 2008 improved. Dale-Olsen et al. (2013) compared firm performance measured in ROA from quota-affected Norwegian companies with unaffected Norwegian companies from 2003 to 2007 and derived that the impact of the quota and the board gender diversity-firm performance link is negligible in the short-term. In contrast to the aforementioned studies, Ahern & Dittmar (2012) observed a large decline in Tobin´s Q of Norwegian PLCs from the introduction of the quota until 2009. Another study with a sample of Norwegian firms found a negative relationship between gender diversity of boards and firm performance measured in ROA and Tobin´s Q (Bohren & Strom, 2010). The dataset of this study however only covered the period from 1989-2002, which was before the introduction of the quota and the subsequent increase in female directorships.

The most recent sample time from the aforementioned works is 2009, only three years after mandating of the quota and only one year after 40 % female board of director representation was achieved. As Dale-Olsen et al. (2013) note, "Future research should look at potential long-term effects of the reform" (p.129). In this paper, it is intended to provide part of this future research, as a dataset ranging until 2013 will provide a medium- to long-term analysis of the quota´s impact and the effect of gender diverse boards of directors on firm financial performance.

3. METHOD

3.1 Variables

3.1.1 Board of director diversity

Board of director information will be collected partially from the company database ORBIS and partially from the companies´ annual reports. If an annual report is not given or particular information for one variable is not included in the annual report, this information is tried to find by other means, for example in annual reports of different companies, from investor services like Bloomberg Business or from news articles using the database LexisNexis. Professional business networks such as Linkedin are furthermore searched for information. Gender diversity of boards of directors will be measured as the aggregate percentage of female board of director members in the sample. For identifying the gender of a director, the rules that Ahern & Dittmar (2012) follow in their research on Norwegian board of director members will be applied as well: First, a photograph from the person out of the annual report is used. If this does not exist, the biographical information will be searched for pronouns like for example his or her. If this does not exist neither, the gender of the director will be derived from the person´s first name. In order to test hypotheses 2-4, additional board of director information will be collected as well. The education level of the directors will be collected making use of the coding scheme developed by Engelen et al. (2012), which divides between five different levels of education: PhD, Master, Bachelor, lower than Bachelor, other. For assessing if a director is an outsider or independent, criteria from the Norwegian Code of Corporate Governance (2014) will be used. Those criteria are 1) the director has not been employed by the company in a senior position any time in the last five years, 2) does not have business relationships with the company 3) is not entitled to any fees dependent on the company´s performance 4) does not have any cross-relationships with executive personnel or other members of the board of directors and 5) has not been a partner or employee of the firm performing the audit of the respective company in the last three years. Independence will then be described as either independent or dependent and coded in those two categories, respectively. Even though the independence of board of director members is hard to judge precisely, it is reasonable to assume that those criteria give a good picture about a director´s relations to the company, their fellow board members and the company´s shareholders. The aspect of multiple directorships will be assessed on if a director is on the boards of directors of other companies as well on at the time in question. This information is usually included in the biographical information about the directors in the annual reports and will be coded as either the director is holding multiple directorships or not. No distinction is made between the numbers of additional director posts.

3.1.2 Firm financial performance

Firm financial performance will be measured using both market-based performance measures and accounting-based performance measures. The market-based measure will be Tobin´s Q, which is furthermore used as the firm performance variable in a considerable number of previous studies about governance and firm financial performance (Ahern & Dittmar, 2012, Carter et al., 2003, Haniffa & Hudaib, 2006). Based on Ahern & Dittmar (2012), "Tobin's Q is computed as the sum of total assets and market equity less common book equity divided by total assets" (p.148). A high value of Q signals the effectiveness of governance mechanisms and a good market perception for the company (Weir, Laing & McKnigh, 2002). Further advantages of Tobin´s Q as a measure of firm performance are that it accounts for risk (Campbell & Minguez-Vera, 2008) and that it is not sensitive to reporting distortions arising from accounting conventions and tax laws (Lindenberg & Ross, 1981).

Additionally, two accounting-based measures will be included in the analysis, namely ROA and ROE. A high ROA signals that

the company´s assets are effectively used in serving the shareholder´s interests (Haniffa & Hudaib, 2006). All financial performance data will be retrieved from the company database ORBIS.

3.2 Modelling of the relationship between the variables

To measure any linear relationship between the (independent variables) diversity indicators gender, independence, directorships multiplicity, education and the (dependent variables) firm financial performance measures ROA, ROE and Tobin´s Q, the following regression models are constructed:

Equation (1)

$$ROA_i = \alpha_i + \beta_{1j} GENDERDIVERSITY_{ij} + \beta_{2j} INDEPENDENCE_{ij} + \beta_{3j} MULTIPLEDIRECTORSHIPS_{ij} + \beta_{4j} EDUCATION_{ij} + \beta_5 SIZE_i + \beta_6 LEV_i + \beta_7 SALES_i + \beta_8 industry\ dummy_{i,m} + \varepsilon_{ij}$$

Equation (2)

$$ROE_i = \alpha_i + \beta_{1j} GENDERDIVERSITY_{ij} + \beta_{2j} INDEPENDENCE_{ij} + \beta_{3j} MULTIPLEDIRECTORSHIPS_{ij} + \beta_{4j} EDUCATION_{ij} + \beta_5 SIZE_i + \beta_6 LEV_i + \beta_7 SALES_i + \beta_8\ industry\ dummy_{i,m} + \varepsilon_{ij}$$

Equation (3)

$$Q_i = \alpha_i + \beta_{1j} GENDERDIVERSITY_{ij} + \beta_{2j} INDEPENDENCE_{ij} + \beta_{3j} MULTIPLEDIRECTORSHIPS_{ij} + \beta_{4j} EDUCATION_{ij} + \beta_5 SIZE_i + \beta_6 LEV_i + \beta_7 SALES_i + \beta_8\ industry\ dummy_{i,m} + \varepsilon_{ij}$$

where ROA_i, ROE_i and Q_i are the respective financial performance measures for firm i in the sample, $GENDERDIVERSITY_{ij}$ the gender diversity on company i´s board measured as the percentage of female directors on the board, $INDEPENDENCE_{ij}$ measured as the percentage of independent directors on company i´s board, $MULTIPLEDIRECTORSHIPS_{ij}$ measured as the percentage of directors holding additional directorships next to the one on company i, and $EDUCATION_{ij}$ measured as the percentage of directors on company i´s board who hold a Master´s degree or a higher form of education. This classification of the "education" variable is similar to the one used by Ahern and Dittmar in their 2012 study about the impact of the quota. Additionally each regression equation contains four control variables, namely firm size measured as the log-value of total assets, leverage measured as the ratio of total debt to total assets, sales growth measured as the year-wise percentage change in sales and industry dummies to capture any industry specific effects. Each regression equation is used to test hypothesis 1.To test hypotheses 2-4, interaction effects between the variables will be further examined by constructing and testing the following regressions:

Equation (4)

$$ROA_i = \alpha_i + \beta_{1j} DIVERSITY*INDEPENDENCE_{ij} + \beta_{2j} DIVERSITY*MULTIPLEDIRECTORSHIPSij + \beta_{3j} DIVERSITY*EDUCATION_{ij} + \beta_4 SIZE_i + \beta_5 LEV_i + \beta_6 SALES_i\ \beta_7\ industry\ dummy_{i,m} + \varepsilon_{ij}$$

Equation (5)

$$ROE_i = \alpha_i + \beta_{1j} DIVERSITY*INDEPENDENCE_{ij} + \beta_{2j} DIVERSITY*MULTIPLEDIRECTORSHIPSij + \beta_{3j} DIVERSITY*EDUCATION_{ij} + \beta_4 SIZE_i + \beta_5 LEV_i + \beta_6 SALES_i\ \beta_7\ industry\ dummy_{i,m} + \varepsilon_{ij}$$

Equation (6)

$$Tobin´s\ Q_i = \alpha_i + \beta_{1j} DIVERSITY*INDEPENDENCE_{ij} + \beta_{2j} DIVERSITY*MULTIPLEDIRECTORSHIPSij + \beta_{3j} DIVERSITY*EDUCATION_{ij} + \beta_4 SIZE_i + \beta_5 LEV_i + \beta_6 SALES_i\ \beta_7\ industry\ dummy_{i,m} + \varepsilon_{ij}$$

where the multiplications of diversity with the remaining board characteristics represent the interacting effects of those characteristics that influence the impact on firm financial performance as hypothesized in section 2.

Because the observation method was to collect data on the same companies from 2006 until 2013, the regression model will inherit multiple responses from the same subject, which cannot be regarded as independent from each other. Therefore a linear mixed model with parameter estimates will be used as regression analysis, which diminishes the need to average over items or subjects (Baayen, 2008).

After the analysis, the results will be further tested using a series of robustness checks. Firstly, the analysis will be repeated dividing between those companies who already accomplished the quota ratio of 40 % female participation and those who did not. For the ones already accomplishing the required ratio of 40 % in 2006, the mandatory imposition of the quota might not have impacted their board composition as drastically as for those who were not complying before, making the change for them easier. Secondly, board size will be included in the analysis to check the robustness of the findings. Previous research found that smaller boards are more effective and successful (Yermack, 1996; Eisenberg, Sundgren & Wells, 1998). In order to account for the impact of possible outliers, the extreme values below the first and above the 99th percentile for each variable will be left out of the analysis.

4. DATA

4.1 Sample

The sample will consist of the shareholder-elected directors of all non-financial Norwegian public limited companies listed on Oslo Stock Exchange from 2006 to 2013. The quota for female board of director representation applies to those companies and directors, as for employee-elected directors a less strict quota was mandated (Nygaard, 2011). The quota law makes Norwegian PLCs a useful ground for examining the effect of gender diverse boards of directors on firm financial performance. This is because of the remarkable spike in female representation on boards of directors: In 2006, the percentage of female board members in Norwegian PLCs was at 25 %; since 2009, it is steadily at around 40 % (Ahern & Dittmar, 2012). After restricting the search according to the aforementioned criteria, the ORBIS database shows an output of 68 companies. Because of unavailability of more than half of the required observations for 13 companies, those companies had to be dropped from the observation. When comparing the sample with the overall population of Norwegian PLCs listed from 2006 to 2013 however, it can be concluded that after left out cases the sample still covers 80% of the population of Norwegian PLCs listed on OSE from 2006 to 2013.

4.2 Descriptive statistics

Appendix 1 shows the mean, minimum, maximum and standard deviation values for each independent, dependent and control variable. The values are shown for the overall sample including the range 2006-2013 as well as for the year-to-year developments of the variables.

The mean percentage of female board of director representation in the sample is at 41.4%, while the minimum value for this variable is 0 and the maximum value is 57%. As can be seen from appendix 1, the percentage of women directors on the boards of

the sample firms is increasing, from a mean value of 33.48% in 2006 up to a mean value of 42.81% in 2013. So overall, female board of director representation in the sample firms increases by 27.8% over the sample time.

The percentage of independent directors on the boards of the sample firms averages 63.37% over the total sample time. This variable shows a moderately increasing development from 2006 to 2013, rising by approximately 6.5%.

The percentage of directors holding multiple directorships is 82.82% on average. Comparable to the independent director variable, the percentage of directors with multiple directorships increases by 7.1% over the sample period from 2006 to 2013.

Regarding the education variable, 65.11% of the directors in the sample are holding a master´s degree or some higher form of education. This percentage is at 67.02% in 2006 and decreases to 61.8% in 2008, then rises again up to 70.06% in 2013.

The leverage ratio of all firms in the sample is at 57.08%. While the ratio shows small decreases or increases from year to year it is rather constant overall, never increasing above 60 or below 55 %.

The same holds for the firm size measured as log value of total assets, which averages 5,9 over the whole sample period, increases from 5,75 in 2006 to 5,93 in 2007 and then constantly stays at around 5,9, indicating no substantial change in the size of the sample firms over the period.

In contrast to the stable development of the aforementioned variables, sales growth shows large fluctuations from year to year. Over the whole sample period the average sales growth of the companies is 21.35%. This large average mostly comes from high growth rates in 2006 and 2007 with 53% and 57% respectively. After 2007 growth rates do not reach that level again and range from 23% in 2009 to 0.5% in 2013.

The three financial performance measures ROA, ROE and Tobin´s Q each show negative development. Average ROA over the whole sample period is 4.24%. It decreases by 72.2% from 2006 to 2013. Average ROE for the whole sample period is 9.61%. It shows a similar development like ROA, decreasing by 73.4% from 2006 to 2013. The average Tobin´s Q for the sample firms is 1,5. Like the accounting-based performance measures ROA and ROE it develops negatively over the sample period, but not as strong as those. Tobin´s Q decreases by 31.7% from 2006 to 2013.

5. RESULTS

5.1 Empirical results for the effects of gender diversity, independent directors, multiple directorships and education on FFP

The parameter estimates for equations (1), (2), and (3) are shown in appendix 2. In the next sections, the results regarding each measurement of firm financial performance are described separately.

5.1.1 ROA

None of the industry dummies is significant, indicating that there are no industry effects influencing the relationship between the independent variables and ROA. The estimates for the other three control variables leverage, firm size and sales growth are all significant. Leverage shows a negative coefficient, while both firm size and sales growth have positive coefficients describing a positive impact of those two variables on ROA of the sample companies.

The three independent variables of gender diversity, independent directors and education are all not significant. Multiple directorships however shows a significant and negative relationship with ROA (β=-8,839; $p<0,05$), indicating that an increase in the percentage of board members holding multiple directorship will decrease ROA of the sample companies.

5.1.2 ROE

The results for ROE closely resemble those already measured for ROA. None of the industry dummies is significant, indicating no industry effects on the relationship between gender diversity, independent directors, multiple directorships and education on ROE. The control variables of leverage, firm size and sales growth are once again all significant, with leverage showing a negative effect on ROE and both sales growth and firm size showing a positive effect. Like in the case of ROA, the independent variables of gender diversity, independent directors and education do not have significant effects on ROE. Contrary to the findings for ROA, the effect of multiple directorships is not statistically significant anymore ($p>0,05$) but a trend is still observable ($p<0,10$), and this trend is negative (β=-18,26).

5.1.3 Tobin´s Q

The industry dummies are again not significant, so also for Tobin´s Q there are no industry-specific effects influencing the relationship between the independent and control variables and the financial performance measure. Despite this, the results for the market-based financial performance measure Tobin´s Q differ significantly from the impacts found for the accounting-based measures. The impact of leverage on firm financial performance is not significant for the Q-value. Sales growth has a significant and positive impact, as is the case for ROA and ROE. Firm size also has a significant effect, but in contrast to the observed result for the accounting-based measures, this effect is negative. Regarding the independent variables, a negative and significant effect can be observed for gender diversity (β=-1.253; p=.004). The three remaining variables of independent directors, multiple directorships and education do not have a significant impact on Tobin´s Q in the model.

Because of the lack of significant and positive parameter estimates for the relationship between gender diversity and ROA respectively ROE, and due to the observed significant negative impact of this variable on Tobin´s Q, there is no support for hypotheses 1, 1a and 1b; they are rejected each.

5.2 Empirical results for the effects of interactions between gender diversity, independent directors, multiple directorships and education on FFP

In order to test for the hypothesized interactions between gender diversity, independent directors, multiple directorships and education which were formulated in hypotheses 2-4, the three additional terms gender diversity*independent directors, gender diversity*multiple directorships and gender diversity*education were computed and put into the regression model. The parameter estimates for equations (4), (5) and (6) are shown in appendix 2. In the next sections, the results are described separately for each measurement of firm financial performance.

5.2.1 ROA

Once again, no industry dummy is significant. Furthermore, the three control variables of firm leverage, firm size and sales growth are all significant, with leverage having a negative coefficient and both sales growth and firm size having a positive coefficient. None of the three new interaction terms is significant, indicating that the interactions between gender diversity, independent directors, multiple directorships and education have no meaningful impact on firm performance measured in ROA.

5.2.2 ROE

As is the case for ROA, no industry dummy is significant, so there are no industry effects observable in the model. The coefficient for firm leverage is not significant, while the coefficients for sales growth and firm size are both significant and positive. None of the three interaction terms is showing a significant effect on firm performance measured in ROE. However, the interaction of gender diversity and multiple directorships results in a largely negative coefficient with a p-value of .089. This makes it statistically not significant anymore ($p>.05$), but a trend is observable ($p<.10$) and this trend is negative ($\beta=-187.06$).

5.2.3 Tobin´s Q

No industry dummy is significant, so for this model as well there are no industry-specific effects observable in the sample. Leverage is not significant, while both sales growth and firm size are significant. For the sales growth variable, a moderately positive coefficient can be observed, while for the firm size variable, a moderately negative coefficient is found. This result is similar to the one in equation (4); in both models, firm size is negatively impacting the Tobin´s Q-values of the sample companies. Regarding the interaction terms, once again no significant relationship is found.

As in each of the three constructed models no significant and positive effect of the interaction between gender diversity, independent directors, multiple directorships and education can be found – for equation (5), there even is a negative trend observable between ROE and the interaction of gender diversity with multiple directorships – hypotheses 2-4 do not find support; each of them is to be rejected.

5.3 Robustness

In order to test for the robustness of the findings, two additional variables are included in the regression analysis. The first one is called quota achievement in 2006 and is coded as a dummy variable with two categories, separating those companies who already reached a 40 % ratio of female board of director representation (as mandated by the quota) in 2006 and those who did not do so in the same year. Bohren & Staubo (2014) found that forced gender balance on boards of directors is costly and that a forced gender balance law brings with it a difficulty to design post-law boards of directors that have the same qualities as pre-law boards of directors. Other researchers argue that a mandatory gender balance law represents a large shock to the ability of shareholders to choose the optimal structure for the board of directors (Ahern & Dittmar, 2012). Therefore it is reasonable to assume that the firms which already had 40 % of women directors on their board did not need to considerably change their board structure in the following years, thereby saving the costs of complying to the law and keeping the board of director structure that was considered optimal by their shareholders before the mandatory introduction of the quota.

The second variable inserted into the regression models is the board size of the sample firms in the respective years. Previous research found that smaller boards are more effective (Yermack, 1996; Eisenberg, Sundgren & Wells, 1998) and bring higher focus and participation (Firstenberg & Malkiel, 1994). So if companies would have tried to accomplish the quota-mandated 40 % of women directors by just filling up their boards with women and not by replacing male directors with female directors, board and firm financial performance might have suffered from the increasing board size.

So including the two variables for robustness checks into the model brings:

Equation (7)

$$FFP_i = \alpha_i + \beta_{1j}\,GENDERDIVERSITY_{ij} + \beta_{2j}INDEPENDENCE_{ij} + \beta_{3j}MULTIPLEDIRECTORSHIPS_{ij} + \beta_{4j}EDUCATION_{ij} + \beta_5 SIZE_i + \beta_6 LEV_i + \beta_7 SALES_i + \beta_8 industry\ dummy_{i,m} + \beta_9 BSIZE_i + \beta_{10} achievement\ dummy_{i,m} + \varepsilon_{ij}$$

And for the interaction effects:

Equation (8)

$$FFP_i = \alpha_i + \beta_{1j}DIVERSITY*INDEPENDENCE_{ij} + \beta_{2j}DIVERSITY*MULTIPLEDIRECTORSHIPSij + \beta_{3j}\,DIVERSITY*EDUCATION_{ij} + \beta_4 SIZE_i + \beta_5 LEV_i + \beta_6 SALES_i\ \beta_7\ industry\ dummy_{i,m} + \beta_9 BSIZE_i + \beta_{10} achievement\ dummy_{i,m} + \varepsilon_{ij}$$

Appendix 3 shows the respective parameter estimates for the additionally introduced variables of equations 7 and 8. None of the robustness checks altered the previously observed results.

The last conducted robustness check was to test if problems of multicollinearity were present in the data. This was not the case.

6. DISCUSSION

After reviewing the literature about the effects of gender diversity of boards of directors on firm performance, deriving hypotheses from literature and theory, collecting data and analysing this data it can be stated that none of hypotheses 1-4 finds support; they have to be rejected. There is no conclusive evidence that gender diversity of boards of directors improves firm financial performance measured in ROA, ROE or Tobin´s Q. Regarding Tobin´s Q, a negative and significant effect of gender diversity on this financial performance measure is found. As the Q-ratio is a market-based measure of financial performance, this finding might indicate that increased gender diversity on the boards of directors is not perceived favourable by financial markets, a claim which is also put forward by Abdullah, Ismail & Nachum (2015) in their study about the impact of societal perceptions on corporate governance in emerging markets. Linking this work and a study having a developed country like Norway as sample should be done with caution, especially as the Norwegian society is fairly advanced in gender equality issues, ranking high on gender equality indices and female labour participation rates (Casey, Skibnes & Pringle, 2011). However, the mandating of the quota by the government resulted in angry reactions by corporate leaders and stock prices declined with the first announcement of the quota (Ahern & Dittmar, 2012), so it might be reasonable to suggest that markets still do not perceive gender equality on boards of directors favourably.

Furthermore, no evidence can be found that the relationship between gender diversity and firm financial performance is positively moderated by the number of independent directors, the number of directors holding multiple directorships or the education level of the board members.

This study´s results support the findings of a number of previous empirical examinations about the impact of gender diversity of

boards of directors on firm financial performance. Farrel and Hersch (2005) could not confirm that gender diversity in the board room is value enhancing, Rose (2007) did not find a significant link between board gender diversity and Tobin´s Q of Danish firms. Engelen, van den Berg and van der Laan (2012) examined board diversity during crisis times, identifying gender as having no impact on firm financial performance during crisis times. Other studies did not find a significant relationship between gender diversity and firm performance neither (Francoeur et al., 2008, Carter et al., 2010). Additionally, results of works in which the sample consist of Norwegian companies are also supported by this study. Ahern & Dittmar (2012) state that the gender diversity quota caused a large decline in Tobin´s Q over the following year, consistent with the negative and significant impact of gender diversity on Tobin´s Q in this paper. Bohren and Strom (2010) also used Tobin´s Q as the measure of firm financial performance and found a negative impact.

So, what are possible explanations for the non-existent or even negative effect of gender diverse boards of directors on firm financial performance measures? One point of reference might be the work of Adams & Ferreira (2009). Using a panel of US firms, the authors identify gender diverse boards as being more active monitors. However, an active board can lead to over-monitoring, which might decrease firm value for companies active in an otherwise strong corporate governance system (Adams & Ferreira, 2009). To assess the strength of the Norwegian corporate governance system, two different indices will be used.

The first is the Standard & Poor´s transparency and disclosure rating. This is a corporate governance rating developed for a study by S&P in 2001, and it is used in a number of empirical research (Doidge, Karolyi & Stulz, 2007). The ratings are derived by researching firm´s annual reports and standard regulatory filings for 98 items, which are then scored binary, so one point for a disclosed item and 0 points for an undisclosed item. The scores are then added and translated to a percentage score (Doidge et al., 2007). The second measure used to evaluate the strength of the Norwegian corporate governance system is the methodology developed by La Porta, Lopez-de-Silanes, Shleifer & Vishny (2001), which investigates the laws covering the protection of shareholders and the quality of their enforcement.

The tables for the two measures can be found in appendix 9. Norway is in the 75th percentile or higher in the S&P transparency and disclosure rating as well as in each of the measures used by La Porta et al. (2001). This indicates that the Norwegian corporate governance system is well developed and that the sample firms operate in an environment characterized by strong corporate governance mechanisms. According to Adams and Ferreria (2009), this is an environment in which actively monitoring and tough boards will decrease firm value. This paper is by no means declaring causality and that this is the reason for the non-existent respectively negative effect of gender diverse boards on firm performance, but it might be a starting point for further research.

Another possible explanation point is drawing on critical mass theory (Granovetter, 1978). According to Torchia, Calabro and Huse (2011) women on corporate boards reach a "critical mass" when at least 3 females are on the board. Studying the board of directors´ impact on firm level innovation, they find that innovation is greater when the "critical mass" of at least three women on the board is reached (Torchia et al., 2011). So, the non-significant impact of gender diverse boards on ROA and ROE might be explainable with the non-accomplishment of reaching a "critical mass", for example when the board consists of five members and two of them are female. This is a setting which complies with the quota but does not meet the "at least three women"-threshold formulated by Torchia et al. (2011). Once again this is not implying causality but rather a suggestion for further research

6.1 Future research suggestions

Even though the field of gender diversity on corporate boards of directors already is commonly researched, there are still suggestions for research directions to take in future works. As mentioned before, a possible future research suggestion is to build upon the findings of Adams & Ferreira (2009) by explicitly comparing the impact of gender diverse boards on firm financial performance in environments with weak corporate governance systems to those with strong ones. For both sets of circumstances there are studies (Liu et al., 2014; Ahern & Dittmar, 2012); but comparative research is rare. Another already mentioned suggestion is to apply the critical mass-concept used by Torchia et al. (2011) to firm financial performance measures as dependent variables, as their study examined the impact on company innovativeness. Furthermore, research could focus on the relationship between diversity and market-based financial performance measures such as Tobin´s Q. As this paper as well as other studies found a significant negative impact of gender diversity on Tobin´s, it would be interesting to further explore the reasons for this negative relation. One might even use qualitative research methods in order to more deeply examine the attitudes of investors, brokers and other stock market actors towards gender quotas and gender diversity on corporate boards.

6.2 Limitations

As is the case with other research in the social sciences, this paper is not free of limitations. The first limitation is related to the predictor variable of independent directors. Even though thorough criteria were used in order to differentiate independent from dependent directors, in the data collection it had to be relied on the companies´ annual reports. Therefore some non-observable business relationship or family tie between a director and the respective company might not have been detected. The second limitation refers to the predictor variable of education. The sample included a number of directors whose education took place outside of Norway, and educational degrees from different countries are sometimes difficult to compare and classify together.

7. CONCLUSION

The gender diversity of corporate boards is a frequently discussed topic both in management practice as well as in academic research. Norway was one of the first countries to mandate a quota for gender diversity, requiring 40 % of board of director seats in Norwegian public limited liability companies to be held by women. The quota was fully complied with in 2008 and makes Norway a useful ground for examining the effect of gender diverse boards of directors on firm financial performance, mainly due to a considerable spike in the number of female directors. In this paper, the research question "What is the effect of gender-diverse boards of directors on firm financial performance in Norway?" is examined. Additionally, possible positively moderating interaction effects of the number of independent directors, the number of directors holding multiple board seats and the education level of directors are investigated as well.

Theoretical perspectives commonly used to explain the impact of gender diversity of corporate boards on firm financial performance are agency theory and resource dependency theory. Both theoretical perspectives suggest a positive effect of gender

diverse boards of directors on firm financial performance. In the agency theoretical view, independent directors and active monitoring are most important to reduce agency problems, and those two aspects are found to be increasing with increasing gender diversity. In the resource dependency theoretical perspective, directors are perceived to span the boundary between the organization and its environment, and to supply critical resources such as counsel and advice. Outside directors are also considered to be important in this perspective, as they offer resources the company otherwise does not get. Studies furthermore found that female directors are better educated on average. These factors explain the suggested positive linkage of gender diverse boards and firm performance when using a resource dependency theoretical perspective.

Existing empirical evidence on the gender diversity-firm financial performance link is mixed, with some studies resulting in positive effects of diversity on performance and others finding negative effects. Furthermore some empirical examinations about this topic did not observe a significant link between gender diversity of boards of directors and firm performance.

In this study, board of director and firm financial performance data from 55 Norwegian public limited liability companies, which are listed on Oslo Stock Exchange from 2006 to 2013, is gathered and linear mixed regression models are used to examine the relationship between gender diversity and firm financial performance measured in ROA, ROE and Tobin´s Q. Additionally, possible positively moderating effects from the number of independent directors, the number of multiple directorships and the education level of board members are investigated. The following hypotheses are formulated:

H1: *Gender diverse boards of directors will improve firm financial performance of Norwegian public limited companies.*

H1a: *Gender diverse boards of directors will improve market-based financial performance measures of Norwegian public limited companies.*

H1b: *Gender diverse boards of directors will improve accounting-based financial performance measures of Norwegian public limited companies.*

H2: *The relationship between the gender diversity of boards of directors and firm financial performance is positively moderated by the number of outside directors.*

H3: *The relationship between the gender diversity of boards of directors and firm financial performance is positively moderated by the level of education.*

H4: The relationship between the gender diversity of boards of directors and firm financial performance is positively moderated by the number of multiple directorships held.

The analysis reveals no supporting evidence on the hypothesis that gender diverse boards of directors will improve firm financial performance. For Tobin´s Q, an actually negative relationship is found between gender diversity and firm performance. Furthermore, no significant effects are found for the interactions between gender diversity, independent directors, multiple directorships and education and their impact on firm financial performance, thereby not detecting support for hypotheses 2-4. So each hypotheses is rejected. This paper supports a number of previous empirical examinations which did not find a significant link between gender diverse corporate boards and firm performance.

This paper has important implications for practice. Many countries are currently following Norway´s example and introduce gender diversity quotas for corporate boards, with Germany being the latest of these in March 2015 (Smale & Miller, 2015). While those mandatory quotas might positively affect the status of women in business life as well as provide steps towards a "fairer society", decision-makers need to be aware of the empirical evidence - including this paper - which suggests that those quotas will not improve and possibly even decrease the financial performance of companies.

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10. APPENDICES

Appendix 1) Descriptive statistics overall sample and year-to-year

Descriptive statistics overall sample

	N	Minimum	Maximum	Mean	Standard deviation
Gender Diversity	345	0,00	0,57	0,41	0,07
Independent Directors	345	0,00	1,00	0,63	0,23
Multiple Directorships	345	0,29	1,00	0,83	0,17
Education	345	0,25	1,00	0,65	0,19
Firm Leverage	345	0,09	0,88	0,57	0,18
Firm Size	345	4,32	7,99	5,91	0,70
Sales Growth	345	-0,78	4,66	0,21	0,54
Board Size	345	4,00	7,00	5,44	0,88
ROA	345	-59,65	36,73	4,24	12,14
ROE	345	-134,70	82,82	9,62	29,02
Tobin´s Q	345	0,70	6,25	1,51	0,83
valid (listwise)	345				

Descriptive statistics 2006

	N	Minimum	Maximum	Mean	Standard deviation
Gender Diversity	40	0,00	0,50	0,33	0,15
Independent Directors	40	0,00	1,00	0,61	0,28
Multiple Directorships	40	0,40	1,00	0,79	0,18
Education	40	0,25	1,00	0,67	0,21
Firm Leverage	40	0,11	0,88	0,57	0,20
Firm Size	40	4,60	7,38	5,76	0,73
Sales Growth	40	-0,24	3,24	0,53	0,61
Board Size	40	4,00	7,00	5,50	0,85
ROA	40	-13,50	29,13	8,07	9,04
ROE	40	-37,98	80,05	20,28	22,36
Tobin´s Q	40	1,05	6,25	2,12	1,08
valid (listwise)	40				

Descriptive statistics 2007

	N	Minimum	Maximum	Mean	Standard deviation
Gender Diversity	44	0,25	0,57	0,43	0,06
Independent Directors	44	0,00	1,00	0,64	0,23
Multiple Directorships	44	0,29	1,00	0,80	0,20
Education	44	0,29	1,00	0,62	0,17
Firm Leverage	44	0,13	0,82	0,56	0,18
Firm Size	44	4,38	7,95	5,93	0,79
Sales Growth	44	-0,46	4,66	0,57	0,92
Board Size	44	4,00	7,00	5,45	0,90
ROA	44	-34,80	36,73	8,91	12,23
ROE	44	-59,15	82,82	23,83	25,90
Tobin´s Q	44	0,77	3,51	1,80	0,66
valid (listwise)	44				

Descriptive statistics 2008

	N	Minimum	Maximum	Mean	Standard deviation
Gender Diversity	44	0,33	0,57	0,42	0,04
Independent Directors	44	0,00	1,00	0,62	0,22
Multiple Directorships	44	0,40	1,00	0,82	0,16
Education	44	0,33	1,00	0,62	0,19
Firm Leverage	44	0,16	0,85	0,60	0,17
Firm Size	44	4,32	7,18	5,86	0,72
Sales Growth	44	-0,26	2,33	0,06	0,44
Board Size	44	4,00	7,00	5,48	0,82
ROA	44	-49,85	25,89	1,45	13,37
ROE	44	-124,49	45,85	1,31	36,08
Tobin´s Q	44	0,71	2,92	1,16	0,49
valid (listwise)	44				

Descriptive statistics 2009

	N	Minimum	Maximum	Mean	Standard deviation
Gender Diversity	45	0,25	0,50	0,41	0,04
Independent Directors	45	0,00	1,00	0,61	0,22
Multiple Directorships	45	0,40	1,00	0,85	0,16
Education	45	0,40	1,00	0,63	0,17
Firm Leverage	45	0,09	0,81	0,56	0,18
Firm Size	45	4,40	7,99	5,97	0,75
Sales Growth	45	-0,55	2,35	0,24	0,48
Board Size	45	4,00	7,00	5,40	0,92
ROA	45	-46,03	25,55	4,71	12,35
ROE	45	-93,77	57,93	11,34	27,62
Tobin´s Q	45	0,81	5,32	1,45	0,81
valid (listwise)	45				

Descriptive statistics 2010

	N	Minimum	Maximum	Mean	Standard deviation
Gender Diversity	43	0,20	0,57	0,42	0,06
Independent Directors	43	0,00	1,00	0,64	0,24
Multiple Directorships	43	0,40	1,00	0,83	0,16
Education	43	0,40	1,00	0,63	0,18
Firm Leverage	43	0,11	0,85	0,58	0,18
Firm Size	43	4,40	7,05	5,91	0,68
Sales Growth	43	-0,43	0,46	0,02	0,22
Board Size	43	4,00	7,00	5,35	0,87
ROA	43	-59,65	18,72	0,17	14,03
ROE	43	-130,33	43,18	0,66	31,64
Tobin´s Q	43	0,74	3,98	1,45	0,66
valid (listwise)	43				

Descriptive statistics 2011

	N	Minimum	Maximum	Mean	Standard deviation
Gender Diversity	39	0,40	0,57	0,42	0,04
Independent Directors	39	0,00	1,00	0,65	0,23
Multiple Directorships	39	0,40	1,00	0,83	0,16
Education	39	0,40	1,00	0,68	0,19
Firm Leverage	39	0,14	0,87	0,58	0,17
Firm Size	39	4,40	7,09	5,92	0,65
Sales Growth	39	-0,42	1,59	0,13	0,30
Board Size	39	4,00	7,00	5,51	0,85
ROA	39	-43,66	31,55	3,49	11,82
ROE	39	-134,70	48,35	5,72	29,29
Tobin´s Q	39	0,70	5,23	1,31	0,88
valid (listwise)	39				

Descriptive statistics 2012

	N	Minimum	Maximum	Mean	Standard deviation
Gender Diversity	45	0,33	0,50	0,43	0,05
Independent Directors	45	0,20	1,00	0,64	0,21
Multiple Directorships	45	0,40	1,00	0,86	0,15
Education	45	0,33	1,00	0,67	0,20
Firm Leverage	45	0,12	0,88	0,56	0,18
Firm Size	45	4,44	7,16	5,98	0,65
Sales Growth	45	-0,28	2,17	0,18	0,35
Board Size	45	4,00	7,00	5,44	0,89
ROA	45	-17,76	27,43	5,09	9,20
ROE	45	-68,63	36,17	8,80	20,89
Tobin´s Q	45	0,72	4,84	1,35	0,75
valid (listwise)	45				

Descriptive statistics 2013

	N	Minimum	Maximum	Mean	Standard deviation
Gender Diversity	45	0,33	0,57	0,43	0,05
Independent Directors	45	0,20	1,00	0,65	0,21
Multiple Directorships	45	0,40	1,00	0,85	0,17
Education	45	0,33	1,00	0,70	0,20
Firm Leverage	45	0,09	0,85	0,55	0,19
Firm Size	45	4,44	7,16	5,94	0,68
Sales Growth	45	-0,78	1,80	0,01	0,33
Board Size	45	4,00	7,00	5,40	0,96
ROA	45	-43,42	22,26	2,25	12,23
ROE	45	-107,77	43,48	5,38	28,79
Tobin´s Q	45	0,76	4,48	1,45	0,85
valid (listwise)	45				

Values are rounded to two decimals.

Appendix 2: Parameter estimates for equations 1-6

	Equation (1)	Equation (2)	Equation (3)	Equation (4)	Equation (5)	Equation (6)
Constant	-18,933 (98,035)	-28,117 (203,650)	11,164* (5,302)	-30,008 (97,596)	-83,306 (203,442)	10,829 (5,386)
Firm Leverage	-17,235* (5,738)	-37,962* (14,126)	-0,403 (0,332)	-17,200* (5,748)	-36,896 (14,113)	-0,378 (0,333)
Sales Growth	4,811* (0,897)	10,382* (2,358)	0,199* (0,053)	4,790* (0,906)	10,156* (2,374)	0,193* (0,053)
Firm Size	5,650* (1,991)	12,392* (4,506)	-0,399* (0,111)	5,574* (1,987)	12,297* (4,476)	-0,409* (0,112)
Gender Diversity	3,536 (7,293)	5,364 (18,996)	-1,254* (0,430)	40,073 (36,568)	147,905 (95,144)	-0,053 (2,151)
Independent Directors	-0,941 (3,732)	0,131 (9,454)	-0,074 (0,218)	3,723 (13,410)	-21,890 (34,450)	-0,151 (0,786)
Multiple Directorships	-8,839* (3,961)	-18,265** (10,157)	0,056 (0,232)	4,047 (17,451)	57,244 (45,365)	1,091 (1,026)
Education	1,356 (3,782)	4,072 (9,700)	0,093 (0,222)	5,275 (13,574)	22,136 (35,232)	-0,244 (0,798)
Gender Diversity * Independent Directors				-11,406 (30,504)	53,160 (78,834)	0,249 (1,791)
Gender Diversity * Multiple Directorships				-31,970 (42,140)	-187,067** (109,591)	-2,541 (2,478)
Gender Diversity * Education				-10,729 (32,375)	-44,619 (83,969)	0,847 (1,902)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
y	ROA	ROE	Tobin,s Q	ROA	ROE	Tobin´s Q

Standard errors are given in brackets. * represents significance at the 5 % level, ** represents significance at the 10 % level.

Appendix 3: Robustness tests and results

	Robustness Equation 1	Robustness Equation 2	Robustness Equation 3	Robustness Equation 4	Robustness Equation 5	Robustness Equation 6
quota not achieved in 2006	-2,178 (3,524)	-3,597 (7,381)	-0,077 (0,192)	-2,017 (3,469)	-3,147 (7,243)	-0,068 (0,193)
quota achieved in 2006	0	0	0	0	0	0
Board Size	-0,529 (0,825)	-2,561 (2,100)	-0,033 (0,048)	-0,565 (0,847)	-2,737 (2,142)	-0,027 (0,050)
y	ROA	ROE	Tobin´s Q	ROA	ROE	Tobin´s Q

Standard errors are given in brackets. * show significance at the 5 % level. Estimates for quota achievement in 2006 are set to 0 due to redundancy.

Appendix 4: Standard & Poor´s transparency and disclosure rating and La Porta et al.´s (2001) variables

S&P Transparency and Disclosure Rating

Country	Mean
Finland	75,7
Ireland	75,25
UK	71,36
Greece	68,04
France	67,91
Netherlands	63,23
Sweden	61,51
Australia	61,14
Singapore	58,86
Norway	58,83
Italy	58,58
New Zealand	55,91
Germany	55,9
Portugal	55
Switzerland	54,91
Belgium	54,16
Japan	54,15
Spain	52,67
Denmark	52,17
Thailand	51,63
Austria	49,7
China	48,58
Hong Kong	47,47
South Korea	46,65
Malaysia	45,44
Pakistan	39,76
India	38,75
Luxembourg	38,3
Indonesia	36,47
Chile	34,33
Brazil	32,75
Venezuela	30,65
Argentina	28,63
Phillipines	27,21
Mexico	24,77
Peru	23,26
Taiwan	21,63
Colombia	19,15

La Porta et al.: Shareholder Protection and law enforcement around the world

Country	ADR	Efficiency of Judical System	Rule of Law	Corruption	Risk of Expropriation	Risk of Contract Repudiation	Accounting Standards
Australia	4	10	10	8,52	9,27	8,71	75
Canada	4	9,25	10	10	9,67	8,96	74
Hong Kong	4	10	8,22	8,52	8,29	8,82	69
India	2	8	4,17	4,58	7,75	6,11	57
Ireland	3	8,75	7,8	8,52	9,67	8,96	0
Israel	3	10	4,82	8,33	8,25	7,54	64
Kenya	3	5,75	5,42	4,82	5,98	5,66	0
Malaysia	3	9	6,78	7,38	7,95	7,43	76
New Zealand	4	10	10	10	9,69	9,29	70
Nigeria	3	7,25	2,73	3,03	5,33	4,36	59
Pakistan	4	5	3,03	2,98	5,62	4,87	0
Singapore	3	10	8,57	8,22	9,3	8,86	78
South Afric	4	6	4,42	8,92	6,88	7,27	70
Sri Lanka	2	7	1,9	5	6,05	5,25	0
Thailand	3	3,25	6,25	5,18	7,42	7,57	64
Uk	4	10	8,57	9,1	9,71	9,63	78
US	5	10	10	8,63	9,98	9	71
Zimbabwe	3	7,5	3,68	5,42	5,61	5,04	0
Argentina	4	6	5,35	6,02	5,91	4,91	45
Belgium	0	9,5	10	8,82	9,63	9,48	61
Brazil	3	5,75	6,32	6,32	7,62	6,3	54
Chile	3	7,25	7,02	5,3	7,5	6,8	52
Colombia	1	7,25	2,08	5	6,95	7,02	50
Ecuador	2	6,25	6,67	5,18	6,57	5,18	0
Egypt	2	6,5	4,17	3,87	6,3	6,05	24
France	2	8	8,98	9,05	9,65	9,19	69
Greece	1	7	6,18	7,27	7,12	6,62	55
Indonesia	2	2,5	3,98	2,15	7,16	6,09	0
Italy	0	6,75	8,33	6,13	9,35	9,17	62
Jordan	1	8,66	4,35	5,48	6,07	4,86	0
Mexico	0	6	5,35	4,77	7,29	6,55	60
Netherlands	2	10	10	10	9,98	9,35	64
Peru	2	6,75	2,5	4,7	5,54	4,68	38
Philippines	4	4,75	2,73	2,92	5,22	4,8	65
Portugal	2	5,5	8,68	7,38	8,9	8,57	36
Spain	2	6,25	7,8	7,38	9,52	8,4	64
Turkey	2	4	5,18	5,18	7	5,95	51
Uruguay	1	6,5	5	5	6,58	7,29	31
Venezuela	1	6,5	6,37	4,7	6,89	6,3	40
Austria	2	9,5	10	8,57	9,69	9,6	54
Germany	1	9	9,23	8,93	9,9	9,77	62
Japan	3	10	8,98	8,52	9,67	9,69	65
South Korea	2	6	5,35	5,3	8,31	8,59	62
Switzerland	1	10	10	10	9,98	9,98	68
Taiwan	3	6,75	8,52	6,85	9,12	9,16	65
Denmark	3	10	10	10	9,67	9,31	62
Finland	2	10	10	10	9,67	9,15	77
Norway	3	10	10	10	9,88	9,71	74
Sweden	2	10	10	10	9,4	9,58	83