The Norwegian Gender Quota Law and its Effects on Corporate Boards

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Abstract

This paper has examined which medium-term effects the Norwegian gender quota law has had on corporate boards listed on the Oslo Stock Exchange from 2009 to 2015. We have studied the gender quota law’s impact on different corporate board factors, such as board composition, the number of directorships held, basic remuneration, board size, and the age of directors. Further, we also compared the gender quota law’s effects on these factors with similar studies made in earlier periods. The reason for that is to recognise whether there is a tendency of convergence over time.

The study have been conducted using a quantitative approach by gathering information from mostly annual reports. Since, this is a comparative study, we will be using the same methods as previous researchers. These methods are arithmetic averages and standard deviations. We have also included some other methods to strengthen the results, such as geometric average, median, correlations, and significance test.

The results of our research show that the number of directorships held by female directors decreased in both absolute numbers as well as in averages and dispersion. Remuneration for female directors increased. However, it diverged with male directors. The average board size did not remain significantly constant over time. We also found that the average age of board directors both increase and converges between the genders. We also believed that the proportion of female directors was depended on the firm’s board size, which the results showed was an incorrect assumption.

This paper has applied an overarching theory called contingency theory. Further, other complementary theories within the area of corporate governance have also been used such as stakeholder theory, agency theory, and resource dependency theory. When analysing the results from this paper, there were too many plausible and contrasting theoretical explanations for why the various outcomes occurred. Therefore, we do not believe that the existing theoretical frameworks available are appropriate to explain how the gender quota law will impact corporate boards.

The main contribution of this study is the results that show how both female and male directors’ average age and directorships held are converging over the observed period. Also, that the gender quota law has enabled female directors to gain more experience, which has led to a higher proportion of female directors.

Key words: gender quota, board composition, board remuneration, board size, directors’ age.
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1. Introduction

1.1. Background

Warren Bennis (1999, p. 163), once wrote: “The most dangerous leadership myth is that leaders are born—that there is a genetic factor to leadership [...] That's nonsense; in fact, the opposite is true. Leaders are made rather than born”. Is equality of outcome important to you? Alternatively, is equality of opportunity important to you? Whatever your preferences are, an important question is - How will such a change affect the corporate boards’ environment? Moreover, even if the answer is less desirable than one would have hoped for, maybe it is worthwhile doing, regardless of the consequences for the sake of principle.

A hot topic in today’s political debate is whether the gender quota laws should be implemented for the underrepresented gender on corporate boards. Some argue that it is important to achieve equality between the genders and others argue that it violates the rights of the employer. Most of the research already conducted about gender quotas laws for boards focus on how it affects the firm's performance, employees wage gaps, management’s positions, and the society as a whole. Since Norway was the first country, in 2006, to legislate and enforce a gender quota law, they have been studied numerous of times over the years. However, the previous studies have had conflicting results; some argue that the gender quotas law has not had the “wanted” practical effect in Norway that it set out to have (Sanandaji, 2016). In theory, a gender quota law should improve firm performance because companies’ boards would be more diversified to better represent a diverse customer base (Economist, 2014a). A problem with that argument is that not all customers are the same in all industries, and forcing gender quotas might change companies’ boards to become less similar to its customer base. Moreover, diversifying boards could lead to worsening communications within the board because there may be more cultural and subcultural conflicts among the board’s members (Economist, 2014b). Nemeth (1986, p. 23) points out that even though minorities’ viewpoints does not tend to be carried out, they do stimulate discussion and contribute to different solutions being tested and more qualitative decisions being implemented in the process. Another problem, according to Coate and Loury (1993, pp. 92-92), is that gender quota law for boards might have an adverse outcome if highly-skilled women suitable for the board are difficult to find. Thus, resulting in that standards have to be lowered to find female board candidates to comply with the gender quota law. It might signal to other women that it is possible to get these positions without effort and further costly investing in skills since companies are obligated to continue to lower their standards to meet the legislated quota. Another interesting point of view is from Zald (1969, p. 98), which mentions that some scholars argue that boards are merely a legal consequence that provides little if any value to a firm, while others claim that they have the ultimate power to fire and hire executives which in turn shapes their decision-making.

Many countries have implemented the same type of gender quota law as in Norway, and some have proposed the legislation several times without success. One example of that is the Swedish Government that has recently put forth a proposition regarding a gender quota law for corporate boards. However, a majority in the Swedish Parliament had already agreed to vote it down before it even reached the Parliament. The previous gender quota law proposal has been that boards should have at least 40 percent of the
underrepresented gender on boards by 2019; otherwise, companies would be subject to monetary penalties (Dagens Nyheter, 2017).

Allbright, which is a Swedish interest group for women's issues, has released a report, describing that the Swedish society and its board composition is almost equal, or at least that Sweden is heading in the right direction. Further, the report forecasted that the Swedish board would be equal, at least 40 percent of the underrepresented gender, in 2025. However, if the same acceleration of change that has occurred in recent periods on board composition, equal board representation might be achieved in 2019 (Allbright, 2015, p. 5). The report shows that there are differences in gender representation if company size varies, where companies that belong to Large Cap on Nasdaq OMX has the largest proportion with 31 percent women sitting on board, while Mid Cap had 30 percent and Small Cap had only 24 percent (Allbright, 2015, p. 9). Another important point is that only 9 percent of listed companies in Sweden does not have a single female director. Moreover, according to Allbright (2015, p. 10), more female directors hold more directorships, simultaneously, than male directors. There are approximately 18 percent women and 13 percent men holding more than one directorship simultaneously. One reason for that could be that it is hard to find women with previous board experience. Therefore, boards tend to hire the same women to several boards. The average compensation is also lower for female directors than male directors (Allbright, 2015, p. 17).

Since, Sweden and Norway has similar institutions and economic systems, we thought that it would provide the reader the possibility to relate our result to another population. However, we want to be clear that this study will not be conducted on Swedish companies, only Norwegian publicly listed companies.

Individual countries have proposed the idea of gender quota laws and some have already implemented it. The European Union (EU) is in the alignment with the same idea, and the European Commission proposed an EU-directive, in 2012, that will make EU’s member states implement laws or self-regulate gender quotas for women on corporate boards. The proposed EU gender quota law target of at least 40 percent of the underrepresented gender on publicly listed companies by 2018, which is the same as in Norway. However, the directive is time-limited and are supposed to be removed by 2028 (European Commission, 2015). There has been progress with a higher representation of women, but that progress has only occurred in some countries and not in others (European Commission, 2012). The largest publicly listed companies in EU had an average of 11.9 percent women on boards in 2010 and 21.2 percent in 2015 (European Commission, 2015, pp. 1-2). Even though there was an 11.9 percent increase during these years, it was not followed by a proportionate increase when it came to the higher ranked positions in the corporations, such as CEO and Chairman.
### Table 1. Countries with gender board quotas for publicly listed companies.

<table>
<thead>
<tr>
<th>Country</th>
<th>Quota</th>
<th>Passage</th>
<th>Compliance</th>
<th>Criteria</th>
<th>Sanctions for non-compliance PLCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>33%</td>
<td>2011</td>
<td>2017/2019</td>
<td>Large Cap PLCs; 2019: SMEs</td>
<td>Directors will not receive any benefits or compensation</td>
</tr>
<tr>
<td>France</td>
<td>40%</td>
<td>2011</td>
<td>2017/2020</td>
<td>PLCs with 500+ employees or €50 million in revenues; 2020: PLCs with 250+ employees or €50 million in revenues</td>
<td>Directors will not receive compensation</td>
</tr>
<tr>
<td>Germany</td>
<td>30%</td>
<td>2015</td>
<td>2016</td>
<td>Applies to PLCs’ supervisory boards, submitted to parity codetermination.</td>
<td></td>
</tr>
<tr>
<td>Iceland</td>
<td>40%</td>
<td>2010</td>
<td>2013</td>
<td>PLCs with 50+ employees</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td>1 WBD</td>
<td>2013</td>
<td>2015</td>
<td>PLCs must have at least one WBD. Excluded: PLCs with share capital up to INR 100 million; net worth up to INR 250 million, and listed as Small or Mid Cap</td>
<td>Firm will be fined with INR 50,000-500,000</td>
</tr>
<tr>
<td>Israel</td>
<td>1 WBD</td>
<td>1999</td>
<td>2015</td>
<td>PLCs must have at least one WBD</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>33%</td>
<td>2011</td>
<td>2012</td>
<td>Applies to PLCs’ supervisory and management boards</td>
<td>First, fine: BOD: €100,000-€1,000,000; Supervisory Board: €20,000-€200,000; Second, directors will lose their office</td>
</tr>
<tr>
<td>Malaysia</td>
<td>30%</td>
<td>2011</td>
<td>2016</td>
<td>PLCs with 250+ employees</td>
<td>Dissolve firm</td>
</tr>
<tr>
<td>Norway</td>
<td>40%</td>
<td>2009</td>
<td>2006/2008</td>
<td>new PLC; 2008: if PLCs was registered before 2006</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>40%</td>
<td>2007</td>
<td>2015</td>
<td>PLCs with 250+ employees</td>
<td>Risk losing new public contracts and government subsidies</td>
</tr>
</tbody>
</table>

**Notes:** "PLC" Publicly Listed Companies, "SME" Small and Medium-sized Enterprises, "WBD" Women Board Directors, "BOD" Board of Directors. **Passage** is the year when the gender quota law was implemented without enforcement and **Compliance** is the year when the law was enforced. The table is a consolidation of information collected from different sources including: Catalyst (2014), Deloitte (2015) and European Commission (2016).
Publicly listed companies registered in countries that have implemented a gender quota law face different sanctions if they do not comply with the law. Table 1 shows that the most common sanction is related to some form of fiscal fees, which is the case for publicly listed companies in France, India and Spain. The monetary sanctions in these countries are either aimed at the firm whereas others are directly targeting the firm’s directors. While Norway has the strictest sanction where publicly listed companies that do not comply with the country’s gender quota law will be forced to dissolve, Germany, Israel and Malaysia do not have any sanctions in place yet. However, the absence of legal sanctions may not always be needed to make companies submit to the legislations.

A study made by Dyck and Zingales (2002) showed that companies’ and directors’ fear of bad reputation and media coverage might be just as effective. Their findings suggest that just the risk of receiving bad media attention and public shaming can make politicians impose new corporate law reforms. Further, media attention that can adversely impact organisations’ reputation and credibility makes companies’ leaders act in the interest of their shareholders, and the society as a whole (Dyck & Zingales, 2002, p. 4). As an example of this; The Hong Kong Stock Exchange do not have legal authority to discipline listed companies that misbehave and its only tool, according to Dyck and Zingales (2002), to penalise them is by using advertising space in media to inform the public about the companies’ violations. Other reasons for why the same effects have occurred in countries that have not implemented gender quota laws, besides for social pressure as mentioned above, could be due to conformity to cultural norms (Hillman et al., 2007, p. 942). However, that is not factors that will be considered in our study. Compared to countries where a changing environment has been forced by government, other countries has seen similar changes to their board compositions without governments through reputational risk.

Publicly listed companies in Norway uses a hybrid unitary board structure, which means that it has a CEO and directors sitting on the same board. The board is structured to have both a management and a supervisory function (Thomsen & Conyon, 2012, p. 291). In Norway, employee representatives may have to be included on the boards depending on how many full-time employees it has according to the Public Limited Liability Companies Act (1997). A corporate assembly is also compulsory if the firm has more than 200 full-time employees with the main task to elect the board of directors, but also to supervise and inspect the firm’s board and executives. However, the firm does not need to have a corporate assembly if it comes to an agreement with either the trade union or the majority of the employees. Publicly listed companies are required to have at least three directors on the board, and if the firm has a corporate assembly, it has to consist of at least five members. Further, half of the board must be Norwegian residents or citizens within the European Economic Area.

1.2. Problem discussion

As mentioned in the background, many countries are adopting gender quota laws or are in the planning phase of implementing it, while other countries had already done it a decade ago. Whether it is possible to apply a gender quota law without any consequences is highly doubtable, and what those consequences are is also uncertain. Studies have been done on this issue before. However, it has only focused on the short-term effects and not on the medium-term, which will be the main focus in this paper.
The theoretical framework in this paper will focus on contingency theories that will be used to explain the particular outcomes from our empirical findings. Those theories will be divided into external and internal environmental theories. Resource dependency theory and stakeholder theory are external environmental theories while agency theory is an internal environmental theory. Pfeffer and Salancik (2003) explains that resource dependency theory focuses on organisations’ reliance on resources and that there is competition for those resources. Freeman and Velamuri (2005) explains that stakeholder theory deals with cooperation among different interest groups to the organisation and not about competition. It is, rather, a continuous process of balancing the interest of the organisation’s stakeholders. Thomsen and Conyon (2012) explains that agency theory is more concerned about the internal conflict of interest that may occur between the board of directors and shareholders or the firm’s management. The benefit of using those theories is that they explain certain outcomes depending on a limited world view and does not include all possible variables. Hence, using these theories will provide a better explanatory power of the possible reasons for why the outcomes did occur. Earlier work on resources dependency theory has made empirical studies on the correlation between resources and firm performance (Ray et al., 2004, p. 23). There is one significant limitation to this, that is that companies can have competitive advantages in some areas of their business but weak advantaged in others. Instead, a more appropriate way to study resource dependency theory is to investigate the effectiveness of a certain process (Ray et al., 2004, p. 24), such as how boards are affected by a change in a particular environmental context. Companies that cannot exploit resources in the most efficient way will not be able to gain competitive advantage from these resources (Ray et al., 2004, p. 26).

Norway was the first country to legislate a gender quota law that has had major implications for the Norwegian board compositions. A voluntary gender quota of at least 40 percent of each sex was first implemented in 2003, which later in 2006 was made compulsory for new companies while already publicly listed companies had a two-year period to comply with the gender quota law. The purpose of this was to balance the board participation since it was a ”question for democracy” (Bekkemellem, 2009). The consequence of this was an increase in female directors, from 9 percent in 2003 to over 40 percent in 2008 (Ahern & Dittmar, 2012, p. 138). Bøhren (2012, p. 2) found that from 2003 to 2008, the number of women on boards rose by 260 percent, which corresponds to an increase from 165 to 592 board seats. Men on boards declined by 38 percent, from 1516 to 938 board seats. Further, Seierstad and Opsahl’s (2011, p. 50) findings clearly showed that the highest increase of women on boards was, maybe not surprisingly, during 2005 and 2008. The greatest increase was measured in 2007, the year before the gender quota law was also enforced for publicly listed companies registered before 2006. However, Seierstad and Opsahl (2011) concluded that the companies affected by the law were only complying with its minimum requirements since the average ratio for women on boards did not continue to rise from 2008 to August 2009. Companies only have to comply with the law if they remain publicly listed. However, they do have the possibility to avoid compliance by changing its status to privately limited instead, or incorporate into another country. More than 30 percent of publicly listed companies went private from 2003 to 2009 (Ahern & Dittmar, 2012, p. 182). Bøhren (2012, p. 19) stated that the Norwegian Government has indicated that the exit option available for companies to go private and avoid the gender quota law might be removed. Bøhren (2012, p. 19) found that compared to having an exit option to not having one, would be a costly way of regulating gender balance.
The average Norwegian board size was roughly 5.5 members and did not change during the studied period, suggesting that companies did not choose to add more board members to fulfil the requirements, instead, replacing existing directors with new ones (Ahern & Dittmar, 2012, pp. 153). The reason could be that it would have been too costly to increase the board size to comply with the new gender quota law, so it was more beneficial for companies to replace men with women (Ahern & Dittmar, 2012, p. 141). When Mats and Miller (2013, p. 144) compared Norway with other Scandinavian countries, they found that the increased proportion of women on boards doubled for Norwegian female directors, while other Scandinavian countries had an increase of 58 percent for public limited companies. However, an interesting finding was that private listed companies in Scandinavia that was not under constraint by the gender quota law had a higher increase of female directors to 45 percent, compared to Norway’s 35 percent. However, prior studies have only been able to measure the gender quota law’s short-term effects on boards’ gender balance and size. A research gap, therefore, exists on the gender quota law’s effect in a longer time perspective.

Chaganti et al. (1985, p. 2-4) identify reasons for why boards are weak. Some of those reasons are that there is a shortage of qualified directors as well as directors that cannot spend enough time dealing with board assignments. After the gender quota law was implemented and more women were elected to board positions, there was no significant change in women elected to chairman and CEO positions (Ahern & Dittmar, 2012, p. 138; Seierstad and Opsahl, 2011, p. 50). The reason could be that the new female directors were younger and had less experience than male director candidates. Only 31.2 percent of the women had prior CEO experience compared to 69.4 percent of retained male directors. Thus, not only did the composition change as a result of the gender quota law but also its characteristics (Ahern & Dittmar, 2012, pp. 140, 153-154). According to Seierstad and Opsahl (2011, pp. 50-51), a result of the gender quota law was that the number of directors that had more than one board assignment increased from 91 directors in 2002, to 224 directors in August 2009. Also noteworthy was the dramatically increase in the number of female directors that had more than one board membership. 7 out of the 91 directors that held more than one directorship in 2002 was women, which grew to 107 out of the 224 directors in 2009. The maximum number of simultaneously held directorships for a director went from 4 board assignments in 2002, and was held by one woman and two men, to 8 board assignments in 2009, and was held by one woman. During the same period, the standard deviation increased from 0.40 to 0.64 in August 2009. Seierstad and Opsahl (2011) interpreted standard deviation as a measure for how much concentration of power directors had within their group. The higher the female standard deviation is compared to their male counterparts, the more unequal the directors are in relation to each other. Seierstad and Opsahl (2011, p. 51) also found that 61.4 percent of the directors that had three or more board assignments were women and that only women had seven or more board assignments simultaneously. Seierstad and Opsahl (2011, pp. 50-51) concluded that the Norwegian gender quota law was effective and that the Norwegian Government had achieved a minimum of 40 percent gender-balanced boards. However, Seierstad and Opsahl (2011, p. 52) also concluded that their results might not be coherent with the Norwegian Government’s purpose if the purpose is a more balanced dispersion of power. Since a group of directors, with more than one directorship held, had clearly emerged in the short-term perspective. Norway is an interesting empirical subject for our study since they were the first country to implement a gender quota law. This gives us the possibility to study the gender quota law’s implications in a longer time perspective.
As mentioned above, Chaganti et al. (1985, p. 2-4) identified that the reason boards are weak in general is because there is a shortage of competent directors. Storvik (2011, pp. 37-39) studied the formal competence as well as informal competence by surveys and found that the formal competence for newly appointed female directors was higher after the reform than formerly appointed directors for both genders. She also found that, overall, directors sitting before the reform experienced a positive change, and only 6 percent experienced a negative change after the reform. Storvik (2011) concluded that the gender quota law have had a positive effect that outweighs the adverse consequences. We believe that this could be a reason for why female directors will have a higher proportional increase in their basic remuneration compared to male directors.

The age of the directors has also been affected, which could have brought other difficulties, for example, a lack experience and knowledge on boards. Mats and Miller (2013, pp. 156-157) found that the average age of directors is stable after the reform. The reason is that the increase of male director’s average age is offset by the decreased average age of female directors. The effects on the director’s age have only been studied in the short-term and not what effect it has had in a longer time perspective.

1.2.1. Research gap

Previous studies have researched how Norwegian corporate boards are affected by the gender quota law. The research period has often been conducted from 2001 to 2009, on how different factors have affected boards, such as gender-balance, directorships held, board size, and director’s age (Ahern & Dittmar, 2012; Seierstad & Opsahl, 2011; Mats and Miller, 2013). Another interesting factor that we have studied is comparing the basic remuneration between female and male directors. However, the gender quota law did not come into full effect for all publicly listed companies until 2008. Therefore, the previous research on the gender quota law’s effects has been short-termed. This short time-frame has been argued, by Seierstad and Opsahl (2011, p. 50) not to be adequately showing the law’s full utility, and they propose that new studies should be made for at least five years after theirs, which is after August 2009. Our study has used the time-frame from 2009 to 2015, which we will use to compare with previous studies from 2001 to 2009. All factors previously mentioned, has been used in this study to find whether there is a tendency of convergence between female and male directors over time. The stated goal of the Norwegian gender quota law was for publicly listed companies on the Oslo Stock Exchange to meet a 40 percent gender-balanced board. We will observe if this proportion of 40 percent remains after 2009. The gender quota law might have an implicit purpose according to Seierstad and Opsahl (2011, p. 52), who implied that it also aims to increase the dispersion of power between directors. However, the short-term effects showed that it had emerged a concentration of power to an elite group of female directors, which Seierstad and Opsahl suggest indicate an increase in inequality. This effect might be just a short-term result of the market adapting to new market conditions, and there is a lack of understanding of how the dispersion will change in longer time perspective.

1.3. Research Question

- What is the medium-term effects of the Norwegian gender quota law on publicly listed companies: board composition, the number of directorships held, director’s basic remuneration, board size, and directors’ average age, on the Oslo Stock Exchange from 2009 to 2015?
This research will study how the Norwegian gender quota law will affect board composition, the number of directorships held, board member’s basic remuneration, board size, and director’s age for all publicly listed companies on the Oslo Stock Exchange, from 2009 to 2015. Most previous research has focused on how companies’ performance are affected by the gender quota law and have concluded contradictory results whether this type of changes will have a positive impact on companies, and society as a whole. This paper has not focused on how gender quota laws will impact firm performance or other societal factors. Instead, we will measure how the gender quota law will impact certain corporate governance factors in the medium-term, and if those factors converge over time between female and male directors. We define short-term as one to four years and medium term as five to nine years, and the long-term as ten year and longer.

1.4. Purpose

The main purpose of this paper is to describe how a gender quota law can affect publicly listed companies’ board and different factors associated with the boards’ composition as mentioned in research problem. We regard this topic as highly relevant, and it is important to understand the consequences of the law since many governments are considering implementing the similar gender quota law. The reason for why we will examine factors, such as board composition, the number of directorships held, remuneration, board size and directors’ age is because previous studies has based their research on these particular factors and that our research is a continuation from their studies. Some of these factors have been studied before, regarding the gender quota law. Therefore, it will generate a valuable contribution since it will provide greater insight regarding these factors for further research, and for decision makers in both governments and corporations. Since the gender quota law is a very popular and important subject of discussion, it has, therefore, been proposed to be implemented by, and within, EU and also by many countries all around the world. Thus, it is important to understand what the effects of this law may be. To get a greater understanding of the gender quota law's medium-term effects, we have chosen to study whether the effects will converge over time between male and female directors. Further, to recognise if the effects of the law are only short-termed, or if the impacts remain even in a longer time perspective, we have formed a sub-purpose where we will examine if these factors will converge between female and male directors over time.

1.5. Contribution

Theoretical contribution
As most previous research regarding the field of corporate governance and gender quota law, studies on the Norwegian market has mostly been focused on the legislation’s effects on firm performance. Few studies have been conducted on the subjects of the number of directorships held by board members, board sizes, and age of directors in regards to gender quota laws. However, the period that has been previously tested has usually ended in 2009, which is just a year after the legislation was fully implemented for all Norwegian publicly listed companies. These studies can only show short-term effects, and its limitation provides a research gap for further research for testing the medium- and long-termed effects. Therefore, we believe this paper will contribute not only to the aggregated theoretical foundation of corporate governance when it comes to the number of directorships held, board size, and age of directors, but also new research regarding board remuneration in relation to the gender quota law. The reason for that is because we believe that female directors’
remuneration should improve, and converge with males, as female directors become more experienced as a direct effect of the gender quota law. This study will verify chosen theories when applied in similar circumcises. Conducting this study will hopefully provide, researcher and other interest groups, a more profound understanding of the consequences a gender quota laws will imply and successfully provide mapping for a continuation within this field of research.

**Practical contribution**

Besides the theoretical contribution, this paper will also provide a practical contribution. Since there are governments that are in the process to implement gender quota laws while other governments are planning to do it in the future, this study will help those governments understand the implications of what such laws could mean for their corporate governance environment. This research would also highlight some of the changes in corporate boards that may occur if a gender quota law is implemented. These changes could be taken into consideration by board committees and stakeholders. It would also help boards that may be directly affected by the new law, for instance, dealing with remuneration negotiations and prepare for the changes that may occur. In addition to actors that would be directly impacted by this change, such as politicians and board members as well as other stakeholders, there would be a possibility for investors to use the results from this paper to more appropriately allocate its portfolio as a response to the gender quota laws. Even though this paper does not provide results regarding firm performance, it will provide results on certain corporate governance consequences and depending on investors’ beliefs and preferences about what governance factors will, in the end, lead to better firm performance. Therefore, investors could use this study to invest more profitably if their premises are correct.

1.6. Disposition

In this section, we will provide a short description of what the reader can expect in the following chapter. The theoretical methodology is described in Chapter 2. There, we will discuss the methodological choices made in this paper that relate to answering the stated research question, which includes: our scientific point of view; the logical approach; the ethical perspective; the paper's research design; and time perspective. Further, it explains the literature search for which our theoretical framework has been found and later applied in our paper. In Chapter 3, we will explain the theoretical framework that is relevant to the research within the corporate governance topic. Chapter 4 includes the assumptions and reasoning behind our hypotheses that we have generated and tested. In Chapter 5, we will explain the empirical method and how we selected and collected our data. Further, we discuss the data's limitations and the analysing models that are applied to the results. We will also describe how the hypothesis will be measured. We will present the results in Chapter 6, and in Chapter 7, we analyse the results and compare it to both the theoretical framework and prior studies. We will also determine whether we can, or cannot, reject our formed hypotheses. In Chapter 8, we will go through our concluding remarks, contributions as well as suggestions for further research. Lastly, in Chapter 9, we will provide our judgement regarding the paper’s quality and whether the research is reliable and if it has high or low validity.
2. Methodology

2.1. Choice of subject

We believe, as a researcher, that you should not choose a topic that you are too emotionally engaged with since we think that it could increase the risk of your biases affecting how a researcher conducts its study and interpret its results. However, a researcher should, of course, choose a topic which one is interested in. We are genuinely interested in corporate governance and everything that concerns that subject. A current topic of corporate governance in Sweden, but also in the rest of the world, is gender quota laws and the potential effects from it.

Even though we are not emotionally engaged in gender quotas, we are still interested in the gender quota law because of its possible effects on corporate governance. We believe that we have fulfilled our criteria, which in the end should lead us to be less biased towards the research results and the possible conclusions that can be made from it. For instance, this can be shown as we have received a statistically significant result regarding hypothesis 3a, but still, highlights that it is probably not economically significant.

2.2. Scientific point of view

It is paramount that we explain our scientific point of view. We will use a positivistic view when conducting our research because we will assume that the world is, in some way, determined by laws of cause and effect. Moreover, we will not use our interpretation of the result. Hence, this will be an objective study of reality and not subjective (Sachdeva, 2009, p. 25). There are two aspects that we need to take into consideration of how to approach this study. First, we will apply either an atomistic or holistic, as well as an empirical or rationalistic point of view. Holism is a viewpoint of studying something as a whole by including as many factors that could contribute to having an impact on the subject of study. Atomism, on the other hand, applies a more reductive approach by removing as many factors as possible and only include the factor that is subject to study. As the word implies, it is about reducing evidence into smaller units, for instance breaking everything down sentence by sentence (Mnookin, 2013, p. 1534). Because we want to isolate the factors we are studying as much as possible, therefore, we are applying more of an atomistic point of view than the holistic. Empiricism is a study of reality which means that only knowledge gathered from experience and through senses can be accepted, and this means that our ideas have to submit to the more stringent criteria that include the term “test” before it can be seen as knowledge. (Bryman, 2011, p.25). Since we are testing hypotheses by gathering empirical data to determine if the hypotheses can be rejected or not, this paper would be considered empirical. The role of positivism is to test theories through a deductive approach to develop scientific laws (Bryman & Bell, 2015, p.27). We will not be testing theories. Instead, we will use theories to explain particular outcomes and try to draw general conclusions from those outcomes.

A criticism to positivism is that a person cannot distinguish between scientific reasoning and common sense, there are only differences in degrees. A person is biased and applies their beliefs and perspectives in a particular scenario, no matter how hard the person tries. Scientific reasoning, follow a more rigorous method of verifying and falsifying than
common sense (Sachdeva, 2009, p. 25-26). We will take this into consideration by developing a strong quantitative method and analysing tools based on well-developed and known models. We will apply a logical conclusive system and criteria for how data is collected, analysed and how conclusions will be drawn. This methodology will to a higher degree be objective than subjective.

2.3. Logical approach

Deductive reasoning is the process to derive conclusions from premises. If the premises are true, then the conclusion must also be true. In other words, the conclusion is derived from assumptions. For example, given that, all companies are producing products, and Firm A is a company, it follows that Firm A is producing products (Johnson-Laird, 1999, p. 110).

There are three laws of deduction that eliminates or introduces connections among variables. These three laws are; affirming the consequent; denying the antecedent premise; and laws of syllogisms. The first law, affirming the consequent, states that; if A then B, A, therefore we conclude B. The conclusion B is therefore deduced from the premise A. Second law is denying the antecedent premise, which is similar to the first law but instead of affirming the consequence it denies. If A then B, not B, therefore not A. Both of these laws have a single condition. Affirming the consequent premise and denying the antecedent premise are biconditional (Johnson-Laird, 1999, p. 114-115, 120), which means that both conditions must be true or false, A is equal to B, and are fallacious if they are not (Encyclopedia, 2004). That is why we can know that A is false when B is false (Johnson-Laird, 1999, p. 114-115, 120). The third law of deduction is the law of syllogisms, which states that if A is B, and B are C, therefore A are C. This is a two conditional statement, where the conclusion, C, are deduced from the two conditions or premise A is B, and B is C. (Johnson-Laird, 1999, p. 123).

In this paper, we will conduct a deductive approach to form hypotheses and conclusions. When using a deductive approach, the researcher forms hypotheses from existing knowledge, which are subject to empiricism and can, or cannot, be rejected. The purpose of the deductive logical system is to test theories on empirical evidence (Bryman et al., 1997, p. 25), and to look at the consequences of a theory (Ghauri & Grønhaug, 2010, p. 16). Bryman and Bell (2015, pp. 23-25) explains that for the research to be tested, the hypotheses needs to be operationalized, which means that the author has to explain how the information can be collected and the concepts being used. However, once data has been collected, and reflection has been made in consideration of theories, a further collection of data might be needed, in which theories will either be strengthened or weakened. This process is an iterative process, which we have applied to our hypothesising, going back and forth between hypotheses and theories. Bryman and Bell (2015, pp. 23-25) notes that it is important to be cautious about the development of theories, where some researcher only generates empirical generalisations. They also explain that the process of deduction is not always straightforward and can change over the duration of the research, for instance, the relevance of the data collected for certain theories may become apparent after the data has been collected, or the data does not fit the hypotheses.
The process in a deductive approach begins with; hypotheses deduced from a theoretical point of departure. After that, hypotheses are constructed, in other words, operationalized. The research is then planned so that it is possible to validate the hypotheses. Then the empirical data is gathered and analysed. Finally, the hypotheses can, or cannot, be rejected. This is similar to what we have done in our paper. However, our hypotheses are not strongly deduced from theory; it has been more of an iterative process of deriving hypotheses and theory.

2.4. Research design

2.4.1. Quantitative approach
A typical quantitative approach is constructed together with a deductive approach, a positivistic, and an objective point of view (Bryman, 2012, p. 36). In this paper, we will apply an ontological and an epistemological point of view that is positivistic and objectivistic using a deductive approach. Therefore, a quantitative approach is more appropriate than, for instance, a qualitative approach. Bryman (2012, pp.160-163) explains that the quantitative approach begins with forming a theoretical framework and deducing hypotheses from the theory. A research design, operationalization, selections of research subject/object has to be planned before the collection of data, which in turn is then processed, analysed and at last a conclusion is drawn. As mentioned before, we used an iterative process deducing hypotheses and forming theories. Further, we selected our research subject, the Oslo Stock Exchange,
before we created the research design and operationalization. Since we will collect data from annual reports, we do not need to concern ourselves with a codification of the collected data.

There is some critique of the quantitative method. One of those critiques is that quantitative method fails to distinguish between the social world and the natural world and assumes both are impacted in the same way, in particular through laws. This makes a point of view of society as static because individuals that make up society is being separated from the society being researched (Bryman, 2012, pp. 178-179). This is a problem in our paper since we will only be concerned with the effects of the gender quota law and what implications that it might have had on corporate boards and not take individuals attitudes into consideration.

2.4.2. Time perspective and cross-sectional perspective
We have chosen to make an observational study since we will not interfere with the research subjects. Instead, we will collect data from existing databases. There are numerous of research designs that can be utilised within the area of observational study. For instance; cohort, case-control, case series, cross-sectional (Stroup et al., 2000, p. 2008) and longitudinal (Rosenbaum, 2005, p. 3). We came to the conclusion that a combination of both cross-sectional and longitudinal research designs would be most suitable for our type of study. A cross-sectional study collects quantifiable data, from multiple events, at a given moment in time (Mann, 2003). Further, a cross-sectional study cannot by itself be used to come to any causal conclusion; it can only be used to examine the relationship between two or more variables (Bryman, 2011, p. 64). Thus, the cross-sectional approach fits the purpose of our study as we are interested in comparing Norwegian publicly listed companies’ corporate boards. The study’s events are represented by data gathered from all publicly listed companies on Oslo Stock Exchange and their board of directors. The point in time is the end of a year since we are using year-end data. A disadvantage with a cross-sectional approach is that the results may shift if a different timeframe is used (Levin, 2006, p. 25) and that is why we also conducted a longitudinal examination. Longitudinal studies are used to identify changes or developments for one or more subjects over time (Pettigrew, 1990, p. 271). We have conducted a comparative time-series analysis for board composition, the number of directorships held, directors’ basic remuneration, board size, and director’s average age, over the period 2009 to 2015. Thus, the longitudinal design is coherent with our time-series approach.

2.5. Literature search
It is important that the literature in the study be of high quality and reliable, and can withstand to be scrutinised by a third party. We have taken a traditional review approach, which means that we will subjectively choose relevant literature for what we believe will contribute to the study (Jesson et al., 2011, p. 24). There are valid criticisms of a traditional review, for instance, that it does not provide reliable evidence and is more of an opinion based then scientifically. What makes it non-scientifically is that there is not a systematic protocol, which means that the reader is unable to judge the soundness of the arguments in such a review (Jesson et al., 2011, p. 74-75). However, we think that the traditional approach is more appropriate for our research because the literature in this research field is too broad, and to form hypotheses it has been necessary to use an iterative process by going back and forth between literature and hypotheses. It would have been difficult to use a systematic approach when we were unclear about what specific theories we would use to form our hypotheses. Using well-cited scientific articles in the area of corporate governance,
management and gender equality theories. The scientific articles used in this paper has been peer-reviewed and retrieved from Umeå University Library and other, what we asses are credible and commonly acknowledged, sources such as: JSTOR, Wiley, ScienceDirect, Oxford Academic Journals and Springer Link. Most articles have been found by being well-cited by other scholars while others, more recently published, has been found through search engines as in the sources just mentioned, and to some extent Google. Keywords used to find relevant literature has been: gender quota law, directorships held, board remuneration, board size, directors age, diversity, wage gap, and corporate governance. Reports from the European Commission, Allbright, Catalysts and Deloitte, have been used to get an overall view of quota legislations around the world, and the Norwegian Government’s website for accurate information about country’s gender quota law.

2.6. Ethical perspective

There are four main ethical perspectives: consequential ethics, deontology ethics, virtue ethics, and discourse ethics. Consequential ethics act in a manner that achieves the greatest outcomes. Deontology ethics act in a manner that conforms to a particular set of principles. Virtue ethics is instead about building a good character, and discourse ethics regard civility, as Sigmund Freud once stated: "civilisation began the first time an angry person cast a word instead of a rock" (as cited in Waisanen, 2014, p. 287). For personal reasons, we will apply a consequential ethical perspective, since we believe that perspective will benefit this thesis result the most. Consequential ethics strives to maximise a person’s values. This type of ethics is considered to be objective because the question about what values should prioritise are not analysed. In other words, given a particular value system, a result from a consequentialist would be the same for anyone. There is some critique against this type of ethical perspective that our actions lead to many consequences and these can be described by many different values. It is not possible to rank unambiguously or reduce to a single value (Brytting, 2005, p. 37-38). However, our consequential perspective will be to maximise the objectivity and scientific result of our research because we believe it is more ethical for other researchers and practitioners to be able to trust the research results and conclusions from our study. Since this study will not have any common ethical research problem, such as human and animal experiments, deception, invasion of privacy, and consent, instead, the ethical problems we may encounter are objectivity and truthfulness of how we manage our data. There are ethical issues that has arisen from the increased sharing of digital data and that it may be used for research purposes even though it was not originally meant for that. The researcher should seek consent from the data sharer if it can be used for research purpose (Bryman, 2011, p. 139). The data has been published through annual reports, which are commonly used for research purposes and we will use it without asking for content.
2.7. Summary of methodology choices

Figure 2, shows which methodology choices we have made. Positivism, objectivism and deductive approach are all relevant choices when conducting a quantitative research paper.

Figure 2. Methodology choices (Gidlund & Lund, 2017)
3. Theory

3.1. Corporate governance

The purpose of corporate governance and its mechanisms is to solve the problem between a firm’s principals and their agents. This issue is dealt with through monitoring and incentive programs, which in turn has to be evaluated and a trade-off has to be made between more incentives or allowing more conflict of interests (Thomsen & Conyn, 2012, pp. 46-47). Mintzberg (1983, pp. 70-86) identifies seven roles of a governing board:

- Role 1: Selecting the CEO
- Role 2: Exercising direct control during periods of crisis
- Role 3: Reviewing managerial decisions and performance
- Role 4: Co-opting external influences
- Role 5: Establishing contacts and raising funds for the organization
- Role 6: Enhancing the organization’s reputation
- Role 7: Giving advice to the organisation

These roles will be influenced by an internal and external coalition, which will be explained in 3.2.2, in a network of power relations, where directors either strive to serve, control the organisation or appear as passive. Mintzberg (1983, p. 94) also recognises that to the extent that the organisation is dependent on resources, the board could not stay passive for long, as it would have to interact with both the external and internal environment for the continuation of the organisation. Thomsen and Conyn (2012, p. 166) explains that directors are constrained by company law and that they have particular duties that should be followed if the firm is to have a sensible and sustainable corporate boards. The tasks of the board are to act in the best interest of the shareholders and to be prudent, diligent, and loyal to the firm and not act for personal gain.
3.2. Corporate Governance theories

The above summary highlight the main theories and concepts regarding the research topic, corporate governance. The overarching theory, which is the contingency theory, is a broad and explains that boards have to adapt to its ever-changing environment and is contingent on its external and internal environment. Within both environments, there are different theories providing an explanation of which role boards should play to deal with its environmental context. Some of those theories are summarised below:

- **Agency theory.** Agency theory explains how to better align the interest of firms’ outcomes with its shareholders’ interest. However, the agency theory view is that board members and its management have a conflict of interest, and they are needed to be incentivized, for instance through remuneration, in order for the management to act in the best interest of the shareholders.

- **Stakeholder theory.** This theory explains that boards should not only pursue increasing shareholder value for the benefit of the firm. Instead, they should forego that endeavour for the ambition of balancing the interest of all stakeholders.

- **Resource dependency theory.** This theory is regarded as one of the most critical theories, for our study, to explain board outcomes. It provides a theoretical explanation of how companies adapt to the environment of scarce resources.
3.2.1 Governance Board Theory
Judge and Zeithaml (1992, p. 768) argues that boards responses are determined by institutional or contingency theory. The institutional perspective assumes that organisations behaviour and decisions repeat a pattern that becomes legitimated within its environmental context. Therefore, board responses could be predicted by a cause and effect relationship. For example, if a new gender quota law is implemented in markets, all companies in their environmental context will respond in the same way as well as over time. The institutional perspective is more an intrinsic perspective since it views the organisation through an endogenous model, where if one changes an institutional factor, all else equal, the model will produce a certain outcome. According to this perspective, the boards' responsibility is to conform to institutional expectations. Tolbert and Zucker (1983) explains that institutional changes affect the formal organisational structure, where required reforms will rapidly change organisation structures, while other institutional changes adopt over time. According to Williamson (1988, pp. 580-581), the board is merely a body that supports management with the aim of reducing transaction costs and is supposed to be structured accordingly. Even though the institutional perspective is important, we will not consider it because this point of view assumes a strong cause-and-effect relationship, a softer premise such as a contingency perspective is more appropriate, where we examine at correlations and tendencies.

Judge and Zeithaml (1992, p. 770) also explains contingency theory, which assumes a complex view of board responses and focuses on environmental adaptation that requires an evolving explanation of how boards adapt to its environment. In this perspective, the theory has an extrinsic view of the organisation, where the outcome is not certain, and that many variables are dependent on each other and have to interact in order to produce a particular outcome that could differ even from the same event. A fundamental concept in contingency theory is that a firm’s structure must fit its environmental contexts, such as culture, size, and technology to survive. This means that there is no clear or optimal way to organise every organisation, rather, every organisation has to adapt to its environment and is contingent on its internal and external environment for its survival (Drazin & Van de Ven, 1985, p. 515). For instance, in a case of a new law is introduced.

3.2.2. Corporate board theories
Mintzberg (1983, pp. 22-24; 27-29) explains that organisations are subject to influencers (stakeholders), trying to control the organisation's decisions. An organisation can be divided into an external and internal coalition which can be used to explain particular organisational outcomes. The organisation begins with a group of stakeholders joining to meet a common goal. Other stakeholders outside the organisation will be attracted if it provides a net value to the business environment. Since stakeholders' interests vary, they might try to lever power over each other. This power could be regarded as dependency on resources such as skills and knowledge. Mintzberg (1983, p. 26-29) have divided stakeholders into two types, internal (employees) and external (non-employees). Mintzberg (1983, p. 111) also explains that the internal coalition is a power relationship within the organisation among internal stakeholders and they tend to be dependent on the success of the organisation itself since they are affected reputational-wise. The external stakeholders must affect the internal coalition to gain power over the organisation, for instance, the society will try to regulate companies.
The board of director’s function is mainly determined by the external environment and has been described by Mintzberg (1983, pp. 79-80) to have two main functions. The first function is that directors serving on more than one board may link those organisations together and provide greater influence to the organisation through more resources, skills and knowledge. The second function is the increased attention to stakeholders and the organisation’s relationship with them, and the purpose of the directors is to coordinate the firms’ stakeholders.

3.2.2.1. Stakeholder theory
According to Freeman and Velamuri (2005, p. 6), a stakeholder is “any group or individual who is affected by or can affect the achievement of an organisation’s objectives”, for instance: owners, customers, suppliers, employees, creditors, and governments are stakeholders by that definition. The stakeholder approach aims to help the firm to deal with changes in external factors and its business environment, by using it as a management tool to gather support from affected parties (Freeman & Velamuri, 2005, p. 8). It is necessary for the firm to harnessing support and nurture its relationships with its stakeholders to develop common objectives and successful long-term strategies (Freeman & Velamuri, 2005, p. 7). In stakeholder theory, common objectives will be achieved through value-based management. Considering the diverse group of stakeholders’ economic, ethical, political and social considerations, for instance, gender quotas, and based on these factors, together develop a shared set of core values and objectives (Freeman & Velamuri, 2005, p. 8). The stakeholder theory describes how the firm governs the balance of conflicts that can arise when different interests collide among the stakeholders, and how the firm has to coordinate the various stakeholders to set an overall direction (Hung 1998, p. 106).

3.2.2.2. Agency and stewardship theory
Publicly listed companies are usually owned by numerous of different shareholders that not only consist of the founders but also external parties, for instance: investment companies, funds and private investors. Since the shareholders might not have the time, knowledge or resources to run the firm’s day-to-day business, they hire executives that will do it for them (Fama & Jensen, 1998). However, in this case, it will exist a separation between the shareholders’ ownership (the principals) and its executives’ (the agents) control, and there is a risk of conflicting interests between the two parties due to its separation, called principal-agent problem. The principal-agency problem is a concept within agency theory and explains how conflicts and uncertainties can emerge from information asymmetry, which is when the agents have more information than its principals, and moral hazard, which is when the agent take advantage from the information asymmetry (Thomsen & Conyon, 2012, pp. 16-21). To mitigate these types of risks, the shareholders will set up a board and elect its members with the purpose to act as an intermediary between the owners and the firm’s executives, and the cost associated with the solution is called agency costs (Fama & Jensen, 1998, p. 5). The board of directors is responsible for managing the firm’s assets in the most beneficial way to its shareholders. For instance, by hiring, firing and monitor the firm’s executives; evaluate the firm’s performance; and ensure the business strategies (Fama & Jensen, 1998; Thomsen & Conyon, 2012, p. 142). Agency theory lies, together with stewardship theory, within the contingency perspective’s internal environment. However, while boards have a conformant function in the agency theory, it has a performance function in stewardship theory (Hung, 1998, p. 105). The main differences are, first, that stewardship theory assumes that the hired executives are rational and self-motivated and their interest is aligned with the owners

3.2.2.3. Resource dependency theory

Resource dependency theory, which is the main theory we have used as an explanatory factor for why a particular outcome has occurred for publicly listed companies on the Oslo Stock Exchange corporate boards. It is connected to how the board composition, number of directorships held, basic remuneration, board size, and age of directors are affected by the resource constraint companies are under. Pfeffer and Salancik (2003) has developed the idea that a firm is affected by its external environment through a linkage by its dependency on resources and its coordination of stakeholders. Directors are the primary linkage between the firm and the necessary external resources. The firm has to adapt to the ever-changing environment and the need for scarce resources. Moreover, the need for directors having the right skills, influence, and linkage with external resources, is essential to deal with the changing environment and for the firm to maintain itself, and survive in a competitive market, which is why some companies might have to delist. According to Pfeffer and Salancik’s (2003, pp. 258-259), companies are dependent on both resources to survive and interact with other actors in the market who control those resources. Companies never have complete control over the necessary resources since there are constant claims for those resources. Moreover, activities of the organisation and other market actors are visible and known to each other and allocation and lack of control over those resources. This visibility, or lack of it, is known as information asymmetry. For example, other market participants may experience that our firm is short of a certain product and take advantage of the situation. Each of these conditions can be altered depending on which actor has more power over those resources or conditions. Adapting to its environment may seem simplistic, however, complying with demands of one stakeholder could mean noncompliance with other stakeholders. Because of this complexity, companies has to adapt to future requirements as well as maintain stability and development of the firm's structure and behaviours. Since publicly listed companies are entities that are dealing with the demands of society as well as striving to meet its needs, companies will have to accept a loss of control over one’s activities and, at the same time, try to avoid too much dependency. For instance, a firm needs to conform to the gender quota law if the firm wants to stay listed on the Oslo Stock Exchange. However, this might mean noncompliance with important shareholders or employees striving for a career. Hillman et al. (2007, pp. 943-944) have argued that companies can benefit in three ways from board linkage with its environment, the benefits are advice and counsel, legitimacy, and communications and resources.

Advice and counsel

Hillman et al. (2007, pp. 943-944) conclude that it is not always obvious which advice and counsel should be provided by directors. Some studies have shown that heterogeneous groups provide greater perspectives and more creative solutions to problems. However, it
may also lead to a worsening communication and an increased amount of conflicts. A study made by Watson et al. (1993, pp. 595-596), showed that homogeneous groups had more effective group processes than heterogeneous groups since they make decisions faster. Depending on time-frame, homogeneous groups, in general, scored higher on group performance, to begin with. However, as time goes and the heterogeneous group gets more experienced and familiar with each other, the group starts to provide a wider range of perspectives, while alternative solutions and the overall performance remains the same. Therefore, increasing diversity of female directors in male-dominated boards could add better advice and counsel. On the other hand, it could also increase conflicts and make management, processes and performance less efficient.

**Legitimacy**

According to the resource dependency theory, companies has to seek legitimacy with its environment to continue operating within it. Because of this, companies might be pressured to include women on boards to meet society’s ethical and political values regarding boards’ composition and basic remuneration. Adding women to boards as tokens can also be a way for companies to mitigate, or avoid, negative media attention (Elgart, 1983, pp. 121-122), which, in some cases, Dyck and Zingales (2002, p. 4) found to be just as efficient as government sanctions.

**Communication, commitment, and resources**

The role of the board is to link directors' knowledge and their network with its environment. A study made by Kanner in 2004, (cited by Hillman et al., 2007, p. 946) showed that it is the women that undertake most of the household purchases, which indicates that it is important to have those stakeholders on the board as directors to be able to communicate their preferences, beliefs and experience. A similar study by Mattis in 1993, (cited in Hillman et al., 2007, p. 946) stated that directors serve as a role model to people inside the firm as well as outside the firm. Having women on boards may signal to other women that their preferences and beliefs are heard.

### 3.2.3. Theories regarding Board Factors

#### 3.2.3.1. Board size

Chaganti et al. (1985, p. 2-4) studied how board size and composition was constructed in successful and failed companies. The result showed the successful companies tended to have larger boards and failed companies tended to have smaller and weaker boards. Chaganti et al. (1985, p. 2-4) identified six reasons for why some boards are weaker in general. Those reasons are the shortage of qualified directors; CEO has too much influence in boards and tends to recruit directors they can work with and not the most suitable directors; directors are too busy, and inefficient; the lack of information; and badly prepared proposals suggested to the boards. Pfeffer (1972, p. 223) noted that the board of directors are affected by its environment and the greater its effect is on the environment, the greater the need is for more board members in the organisation. This occurs mainly because companies usually become larger when the need for external capital is higher. Another reason is that companies are more diversified and have to deal with more consumer sectors and characteristics, and therefore, companies have to relate to these new consumers. Further, Pfeffer (1972, p. 223) states that if boards are homogeneous, they can remain small, but if boards are more heterogeneous they need to become larger to represent all differences.
3.2.3.2. Board diversity

Diversity in boards can have many different consequences for the firm and previous scholars’ theoretical research have concluded interesting arguments that can be applied in our study to indicate reasons for certain outcomes. Milliken and Martins (1996, pp. 3-4) states that diversity is usually categorised into either observable diversity such as age, race and gender, or less visible diversity, such as education, human capital, abilities, socio-economic background, personality, and values. The less visible attributes have always been important for companies that strive to increase knowledge and skills within the firm. However, diversity among the observable attributes is a less common endeavour for companies. Board members bring value through the human capital they possess, and Hillman and Dalziel (2003, p. 383) have identified two types. First, the skills and knowledge that board members obtain through experience. The second type is the social capital that is the board member’s network and the resources that can be obtained from it. Robinson and Dechant (1997, pp. 26-27) states that people's’ beliefs and abilities do not have the same distribution in the population among different demographic variables such as age, race, and gender. Therefore, increasing diversity should provide different perspectives and solve problems in a more creative way.

Pfeffer (1972, p. 222) explains that companies that want to continue getting support from stakeholders have to co-opt, meaning giving in to a certain degree of control and information. This is more likely to occur if companies are resource depending; necessary to solve problems facing the firm when dealing with stakeholders; legally forced, as in the case of publicly listed Norwegian companies and the gender quota law. Cooptation as a strategy is more likely to be used in large companies and financial institutions that are dependent on their stakeholders. According to Pfeffer (1972, p. 223), the board size is affected by its relationship with its environment. The stronger the firm’s dependence becomes, the greater the need for co-opting, and the more members the organisation will hire to its board. Pfeffer (1972) concluded that larger organisations tend to have larger boards. The reason for this occurs because large organisations are more diversified and have a greater impact on society and the economy as a whole since the organisation would have to seek legitimacy from its environment and would, therefore, need more members on its board representing that legitimacy.

Kanter (1977, p. 966) divide people into four types of group compositions. The first is the uniformed group, which constitute a ratio of 100:0 to 85:15 of the population. Second is the skewed group that has a ratio below 85:15. The 15 percentile may be called tokens since they represent more of a symbol of the group, rather than individuals. The third group is the titled group, which is less extreme distributed with a typological ratio of about 65:35, where the smaller group is a just a minority and not considered as tokens anymore. The last group has a ratio of 60:40 or 50:50 is called a balanced group. Kanter (1977, p. 971) argues that tokens capture more awareness from the larger group about both the similarities and differences between them and that tokens are mischaracterized to fit a generalisation about that group's persons’ social type.

McDonald (2008, p. 1159-1161) states that executives with better expertise will provide a more efficient and effective decision-making process and they are better able to manage large quantities of information that are of importance to decision-making. Since directors will have knowledge and expertise in some areas; it is more likely that they will pursue
related projects within the same field, while other directors may have expertise in dealing with unrelated projects to the firm.
4. Hypotheses

In accordance with the resource dependency theory, the board of directors should consider whether its board capital fulfils the firm’s needs, or if a change in composition is necessary (Hillman et al., 2007, p. 383). Thus, a gender quota law will force an additional perspective that the firm has to consider, even if it is in the process of recruiting human capital to the board or not. The Norwegian legislation was enforced in 2006, for new publicly listed companies, and aim to increase gender equality and gender dispersion in leading top positions. However, Seierstad and Opsahl (2011, p. 50-51), who measured average directorships held in a short-term perspective, empirical findings showed that there was a concentration of few women that was serving on multiple boards. Their findings suggest that women that already had experience from serving on boards were more often selected to serve on other boards as well. There are indications that a change has already begun, Seierstad and Opsahl (2011) found that the number of directors that held more than one board assignment increased and that the proportion of women on boards, with more than one board membership, went from 7 out of 91 to 107 out of 224 during an eight-year study. Terjesen et al. (2008, pp. 161-162) findings suggest that new female directors have similar, or additional human capital, to their male counterparts in Norway after the reform. Storvik (2011, pp. 37-39) discovered that women after the reform had spent more year in the universities than men, which would indicate that in the long-term, there should be more qualified women to serve on boards. In a more recent study, Bertrand et al., (2014, pp. 26-27) found that women that got selected to board positions were better qualified than female board members before and concluded that companies had improved their recruiting process. As companies have become better at finding female talents for board positions and that women should be better qualified as suggested by prior studies and according to the resource dependency theory, we assume that the dispersion of board members will increase.

**Hypothesis 1a.** The proportion of women on boards has increased from 2009 to 2015.

**Hypothesis 1b.** The average number of board directorship held by women has decreased from 2009 to 2015.

**Hypothesis 1c.** The concentration of board memberships held by women has decreased from 2009 to 2015.

A study conducted by Robinson and Dechant (1997, pp. 22-23) found that employment and executives’ turnover for women was twice as high as for men and that absence rate for women was 58 percent higher than for men during the same period. Robinson and Dechant's findings suggest that women are more expensive as employees than men, and therefore, according to them, can be priced lower. However, Robinson and Dechant (1997, pp. 26-27) also showed that abilities and beliefs tend to differ among demographic variables such as age, race, and even gender. Thus, increased diversity on the board of directors should provide different perspectives and more innovative solutions to problems. However, the adverse effects have shown to be that communication tends to worsen and conflicts increase the more diversified a group becomes. Before the reform, actors in the market feared that there might not be enough qualified women. However, after the reform, the women that filled the board seats were better qualified than women appointed before the reform, and at least as qualified as the male appointed directors. Thus, the gender gap became smaller as boards became more diverse (Bertrand et al., 2014, p. 26-27), which can indicate that companies became
willing to pay more for the positive effects from a well-diversified board. Further, Bertrand et al.’s (2014, p. 25) found that the wage gaps were about 25 percent before the first gender quota reform in 2003, but the result was not statistically significant. Even though some studies have found that organisations have incurred a higher cost per woman employee (Robinson & Dechant 1997), there are other studies that highlights the positive effects of well-diversified groups such as understanding new perspectives and finding more creative solutions (Hillman et al., 2007; Watson et al., 1993). Given that women with prior board membership experience and knowledge have increased in relation to relatively constant demand after the gender quota law was implemented, it may result in women directors being more attractive to board positions while calling for a higher wage since 2008.

**Hypothesis 2a.** The increase in average basic remuneration for female directors will be higher than male directors.

There is a possibility that female directors’ remuneration is an effect of an overall remuneration increase, or decrease, that affect both male and female directors, which will be needed to control for.

**Hypothesis 2b.** Female directors’ remuneration correlates with male directors over time.

An interesting question is whether or not larger companies result in more or fewer women on boards. One study shows that firms seek legitimacy and that larger firms have a higher probability of women on boards to meet the criteria for legitimacy (Hillman et al., 2007, p. 948). According to the resource dependency theory, changes in the external environment may create the demand for organisational changes (Pfeffer & Salancik, 2003). According to Pfeffer (1972, p. 223), board size is affected by its environment, and the stronger the firm’s dependence gets on its environment, the greater the need for co-opting. Ahern and Dittmar (2012, p. 153) showed that the average Norwegian board size was approximately 5.5 members in 2001 and did not noticeable change over time, suggesting that companies did not choose to add more board members to fulfil the requirements. Instead, replacing existing directors with new ones. We cannot see why that would change and the hypothesis is as follow:

**Hypothesis 3a.** The average board size does not change over time.

Pfeffer (1972) concluded that larger companies tend to have larger boards. The reason for these occurrences is because large companies are more diversified and have a greater impact on society and the economy as a whole. Thus, the firm would have to seek legitimacy from its environment and would, therefore, need more members on its board representing that legitimacy. Also, McCormick Hyland and Marcellino (2002) examined the relationship between board gender composition and the firm size and showed that it is a positive relationship between them.

**Hypothesis 3b.** The proportion of women on boards correlates with the firm’s board size.

McDonald (2008, pp. 1159-1161) states that executives with better expertise will provide a more efficient and effective decision-making process. The study made by Ahern and Dittmar (2012, pp. 140, 153-154) showed that only 31.2 percent of women had prior CEO experience compared to 69.4 percent of retained male directors. Not only did the composition change
as a result of the gender quota law, as mentioned in previous hypotheses, but so did its characteristics as well, such as the directors’ age. Mats and Miller (2013, pp. 156-157) studied Norwegian directors and found that the average age of the board was stable after the implementation of the gender quota law. However, the reason for that is because male directors increased in ages which offset the decreased ages of the female directors that replaced the male directors. Kang et al. (2007, p. 195) found that the size of the board had a significantly correlation with the age of directors. In accordance with the resource dependency theory, given that women have gained more experience and competence, boards characteristics between genders should converge over time, and therefore, become more similar.

**Hypothesis 4.** Both female and male directors average age will become more similar from 2009 and 2015
5. Empirical Method

5.1. Data and data selection

Norway passed the first gender quota law in 2003 that requiring all publicly listed companies to have at least 40 percent representation of either gender in the corporate boards. The law was used more as a target until July 2005, and if the requirements were not fulfilled until then, the law would be enforced. The law was unsuccessful the Norwegian Parliament made it compulsory for January 1, 2006. Companies that registered after that date had to obey it from the start while already listed companies had until January 2008 to comply. Companies that could not comply within the two-year transition period were forced to dissolve. According to Public Limited Liability Companies Act (1997), article 6-11a, there are different thresholds for the minimum number of board members that must be represented by the minority gender, depending on the number of serving directors:

- For a board that has two or three members, it is enough if at least one of each gender are represented.
- Boards that consist of four or five members, at least two of the members must be from the minority represented gender.
- If the board has from six to eight members, a minimum of three of each gender must be represented.
- If to board consist of nine members, at least four should be of the minority gender.
- If the board has more than nine members, at least 40 percent of each gender must be represented.

We are interested in the gender quota law’s medium-term impact on Norwegian companies’ boards and, therefore, we have chosen to observe and measure the following years after 2008, which has been the ending year in time-frames in prior studies. Thus, the study observes all Norwegian companies that have been publicly listed throughout the entire year, on Oslo Stock Exchange from 2009 to 2015.

We have collected data regarding publicly listed companies’ firm name, ticker code, ISIN-code, and information about eventual firm listings, delistings, and if a firm change its name. This data and information have been collected from the Oslo Stock Exchange’ database, which is open to the public on its official website oslobørs.no. We have also used other secondary sources for information about the publicly listed companies' directors. The annual reports have been the main source of information when collecting the board of directors’ name, age, gender and basic remuneration for each year. The annual reports have been collected from the companies’ websites. If an annual report has not been available on the firm’s website, it has been sent to us by e-mail after we have requested it, with some exceptions.

The process of retrieving the data has been constructed in the following way. First, we downloaded all the available annual reports and e-mailed those companies where we could not find annual reports. We have primarily found all annual reports on each company's website. If this was not possible, we used Google to find the missing annual reports. From these reports, we have extracted each board member and only include the persons that began their directorship before 1 July each year. We have also controlled for each individual's name.
by comparing between boards and years to see if any board member has changed the last name. We will use a similar method as Ahern and Dittmar, (2012, p. 147) to identify board member’s gender. We first used a photograph of the member in the annual report or the photographs on the company website. When that was not available, we searched for gender pronouns such as “he”, “his”, and “Mr” and “she”, “her”, “Ms”, and “Mrs” in biographical information. If none of these was to be found in the annual report, we have then used alternative databases such as regnskapstall.no and companies press releases that can be found on companies’ websites. The age of respective board member has been determined by prioritising in the following order: annual reports, relsci.com, regnskapstall.no, bloomberg.com, alternatively from different press releases. If it was not possible to find either the board member’s basic remuneration or age, we still included them in the study. However, we excluded the missing data when we conducted measurements of the factors in the study.

We have been manually cleaning some of the data, for instance, some board members had changed their name or been incorrectly reported during the observed period. Without manually cleaning, these directors would have appeared to be multiple persons. To be sure that we have not made any mistakes collecting all the data. We have filtered out the data and carefully looked through all the names (First and Last), genders, and ages for all directors twice. However, it is still possible that some errors can have occurred since we are, in the end, still human beings.

5.2. Delimitations

A sample will be used to represent a population, the Oslo Stock Exchange, which is our subject of study. Oslo Stock Exchange will be considered a sample which can be used to generalise about other markets around the world. Foreign companies that have been registered and traded on the Oslo Stock Exchange was excluded from this study since the Norwegian gender quota law does not apply to these companies. We have used companies ISIN-code to recognise if the company is Norwegian and only include companies that start their ISIN-code with “NO”. If companies changed name during the studied period, we used the more recent name during the entire period. We have limited the study to only focus on the board of directors. Therefore, committee members have been excluded from our data. We have also excluded employee’s representatives and deputy board members because different rules apply to them. However, we have included the deputy chairman since they are considered as a regular board member, according to Public Limited Liability Companies Act (1997). Data regarding board members’ remunerations has been restricted to cover the basic remuneration because we consider performance-based compensation be less comparable. We have not taken board meeting attendance into consideration when it comes to basic remuneration even though some companies use meeting attendance as a basis for remuneration. However, for basic remuneration, sometimes it has not been possible to determine if the board fees are only made up out of fee’s or also including consultancy fees. We have chosen to present remuneration amounts in the local currency Norwegian Kroner (NOK) since we are only interested in conducting relative measurements and comparisons. If companies use other currencies than NOK and have not presented the exchange rates, we have then used exchange-rate.org to determine the exchange rates for 31st December each year, to convert both EUR and USD to NOK. We have excluded the years where companies have been delisted as well as duplicates of A-shares and B-shares. This paper will not take
social factors into consideration, and we have, therefore, not measured factors such as culture, experience, skills and education. These factors are left for other theoretical studies. The number of companies before exclusion was 263, from these, 97 was foreign, delisted, or we were unable to find the annual reports. This resulted in a sample with a total of 166 companies for the period 2009 to 2015. From this sample, we extracted 1300 board members, and of these, 525 were women, and 775 were men.

There are some limitations of the secondary analysis, which is that the collected data is unfamiliar to the researcher. Since the data has not been collected by the researcher, there is no control of the quality of the data. Thus, the researcher is exposed to the risk that the necessary data might be missing. If a required data is missing in the result, the entire research might have to be discarded (Bryman and Bell, 2015, pp. 328-329). Since we have used secondary data from temporary data sources, there is a possibility that the data will not include all the necessary data for verifying our hypothesis. Since the data is temporary and, therefore, could be missing for a future researcher to test the reliability of this paper. For example, a company’s annual report might disappear when it is delisted. Unfortunately, there is no way, which we know of, to solve this problem. Another issue with this research is that the primary data has not been collected by us. This means that we cannot verify the accuracy of the data and whether the data is stated incorrectly in the secondary sources. For instance, if the name, gender, age, and remuneration is incorrectly presented in an annual report.

5.3. Operationalization

Concepts in a quantitative research have to be measured, which is called operationalized, and these measurements will constitute either independent or dependent variables. Variables can be used to explain a certain event or attributes of a thing (Bryman, 2012, p. 163). To provide a measure of concepts, for instance, intelligence, indicators need to be used such as IQ-tests (Bryman, 2012, p. 164-165).

There are three main preoccupations that would constitute quantitative research as acceptable knowledge. These are measurement, causality, and generalisation. Measurement of concepts is important for strengthening the validity of the research. We have to operationalize four concepts in this paper: board composition, remuneration, board size, and directors’ age. How these concepts are measured will be explained in section 5.4.3. Causality tries to find the reason for why something occurs. In most quantitative research there will be concepts of dependent and independent variables which constitute cause and effects (Bryman, 2012, p. 205). In this study, we will look at independent variables such as board composition, remuneration, size, and age to explain how the gender quota law have affected those factors. However, we will look at how our concepts correlate as well as analyses different tendencies that have occurred after the gender quota law was implemented. The third preoccupation is the generalization, where the research has focused on the particular outcomes, which in turn should be able to be used elsewhere if the same criteria are met. For instance, a sample from a population is studied, and from that, a general conclusion can be drawn for the population. A problem with generalisation is that even though a sample can be used for generalisation about the population, one needs to be cautious to apply it to another population (Bryman, 2012, p. 205). For instance, the generalization about our sample, companies listed on the Oslo Stock Exchange to the entire Norwegian market as well as to other markets. We will use Oslo Stock Exchange as a sample, which we will
generalise to explain the whole population and how that market can be extrapolated to explain other markets.

5.4. Analysing model

In this paper, we will apply both univariate analysis and bivariate to analyse the empirical findings. The reason for this is because they are used for different measures. Univariate is used to analyse a single variable, X, and in bivariate, two variables are analysed, X and Y, and the relationship between them (Bryman, 2012, pp. 337-338). The formulas for the arithmetic mean, geometric mean, median, sample standard deviation, bivariate regression and correlation that has been used in this research paper will be presented in Appendix 1. The calculated regressions and significance test will be shown in Appendix 2.

5.4.1. Univariate analysis

To find tendency and convergence amongst variables at different time intervals. Using central tendency and dispersion will result in an appropriate comparison. One important measure used in this paper is the arithmetic mean, which is the sum of all the values in a distribution and then divided by the number of values (Bryman, 2012, p. 338). Another measure of central tendency is the geometric mean, which is the \( n^{th} \) root of the product of all X values (Young & Trent, 1969, p. 179). A third measure used is the median, which is the average value for the middle two observations when the observations have been ordered lowest to the highest value (Anderson et al., 2004, p. 88). Finally, we will measure dispersion by using standard deviations, which is the average amount of variation around the mean (Bryman, 2012, p. 339).

5.4.2. Bivariate analysis

Bivariate analysis is used to analyse two variables during the studied period to understand if they are correlated, not causal. Two methods that can be used to analyse dependency between variables are correlation measures and simple linear regression (Bryman, 2012, pp. 339-341).

Correlation

A popular correlation method that we will use is the Pearson's R. The assumptions used for correlation study is that (Bryman, 2012, pp. 341-342):

- The coefficient will lie between -1 to 1.
- Close it is to 1, the stronger the relationship is, and the closer to 0, the weaker the relationship is.
- The coefficient can be either negative or positive which indicates the direction of a relationship.

This means that all observations lie on a positive, negative or neutral straight line and if the correlation is 0, it means that there is no relationship between variables (Anderson et al., 2004, p. 531).

Regression model

Regression model described how a dependent variable is related to independent variables and an error term. A bivariate simple linear regression is a straight line that has an intercept
value and a constant slope that changes independent variables and affect the dependent variable. The regression can be positive, negative or no relationship and this is dependent on the relationship the direction of the slope of the regression (Anderson et al., 2004, pp. 511-512). To make a valid inference from a regression model, we need to make five assumptions, which if violated would make the results invalid. The five assumptions are (Hayes & Cai, 2007, p. 709):

- Linear relationship
- Independent variables are not random
- Error terms are uncorrelated random variables and normally distributed
- Error terms have 0 means
- Error term have constant variance

Once the statistical findings have been rejected or not, one has to consider if there have been a Type I or II errors. Type I error occurs when you reject the null hypothesis when it should not be. Type II error occurs when one accepts the null hypotheses when you should have rejected it. The higher the confidence level is, the more likely it is to make Type I error and the lower it is, the more likely it is to make Type II error (Bryman, 2012, p. 348).

To determine if the confidence level is reached for the statistical test, one can examine the p-value to determine if the statistical test is statistically significant. A p-value is the probability of getting a value equal to the observed value. If the p-value is less than the confidence level, the null hypothesis should be rejected (Anderson et al., 2004, pp. 368). In this study, we have determined that if a p-value is lower than 5 percent, the result is statistically significant. Because, a confidence level of 95 percent is commonly considered as an appropriate significant level (Anderson et al., 2004, pp. 368). For the paper’s significance and regression tests, we have used Microsoft Excel’s Analysis ToolPak.

5.4.3. Hypothesis testing
In this section, we will explain our empirical strategy to measure how the Norwegian gender quota law affects the board of director’s composition, remuneration, size, and age from 2009 and 2015. The methods we have used are explained in the same order as we have presented the hypotheses.

Hypothesis 1: Directorships held
The explicit goal of the gender quota law in Norway was a 40 percent gender balance on corporate boards. However, Seierstad and Opsahl (2011, p. 52) suggest that there is an implicit goal of the law aimed to increase the number and dispersion of female directors. In other words, help new women to board seats. Seierstad and Opsahl (2011, p. 52) concluded that Norway failed to increase dispersion since directorships were concentrated to just an elite group of female directors. However, the study only measured short-term effects. Since then, newer studies have been made that argues that companies have become better at tapping the candidate pool of qualified women. Thus, suggesting that more women can reach board seats (Bertrand et al., 2014) and that newly appointed female directors have become higher educated and more qualified (Storvik, 2011, pp. 37-39). For hypothesis 1, we measure whether the tendency and dispersion of women have increased. To test hypothesis 1a; we have collected data regarding every individual directors' gender and the names of the publicly listed companies they have been serving on from 2009 and 2015. This has been used to determine whether the proportion of women on board has increased.
For the second sub-hypothesis, 1b, we assume that an increasing number of women are serving on more boards and that new, inexperienced women have few board memberships, which will lead to a decline in the average number of directorships held by individual female directors. This will be estimated by taking the total number of directorship held by female directors divided by the total number of female directors for each year.

\[
\frac{\text{Total number of female directors}}{\text{Total number of female and male directors}} \quad (1)
\]

If hypothesis 1a and 1b are true, more women with board experience should increase over time and, therefore, the need for hiring the same group of elite female directors might decrease with time. Thus, new women with board experience have increased the supply while the demand has, more or less, stayed the same. Hence, for hypothesis 1c, we assume that the concentration of board memberships, held by women, have decreased. We have used the same univariate approach as Seierstad and Opsahl (2011) to measure the board members’ assignment dispersion, which is to separate male and female directors and then measure each group’s standard deviation in terms of the number of board directorships per person. A high standard deviation suggests that the directorships, the power, is concentrated to a few directors and, therefore, there is inequality among directors. A low standard deviation would indicate the opposite, that a low standard deviation indicates a dispersion of power and equality among directors.

\[
\frac{\text{Total number of directorships held by female directors}}{\text{Total number of female directors}} \quad (2)
\]

**Hypothesis 2: Board remuneration**

Bertrand et al. (2014, pp. 26-27) states that companies had over time become more efficient at finding female candidates for board positions, and that the new female board members that got their seats after the gender quota law came into effect was not only more experienced than their predecessors, but also at least as competent as their male counterparts. Storvik (2011, pp. 37-39) also came to a conclusion regarding female directors progress when studying how formal and informal competence among female directors had developed before and after the reform. Given these premises, and the fact that the female directors that were newly appointed to their positions in around 2009 should have become more experienced over the years, we believed that the proportional increase in directors’ average basic remuneration would be higher for women than for men. For hypothesis 2a, we have calculated the arithmetic mean and median for each year as well as its geometric mean for both female and male directors.

\[
\frac{\text{Total basic remuneration for female directors}}{\text{Total number of female directorships}} \quad (3)
\]

Further, a bivariate simple linear regression is used to test hypothesis 2b, whether female directors’ basic remuneration has been historically correlated with male directors since we
assume that both female and male directors’ basic remuneration are under the effect of an overall remuneration increase.

\[
FREM_i = \beta MREM_i + \alpha + \epsilon_i
\]  

\(FREM\) = Female directors’ basic remuneration  
\(MREM\) = Male directors’ basic remuneration  
\(\beta\) = coefficient for \(BSIZE_i\)  
\(\alpha\) = intercept  
\(\epsilon\) = error term

**Hypothesis 3: Board size**

There is more than one solution to fulfil the 40 percent board criteria and to demonstrate this; we are assuming that the board in the following example are in need of more women to achieve the requirements. The first alternative is just to add new female directors to the already existing board and increasing the number of board seats. However, that is also associated with additional cost in the form of paying remuneration fees to the additional board members. The second alternative is to decrease the number of male directors. For instance, if there are 12 members of the board, where 8 of them are men and 5 are women, the board could then choose to reduce the number of male directors to 6 to meet the 40 percent criteria. If that alternative is chosen, the board size will decrease. The third alternative is to replace male directors with female directors. Ahern and Dittmar (2012, p. 153) found that most boards chose the third alternative, replacing men with women since the board size remained relatively constant during the measured period from 2001 to 2009. To test hypothesis 3a, which assumes boards will continue to choose the replacement alternative, will keep the average board size at approximately the same level during the measured period from 2009 to 2015.

\[
\frac{\text{Total number of board directors}_t}{\text{Total number of companies}_t}
\]  

According to Pfeffer (1972, p. 223), larger companies have, understandably, greater impact on its surrounding than smaller companies and are, because of this, expected to adapt to its environments interests to justify their legitimacy claims. Pfeffer (1972), McCormick Hyland and Marcellino (2002) found that larger companies tend to have both larger boards and a higher proportion of female directors than smaller companies. This could indicate that companies values representation of a wider interest spectrum to adapt to the environment. Given that larger companies have larger boards to adapt to the environment and justify their legitimacy, we conducted a bivariate simple linear regression analysis to test hypothesis 3b.
\[ WOB_i = \beta BSIZE_i + \alpha + \varepsilon_i \]  \hspace{1cm} (6)

\( WOB \) = Proportion of the firm’s board’s seats held by women.
\( BSIZE \) = The board’s size counted in the number of board seats.
\( \beta \) = coefficient for \( BSIZE_i \)
\( \alpha \) = intercept
\( \varepsilon \) = error term

**Hypothesis 4: Directors’ age**

Mats and Miller (2013, pp. 156-157) found that the Norwegian gender quota law did not change the average age of directors. Even though younger female directors often took older male directors’ seats, the male directors got older with time, thus, offsetting the overall average age of board directors. Given that more, and younger, women are taking board positions and replacing older men, we have analysed the non-stationary time series and the geometric mean for each gender to measure whether there is a noticeable age convergence between male and female directors during 2009 and 2015.

\[
\frac{\text{Sum of female directors' ages}_t}{\text{Total number of female directors}_t}
\]  \hspace{1cm} (7)
6. Results

As shown in Figure 4, the average proportion of women on boards varies between 42.2 and 43.2 percent from 2009 to 2015.

![Figure 4. The average proportion of women on boards in Norwegian publicly listed companies (Gidlund & Lund, 2017)](image)

6.1. Hypothesis 1: Directorships held

Hypothesis 1 regards the number of directorships held by women and whether they converge with the number of directorships held by men. The descriptive data for the hypothesis 1 is shown in Table 2. The first item “Directorships held”, shows how many directorships in total were held by both women and men for each year. The reason why the number of directorships held is higher than the total number of directors, as can be shown in the last item “n”, is because one director can hold several directorships at the same time. This is also shown in the item “Members with >1 directorship”, which states how many women and men that hold more than one directorship simultaneously. The other items “Mean”, “Median”, “Maximum”, “Minimum” and standard deviation (“Std. dev”) measures central tendencies and dispersions. For instance, in 2009, the average number of directorship held by female directors was 1.21 and decreased to 1.12 in 2015. The highest number of directorships held by a single person was 6 in 2012, 2014, and 2015.
Table 2. Directorship characteristics

<table>
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<tr>
<th>Directorship characteristics</th>
<th>2009</th>
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<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Directorships held</td>
<td>300</td>
<td>413</td>
<td>311</td>
<td>424</td>
<td>311</td>
<td>412</td>
<td>291</td>
</tr>
<tr>
<td>Members with &gt;1 directorship</td>
<td>38</td>
<td>41</td>
<td>47</td>
<td>44</td>
<td>49</td>
<td>36</td>
<td>45</td>
</tr>
<tr>
<td>Mean</td>
<td>1.21</td>
<td>1.13</td>
<td>1.23</td>
<td>1.14</td>
<td>1.24</td>
<td>1.13</td>
<td>1.24</td>
</tr>
<tr>
<td>Median</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Std.dev</td>
<td>0.54</td>
<td>0.37</td>
<td>0.53</td>
<td>0.40</td>
<td>0.55</td>
<td>0.44</td>
<td>0.59</td>
</tr>
<tr>
<td>Maximum</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Minimum</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>n</td>
<td>248</td>
<td>367</td>
<td>252</td>
<td>373</td>
<td>250</td>
<td>365</td>
<td>234</td>
</tr>
</tbody>
</table>

Notes: Directorship held is the total number of directorships held. Members with >1 directorship show how many men and women that hold more than one directorship. Mean is the arithmetic mean.
Hypothesis 1a states that the proportion of women on boards has increased from 2009 to 2015. Table 2 shows that the number of women has declined from 248, in 2009, to 244, in 2015. However, the number of male directors has also declined from 367, in 2009, to 334, in 2015. The number of companies used in this study were 128 in 2009 and decreased to 117 in 2015. The result shows that, as can be seen in Figure 5, the proportion of female directors to total directors has increased from 40.3 percent in 2009 to 42.2 percent in 2015. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). The geometric mean for female directors was negative 1.0 percent and a negative of 1.6 percent for male directors.

Hypothesis 1b states that the average number of board directorships held by women has decreased from 2009 to 2015. Table 2 shows that the average number of female directorships has declined from 1.21 in 2009 to 1.16 in 2015. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). The average number of directorships held by males was reduced from 1.13 in 2009 to 1.12 in 2015. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). The geometric mean of female directorship is a negative of 0.1 percent, and for male directors, the geometric mean is zero.

Table 2 also shows that the total number of female directorships held has declined from 300 in 2009, to 282 in 2015. We have also extracted directors with more than one directorship and what we can recognise from that is those female directors with more than one directorship has decreased from 38 to 29 while male directors have declined from 41 to 35 during the same period. The geometric mean for female directors is 4.6 percent and 2.67 percent for male directors. As can be shown in Figure 6, the proportion of female directors that had three, or more, directorships held in 2009 was 70.6 percent, and this decreased to 40 percent in 2015. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2).
The proportion of female directors that held more than one directorship to the total number of female directors was 15.3 percent in 2009 and decreased to 12.7 percent in 2015. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2).

Hypothesis 1c states that the concentration of board directorships held by women has decreased from 2009 to 2015. Table 2 shows that the standard deviation for women has declined from 0.54 in 2009, to 0.46 in 2015. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). For men, on the other hand, the standard deviation has increased from 0.37 in 2009, to 0.45 in 2015. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2).

**6.2. Hypothesis 2: Basic remuneration**

The descriptive data for hypothesis 2 is shown in Table 3.
Table 3. Remuneration characteristics

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Amounts in NOK</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Mean</td>
<td>161,145</td>
<td>201,559</td>
<td>184,637</td>
<td>244,396</td>
<td>196,904</td>
<td>265,470</td>
<td>205,020</td>
</tr>
<tr>
<td>Median</td>
<td>150,000</td>
<td>160,000</td>
<td>165,000</td>
<td>183,000</td>
<td>175,000</td>
<td>200,000</td>
<td>182,013</td>
</tr>
<tr>
<td>Std.dev</td>
<td>111,363</td>
<td>240,120</td>
<td>185,309</td>
<td>346,842</td>
<td>132,834</td>
<td>371,475</td>
<td>129,175</td>
</tr>
<tr>
<td>Maximum</td>
<td>1,250,000</td>
<td>3,510,000</td>
<td>2,625,000</td>
<td>4,325,000</td>
<td>1,250,000</td>
<td>5,459,000</td>
<td>848,000</td>
</tr>
<tr>
<td>Minimum</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>n</td>
<td>297</td>
<td>410</td>
<td>308</td>
<td>419</td>
<td>311</td>
<td>412</td>
<td>288</td>
</tr>
</tbody>
</table>

Note: Mean is the arithmetic mean.
Hypothesis 2a states that the proportional increase in directors’ average basic remuneration will be higher for women than for men. Table 3 shows that the average basic remuneration for female directors has increased from 161,145 in 2009 to 219,798 in 2015, which has a geometric mean of 5.3 percent. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). Male directors’ basic remuneration has increased from 201,550 in 2009 to 285,588 in 2015, which has a geometric mean of 6 percent. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). We have also measured the median basic remuneration. For women, the median, in 2009, was 150,000 and increased to 200,000 in 2015, which has a geometric mean of 4.9 percent. For men, the median in 2009 was 160,000 and increased to 221,508 in 2015, which has a geometric mean of 5.57 percent. The results for both the women and men is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). As can also be seen in Table 3, the standard deviation for male directors are 240,120 in 2009 and increased to 424,227 in 2015. For female directors, the standard deviation increases in 2009 from 111,363 to 131,036 in 2015.

Hypothesis 2b states that female directors’ basic remuneration trend has been historically correlated with male directors. As discerned in Appendix 2, the correlation between male and female directors’ basic remuneration, during the period from 2009 to 2015, is correlated at 97.6 percent, with an adjusted R-square of 94.3 percent and is statistically significant with a p-value at 0.017 percent.

6.3. Hypothesis 3: Board size

The descriptive data for hypothesis 3 is shown in Table 4.

<table>
<thead>
<tr>
<th>Board size characteristics</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>5.57</td>
<td>5.65</td>
<td>5.74</td>
<td>5.80</td>
<td>5.78</td>
<td>5.70</td>
<td>5.62</td>
</tr>
<tr>
<td>Median</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Std.dev</td>
<td>1.48</td>
<td>1.44</td>
<td>1.45</td>
<td>1.60</td>
<td>1.37</td>
<td>1.38</td>
<td>1.35</td>
</tr>
<tr>
<td>Maximum</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>13</td>
<td>10</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Minimum</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>n</td>
<td>128</td>
<td>130</td>
<td>126</td>
<td>117</td>
<td>113</td>
<td>114</td>
<td>117</td>
</tr>
</tbody>
</table>

*Note: Mean is the arithmetic mean.*

Hypothesis 3a states that the average board size in terms of board members does not change over time. Table 4 shows that the average board size in 2009, was 5.57 and increased to 5.62 in 2015, while the median board size remains at 5 board members. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). The maximum number of board members in a single board was 11 directors in 2009 and stayed approximately at the same level during the observed period, with a peak of 13 board members in 2012. As one can notice is the minimum number of board members in 2015, which shows that a board only consisted of 1 board member. According to Public Limited Liability Companies Act (1997) article 6-1, a board must have a minimum of three board members. The reason for that is because the two other members left before 1 July and therefore, we excluded them out of the sample that year.
Hypothesis 3b states that the proportion of women on boards correlates with the firm’s board size. The proportion of women increases with 0.6 percent for every new board member and that the correlation between the genders is 10.5 percent with an adjusted R-square of 1 percent. This correlation is statistically significant with a p-value of 0.2 percent (Appendix 2).

6.4. Hypothesis 4: Age

The descriptive data for hypothesis 4 is shown in Table 5 below.

Hypothesis 4 states that both female and male directors average age will become more similar from 2009 to 2015. Table 5 shows that the average age of female directors has increased from 48.3 in 2009, to 52 in 2015, with a geometric mean of 1.24 percent. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). For male directors, the average age has increased from 55.1 in 2009 to 56.9 in 2015, with a geometric mean of 0.53 percent. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). The median for female directors increased from 48 in 2009, to 52 in 2015. For male directors, the median rose from 56 in 2009, to 57 in 2015. We can also see from Table 5 that the maximum age of female directors declined from 75 in 2009, to 74 in 2015. For male directors, the maximum age increased from 89 in 2009, to 95 in 2015.
Table 5. Age characteristics

<table>
<thead>
<tr>
<th>Age characteristics</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Mean</td>
<td>48.27</td>
<td>55.14</td>
<td>49.40</td>
<td>55.50</td>
<td>50.69</td>
<td>55.86</td>
<td>50.97</td>
</tr>
<tr>
<td>Median</td>
<td>48</td>
<td>56</td>
<td>49</td>
<td>56</td>
<td>50</td>
<td>56</td>
<td>51</td>
</tr>
<tr>
<td>Maximum</td>
<td>75</td>
<td>89</td>
<td>76</td>
<td>90</td>
<td>77</td>
<td>91</td>
<td>78</td>
</tr>
<tr>
<td>Minimum</td>
<td>26</td>
<td>27</td>
<td>27</td>
<td>28</td>
<td>28</td>
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<td>28</td>
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<tr>
<td>n</td>
<td>293</td>
<td>404</td>
<td>307</td>
<td>416</td>
<td>307</td>
<td>406</td>
<td>287</td>
</tr>
</tbody>
</table>

Note: Mean is the arithmetic mean.
7. Analysis

7.1. Hypothesis 1: Directorships held

Figure 7. The average proportion of women on boards in Norwegian publicly listed companies (Gidlund & Lund, 2017)

Figure 7 shows that companies reached the gender balance quota law of having over 40 percent of the underrepresented gender on boards. However, it has not increased by much more than a few percentages over 40 percent during the eight years since Norway implemented the enforced gender quota law in 2008.

Since women have had a proportion of over 40 percent to total directorship, and as suggested by Kanter (1977, p. 966), women that have breached the 60:40 ratios should no longer be perceived as a minority, and therefore, no longer tokens for the board. Thus, adding more women to the board would reduce the marginal utility of diversifying.
7.1.1. Hypothesis 1a. The proportion of women on boards has increased from 2009 to 2015

![Figure 8. The proportion of female directors to total directors in Norwegian publicly listed companies (Gidlund & Lund, 2017)](image)

From our observed results, the total number of female directors has decreased from 248 to 244 during the measured period. However, we can also see that the number of male directors has declined from 367 to 334. This can be a natural consequence of the fact that the total number of companies has decreased from 128 in 2009, to 117 in 2015. In addition, in Figure 8, one can also observe that the proportion of women to total directors has increased from 40.3 percent in 2009 to 42.2 percent in 2015. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). This is the result from male directors declining at a higher rate than female directors. This is also supported by our calculated geometric mean which indicated that the proportion of female and male directors are converging over time. This means that the proportion of female directors has increased and therefore, suggest that hypothesis 1a cannot be rejected.

According to Storvik (2011, pp. 37-39), women have become higher educated than their male counterparts, also more experienced with time. Parallel with this development, companies has become more efficient at finding talented female directors (Bertrand et al., 2014, pp. 26-27). Therefore, the resource dependency theory would indicate that companies should hire proportionally more female directors than male since they are better qualified. The prior studies by Storvik (2011) and Bertrand et al. (2014), as well as Pfeffer and Salancik’s (2003) resource dependency theory, are all coherent with our result.

Some studies have shown that heterogeneous groups provide greater perspectives and more creative solutions to problems. However, it may also lead to decreased communication and increased amount of conflicts. A study made by Watson et al. (1993, pp. 595-596), showed that homogeneous groups had more effective group processes than heterogeneous groups since they make faster decisions. This could be a reason why the proportion of women remains at a constant 40 percent and does not reach over the 50 percent mark.
7.1.2. Hypothesis 1b. The average number of board directorship held by women has decreased from 2009 to 2015.

Figure 9. The average number of directorships held in Norwegian publicly listed companies (Gidlund & Lund, 2017)

Figure 9 shows that the average number of female directorships has decreased from 1.21 in 2009 to 1.16 in 2015, which is a percentage decline of 4.13. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). The average number of male directorship has decreased from 1.13 to 1.12, which is a percentage decline of 0.9 percent. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). Male directorships held remains at an almost constant rate, while female directors do have a noticeable decline in directorships. This suggests that hypothesis 1b cannot be rejected.

Figure 10. The average proportion of female directors holding 3, or, more directorships in Norwegian publicly listed companies (Gidlund & Lund, 2017)
As shown in our result, there has also been a decrease of female directors holding more than one directorship in total, from 38 to 29 with a geometric mean of 4.6 percent. Male directors that were holding more than one directorship also declined from 41 to 35, with a geometric mean of 2.67 percent. As depicted in Figure 10, of all directors that held 3, or more, directorships, the female made up 70 percent of them in August 2009, which has consistently decreased to 40 percent to 2015. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2) Comparing this to Seierstad and Opsahl (2011, p. 50), which found that 69.4 percent of the directors that had three, or more, directorships were women. This shows, together with the average female directorships, a decline of 4.13 percent compared to male directors, which decreased by 0.9, that female and male directorship is converging.

The Swedish interest group Allbright (2015, p. 10) found that of all Swedish female directors in 2015, around 18 percent held more than one directorship while 13 percent of the Swedish male directors held more than one directorship. As can be calculated from Table 2, the relationship in Norway for female directors has decreased from 15.3 percent in 2009, to 12.7 percent in 2015. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). For male directors, the relationship decreased from 11.2 percent in 2009, to 9.6 percent in 2015. According to Allbright (2015, p. 17), the reason that more Swedish women, than men, serves on more boards simultaneously, could be because it is difficult for boards to find women with previous board experienced. Thus, boards tend to hire the same women to several boards. This is coherent with resource dependency theory that assumes that when some resources are scarce, organisations might have to share them with one another (Pfeffer & Salancik, 2003). However, there are benefits of recruiting directors that are already serving on other boards. Mintzberg (1983, pp.79-80) states that directors could link two organisations together and by that, transfer skills, knowledge and other resources from one organisation to another. Hillman and Dalziel (2003, p. 383), also argues that board members bring value through the human capital they possess. First, through their skills and knowledge, and second, through their social capital. The board members utilise its different human capitals and create value for the firm when they interact and link resources, skills, and knowledge through a network amongst the various organisations they have relationships with. Studies from Mintzberg, as well as Hillman and Dalziel’s, provide reasons other than that it is hard to find talented and qualified female directors. Therefore, we have two contrasting theories that could explain the result in this paper.
7.1.3. Hypothesis 1c. The concentration of board memberships held by women has decreased from 2009 to 2015.

Figure 11. The standard deviation for both male and female directors in Norwegian publicly listed companies (Gidlund & Lund, 2017)

Figure 11 shows that the standard deviation for women has decreased from 0.54 in 2009 to 0.46 in 2015. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). For men, on the other hand, the standard deviation had increased from 0.37 in 2009 to 0.45 in 2015. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). However, as shown in our result, the maximum number of directorships held by female directors are 4 in 2009 and 2015, with a slight peak in 2012 to 6. For male directors, the maximum number directorships held by one person has increased from 3 in 2009, to 6 in 2015. Both results indicate a convergence between the gender since the standard deviation for women has decreased while it has increased for men. Thus, in the long-run, these might converge at a single point.

Seierstad and Opsahl (2011, pp. 50-51) found that the maximum number of directorship held by women increased from 4 in 2002, to 8 in August 2009. The increased standard deviation, which rose from 0.40 to 0.64, could be a plausible explanation of the increased maximum number of female directorships. To interpret concentration of power and inequality, Seierstad and Opsahl (2001, p. 50) used standard deviation measurement; a higher standard deviation value indicates a higher concentration of power and inequality among directors vice versa for a low standard deviation value. We will make the same interpretation of the standard deviation and note that the concentration of power, in other words, the inequality between female directors has decreased. Therefore, the concentration of female directors has declined, and we cannot reject hypothesis 1c.

*Hypothesis 1a states that the proportion of women on boards has increased from 2009 to 2015, cannot reject.*
Hypothesis 1b states that the average number of board directorships held by women has decreased from 2009 to 2015, **cannot reject.**

Hypothesis 1c states that the concentration of board directorships held by women has decreased from 2009 to 2015, **cannot reject.**

### 7.2. Hypothesis 2: Basic remuneration

#### 7.2.1. Hypothesis 2a. The proportional increase in average basic remuneration for female directors will be higher than men

![Graph showing average basic board remuneration for female (Female) and male (Male) directors from 2009 to 2015.](image)

**Figure 12.** The average basic board remuneration in Norwegian publicly listed companies (Gidlund & Lund, 2017)
As shown in Figure 12 and 13, for both male and female directors the basic remuneration has increased. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). However, the increase has been higher for the male directors compared to the female directors. We also measured the median basic remuneration since there are a few outliers in the dataset, especially regarding the chairman position, which was usually held by males. Because the median and the arithmetic mean has the same difference in their respective geometric mean, the outliers do not seem to impact the result. Moreover, one may observe from our result, that male directors has a higher standard deviation than female directors. These relations indicate that the basic remuneration for both genders is diverging. Therefore, we can reject hypothesis 2a.

Storvik (2011, pp. 37-39) found that newly appointed female directors, after the gender quota law was enforced, had a higher formal and informal competence than female directors that sat before the gender quota law. Female’s board experience has also increased since more women, in total number, is sitting on the board over a longer period. This indicates that female directors should have a higher increase in their basic remuneration compared to male directors. Bertrand et al. (2014, pp. 26-27) also found that companies had become more efficient at finding talented female candidates for board positions. This is aligned with hypothesis 2a. However, female directors’ basic remuneration increased at a lower rate than male directors’ basic remuneration during the observed period, which means that we predicted the outcome incorrectly.

As Judge and Zeithaml (1992, p. 770) explains using the contingency theory, the board is a complex system where the optimal structure cannot be determined and has to adapt to survive. This means that the basic remuneration could differ from one period to the next since there are many factors that could indicate a higher or lower basic remuneration for directors. An interesting result is that the maximum amount of basic remuneration for female directors were 1,250,000 in 2009, and decreased to 946,000 in 2015. For male directors, the maximum amount of basic remuneration was 3,510,000 in 2009 and increased to 7,152,873

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**Figure 13.** The median basic board remuneration in Norwegian publicly listed companies (Gidlund & Lund, 2017)
in 2015. According to the contingency theory, these seemingly large changes in maximum basic remuneration was necessary for companies to make in order to adapt to its industry, directors or other internal and external factors.

According to Thomsen and Conyon (2012, pp. 16-21) and Fama and Jensen (1998, p. 5), agency theory is used to explain certain outcomes when there is information asymmetry between the board members and their principals. To mitigate these risks, principals can set up a remuneration committee with a purpose to align board members’ interests with the principals. The information asymmetry between the principals and the female directors might be higher since a large proportion of them has not been active board members for as long as their male counterparts. Therefore, female directors’ competence and experience might be more difficult to price, which could explain the higher rate of growth in remuneration for male directors compared to female directors.

7.2.2. Hypothesis 2b. Female directors’ basic remuneration trend have been historically correlated with male directors.

The correlation between male and female directors’ average basic remuneration during the observed period is correlated at 97.6 percent, which we consider being a strong correlation. The test is also significant with a p-value lower than 0.01 percent. The reason that both genders basic remuneration correlate may be that there has been a general remuneration increase and, therefore, has affected both genders. Even though the adjusted R-square is 94.3 percent, which would indicate that male director’s average basic remuneration explains 94.3 percent of female directors’ average basic remuneration. We do not consider such cause-and-effect relationship between the genders. Instead, we assume that there is a strong tendency of an increase in remuneration both genders. In other words, that both genders remuneration has causality with a third or fourth variable, such as general remuneration increase. This means that both genders’ remuneration will increase by approximately the same amount in proportion to their board fees. However, it does not mean that, for instance, male directors’ remuneration will affect the female directors’ remuneration, nor the opposite. Therefore, we cannot reject hypothesis 2b, that there exists a correlation among both female and male directors’ average basic remuneration.

Hypothesis 2a states that the proportional increase in directors’ average basic remuneration will be higher for women than for men, can be rejected.

Hypothesis 2b states that female directors’ basic remuneration trend have been historically correlated with male directors, cannot be rejected.
7.3. Hypothesis 3; Board size

7.3.1. Hypothesis 3a. The average board size in terms of board members does not change over time.

![Figure 14](image)

The average board size in Norwegian publicly listed companies (Gidlund & Lund, 2017)

The results in hypothesis 3a show that the average board size increases by 0.05 board members on average, and the median board size remains at 5 board members throughout almost the entire observed period. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). The maximum number of board members also remains at approximately 11 from 2009 but declines by one board member, to 10, in 2015. As can be shown by the results in Figure 14, the results show an inverted U-shape, where maximum board size peaks at 13 board members in 2012, and had an average mean of 5.8.

According to Ahern and Dittmar (2012, pp. 153), the average Norwegian board size was roughly at 5.5 board members during their measures period from 2001 to 2009 and did not noticeable change over time. However, it is not mentioned in their research paper whether the performed a significance test. Thus, they suggested that companies do not choose to add more board members to fulfil the requirements, instead, replacing existing directors with new ones. The reason could be that it would have been too costly to increase the board size to comply with the new gender quota law. Hence, it was more beneficial for companies to replace men with women (Ahern & Dittmar, 2012, p. 141). However, Pfeffer (1972, p. 223) suggest that heterogeneous boards need to become larger to represent a more diverse group of stakeholders. As we perceive it, results from hypothesis 3a shows that the average board size of 5.5 board members and has statistically changed over time. However, by only observing the change, it does not seem noticeable. Also, we do not consider this statistically significant changed average board size to entail any underlying economic significance. By studying the variable in a longer period, the trend in the changes in average board size could become more apparent.
As mentioned before, the average board size between 2001 and 2009 remained at a similar average of 5.5 members as our result. Pfeffer’s (1972) conclusion is not coherent with the results in hypothesis 3a if one considers that the board size stayed the same while the result from hypothesis 1a, which shows that the proportion of female directors are increasing. Thus, making the boards more heterogeneous, at least according to Milliken and Martins’ (1996) observable attribute “gender”, during the same period, which should make the board size larger. Freeman and Velamuri (2005, p.7) argues that it is necessary for the firm to maintain support with its stakeholders to develop common objectives and successful long-term strategies. Since the average board size has remained the same during the observed period, companies have chosen not to hire more directors to diversify the board, which might be necessary to meet the demand of its stakeholders. Chaganti et al. (1985, p. 2-4) might have another plausible explanation for the static board size. They showed that successful companies tended to have larger boards while failed companies tended to have smaller and weaker boards. Therefore, the reason for why the board size remains at the same average, as before the gender quota law, could be because the average performance of all companies has worsened and some have even gone bankrupt. This might have offset the possible increased board size from the increased diversified group of board members. However, Ahern and Dittmar’s (2012) findings, suggests that boards are replacing male directors with female directors to comply the gender quota law at a lower cost, are more aligned with our results, and therefore, we can reject hypothesis 3a due to its statistical significance.

7.3.2. Hypothesis 3b. The proportion of women on boards correlates with the firm’s board size

Pfeffer (1972), McCormick Hyland and Marcellino (2002) concluded that larger boards need to deal with a higher level of diversification. This would be necessary to meet the demand from society and seek legitimacy from it. The results from hypothesis 3b show that the correlation between the female and male directors is 10.5 percent with a p-value of 0.2 percent (Appendix 2). This is not aligned with Pfeffer (1972), McCormick Hyland and Marcellino (2002) since the correlation is significantly low, with a slope of 0.6, which would indicate that any additional board member should increase the proportion of female directors with 0.6 percent. Thus, even if there is a correlation between the board size and the proportion of female directors, the effects would be hardly noticeable. However, since the explanatory value, adjusted R-square, is at 1 percent, only 1 percent of the independent variable explains the dependent variable and, therefore, other variables are needed to explain the outcome. This means that we cannot conclude that there is a correlation between the board size and the proportion of female directors. Therefore, we reject hypothesis 3b.

_Hypothesis 3a states that the average board size in terms of board members does not change over time, can be rejected._

_Hypothesis 3b states that the proportion of women on boards correlates with the firm’s board size, can be rejected._
7.4. Hypothesis 4: Age

7.4.1. Hypothesis 4. Both female and male directors average age will become more similar from 2009 and 2015

![Graph showing average age of directors over time](image)

Figure 15. The average age of directors on boards in Norwegian publicly listed companies (Gidlund & Lund, 2017)

One finding that can be discerned from Figure 15 is that both male and female directors’ average age has increased during the observed period. The result is also statistically significant with a p-value lower than 0.01 percent (Appendix 2). However, female directors’ average age has increased at a higher rate than male directors, with a geometric mean of 1.24 percent compared to male directors having a geometric mean of 0.54 percent. We can also see an age difference between female and male directors’ average age, which was 7 years in 2009 and declined to 5 years in 2015. We have also observed that the difference between female and male director’s median age was 8 years in 2009, and declined to 5 years in 2015. This points to the fact that the average age between female and male directors are converging during the observed period. Another interesting finding is that male directors’ maximum age has increased from 89 to 95, while female directors declined age from 75 to 74 during the observed period, with a peak of 79 years in 2013 and 2014. These are outliers, and the maximum ages are represented by a single director for each gender category, which could provide a plausible explanation of the higher average age for male director in relation to female directors. However, the difference between male and female directors in both the median and mean is approximately the same, which indicates that the outliers do not affect hypothesis 4’s result. Therefore, we cannot reject hypothesis 4, that both genders average age has become more similar during the observed period.

Mats and Miller (2013, pp. 156-157) found that the average age of Norwegian board of directors was stable after the first reform from 2006 to 2009, and did not noticeably change during that period. They concluded that there was an offset effect since male directors’
average age increased while female directors’ decreased. This is not supported by our findings, which does not show the offset effect that Mats and Miller describe. Instead, both male and female directors’ average age are increasing over time.

_Hypothesis 4 states that both female and male directors average age will become more similar from 2009 and 2015, cannot be rejected._
8. Conclusion

The Norwegian gender quota law was implemented in 2003 and fully enforced in 2008 for all publicly listed companies. The law has been studied numerous times and how it has impacted Norwegian companies, as well as other institutions and markets in society, at least in the short term. Governments all around the world, especially in Europe, has proposed and implemented some form of gender quota law or similar gender quota targets. This fact makes it even more relevant and interesting to continue researching this topic to get a better understanding of what the laws’ implications might be.

This paper has examined which medium-term effects the Norwegian gender quota law has had on corporate boards listed on the Oslo Stock Exchange from 2009 to 2015. The primary purpose of this paper is to understand how the gender quota law will affect corporate boards, while our sub-purpose is to figure out if females’ and males’ board characteristics converge over time. The reason for why we have chosen to examine the Norwegian gender quota law’s effects is because it is a current topic of discussion in many governments today that could potentially have large-scale implications for corporate boards.

Our study is mainly a continuation of a combination of previous research and is based on scholars such as Ahern and Dittmar (2012), Seierstad and Opsahl (2011), and Mats and Miller (2013). From these scholars, we have received suggestions to continue to examine the same factors as they have studied, for example, board size, the number of directorships held, and age, but in a longer time perspective. We have, therefore, used the same theoretical framework and empirical methods as these scholars. We also thought it would be relevant and interesting to investigate how the board remuneration has been affected since it is commonly debated in political discussions.

Some of the results in this paper were aligned with our predictions. For instance, the number of directorships held by female directors decreased in both absolute numbers as well as in averages and concentration of directorships. This result was not coherent with Seierstad and Opsahl’s (2011) previous result, indicating that concertation of directorships had increased. We also predicted that remuneration for female directors would increase, which it did. We also believed that the age of board directors would converge between the genders, which has also occurred. This is not align with Mats and Miller’s (2013) result suggesting that the age had not changed due to the gender quota law.

However, some results had a different outcome than we first thought, which we found to be interesting. One of those assumptions were that remuneration between the genders should converge over time, that female directors’ basic remuneration would increase at a higher rate of growth than male directors, but this was not the case. Male directors’ basic remuneration increased at a higher rate of growth than female directors. We also believed that the proportion of female directors depended on the firm’s board size, which the results showed was incorrect. Another assumption we made was that the average board size would remain constant over time, which did not happen. Both of those predictions were not coherent with the result from Ahern and Dittmar (2012), which showed that the average board size remain constant and that the proportion of female directors depended on the firm’s board size.
As mentioned, we used the same empirical methods as the scholars from which we continued our research. For that reason, we have thought it to be useful and relevant to compare our results with the previous scholars.

As we have shown in our result, the proportion of female directors remains over 40 percent, which means that the Norwegian Government’s purpose of achieving and maintaining a minimum of 40 percent gender-balanced board has been met. Another implicit purpose, stated by Seierstad and Opsahl (2011), could be that the gender quota law should also lead to a more balanced dispersion of power. According to them, it did not have that effect in their study. What we can conclude from our result is that the dispersion of power has increased and that it has become more equally between and within both genders.

Our results can be explained by the fact that corporate boards is a complex system and will have to adapt to the many unforeseeable variables to survive. There have been many different explanations for how corporate boards can adapt to this new environment, for instance, by either increasing the board size or shrink it to make it more efficient. When analysing our results, there are too many plausible and contrasting explanations for why the outcomes occurred. Therefore, we do not believe that the existing theoretical frameworks available are appropriate to explain how the gender quota law will impact corporate boards currently or for future implications.

8.1. Contribution

Prior studies regarding the gender quota law’s effects have mostly been about how the companies’ performance and values have been affected. Another common topic regarding the gender quota law is whether it has had an increasing effect on companies to promote more women to managerial positions. However, few scholars, to our knowledge, has focused on the gender quota law’s effect on the board composition factors such as board size, directors’ ages and the overall distribution of power among directors in a market. The previous research has only been measuring the gender quota law’s short-term effects, which after a few years, open up for a continuation to study the law’s medium-term effects on the boards and its directors. We based our empirical methods on well-cited scholars within this area of study, which should strengthen the credibility of our results.

This paper has studied the Norwegian gender quota law and how it has affected corporate boards listed on the Oslo Stock Exchange from 2009 to 2015. The purpose is to understand how different corporate governance factors will be impacted by such laws. The result from this paper shows that the gender quota law in Norway, in the medium-term perspective, might have increased the dispersion of power and equality between the female and male directors. The results also show that both genders seem to converge toward the same average age, while their remuneration has diverged.

The main contribution of this study is to show that female and male directors are converging in terms of average age and directorships held. When comparing our results with previous scholars, a plausible explanation that we have concluded is that the gender quota law has enabled female directors to gain more experience, which has led to a higher averaged age and a higher proportion of female directors. The uniqueness of our study is that we have included a longer time perspective that can be used to compare with previous researchers’ contributions. Moreover, we have not only measured factors that have been employed in
other research papers that have been conducted on the topic but have also included basic remuneration, which we consider an interesting factor to measure, whether it converge over time.

The theoretical frameworks applied was chosen since we found them to be most commonly used by other scholars within this corporate governance field of study. However, we do not think that the theories used fully explain our results, at least not as credible or evident as we would like. Thus, there seem to exist a gap in the theoretical framework which requires further development to be able to explain how particular inputs will change a certain outcome within the corporate governance field.

The practical implications of our results depend on the decision-makers’ beliefs and preferences about corporate governance, and it may help them to better understand the possible consequences for corporate boards of a gender quota law.

The societal contribution of this study is to provide an understanding of how corporate boards are affected by a governmental law that is directed to increase equality between female and male directors. The consequences for society, as implied by our study, could provide benefits of understanding how a governmental law would impact the dispersion of power and increase equality between the genders as well as highlighting the differences between them. Another conclusion, made in this paper, could contribute to an understanding of how a longer time perspective would impact corporate governance compared to the previous researchers studying the short-term effects.

We hope that this paper will be useful for further research since it is based on the same empirical method and corporate board factors as previous scholars have studied. This study could be used to continue the research with a long-term perspective to gain a greater understanding of the gender quota law’s implications on corporate boards.

8.2. Suggestion for further research

A limitation of our study is that we have not completely isolated the studied factors, which makes it difficult to draw any conclusions about causality from the results. Suggestion for further research would be to include more control factors to isolate the effects of studied factors. Such factors could be controlled for by including a similar cultural environment, for instance, Sweden that has not yet implemented a gender quota law, or Iceland that has implemented one in 2013.

Another limitation in our research is that we cannot measure the consequences of the gender quota law in the long-term perspective, which is beyond the seven-year period. A study with a long-term scope can confirm whether the concentration of power continues to decrease amongst directors and if directorships held and directors average ages actually converge over time.

A third limitation of our study is that the sample of board members has only been divided into genders. To make a more in-depth research of how a gender quota law might affect different board factors such as board size, age and dispersion of power, one could include and specify positions, for instance, committee members, chairman, employee representative as well as deputy board members. Another factor that could be studied in more detail is the
basic board remuneration. We have not considered the number of board meetings a director has attended to for earning its board fee. If one would consider the board attendance, one could achieve more comparable data.
9. Quality criteria

9.1. Reliability

The reliability criteria concern the stability of the measurements used over time. It is important that an input results in the same consistent output if the same measurement was conducted multiple times over an applicable period. (Bryman & Bell, 2015, p.168). Since we have gathered historical empirical data from all Norwegian publicly listed companies’ annual reports, from 2009 to 2015. We believe the sample is unbiased and considered to both fulfil the inter-rater reliability and stability criteria. The gathered data regarding corporate board factors such as name, gender, age and basic remuneration are isolated from each other, and therefore, no factor should show the same type indication as another. Thus, our sample should also meet the internal reliability criteria (Bryman & Bell, 2015, p.169).

9.2. Replication

Even though we have explained in detail which empirical data that has been gathered, and our procedures for it, we cannot ensure that our results can be replicated by others. Since we have collected empirical data from publicly listed companies’ annual reports, from some that no longer exist, the annual report may become unable to find with time. We even found it difficult to find some annual reports from earlier periods, even though the companies are listed on the Oslo Stock Exchange today. We have in some cases been required to e-mail existing companies to ask them for annual reports that are older than five years, which is the minimum number of years a Norwegian company need to have an annual report available to the public (Securities Trading Act, 2007, Section 5-5). The companies have usually been kind to send us the requested annual reports, while other times, we have not been able to get a reply at all. Thus, as time pass, it will become harder to replicate our results due to the limitation in the empirical data collection.

9.3. Validity

Validity is necessary for a scientific research paper since it is important for a measurement to actually measure the concept that it is supposed to measure because that will make it possible for comparison among concepts (Bryman & Bell, 2015, p. 50). To figure out if the measured concept is valid, one can apply four different categories of validity to judge if the validity is weak or strong.

The first category of validity is measurement. Measurement validity is concerned about whether the concept that is being studied reflects what is being measured (Bryman & Bell, 2015, p. 50). For instance, does the measurement of standard deviation really reflect the concept of dispersion of power? In our paper, we have applied the same measurements to measure the same concepts as previous researchers has done in order to compare the results. The concepts measured are board composition, dispersion of power, basic remuneration for board members, board size, and directors’ average age.

A second validity category is an internal validity, which deals with the question of whether one can say that there is causality (Bryman & Bell, 2015, p. 50). For instance, if we include dependent variable board size and the independent variable proportion of female directors,
is there actually a dependency between these two variables? The problem is that we have not isolated the factors used in our study to make a claim that there is causality between the measured variables. We can only argue that there is a correlation between them or tendencies. We have estimated geometric means and correlation tests to see if there are any tendencies amongst the variables. To make the study more casual, we have only used basic remuneration for board members instead of using both basic and other forms of remuneration. Since other remuneration could greatly differ, it would be difficult to show whether there is a relationship between basic remuneration and the gender quota law.

External validity regards the question of whether results can be generalised from the chosen sample to the entire population (Bryman & Bell, 2015, pp. 50-51). For instance, is it possible to generalise that the gender quota law will impact other countries if they were to implement the same law? Also, would it be possible to generalise the result in our observed period to another period? We believe that the sample size is large enough and that we have observed a period that is long enough to generalise and claim that the same effects would occur if it were applied, for instance, in Sweden.

The fourth category, ecological validity, is concerned about whether an indicator is realistic. For instance, even if the results have strong statistical significance and the test is technically correct, the result itself might only show an input that is highly unlikely to ever occur in the real world (Bryman & Bell, 2015, pp. 50-51). In our paper, we have examined a government law and how it has affected common corporate governance factors. We believe that this is highly realistically and could occur elsewhere, and as it happens to be, also has.
10. Reference list


Appendix 1

Arithmetic mean

$$\bar{x} = \frac{\sum x_i}{n}$$

$$x_i = i^{th}$$ of the random variable x
$$n =$$ Observations

Geometric mean

$$\bar{x}_{geom} = \sqrt[n]{\prod_{i=1}^{n} x_i}$$

$$x_i = i^{th}$$ of the random variable x
$$n =$$ Observations

Median

$$m = L + \left(\frac{N - F}{f_m}\right)c$$

$$L =$$ Lower boundary of the median
$$N =$$ Sum of observation
$$F =$$ Cumulative observations before the median
$$f_m =$$ Observation of the median
$$c =$$ The size of the median

Sample standard deviation

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n - 1}}$$

$$x_i = i^{th}$$ of the random variable x
$$n =$$ Observations
$$\bar{x} =$$ arithmetic mean

Bivariate regression

$$Y = \beta_i x_i + \alpha + \epsilon_i$$

$$Y =$$ Dependent variable
$$\beta_i =$$ Coefficient for $$i$$
$$x_i =$$ Explanatory variable
$$\alpha =$$ Intercept
$$\epsilon_i =$$ Error term

Correlation

$$\rho = \frac{Cov(X, Y)}{\sigma_X \sigma_Y}$$

$$Cov =$$ Covariance between X and Y
$$\sigma =$$ Standard deviation
Appendix 2

Summary outputs for hypothesis 1:

Hypothesis 1a: The proportion of female directors.

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Hypothesis 1b: The average number of board directorships held by women (and men).

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Hypothesis 1b: The proportion of female directors that have three, or more, board directorships held.

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Hypothesis 1b: The proportion of female directors that have more than one board directorships held.

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Hypothesis 1c: The concentration of board directorships held by women (and men).

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Summary outputs for hypothesis 2:

Hypothesis 2a: The average basic remuneration for female directors (and male).

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Hypothesis 2a: The median basic remuneration for female directors (and male).

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Hypothesis 2b: Correlation of females’ basic remuneration to male directors.

<table>
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<th>Regression Statistics</th>
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<tbody>
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<td>SS</td>
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<tr>
<td>MS</td>
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<td>F</td>
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| Coefficients Standard Error t Stat P-value Lower 95% Upper 95% Lower 95.0% Upper 95.0% | Intercept 38818.6566 16007.6778 2.42500237 0.05974763 -2330.38915 79967.7024 -2330.38915 79967.7024 | Men 0.60220846 0.060153289 10.0112308 0.00017003 0.447579506 0.75683741 0.44757951 0.75683741 |

Summary outputs for hypothesis 3:

Hypothesis 3a: Average board size from 2009 to 2015.

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<td>Variance</td>
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Hypothesis 3b: The proportion of female directors correlates with board size.

Regression Statistics

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ANOVA

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<th>Upper 95%</th>
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Summary outputs for hypothesis 4:

Hypothesis 4: The average age for both female and male directors.

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<td>Variance</td>
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