Strategies and Firm Performance during Implementation of Gender Quotas

Empirical Findings from Norway

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Abstract: Norway offered a natural experiment when the country introduced the gender quota law, imposing a 40 % representation of each gender in the boards of public limited companies and government owned enterprises. External shocks forcing to significant changes in board compositions are rare, but both the Cadbury Committee in UK and the Sarbanes-Oxley Act in the US led to increased board size. The same result was not to be found in Norway and the average board size was practically constant. However; average board size alone does not reveal individual firms' strategies and the nature of the law implies that it may be more beneficial for small boards to add women and increase board size, while other boards may take the opportunity to remove a dysfunctional male director to comply with the law. This study investigates the strategies of compliance and firm performance. The strategies are defined as active with fixed or decreased board size, passive strategy with an increased number of directors equal to the number of women added and a mixture of the two strategies. Firms that already had a 40% representation of each gender are considered to have an equal strategy. Active was the most common strategy followed by mixed, equal and passive. No significant relation between strategies and firm performance was detected.

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Contents

1. Introduction

Diversity in corporate boards and in top management position is a topic that has received remarkable amount of attention in politics, academia and in popular press. Despite the higher participation of women in the work force, the fraction of female directors is only slowly increasing in most European countries (European Commission, 2012). The exception is Norway, which managed to reach the threshold of 40 % female board directors in corporate boards in 2008. The Scandinavian country is an example of how an unexpected political announcement in 2002 made by the minister of Trade and Industry, Ansgar Gabrielsen, led to a new addition about gender representation in corporate boards in the Norwegian Corporate Law. The voluntary quota required a minimum of 40% representation of each sex in the board of directors of government owned enterprises and Public Limited Companies, PLC. Since the majority of the companies did not comply with the voluntary quota, it became mandatory in December 2005 with a two year transition period and the threat of liquidation for non-compliance (Ministry of Children and Family Affairs, 2005). In January 2008, 77 public limited companies received a letter from the Norwegian Business Register, Brønnøysundregistrene, notifying them about the requirements and consequences of the law and in April 2008, all the required corporations were in compliance with the law (Statistics Norway, 2009). .

The time after the implementation of the law has followed by discussions in several countries, both inside and outside EU, about similar laws to promote diversity. The European Commission proposed a new legislation in 2012 with the objective to obtain gender balance, i.e. at least 40% of the under-represented sex in non-executive boards of public limited companies with the exception of small and medium sized enterprises. The proposal was the result of the slow progress of increased female participation in board of directors after several years' promotion of gender equality in decision-making positions in Europe. However, the proposal lacks proper sanctions and every country will have to decide about the consequences for non-compliance. Countries like Spain, France and the Netherlands have already passed laws about gender quotas in non-executive boards, though there are no formal sanctions for non-compliance or the law has a "comply or explain" approach. Countries like Austria and Denmark are implementing quota laws for state-owned companies, and even more countries are relying on self-regulation to increase the proportion of female directors (European Commission, 2014).

The gender quota law in Norway has not only inspired to similar regulations, but also been subject to various studies and articles. The most extensive study of the quota law in

Norway investigates the abnormal accumulated return on the day of Gabrielsen's announcement in 2002 as well as the long-term effect measured as Tobin's Q. The study found a negative effect, both on the day of Gabrielsen's announcement and as a long-term effect of the law (Ahern & Dittmar, 2012). The results are not controversial and another study of the effect on firm value found a positive correlation for companies with low information asymmetry and a negative effect on firm performance for firms with a high level of information asymmetry (Nygaard, 2011). These contradictions are in line with other research within the area of female directors' impact on firm performance and inconsistent results of diverse boards' influence on firm value is the norm from both event studies on announcement dates and long term effects measured as Tobin's Q or ROA (Adams & Ferreira, 2009), (Nielsen & Huse, 2010), (Carter, Simkins & Simpson, 2003), (Campbell & Vera, 2009).

Previous research has mainly focused on the effects on firm value, the board composition and the board characteristics as a consequence of the Norwegian quota or an increased fraction of female directors in corporate boards in other countries. Few studies have focused on the implementation and how different implementation strategies relate to firm performance. A reason to the limited number of studies of the implementation phase may be that only some handful events with similar external shocks that drastically require a different board composition have taken place throughout the history. However, the Cadbury Committee's recommendations in UK and the Sarbanes-Oxley Act in USA are exceptional events that both led to an increase in average board size in respective country (Dahya, McConnell & Travlos, 2002), (Linck, Netter & Yang, 2009). The Norwegian law did not lead to the same change of board size. Dittmar and Ahern (2012) studied the average board size from 2002 until 2009 and it stayed around 5.5 board members during the investigated period. However, average board size does not reveal individual firm's strategies to comply with the law, but only that the aggregated sum stays more or less the same. A board of two women and four men may for example find it more convenient to not replace an exiting male director to comply with the law, since a board of five directors only needs two women meanwhile a board of six to eight members needs at least three women. Another board consisting of only three males may on the other hand find it more beneficial to add two women to the board. Several similar situations could even out the calculation of average board size and on the surface indicate a constant board size, while the truth is something else. A study of individual firms' strategies would therefore answer the question of how individual firms act to comply with the new law and also contribute to the understanding of efficient board size and how the market adjusts to external shocks. The study of individual firms' strategies will bring a new

perspective to the Norwegian quota law and the topic is also important to study now; in a time when even more countries discuss legislations of similar quotas. By investigating the quota from a strategic perspective, it is possible to gain insights of the compliance phase in order to milder the consequences of the quota and help companies to be successful in a time of forced changes. It is important to understand how the implementation worked and what strategies were used to facilitate the implementation which can result in guidelines for further implementations in other countries. This study is therefore important in order to bring light to the various implementation strategies and their relation to firm performance.

This study uses four different strategies when categorizing the companies; active, passive, mixed and equal. The active strategy is when a company keeps the board size constant or diminishing the board to comply with the quota's requirements. It can be achieved through substituting male directors for female or decrease the board size by removing male directors until the firm is in compliance with the law. A passive strategy connote that the board size increase with the number of women added. Mixed strategy is a mixture of the two pure strategies and can be the case when the board size increase with less than the number of women added. Another form of mixed strategy is when the board requires more than one year to satisfy the law's requirements and when the board uses an active strategy one of the years and a passive strategy the other year. The forth strategy is added for the companies that have more than 40% women on the board before the law was introduced. This strategy is called Equal and is not a real strategy. The strategies are based on changes in board structure between 2003 and 2008 and pure additions or removals of male directors are not considered in the evaluation of different strategies. The division into different strategies facilitates the understanding of what pre-quota differences in board composition drives the implementation and the changes in board size and board composition after the quota. The division also creates natural groups to study firm performance in a new way.

The findings of the study imply that the active strategy was the most common one, followed by mixed, equal and passive. The average fraction female directors were distinctively different in 2002 for the various strategies. The equal strategy had the highest proportion women followed by active, mixed and the passive strategy with zero women pre-quota. However, there were no statistical significant relationship between the proportion of women and an active strategy or between the fraction female directors and a passive strategy. The equal strategy on the other hand have a positive correlation with the fraction of female directors meanwhile the mixed strategy faces a negative relation between the strategy and the fraction female directors before the quota. However, small firms are more likely to have a

passive strategy and there is a negative correlation between passive strategy and board size. The average board size was kept stable around 5.5 directors across all firms and the fraction female directors across all companies increases from approximately 12% in year 2002 to 43% in 2008, where it also stabilize for the following years.

There are no indications that any specific strategy would lead to better firm performance neither any statistical significant result promoting any strategy to increase firm performance. Instead it seems like different companies may benefit from different strategies depending on the pre-quota board characteristics. The summary statistics indicated distinctive differences in board size and the proportion female directors across the various strategies and could therefore support the possible explanation that the strategies are selected to maximize firm value and that there is not a particular strategy that improve firm performance across all firms due to their different pre-quota conditions. However, the sample of passive firms is small consisting of only four companies and the total sample consisting of 56 companies is also relatively small. The small sample may be another possible explanation of the lack of significant results of selected strategies and firm performance. There are also more aspects than board characteristics such as individual features of the directors, tenure and retention that have not yet been studied in the light of the implementation and the strategies. A further study of the strategies and the directors' characteristics is therefore recommended and may bring new insights to the gender quota law, implementation of the law and firm performance.

The study does regardless of the result bring light to what different strategies the boards may use to comply with a gender quota law. In a time when even more countries discuss similar laws, it is definitely of great importance to have examples of previous events and the different strategies can work as guidelines to shareholders in similar situations when implementing a gender quota.

The structure of the thesis is organized in sections. The first section will provide an introduction to the characteristics of Norway and the Norwegian quota law. The following section provides a presentation of previous research within the areas of corporate governance and the role of the board, external shocks affecting the board composition as well as studies of women on the boards. The second section will conclude with a segment about previous research about the Norwegian gender quota. Section 4. Hypothesis will describe the hypothesis and is followed by a unit describing the data and methodology. Later will follow a section with the results and the last section will follow up with the conclusions of the study and a critical discussion around the thesis and the research.

2. Corporate Governance and Gender Quota Law in Norway

2.1. Corporate Governance in Norway

Norway has two different forms of limited liability stock incorporations, Allmennakseselskap, ASA, and Aksjeselskap, AS. ASA is corresponding to public limited companies, PLC, with a capital requirement of at least NOK 1 million. This form of incorporation is intended to have many shareholders and the enterprises are often listed on stock exchanges. Aksjeselskap, AS, is equal to private limited companies. They are usually smaller than ASA and the capital requirement is only NOK 30,000. ASA and AS are subject to different sets of laws and regulations due to the differences in size and ownership (Norwegian Business Register, Brønnøysundregistrene, 2013). The gender quota law is for example only applicable to Allmennakseselskap, ASA and government owned enterprises and not to Aksjeselskap, AS. The law requires a representation of approximately 40% of each gender in the board of directors and lead to liquidation for non-compliance. The details specify that a board with two or three members needs both genders represented on the board. A board consisting of four or five members should have at least two directors from each gender represented, board with six to eight directors have a requirement of three directors of each sex, boards consisting of nine directors must have at least four women on the board and even bigger boards are required to have a minimum of 40% of each sex (Lov om allmennaksjeselskaper, 2013).

Norway has a board structure with shareholder elected directors. The requirement is that at least two of the directors are independent from the main shareholders and it is also advisable that the majority of the directors are independent from the executive management of the company since the board monitors the executive management and appoint the managers. Executive personnel are excluded from the board of directors and it is therefore recommended that the CEO neither belongs to the board. However, the CEO's membership of the board is subject to exceptions. The quota law is only applicable to the board of directors and not the appointment of executive managers (Norwegian Corporate Governance Board, 2012).

Directives and guidelines about the role of Norwegian boards can be found in *The Norwegian Code of Practice for Corporate Governance* issued by the Norwegian Corporate Governance Board. The board's assignments are mainly activities of supervision and monitoring nature. The activities include for example strategic planning and decision making about the financial position and investments. The board is also ultimately responsible of the executive management and should provide the managers with the necessary tools to accomplish their commitments, but the board should also monitor the executives'

performances. The board's responsibilities could also include the creation of annual plans with objectives, corporate strategies and guidelines for implementation, creating instructions for the board's work as well as instructions for the executive managers. Audit and remuneration committees are also crucial part of the board's responsibilities according to the code (Norwegian Corporate Governance Board, 2012).

2.2. The Gender Quota Law

It took nearly ten years from the initial proposals of a gender quota for board of directors until a 40% representation of women in corporate boards was achieved in Norway. Norwegian politicians in Bondevik I Cabinet proposed new rules for gender representation in corporate boards in a public hearing in October 1999. The proposal had several options and based on the reactions to the different options, the Ministry of Children and Family Affairs together with the Ministry of Justice composed a new proposal. This revised proposal was presented in a hearing in July 2001 and these two events can be considered the first attempts towards what later became the gender quota (Ministry of Children and Family Affairs, 2005).

On February 22 2002, the Minister of Trade and Industry, Ansgar Gabrielsen, made the unexpected announcement in the Norwegian newspaper Verdens Gang, about a new legislation requiring at least 40% women in corporate boards (Verdens Gang, Feb 22 2002). The announcement came as a shock for Norway and the Norwegian Industry and Mr Gabrielsen spent the next coming months in close contact with the Norwegian business life and its main organizations lobbying for the quota. The following preparations took almost two years. In December 2003, a majority in the Norwegian Parliament voted for a change of the Norwegian Corporate Law, including a new part about a voluntary quota requiring at least 40% of each gender represented in the board of directors of government owned enterprises and public limited companies (Ministry of Children and Family Affairs, 2005).

By July 2005, only 68 of 519 of the companies had complied with the voluntary quota and the law became mandatory later that year. From December 2005, all state-owned enterprises and public limited companies were required by law to have a minimum of 40% women on the boards within the next two years or be forced to liquidation (Ministry of Children and Family Affairs, 2005). In January 2008 most of the companies had complied with the law and only 77 non-complying firms received a letter from the Norwegian Business Register, Brønnøysundregistrene, advising them to comply and in April that year, all the boards of government owned enterprises and public limited companies affected by the law consisted of at least 40% women (Statistics Norway, 2009).

3. Theoretical Background

3.1. The Role of the Board and Board Size

Previous research of the role of the board and the board structure is an extensive field where different approaches and perspectives are used to answer the question of the board's role and the board's impact on the company and firm performance. Davies (2000) uses the principal/agent problem and company laws to investigate the role of the board. There exist several principal/agent issues within a company and they can arise from the different relationships between management, majority and minority shareholders or other stakeholders. The problem between the board and the shareholders is that the board should work as an extension of the shareholders and act according to the shareholders' interests, not their own interests. The board has therefore the important task to make decisions and advice executive managers (supervision) and assure that the company and the executives are acting in line with the shareholders' opinions (monitoring). The division of the responsibilities of the board into monitoring and supervision is also supported from the studies by Adams and Ferreira (2007) and Raheja (2005).

The board structure should be optimized for these tasks. However, not every company has the same need of monitoring and supervision and different company characteristics create special demands of the board of directors. Complex firms defined by their large size, with diversified business units or high leverage are likely to require more advising and also benefit from bigger boards with more outsiders meanwhile simpler firms benefit from smaller boards. A study by Coles, Daniel and Naveem (2008) found that there is a U-shaped relation between Tobin's Q and board size, which implies that neither really small nor really big boards are optimal. The U-shape is driven from the differences between simple and complex firms. The study also found that R&D-intensive firms, where firm-specific knowledge is valuable, tend to have a bigger proportion of insiders on the board (Coles, Daniel & Naveem, 2008). A complementary study by Linch, Netter and Yang (2008) investigates almost 7000 firms from 1990 to 2004. The results indicate that companies with high growth opportunities, high R&D expenditures together with high stock return volatility are more likely to have smaller and less independent board. The fraction of insiders is positive correlated with the CEOs influence over the board and whether insiders have big opportunities to extract benefits. Larger companies tend to have larger and more independent boards. When the owners and the management team consist of the same persons, the board is more likely to be small and less independent. The boards are however sensitive for external

shocks, like new regulations or scandals. An example is how the Sarbanes-Oxley Act changed the trend of diminishing board size for large firms in the opposite direction when the act was introduced in 2002. Dahya, McConnell, and Travlos (2002) could not find any general equilibrium theory for board structure from their study of the effect of the Sarbanes-Oxley Act. However, the theory that the board size and board composition is selected to maximize utility explains why the board characteristics change after external shocks like new regulations or scandals. The board tries to maximize value by changing different characteristics and adapting to the new constraints. Consistent with the utility and shock theory, Dahya, McConnell, and Travlos (2002) found how the board composition dramatically changed as a consequence of the Cadbury committee recommendations and Linck, Netter, and Yang (2009) had the same findings for the Sarbanes-Oxley Act case.

The Cadbury committee's recommendations consist of the advice of a minimum of three outside directors among other requirements. The board size increased significant after the committee's recommendations and this was driven from the increase of independent directors. Both the number and the fraction of outside directors increased after the recommendations (Dahya, McConnell & Travlos, 2002). The Sarbanes-Oxley Act also demands more independent directors on the board. Similar to the result in UK after the Cadbury Committee's recommendation, the Sarbanes-Oxley Act resulted in an increased board size as well as increased number and a bigger fraction of independent directors. The less independent boards before the Act naturally showed a bigger increase in independent directors after the new requirements compared to boards with more independent directors before the act. The findings indicate that the compliance with the recommendations was implemented through adding outside directors instead of replacing inside directors. A possible explanation to the strategy of increasing the board size may be that the insiders have special knowledge or have served special needs on the board which therefore makes it difficult to replace the insiders with outsiders. The Sarbanes-Oxley Act also increased the board's work load which may justify an increased board size (Linck, Netter & Yang, 2009). The explanation of insiders' valuable knowledge can neither be rejected as a valid explanation for the Cadbury case (Dahya, McConnell & Travlos, 2002).

3.2. Women on Boards

Studies of board composition often include the impact of diversity and gender representation on firm value. It is an extensive field with inconsistent findings where the results of the studies indicate that women's contribution to firm value may be positive, negative or neutral

(Adams & Ferreira, 2009), (Rose, 2007), (Lückerath-Rovers, 2013) & (Carter, Simkins & Simpson, 2003). However the research question of women's impact on firm value and performance is of an endogenous nature. Do women create better firm performance or do better firms have easier to attract women to their boards? Are the better performing firms more interested in diverse boards and actively appoint women? However, most studies are consistent with one finding; that women are in minority in the board room (European Commission, 2014) & (Catalyst, 2004).

A study by Adams & Ferreira (2009) of S&P 500, S&P MidCap and S&P SmallCap revealed that only 8.10% of the board directors were women in 1996. The same number had slightly increased to 10.41% in 2003. The authors found differences between companies with at least one woman on the board compared to firm without female directors. The companies with at least on woman tended to be larger, have more business segments, perform better in terms of ROA, but worse performance in terms of Tobin's Q, have lower volatility and larger boards compared to companies without any female directors. The study tries to find the drivers of any potential differences in firm performance caused by diverse boards through investigating possible differences in behavior or board composition between diverse boards and gender homogenous boards. The results reveal that women are less likely to experience attendance problems with 30% compared to men. This behavior tends to influence the men in a more diverse board as well and the men have a 90% reduced risk of attendance problems when there are women on the board. The effect is statistical significant and controlled for several factors to exclude any peer effect of good acting friends or newly appointed directors. Another result implies different trends in attending board committees between men and women. The women attend committees in higher proportion than men. The women were more likely to be found in committee functions as audit, nominating or corporate governance meanwhile men have a higher probability of attending compensation committees. These results could imply that increased female participation in decision making also increase the monitoring. The study of gender diverse boards and firm valuation in terms of Tobin's Q and ROA indicates a negative relation between firm performance and female board directors after controlling for board size, industry and endogeneity. The authors' main conclusion is that tough boards with more monitoring do not always increase firm value and hence the negative correlation. Though, boards with week governance could enjoy better financial performance from better monitoring resulting from having more women on the board.

Another study, made in Norway, focused on female board participation and value creating using the "Value creating board" database with survey answers from

Norwegian CEOs in companies with 50 to 5,000 employees sampled in 2003 and with a sample size of 234 returning questionnaires. The female directors' impact on different board characteristics was measured as board development activities and board strategic control. Board development activities are the activities related to existence of instructions for the board's work, regular use of the instructions, the introduction of new board members, regular board development programs and regular evaluation of the board. Board strategic control is considering the topics related to the board's involvement in decision making concerning firm strategy in questions regarding corporate social responsibility, human resources, product quality and healthy, environment and safety. The authors found empirical support for a positive correlation between the ratio of female directors and board strategic control, a positive correlation between the ratio of female directors and board development activities and also a positive statistical significant correlation between board development activities and board effectiveness in terms of strategic control. No significant relation could be proved for the rate of female directors and an open debate, but a higher fraction of female directors tend to decrease the level of conflicts within the board. However this study could not find any overall performance differences between firms with high fraction of women on the board and those with low fraction female directors, despite the differences in activities. A possible explanation could be that the board performs multiple tasks simultaneously and women have greater impact on some of the responsibilities, but not on others and it would therefore even out the differences resulting in no difference in firm performance for companies with female board directors (Nielsen & Huse, 2010).

A study of board diversity and firm performance measured as Tobin's Q in Denmark between the years 1998 and 2001 could not detect any differences in the behavior of male and female board directors neither did the study find any differences in firm performance for companies with a higher fraction female directors. The authors provide the socialization process as a possible explanation. The women adapt to the norms and behaviors due to the small fraction of female directors (4%) as part of the socialization process and it is therefore not possible to distinguish any differences in the behavior of male and female directors in the Danish firms (Rose, 2007).

Similar findings of the correlation between female directors and firm performance was made by Lückerath-Rovers (2013) studying Dutch companies. The Netherland's have a similar structure for corporate governance as Denmark and a similar fraction of female directors. The authors did neither find any statistical significant results for

most of the performance measures, with the exception of ROE and diverse boards where a statistical significant positive correlation was found.

Carter, Simkins and Simpson (2003) investigated board diversity of American companies and found a statistical significant positive relationship between firm value measured as Tobin's Q and the fraction of women or other minorities like Asians, Hispanic or Afro Americans after controlling for firm size, industry and other corporate governance measurements. The study also discovered that the fraction of women increase with increased firm size and board size, but tends to decrease with bigger proportion of insiders on the board. Two studies from Spain support the hypothesis that more women on the board lead to better performance. A study of women's impacts on firm performance found a statistical significant positive correlation between the fraction of female directors and firm performance measured as Tobin's Q (Campbell & Vera, 2007) Another study from Spain investigates the market's response to the announcement of the appointment of female board directors. The result of the event study reveals a positive response from the market with a positive accumulated abnormal return around the announcement date (Campbell & Vera, 2009).

The literature review of female directors' impact on firm performance clearly demonstrates the contradictions and the difficulties of the topic. The results of the previous research of female board directors and firm performance can therefore not provide any prediction of whether a quota will automatically benefit or harm the companies in the legislating country.

3.3. The Effects of the Gender Quota Law in Norway

Several articles have already been published with inconsistent findings about the Norwegian quota. One of the first, most quoted and most extensive research about the topic is "*The Changing of the Boards: The Impact on Firm Valuation of Mandated Female Board Representation*" by Kenneth R. Ahern and Amy K. Dittmar from 2012. Their study mainly focuses on the consequences on firm valuation from the increased fraction of female directors. The effect of the law is investigated for both short-term and long-term financial impact. The short-term effect is studied through an event study at the announcement date of the law in 2002 and the findings show proofs of a statistical significant decrease in firm value for Norwegian companies compared to American firms. The average stock return for firms without any female director was – 3.54% and – 0.02% for firms with at least one female board director compared to American indices. The average decrease across all Norwegian firms was – 2.57%. The industry adjusted values indicates an even bigger decrease ranging from – 3.6%

to – 4.3% and the results are robust controlling for industry, firm size or board size. The second study of firm valuation tried to capture the accumulated long-term effect during the implementation of the law. The firms are divided into two groups, where one group consists of the firms without women on the board and the other group consists of firms with at least one female representative in 2002. The long-term effect indicates that a 10% increase of women on the board lead to an average decline of 0.19, equal to 12.4%, in Tobin's Q from 2003 to 2009 with an average Tobin's Q of 1.53 across all firms. The companies with at least one female director in 2002 had a 0.26 statistical significant higher industry-adjusted Tobin's Q compared to firms without female directors the same year. The changes in firm value can be considered a proof of that boards do apply influence on the firm and therefor the company's value. Since the law implies new constrains on the board composition, the market reacts to the quota law. Firms with no women face greater constraints from the quota and are therefore more restricted and more affected by the law. Some companies even opt for the exit option and decided to delist and change corporate status to avoid the quota. The study found that firms without female directors in 2002 have a higher probability of delisting from the Oslo Stock Exchange compared to companies with at least one woman on the board. The number of public limited companies demonstrates a decrease of more than 30% of the companies in 2001 for the time period between 2001 and 2007, indicating that 30% of the companies in 2001 changed corporate statues when the law was introduced.

The study also found that the companies that did comply with the law kept the average board size constant. The average board size was approximately 5.5 directors in 2001 and did slightly decrease to 5.32 in 2004. In 2006 it had increased to 5.60 members and stayed around 5.60 until 2009 when it decreased to 5.29. Ahern and Dittmar (2012) argue that most of the companies replaced male represents with women to comply with the quota and that is the reason to the constant average board size around 5.5 directors. The board size can therefore not explain the negative effect in firm performance. Instead, the authors test the hypothesis that the negative effect on firm performance is the result from different characteristics of the new female board members compared to the male directors. The quota led to the appointment of younger women, with more higher-education, less CEO-experience and higher probability of being non-executive managers compared to the retained male directors. The entering women were about 8 years younger and only 31.2% of the women had prior CEO-experience compared to the men where almost 70% of them had experience of being a CEO. Wang and Kelan (2013) study the board characteristics pre-quota and post-quota as part of their research of the quota's effect on CEO appointment. The results of the

differences between male and female directors are consistent with Ahern and Dittmar (2012) regarding age, CEO experience, education and independence. Their result shows that women tend to have an average age of 47 years while the men tend to be older with an average age of almost 53 years. The women had on average more qualifications and more higher education than the men and women were also more likely be independent compared to their male counter parts.

Ahern and Dittmar (2012) go even deeper in the search of an explanation to the decrease in firm performance and investigate how the differences of the directors' characteristics affect the firm's behavior. The result indicates that the quota tends to lead to a different behavior for the firm resulting in more acquisitions, increased firm size, increased leverage and reduced cash holdings compared to the behavior before the quota. The argumentation is that the board is usually involved in strategic topics regarding acquisitions as well as financial policies and that these changes in behavior can be traced back to the change in board composition. However the changes won't necessary relate to the new female board directors' behavior or characteristics, but can as well be the result of a different behavior by the retained male board directors.

Nygaard (2011) investigates the quota's effect on firm valuation from a perspective based on information asymmetry and have a contradictory result of the effect on firm value from the quota law compared to Ahern and Dittmar (2012). The author study the law's short-term effect in 2005 when the law was legislated and became mandatory as well as the following long-term effect using Tobin's Q. Firms with high information asymmetry were harmed by the quota, since they benefit from having insiders on the board and the quota heavily restrict the supply of inside directors since there is often a scarce resource with only a limited number of women in top management positions that can act as insiders in the board of directors. Nygaard found, on the other hand, that firms with low information asymmetry will benefit from the quota. The new outside directors will most likely be efficient in supervision and monitoring of the firm due to the low information asymmetry and the board can therefore benefit from the female directors.

The different results from the studies by Ahern and Dittmar (2012) and Nygaard (2011) show that the Norwegian case is not an exception of inconsistent results from studies of the relation between firm performance and female directors. However, the quota is also an interesting experiment of spillover effect to female CEO and female board chair appointment. Wang and Kelan (2013) find that the quota lead to more female CEOs and female board chair appointments and that Norway is having the world's highest rate of female directors after the

introduction of the law. 0% of the Norwegian firms had a female CEO in 2005 but 5% of the firms had a female CEO in 2007. The percentage of female board chairs had also a significant increase from 0.001% in 2001, 5% in 2007 and 15% in 2008, while the male rate naturally decreased during the same time. The quota effect also increased the probability of a female CEO with 1.01% and a female board chair by 1.29%. The authors found that the probability of a female CEO and a female board chair appointment is increased with a more experienced board, more independent directors as well as higher educational background of the directors, i. e. characteristics that many female directors tend to have post-quota. The authors did not find any differences in competence and qualifications between the appointed female and male chairmen. Another study concludes the opposite about female board chair appointment after studying the years after the quota and interpreting the results differently. The conclusion is that there is only a marginal effect of the appointment of female board chair and that the rate keeps low and stable after the introduction of the quota due to the lack of women with the right competences. However, the authors argue for that it is too early to see the consequences of the quota law on CEO and board chair appointment and that it is only a matter of time until the newly appointed female directors have developed the skills and can be appointed the board chair (Seierstad & Opsahl, 2011)

4. Hypothesis

4.1. Definition of the Strategies

After outlining the most important theory and previous studies, only a few examples in history like the Cadbury Committee and the Sarbanes-Oxley Act have forced to such dramatically changes in board composition and acted as natural experiment as the Norwegian quota law. The results after studying the shock of the Cadbury Committee and Sarbanes-Oxley Act indicate increased board sizes in UK and US (Dahya, McConnell, and Travlos, 2002) & (Linck, Netter, and Yang, 2009). However, the same result could not be found as a significant trend studying the average board size from the implementation of the quota in Norway according to the research by Ahern and Dittmar (2011). An issue with average board size is that it does not indicate whether individual firms change the board size, only if the accumulated sum is somewhat similar. A firm may, for example, downsize to comply with the quota, since a board of six directors requires three women to comply with the law meanwhile a board of five members only need two women. A board of six directors could therefor decide to downsize and not replace an exiting male director when there already is two female

directors on the board. Another board may however find it more appropriate to add one or more women and increase the board size to comply with the law. This study will therefore investigate individual firm's strategies to comply with the law. The different strategies are classified as active strategy, passive strategy and a mix of the pure strategies. The study also has the option of fully compliance with the law before the announcement in 2002, which is called Equal. The active strategy is when the board size is kept constant or even decrease during the implementation. Equal is when a company complies with the law even before the announcement in 2002 and is not a real strategy. The passive strategy is when the board size increases with the number of women added. A mixed strategy is a mixture of the two pure strategies, active and passive. It indicates that the board size will increase any time during the implementation, but it will increase with less than the number of women added to the board or be the case when the compliance takes more than one year and both the active and passive strategy are used for different years. Table 1 summarizes the strategies.

The categorization is based on the compliance with the quota and does not consider any potential adjustments before 2003 or after 2008. Any pure additions or removals of male directors are not considered in the evaluation of different strategies.

Table I Definition of the different strategies of implementation.

Strategy	Definition
Active	The board size is kept constant or decrease during the implementation of the quota.
Equal	The board was in compliance and stayed in compliance with the law before 2002.
Mixed	The board size increase with less than the number of women added. A mix between the active and passive strategy.
Passive	The board size does increase with the same number of female directors added to the board.

4.2. Hypothesis 1

Hypothesis 1(a): The active strategy is the most common strategy followed by a mixed strategy.

This is based on the evidence of an almost constant average board size of around 5.5 directors from the study by Ahern and Dittmar (2012). If the passive strategy would be the most common, we would have seen a significant increase in average board size. The equal strategy is neither likely due to the change from a voluntary quota to the mandatory law.

Hypothesis 1(b): Firms selecting an active strategy are more likely to have a higher proportion of women before the quota compared to companies selecting a mixed or passive strategy. The time defined as before the quota is year 2002.

Companies with a higher fraction of female directors face fewer constraints from the law. They should therefore have easier to comply with the quota and have less costs related to the compliance. The active strategy could therefore maximize utility, keep an optimal board size and lead to a new optimal board composition while the costs of complying with the law are relatively low compared to other strategies for companies with a higher proportion of women in 2002. Ahern and Dittmar (2012) also found that companies with a higher proportion of female directors complied earlier with the law, which indicates that companies with a higher proportion of women act actively to comply early with the law and make rational and evaluated decisions instead of waiting until the last minute and have to rush into the a decision only to comply with the law before the end of the transition period.

Hypothesis 1(c): Firms with small boards are more likely to use a passive strategy.

A passive strategy costs more for bigger boards than small boards. An only male board of six directors needs four women to comply with the law, meanwhile a board of three male only need two women added to the board to be in compliance with the law. The previous research of board size indicated the U-shaped relation between financial performance and board size (Coles, Daniel & Naveem, 2008). It is therefore not beneficial with neither too small nor too big boards. The small board could hence benefit from the increased board size using a passive strategy, while the board with an already optimal board size would be damaged by a passive strategy increasing the board size.

4.3. Hypothesis 2

Hypothesis 2:

H_0: There is no difference in firm performance between the different strategies.

H_1: There are differences in firm performance between the different strategies.

The previous research of female directors' impact on firm performance is inconsistent. However Ahern and Dittmar (2012) found a negative relation between firm performance and

the female directors in Norway. The companies with lower proportion of women in 2002 faced more constraints from the quota and were therefore more financially damaged by the law. That should imply that if hypothesis 1(b) is true and active firms have a higher proportion of women in 2002, the active companies perform better than companies with a mixed or passive strategy. Despite Ahern and Dittmar (2012) findings, the null hypothesis is based on that the firms try to optimize their value and therefore select the strategy most suitable for them. A small board would then benefit from a passive strategy, while a bigger board is advised to keep the board size fixed. A more complex firm may on the other hand benefit from inside directors with special knowledge and therefore need to increase the board size when adding outside female directors to fulfil the requirements of the law.

One could argue that better performing firms have easier to attract good women and thus the better performing firms do not need to increase board size, but can exchange a male director for a women due to their equal competences. The better performing firms would then select an active strategy. It is therefore not that simple to avoid the endogenous nature between diverse boards and firm performance, neither in a natural experiment as the Norwegian case. Other possible explanations to a true alternative hypothesis could be that firms with higher rate of women in 2002 face fewer constraints and can select a beneficial active strategy at a low cost. It would be beneficial for these firms with an active strategy since they can keep the board size constant and at the same time only undergo minor changes in the board composition. The likelihood of finding one good matched female directors is higher than finding two women and the compliance could also be implemented naturally at the time of an exiting director. An active strategy could therefore imply fewer changes, less costs and lead to better or constant performance of the board while firms with other strategies face worse implementation and are harmed financially from the implementation itself.

5. Data and Methodology

5.1. Data Gathering

Data about board composition is from the Norwegian Business Register, Brønnøysundregistrene, to where all the Norwegian companies need to report owner structure, board composition and financial statements among others. The data for this study covers the board composition from 2002 to 2010. The data contains information about the date of the change in board composition, the names of board members from the reported date, the directors' board position, and the directors' date of birth. The data also contains organization

numbers, addresses to the companies as well as addresses and country codes to the directors. In case of more than one board change update per year to the business register, the latest reported change of board composition for the particular year is used. This implies there may be inconsistence with the sample board and the board presented in the annual report if there is a change in the beginning of a year.

The data is complemented with gender from annual reports and Statistic Norway's First Names Database with a record of how many men and women have that particular first name. International Securities Identification Number, ISIN and Global Industry Classification Standards codes, GICS, are gathered from the website of the Oslo Stock Exchange, Oslo Børs. Data about listening, delisting, name changes and mergers are also collected from the Oslo Stock Exchange's website.

Financial Data is collected from Compustat using ISIN as identification. The variables extracted from Compustat are revenue, total assets, EBITA, number of employees, long term debts, short term debts and R&D expenditures. Annual market value at the end of each year is on the other hand extracted from Thomson's Datastream. All values are in Norwegian Crowns.

The list from the Norwegian Business Register, Brønnøysundregistrene, contained 107 ASA companies from the beginning. Due to mergers, delisting, listings, name changes and no data from the Oslo Stock Exchange, the final list contains only 56 public limited companies listed on the Oslo Stock Exchange. The selection criteria have been strict and companies are required to have available market data from year 2006 to be included in the sample. Companies listed after 2006 are excluded due to the nature of the law and the requirements of immediate compliance for ASA firms registered after 2006. Companies delisted before 2008 are also excluded from the study due to the nature of the law and the risk of avoidance from the law by delisting before 2008. No finance, banks or insurance companies are included in the sample due to the nature of the finance industry and almost 30 companies belonging to the finance industry are removed.

The time frame is from 2002 until 2010 to cover the time at the announcement of the quota and the stabilization after the transition period. Employee representatives are excluded from the sample since the law does not apply to employee elected directors.

5.2. Methodology

5.2.1. Proxy Variables

Proxy variables are important in financial analysis since they represent a phenomenon that is not represented by one sole variable. There are for example several proxy variables for firm performance, but the main proxy variables used for firm performance are Tobin's Q and ROA. These are also common in previous research of the relation between diverse boards and firm performance (Adams & Ferreira, 2009), (Rose, 2007), (Lückerath-Rovers, 2013), (Carter, Simkins & Simpson, 2003).

Tobin's Q investigates the relationship between market value and assets and evaluates the market's belief in the company and how well it can create value from its assets (White, Sondhi & Fried, 2003). ROA on the other hand is an accounting measure that measures the return of invested capital before interest, tax and amortization. It captures the operating profit and how well the company performs according to accounting standards. Norway changed to IFRS accounting standards in 2005 and this may therefore have an impact on the proxy. However, the benefits of using a second proxy for firm performance outweigh the risk of any potential impact from the change in accounting standards, since the standards apply to all firms. Table II summarizes the performance proxy varisables.

Table II Definition of performance proxy variables

Proxy	Definition
Tobin's Q	Market value at end of year i / Book value of assets at the end of year i
ROA	EBITA / Book value of assets at the end of year i

The proxy variables for firm size are revenue and numbers of employees. Revenue describes one aspect of a firm's size, the number of employees another. The number of employees is industry dependent where some industries are more intensive in human resources than others. Table III present the firm size proxy variables summarized in a table.

Table III Definition of firm size proxy variables

Proxy	Definition
No Employees	The number of employees reported in the annual report.
Revenue	Total sales reported in the annual report.

Complex firms are discussed by Coles, Daniel and Naveem (2008). Their findings indicate a difference in optimal board size between simple and complex firms. Board size is one aspect of how complex a company is. Coles, Daniel and Naveem (2008) also define R&D intensity as a proxy variable for complexity. R&D intensity is measured as R&D expenditures divided by book value of assets. Leverage and debt financing is another measure of complexity by Coles, Daniel and Naveem (2008). They use total debt divided by book value of assets in their definition of leverage to account for complexity. More complex firms have a higher ratio of debts to assets and therefore a complex financing of its business. Table IV demonstrates the proxy variables for complex firms.

Table IV Definition of complex firm proxy variables

Proxy	**Definition**
R&D Intensity	R&D Expenditures / Book Value of Assets
Leverage	Total Debts / Book Value of Assets

5.2.2. Hypotheses 1

Hypotheses 1 are investigated through summary statistic and simpler regressions. Hypothesis 1(a) is studied through summary statistics of the number of observations per year and strategy. No regression analysis was needed to find the most common strategy.

Hypothesis 1(b) and 1(c) are answered through the use of a summary statistics showing the average board size and proportion of women for each strategy covering the years from 2002 to 2010. The hypotheses are also complemented with regressions to find out if there are any statistical significant differences in the fraction of female directors for each industry controlled for year 2002, both separately and the two years combined. The regression is a simple OLS, ordinary least square, regression on the form:

$$FFD = \beta_0 + \beta_1 * active + \beta_2 * passive + \beta_3 * mixed + u$$

where:

FFD = fraction of female directors

active = dummy variable for the active strategy; 1 if the company has an active strategy and 0 otherwise

*passiv*e = dummy variable for the passive strategy; 1 if the company has a passive strategy and 0 otherwise

mixed = dummy variable for the mixed strategy; 1 if the company has a mixed strategy and 0 otherwise

u = error term

A regression testing the relation between the fraction female directors on a strategy is also used to investigate any possible relationship. The regression is a simple OLS on the form:

$$Active = \beta_0 + \beta_1 * FFD + u$$

where:

active = dummy variable for the active strategy; 1 if the company has an active strategy and 0 otherwise

FFD = fraction of female directors

u = error term

The regression reveals whether the fraction female directors have any impact on the likelihood of an active strategy. The active strategy could also be substituted for the equal, passive or mixed strategy in order to investigate any possible impact of the fraction female director on any other strategy. This regression is also tested for the years before the quota, i.e. 2002 and 2003.

Hypothesis 1(c) is tested with a regression testing for the relation between board size and the passive strategy. It is a simple OLS regression to test whether the board size has any impact on the probability for a company to select a passive strategy. The OLS regression to test:

$$passive = \beta_0 + \beta_1 * size + u$$

where:

passive = dummy variable for the passive strategy; 1 if the company has a passive strategy and 0 otherwise

size = board size

u = error term

The regressions are also controlled for industry and firm size measured as revenue. The control for industry and firm size are tested through using the above described OLS regressions and adding a dummy variable for each industry and also a variable for firm size, nothing else changed. This removes any potential affects related to any industry or the size of the company. The regression could then look like:

$$passive = \beta_0 + \beta_1 * size + \beta_2 * revenue + \beta_i * iindustry + u$$

where:

passive = dummy variable for the passive strategy; 1 if the company has a passive strategy and 0 otherwise

size = board size

revenue = revenue in millions NOK

iindustry = dummy variable generated for each industry; 1 if the company belongs to the tested industry strategy and 0 otherwise

u = error term

5.2.3. Hypothesis 2

To test the relation between firm performance and the strategies, we have panel data, i.e. several observations from the same source over several years. A simple OLS regression is therefore not appropriate and we instead have a model that looks like:

$$P = \beta_0 + \beta_1 * active + \beta_2 * passive + \beta_3 * mix + a_i + u_{it}$$

where:

P = performance measured as either Tobin's Q or ROA

active = dummy variable for the active strategy; 1 if the company has an active strategy and 0 otherwise

passive = dummy variable for the passive strategy; 1 if the company has a passive strategy and 0 otherwise

mixed = dummy variable for the mixed strategy; 1 if the company has a mixed strategy and 0 otherwise

a_i = firm specific effect which will be removed using a firm fixed effect estimation

u_{it} = error term for firm i at time t

There are firm fixed effects in this model and using a fixed effect estimation, biases and other unobserved factors can be avoided. It is also crucial to control the result from other factors. The analysis will therefore test for industry, board size, FFD, revenue, R&Q intensity, year dummies and other board and firm characteristics as for the OLS regression. The model can therefore look like as follow:

$$P = \beta_0 + \beta_1 * active + \beta_2 * passive + \beta_3 * mix + a_i + u_{it} + \beta_j * iindustry + \beta_k * iyear$$

where:

P = performance measured as either Tobin's Q or ROA

active = dummy variable for the active strategy; 1 if the company has an active strategy and 0 otherwise

*passiv*e = dummy variable for the passive strategy; 1 if the company has a passive strategy and 0 otherwise

mixed = dummy variable for the mixed strategy; 1 if the company has a mixed strategy and 0 otherwise

iindustry = dummy variable generated for each industry; 1 if the company belongs to the tested industry strategy and 0 otherwise

iyear = dummy variable generated for each year; 1 if the observation belongs to the specified year and 0 otherwise

a_i = firm specific effect which will be removed using a firm fixed effect estimation

u_{it} = error term for firm i at time t

Alternative control variables in the estimation could be board size, firm size, fraction female directors, revenue or R&Q intensity. The various control variables are used to test for all possible variables affecting the result and the estimation will become more accurate by adding more explanatory variables as long as the control variables are not correlated.

6. Empirical Results

6.1. Summary Statistics

We start the investigation of the data with the summary statistics. We can notice that we have a total of 466 observations of board size, women and fraction of female directors. The observations come from our 56 different companies over the time period from 2002 to 2010. The average board size among all companies and years is 5.46 directors and the result is consistent with Ahern and Dittmar (2012). The board size range from three to eleven members. The average number of women across all firms and years is 1.77 and the number of women on the board ranges from zero to six women across all firms and years. We have 462 observations of Tobin's Q and 491 observations of ROA. The average Tobin's Q across all companies and years is 1.22 and the average ROA is 0.05. The firms have an average of

almost 4500 employees and an average revenue of 16 172 million NOK. Table V represent these findings in a summary statistics table.

Table V Summary statistics. *Size* indicates board size. *Women* is the number of women on the board. *FFD* is the abbreviation of fraction female directors. *Q* is Tobin's Q and *roa* is the return of assets. *Emp* is the number of employees. *Rev* is revenue in millions. *Rd* is the R&D intensity, i.e. R&D expenses divided by book value of assets and *leve* is the leverage, total debts divided by book value of assets.

```
. summarize size women ffd q roa emp rev rd leve
```

Variable	Obs	Mean	Std. Dev.	Min	Max
size	466	5.457082	1.203616	3	11
women	466	1.76824	1.096397	0	6
ffd	466	.3186335	.1766265	0	.6666667
q	462	1.224218	1.658396	.0153697	14.12128
roa	491	.0507705	.2153897	-1.337565	.5468512
emp	396	4481.937	8666.172	0	44602
rev	492	16712.94	62411.89	0	651977
rd	493	.0161153	.062111	0	.5915937
leve	429	.2845755	.1825635	.000259	.9602218

The next table shows the average size, average fraction female directors and frequency per strategy and year. We can here see that the active strategy is the most popular one with 28 different companies that have used the strategy to implement the quota. The active strategy is followed by the mixed strategy with 15 firms. Nine companies were equal before the introduction of the quota. Only four firms had a passive strategy. This means that the first hypothesis 1(a) is correct. The table also shows how average board size decreases for the active firms, while the fraction of women increases from an average of 13.3% in 2002 to be in compliance with the law with 42.2% in 2007 and stabilize around 42% for the following years. The trend of a decreasing board size can also be seen for the equal firms. However, the fraction female directors stay around 40% throughout the time period. The average board size is more volatile for the mixed group, reaching a peak with an average of 6 board members in 2006. The mixed companies have a higher fraction of female directors in 2006 compared to the active firms. The passive firms have the smallest boards and also the lowest proportion of women in 2002. The average board size was 4 directors in 2002 and the passive firms had no women on the boards before the law. The average board sized increased to 5.25 directors in 2008 and all the passive companies had also reached a 40% representation of women after the introduction of the law. The average board size for all companies is around 5.5 directors with a peak in 2006 with an average of 5.59 directors. Table VI demonstrates the findings in total.

Table VI Average board size, fraction female directors and number of companies per strategy and year. The first value represents average board size, the second; average fraction female directors and the last value represent the number of companies with that strategy for that year. The difference in number of companies depends on missing data for a handful of companies in the earliest years.

```
. table strategy year, contents(mean size mean ffd freq ) row
```

Strategy	Year								
	2002	2003	2004	2005	2006	2007	2008	2009	2010
Active	6	5.61905	5.57692	5.71429	5.57143	5.35714	5.32143	5.25	5.32143
	.1338456	.1245929	.157043	.2390229	.3095238	.4227891	.4307823	.4328231	.4183674
	28	28	28	28	28	28	28	28	28
Equal	6.33333	5.71429	5.5	5.33333	5.33333	5.33333	5.44444	5.44444	5.55556
	.4761905	.422449	.4077381	.3915344	.4259259	.4100529	.4337302	.4253968	.4670635
	7	8	8	9	9	9	9	9	9
Mixed	5.58333	5.38462	5.42857	5.46667	6	5.53333	5.73333	5.73333	5.8
	.0396825	.0628205	.1083333	.2	.336746	.4248413	.4535714	.4295238	.4469048
	13	13	15	15	15	15	15	15	15
Passive	4	3.25	4	3.75	4.75	5.25	5.25	5	5
	0	0	.0714286	.1625	.325	.425	.3833333	.45	.4
	4	4	4	4	4	4	4	4	4
Total	5.69697	5.35556	5.40385	5.44643	5.58929	5.39286	5.44643	5.39286	5.46429
	.118559	.1420058	.1759116	.2476152	.3366284	.4214498	.4339711	.4319728	.4325255
	52	53	55	56	56	56	56	56	56

Table VII Average board size, fraction female directors and number of companies per industry and year. The first value represents average board size, the second; average fraction female directors and the last value represent the number of companies within the industry for that year. The difference in number of companies depends on missing data for a handful of companies in the earliest years.

```
. table sector year, contents(mean size mean ffd freq ) row
```

	Year								
Sector	2002	2003	2004	2005	2006	2007	2008	2009	2010
Consumer Discretionary	8.5	8.5	8.5	6.66667	6.33333	5.66667	6	6	6
	.3484849	.3939394	.4772727	.4292929	.4777778	.4444444	.5	.5	.5
	2	2	2	3	3	3	3	3	3
Consumer Staples	5.5	5.4	5.8	5.6	6.2	5.6	5.8	6.2	6.2
	.0714286	.1371429	.2104762	.2857143	.3290476	.392381	.44	.4171429	.4457143
	5	5	5	5	5	5	5	5	5
Energy	6	5.4	5.61538	5.5	5.78571	5.57143	5.64286	5.57143	5.5
	.1130952	.1642857	.1483517	.207483	.325	.4346939	.4278912	.4204082	.4442177
	13	13	14	14	14	14	14	14	14
Health Care	6	5.66667	5.4	5.6	5.6	5.4	5.2	5	5.2
	.1666667	.0666667	.1633333	.2733333	.3133333	.44	.46	.48	.412381
	5	5	5	5	5	5	5	5	5
IT	4.875	4.9	4.72727	5.16667	5.25	4.83333	5.08333	5.16667	5.08333
	.05	.075	.0712121	.1208333	.2514881	.4076389	.4256945	.4349206	.4090278
	11	11	12	12	12	12	12	12	12
Industry	5.71429	5.1	5.3	5.36364	5.27273	5.54545	5.18182	4.90909	5.18182
	.0680272	.1266667	.2	.2969697	.3554113	.4	.4181818	.4090909	.4363636
	11	11	11	11	11	11	11	11	11
Materials	5.33333	4.75	4.6	4.8	5.2	5.2	5.4	5.2	5.6
	.1984127	.1571429	.2366667	.3466667	.46	.46	.4457143	.42	.4257143
	4	5	5	5	5	5	5	5	5
Telecom	6	7	7	7	7	7	8	8	8
	.5	.4285714	.4285714	.4285714	.4285714	.4285714	.375	.5	.375
	1	1	1	1	1	1	1	1	1
Total	5.69697	5.35556	5.40385	5.44643	5.58929	5.39286	5.44643	5.39286	5.46429
	.118559	.1420058	.1759116	.2476152	.3366284	.4214498	.4339711	.4319728	.4325255
	52	53	55	56	56	56	56	56	56

Table VII shows the average board size, fraction female directors and number of companies per industry and year. Energy is the most common industry followed in decreasing order by IT, Industry, Health Care, Consumer Staples, Materials, Consumer Discretionary and Telecom. Consumer Discretionary has the biggest average board size with more than 6 directors and the other industries have an average board size around 5.5 directors across the years.

When testing an OLS regression for the different industries on one strategy at the time, the result indicates that all industries but materials and telecommunications have a significant positive coefficient for the active strategy. Health care and consumer discretionary are the two industries with the highest probability of having an active strategy. Table VIII shows the regression analysis of the different industries on the active strategy.

Table VIII Different industries' likelihood of having an active strategy
active = dummy variable for the active strategy; 1 if the company has an active strategy and 0 otherwise *ind* = Industry, *en* = Energy, *it* = IT, *hc* = Health Care, *mat* =Mmaterials, *cdisk* = Consumer Discretionary, *cstaples* = Consumer Staples and *tele* = Telecommunication

```
. reg active ind en it hc mat cdisc cstaples tele
note: tele omitted because of collinearity
```

Source	SS	df	MS
Model	14.5113982	7	2.07305689
Residual	109.456344	488	.224295786
Total	123.967742	495	.250439883

Number of obs =	496
F(7, 488) =	9.24
Prob > F =	0.0000
R-squared =	0.1171
Adj R-squared =	0.1044
Root MSE =	.4736

active	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ind	.6363636	.1648859	3.86	0.000	.3123897	.9603376
en	.5080645	.1634949	3.11	0.002	.1868236	.8293054
it	.4245283	.1644316	2.58	0.010	.101447	.7476096
hc	.8	.1729338	4.63	0.000	.4602132	1.139787
mat	.2045455	.173261	1.18	0.238	-.1358842	.5449752
cdisc	.75	.1851146	4.05	0.000	.38628	1.11372
cstaples	.4	.1729338	2.31	0.021	.0602132	.7397868
tele	0	(omitted)				
_cons	7.95e-14	.1578663	0.00	1.000	-.3101815	.3101815

Similar regression analyses have been done for the other strategies too. All sectors but telecommunication have a statistical significant negative coefficient for the equal strategy. Materials is the only industry with a statistical significant positive result for the passive strategy, while all other industries are showing insignificant results. This implies that the

companies within materials are more likely to have a passive strategy compared to companies in other industries. The result for the mixed strategy indicates that firms within Consumer Staples and IT are more likely to have a mixed strategy, meanwhile the other industries show statistical insignificant result. Tables of the regression analyses for the equal, mixed and passive strategy are to be found in the appendix tables A-1 to A-4.

6.2. Statistical Tests

6.2.1. Hypothesis 1

Hypothesis 1(b), that active firms have higher proportion women in 2002 than companies selecting a mixed or passive strategy can be answered through the summary tables. The OLS regression of the different strategies on the fraction female directors does strengthen this finding, indicating that companies with an active strategy have on average 13 % women on the board meanwhile the passive strategy have on average no women on the board and the mixed strategy an average of 4 % women. Table IX presents the result from the regression analysis of the strategy dummy variables on fraction female directors.

Table IX Regession of strategy-dummies on the fraction female directors for the year 2002.

```
. reg ffd active passive mix if y2002==1
```

Source	SS	df	MS		
Model	.504032683	3	.168010894	Number of obs	= 33
Residual	.431238049	29	.014870278	F(3, 29)	= 11.30
				Prob > F	= 0.0000
Total	.935270732	32	.02922721	R-squared	= 0.5389
				Adj R-squared	= 0.4912
				Root MSE	= .12194

ffd	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
active	-.3423449	.077124	-4.44	0.000	-.5000812	-.1846086
passive	-.4761905	.0995667	-4.78	0.000	-.6798271	-.2725538
mix	-.4365079	.0787144	-5.55	0.000	-.5974969	-.275519
_cons	.4761905	.0704043	6.76	0.000	.3321976	.6201833

The result is controlled for industries, board size and firm size and implies a robust result that is still significant, though the control variables appear insignificant in the analyses. Table X presents the result from the regression analysis of the strategy dummy variables on fraction female directors with and without the industries as control variables. The result from the regression analyses with other control variables are found in the appendix table A-5 and A-6.

Table X Regression of strategy dummies on fraction female directors controlling for industry for year 2002. *ffd* is the abbreviation of fraction female directors. *ind* = Industry, *en* = Energy, *it* = IT, *hc* = Health Care, *mat* =Mmaterials, *cdisk* = Consumer Discretionary, *cstaples* = Consumer Staples and *tele* = Telecommunication

```
. esttab, r2 ar2 se scalar(rmse)
```

	(1) ffd	(2) ffd
active	-0.342***	-0.345**
	(0.0771)	(0.0995)
passive	-0.476***	-0.470***
	(0.0996)	(0.114)
mix	-0.437***	-0.425***
	(0.0787)	(0.0987)
ind		-0.144
		(0.128)
en		-0.160
		(0.129)
it		-0.135
		(0.127)
mat		-0.0950
		(0.143)
o.hc		0
		(.)
cstaples		-0.135
		(0.133)
cdisc		0.102
		(0.151)
tele		-0.0917
		(0.192)
_cons	0.476***	0.592***
	(0.0704)	(0.153)
N	33	33
R-sq	0.539	0.680
adj. R-sq	0.491	0.535
rmse	0.122	0.117

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

The regression of fraction female directors on the Active-dummy for year 2002 does not indicate any significant relation. Neither is a correlation found for the fraction female directors on the passive strategy in year 2002. A significant positive result is found for the equal strategy meanwhile the mixed strategy face a significant negative coefficient for the regression of fraction female directors on the mixed strategy. Table XI demonstrate the result from the regression of fraction female directors on the equal strategy.

Table XI Regession of fraction female directors on the equal strategy.
ffd is the abbreviation of fraction female directors

```
. reg equal ffd if y2002==1
```

Source	SS	df	MS		
Model	1.23076947	1	1.23076947	Number of obs	= 33
Residual	1.49650325	31	.048274299	F(1, 31)	= 25.50
				Prob > F	= 0.0000
Total	2.72727273	32	.085227273	R-squared	= 0.4513
				Adj R-squared	= 0.4336
				Root MSE	= .21971

equal	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ffd	1.147149	.2271901	5.05	0.000	.6837914	1.610506
_cons	-.0450957	.0467801	-0.96	0.343	-.1405042	.0503129

An OLS regression of board size on the passive strategy is used to test hypothesis 1(c). The result implies a statistical significant negative relation between the board size and the passive strategy. So when the board size increases, the likelihood of a passive strategy decreases. The hypothesis can therefore not be rejected. Table XII present the result of the regression analysis of board size on the passive strategy.

Table XII OLS regression of board size on the passive strategy.
Size = board size

```
. reg passive size
```

Source	SS	df	MS	Number of obs =	466
Model	1.71582935	1	1.71582935	F(1, 464) =	25.97
Residual	30.6554153	464	.066067705	Prob > F =	0.0000
				R-squared =	0.0530
Total	32.3712446	465	.06961558	Adj R-squared =	0.0510
				Root MSE =	.25704

passive	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
size	-.0504688	.0099033	-5.10	0.000	-.0699296	-.0310079
_cons	.3505194	.0553393	6.33	0.000	.2417727	.4592661

Running a regression of the strategies on board size does not indicate any significant result. It is therefore not possible to conclude that any specific strategy determine an exact board size. The result is also tested for the control variables of industry with the same insignificant result. Table XIII summarize the OLS regression of the strategies on board size. For the regression table of the strategies on board size with and without control variables; see appendix A-7.

Table XIII OLS regression of the strategy dummies on board size.
Size = board size

```
. reg size active passive mix if y2002==1
```

Source	SS	df	MS	Number of obs =	33
Model	11.3863636	3	3.79545455	F(3, 29) =	1.63
Residual	67.5833333	29	2.33045977	Prob > F =	0.2043
				R-squared =	0.1442
Total	78.969697	32	2.46780303	Adj R-squared =	0.0557
				Root MSE =	1.5266

size	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
active	-.3333333	.9654967	-0.35	0.732	-2.307996	1.641329
passive	-2.333333	1.246451	-1.87	0.071	-4.882612	.215945
mix	-.75	.985406	-0.76	0.453	-2.765381	1.265381
_cons	6.333333	.8813739	7.19	0.000	4.530721	8.135945

6.2.2. Hypothesis 2

To test hypothesis 2 and the relation between the strategies and companies' financial performance, we run regressions with the panel data described in the methodology chapter. The robust regression of strategy dummies on Tobin's Q indicates a positive correlation

between the active strategy and firm performance and equal strategy and firm performance, where the active firms perform better. The results are statistically significant controlling for the each year. This indicates that an active strategy has a higher average Tobin's Q compared to an equal strategy. Since the result is insignificant for the passive and mixed strategy, it is difficult to draw any conclusions from the analysis about the passive and mixed strategy's impact on Tobin's Q. Table XIV describes the result from the regression of the strategies impact on Tobin's Q.

Table XIV Regression of strategy dummies on Tobin's Q controlling for industry.
yyear = dummy variable for each year

```
. xtreg q active passive mix y2003 y2004 y2005 y2006 y2007 y2008 y2009 y2010, r

Random-effects GLS regression                   Number of obs      =       462
Group variable: isin                            Number of groups   =        56

R-sq:  within  = 0.0740                         Obs per group: min =         5
       between = 0.0445                                        avg =       8.3
       overall = 0.0530                                        max =         9

                                                Wald chi2(11)      =     67.16
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

                                  (Std. Err. adjusted for 56 clusters in isin)
```

q	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
active	.6684082	.3189073	2.10	0.036	.0433614	1.293455
passive	.958927	.8539255	1.12	0.261	-.7147363	2.63259
mix	.481833	.2472424	1.95	0.051	-.0027532	.9664192
y2003	.0098014	.2411941	0.04	0.968	-.4629304	.4825331
y2004	.3033251	.2884964	1.05	0.293	-.2621174	.8687677
y2005	.3070041	.1982057	1.55	0.121	-.081472	.6954801
y2006	.6352437	.1882436	3.37	0.001	.266293	1.004194
y2007	.6217587	.1767925	3.52	0.000	.2752517	.9682657
y2008	.2003839	.1348734	1.49	0.137	-.0639632	.464731
y2009	-.1140107	.2359778	-0.48	0.629	-.5765187	.3484972
y2010	-.1683901	.1775411	-0.95	0.343	-.5163642	.1795841
_cons	.5345582	.1457381	3.67	0.000	.2489168	.8201995
sigma_u	1.3141261					
sigma_e	1.0827119					
rho	.59565808	(fraction of variance due to u_i)				

However, the result is not robust and statistical significant controlling for other variables such as industry, firm size nor board size. Neither is the result statistical significant using a fixed effect regression. The null hypothesis can therefore not be rejected for financial performance

measured as Tobin's Q. Table XV summarizes the insignificant result of the regression of the strategies on Tobin's Q controlling for industries.

Table XV Regression of strategy dummies on Tobin's Q controlling for industry.
yyear = dummy variable for each year, *ind* = Industry, *en* = Energy, *it* = IT, *hc* = Health Care, *mat* =Mmaterials, *cdisk* = Consumer Discretionary, *cstaples* = Consumer Staples and *tele* = Telecommunication

```
. xtreg q active passive mix en it mat hc cstaples cdisc tele y2003 y2004 y2005 y2006 y2007 y2008 y2009 y2010

Random-effects GLS regression                   Number of obs      =       462
Group variable: isin                            Number of groups   =        56

R-sq:  within  = 0.0741                         Obs per group: min =         5
       between = 0.6185                                        avg =       8.3
       overall = 0.3866                                        max =         9

                                                Wald chi2(18)      =    177.99
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

                                  (Std. Err. adjusted for 56 clusters in isin)
------------------------------------------------------------------------------
             |               Robust
           q |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      active |  -.0712171    .162252    -0.44   0.661    -.3892251    .2467909
     passive |   .4098264   .6953017     0.59   0.556    -.9529398    1.772593
         mix |  -.1568032   .2164476    -0.72   0.469    -.5810326    .2674262
          en |   .0587914   .2010625     0.29   0.770    -.3352837    .4528666
          it |   1.050788   .3916732     2.68   0.007     .2831222    1.818453
         mat |  -.2098157   .2606797    -0.80   0.421    -.7207385    .3011072
          hc |   3.623694   .7989687     4.54   0.000     2.057744    5.189643
    cstaples |  -.0983104   .1592861    -0.62   0.537    -.4105054    .2138846
       cdisc |  -.2408372   .2664592    -0.90   0.366    -.7630877    .2814133
        tele |   .0236172   .1782277     0.13   0.895    -.3257027    .3729372
       y2003 |   .0113904   .2429599     0.05   0.963    -.4648023     .487583
       y2004 |   .3098933   .2901832     1.07   0.286    -.2588554    .8786419
       y2005 |   .3055681   .1977435     1.55   0.122    -.0820021    .6931383
       y2006 |   .6274083   .1854408     3.38   0.001     .2639509    .9908656
       y2007 |   .6139234   .1778094     3.45   0.001     .2654233    .9624234
       y2008 |   .1925485   .1355151     1.42   0.155    -.0730561    .4581532
       y2009 |  -.1218461   .2398857    -0.51   0.611    -.5920135    .3483213
       y2010 |  -.1762254   .1805693    -0.98   0.329    -.5301347    .1776838
       _cons |   .5990717   .2384632     2.51   0.012     .1316924    1.066451
-------------+----------------------------------------------------------------
     sigma_u |  .89923959
     sigma_e |  1.0827119
         rho |    .408215   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

The same regressions are used to test firm performance measured as ROA. The result of the first regression, testing the strategies on ROA controlling for each year indicates insignificant results for all strategies but the active one, which has a negative impact on ROA. The result is tested for robustness and statistical significance using industry, firm size and board size as control variables and the result implies insignificant results for all strategies. Table XVI presents the findings in detail from the regression analysis of the strategies on ROA. For the regression analysis controlled for industry; see appendix table A-8.

Table XVI Regression of strategy dummies on ROA
yyear = dummy variable for each year

```
. xtreg roa active passive mix y2003 y2004 y2005 y2006 y2007 y2008 y2009 y2010, r

Random-effects GLS regression                   Number of obs      =       491
Group variable: isin                            Number of groups   =        56

R-sq:  within  = 0.0746                         Obs per group: min =         5
       between = 0.0579                                        avg =       8.8
       overall = 0.0626                                        max =         9

                                                Wald chi2(11)      =     26.55
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0054

                                  (Std. Err. adjusted for 56 clusters in isin)
```

roa	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
active	-.1152531	.0503849	-2.29	0.022	-.2140057	-.0165005
passive	-.1195752	.0757506	-1.58	0.114	-.2680436	.0288933
mix	-.0612716	.0504494	-1.21	0.225	-.1601506	.0376073
y2003	.0464425	.0161491	2.88	0.004	.0147907	.0780942
y2004	.0794882	.0246749	3.22	0.001	.0311262	.1278502
y2005	.0877159	.0325169	2.70	0.007	.023984	.1514479
y2006	.116971	.0334671	3.50	0.000	.0513767	.1825653
y2007	.1017547	.0319253	3.19	0.001	.0391822	.1643272
y2008	.096422	.0344549	2.80	0.005	.0288917	.1639524
y2009	.0837521	.0404302	2.07	0.038	.0045103	.1629939
y2010	.0928447	.0381167	2.44	0.015	.0181373	.167552
_cons	.0537877	.0409882	1.31	0.189	-.0265476	.1341231
sigma_u	.17989566					
sigma_e	.12107117					
rho	.68825995	(fraction of variance due to u_i)				

The insignificant results are evident in the study of ROA as well as Tobin's Q as a measurement of firm performance. This implies that there are no strong relationships between any of the strategies and firm performance. The null hypothesis can therefore not be rejected. However, there are indications that the companies with an active strategy perform better in terms of Tobin's Q, but worse in terms of ROA compared to the average firms.

7. Implications and Conclusions

The active strategy was the most popular for comply with the Norwegian quota. The mixed strategy was the second most popular strategy. However, smaller boards tended to select a passive quota and increase their board size with the implementation. This is consistent with the theory of optimal board size and the passive firms may have seen the law as an opportunity to improve corporate governance. The board size where kept fixed for the active firms and almost constant for the companies selecting a mixed strategy. However, there was an increase in average board size for the four passive firms.

There are indications that the active strategy is correlated to better performance in terms of Tobin's Q, but worse performance measured as ROA. However, the result are not statistical significant and robust and for most other strategies there are no significant evidence of their effect on firm performance. A possible theory of the insignificant results is that every firm choose strategy to maximize firm value and different strategies are thus beneficial for different companies and there is not possible to find any relationship between a certain strategy and improved firm performance. The summary statistics indicated distinctive differences in board size and the proportion female directors across the various strategies and could therefore support the possible explanation that the strategies are selected to maximize firm value and that there is not a particular strategy that improve firm performance across all firms due to their different pre-quota conditions. Another possible explanation could be the relatively small sample size and a bigger sample could reveal any possible correlation between the strategies and firm performance. The sample of passive firms is small consisting of only four companies and the total sample consisting of 56 companies is also relatively small. However the observations spans across nine years, but the almost 500 firm/year observations are still relatively small for the passive strategy for example. The small sample may therefore be another possible explanation of the lack of significant results of selected strategies and firm performance.

This study is beneficial for future shocks with new requirement of board composition. It provides guidelines of how other companies have been acting and what were characteristic for them. In a time when more governments put pressure on the industry to become more equal, a study like this can help the shareholder to tackle the implementation and prepare the implementation for the best results.

This study is limited to a few aspects and mainly focused on the strategies as explanatory variables and minor firm characteristics as control variables. Hence, a further step would be to investigate trends among the board directors connected to the strategies. There

are more aspects of board characteristics and individual features, like tenure, retention and directors' characteristics between the strategies to study to fully cover the implementation. A further study of the strategies and the directors' characteristics is therefore recommended and may bring new insights about the gender quota law, implementation strategies and the relation between implementation and firm performance.

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Appendix

Table A-1 Different industries' likelihood of having an active strategy
ind = Industry, *en* = Energy, *it* = IT, *hc* = Health Care, *mat* =Mmaterials, *cdisk* = Consumer Discretionary, *cstaples* = Consumer Staples and *tele* = Telecommunication

```
. reg active ind en it hc mat cdisc cstaples tele
note: tele omitted because of collinearity
```

Source	SS	df	MS		
Model	14.5113982	7	2.07305689	Number of obs	= 496
Residual	109.456344	488	.224295786	F(7, 488)	= 9.24
				Prob > F	= 0.0000
Total	123.967742	495	.250439883	R-squared	= 0.1171
				Adj R-squared	= 0.1044
				Root MSE	= .4736

active	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ind	.6363636	.1648859	3.86	0.000	.3123897	.9603376
en	.5080645	.1634949	3.11	0.002	.1868236	.8293054
it	.4245283	.1644316	2.58	0.010	.101447	.7476096
hc	.8	.1729338	4.63	0.000	.4602132	1.139787
mat	.2045455	.173261	1.18	0.238	-.1358842	.5449752
cdisc	.75	.1851146	4.05	0.000	.38628	1.11372
cstaples	.4	.1729338	2.31	0.021	.0602132	.7397868
tele	0	(omitted)				
_cons	7.95e-14	.1578663	0.00	1.000	-.3101815	.3101815

Table A-2 Different industries' likelihood of having a mixed strategy
ind = Industry, *en* = Energy, *it* = IT, *hc* = Health Care, *mat* =Mmaterials, *cdisk* = Consumer Discretionary, *cstaples* = Consumer Staples and *tele* = Telecommunication

```
. reg mix ind en it hc mat cdisc cstaples tele
note: tele omitted because of collinearity
```

Source	SS	df	MS		
Model	6.08947394	7	.869924848	Number of obs	= 496
Residual	90.3117357	488	.185065032	F(7, 488)	= 4.70
				Prob > F	= 0.0000
Total	96.4012097	495	.194749919	R-squared	= 0.0632
				Adj R-squared	= 0.0497
				Root MSE	= .43019

mix	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ind	.2727273	.1497736	1.82	0.069	-.0215534	.567008
en	.2016129	.1485101	1.36	0.175	-.0901852	.493411
it	.4056604	.1493609	2.72	0.007	.1121905	.6991302
hc	.2	.1570839	1.27	0.204	-.1086442	.5086442
mat	.2045455	.1573811	1.30	0.194	-.1046827	.5137736
cdisc	-3.80e-14	.1681482	-0.00	1.000	-.3303839	.3303839
cstaples	.4	.1570839	2.55	0.011	.0913558	.7086442
tele	0	(omitted)				
_cons	4.01e-14	.1433973	0.00	1.000	-.2817523	.2817523

Table A-3 Different industries' likelihood of having a passive strategy
ind = Industry, *en* = Energy, *it* = IT, *hc* = Health Care, *mat* =Mmaterials, *cdisk* = Consumer Discretionary, *cstaples* = Consumer Staples and *tele* = Telecommunication

```
. reg passive ind en it hc mat cdisc cstaples tele
note: tele omitted because of collinearity
```

Source	SS	df	MS		
Model	2.93783545	7	.419690778	Number of obs	= 496
Residual	30.4492613	488	.062396027	F(7, 488)	= 6.73
				Prob > F	= 0.0000
Total	33.3870968	495	.06744868	R-squared	= 0.0880
				Adj R-squared	= 0.0749
				Root MSE	= .24979

passive	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ind	-2.35e-14	.0869664	-0.00	1.000	-.1708748	.1708748
en	.0725806	.0862327	0.84	0.400	-.0968526	.2420139
it	.1698113	.0867268	1.96	0.051	-.0005927	.3402153
hc	-2.36e-14	.0912111	-0.00	1.000	-.179215	.179215
mat	.2045455	.0913837	2.24	0.026	.0249913	.3840996
cdisc	-2.34e-14	.0976357	-0.00	1.000	-.1918382	.1918382
cstaples	-2.36e-14	.0912111	-0.00	1.000	-.179215	.179215
tele	0	(omitted)				
_cons	2.34e-14	.083264	0.00	1.000	-.1636002	.1636002

Table A-4 Different industries' likelihood of having an equal strategy
ind = Industry, *en* = Energy, *it* = IT, *hc* = Health Care, *mat* =Mmaterials, *cdisk* = Consumer Discretionary, *cstaples* = Consumer Staples and *tele* = Telecommunication

```
. reg equal ind en it hc mat cdisc cstaples tele
note: tele omitted because of collinearity
```

Source	SS	df	MS		
Model	13.6117669	7	1.94453812	Number of obs	= 496
Residual	51.4346041	488	.105398779	F(7, 488)	= 18.45
				Prob > F	= 0.0000
Total	65.046371	495	.13140681	R-squared	= 0.2093
				Adj R-squared	= 0.1979
				Root MSE	= .32465

equal	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ind	-.9090909	.1130292	-8.04	0.000	-1.131175	-.6870069
en	-.7822581	.1120757	-6.98	0.000	-1.002469	-.5620475
it	-1	.1127178	-8.87	0.000	-1.221472	-.7785279
hc	-1	.1185461	-8.44	0.000	-1.232924	-.7670763
mat	-.6136364	.1187704	-5.17	0.000	-.8470008	-.3802719
cdisc	-.75	.126896	-5.91	0.000	-.9993299	-.5006701
cstaples	-.8	.1185461	-6.75	0.000	-1.032924	-.5670763
tele	0	(omitted)				
_cons	1	.1082173	9.24	0.000	.7873707	1.212629

Table A-5 Regession of strategy-dummies on the fraction female directors controlled for industries for year 2002. *ind* = Industry, *en* = Energy, *it* = IT, *hc* = Health Care, *mat* =Mmaterials, *cdisk* = Consumer Discretionary, *cstaples* = Consumer Staples and *tele* = Telecommunication

```
. reg ffd active passive mix ind en it mat hc cstaples cdisc tele if y2002==1
note: hc omitted because of collinearity
```

Source	SS	df	MS		
Model	.636283472	10	.063628347	Number of obs	= 33
Residual	.29898726	22	.01359033	F(10, 22)	= 4.68
				Prob > F	= 0.0012
				R-squared	= 0.6803
				Adj R-squared	= 0.5350
Total	.935270732	32	.02922721	Root MSE	= .11658

ffd	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
active	-.3453191	.0995253	-3.47	0.002	-.5517219	-.1389164
passive	-.4697978	.1135164	-4.14	0.000	-.7052164	-.2343792
mix	-.4250707	.0987208	-4.31	0.000	-.6298051	-.2203362
ind	-.1442118	.1276994	-1.13	0.271	-.4090441	.1206205
en	-.1598681	.1291775	-1.24	0.229	-.4277659	.1080297
it	-.1353917	.1274389	-1.06	0.300	-.3996839	.1289005
mat	-.0950351	.14279	-0.67	0.513	-.3911634	.2010931
hc	0	(omitted)				
cstaples	-.1351139	.1325953	-1.02	0.319	-.4100997	.139872
cdisc	.1020666	.1508639	0.68	0.506	-.210806	.4149393
tele	-.0917374	.1921626	-0.48	0.638	-.4902582	.3067835
_cons	.5917374	.1527617	3.87	0.001	.274929	.9085457

Table A-6 Regession of strategy-dummies on the fraction female directors controlled for board size and firm size (revenue) for year 2002.

```
. reg ffd active passive mix size lrev if y2002==1
```

Source	SS	df	MS		
Model	.602065444	5	.120413089	Number of obs	= 32
Residual	.285635755	26	.010985991	F(5, 26)	= 10.96
				Prob > F	= 0.0000
				R-squared	= 0.6782
				Adj R-squared	= 0.6164
Total	.887701199	31	.028635523	Root MSE	= .10481

ffd	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
active	-.268492	.0823038	-3.26	0.003	-.4376698	-.0993142
passive	-.306543	.1072736	-2.86	0.008	-.527047	-.0860391
mix	-.3360067	.0830151	-4.05	0.000	-.5066467	-.1653667
size	.0280152	.0131623	2.13	0.043	.0009597	.0550708
lrev	.0160335	.0100039	1.60	0.121	-.0045298	.0365968
_cons	.1106804	.1397201	0.79	0.435	-.1765184	.3978793

Table A-7 OLS regression of strategy dummies on board size controlling for industry.
size = board size, *ind* = Industry, *en* = Energy, *it* = IT, *hc* = Health Care, *mat* =Mmaterials, *cdisk* = Consumer Discretionary, *cstaples* = Consumer Staples and *tele* = Telecommunication

```
. esttab, r2 ar2 se scalar(rmse)
```

	(1) size	(2) size
active	-0.333	-0.809
	(0.965)	(1.301)
passive	-2.333	-2.108
	(1.246)	(1.484)
mix	-0.750	-0.810
	(0.985)	(1.291)
ind		-0.286
		(1.670)
en		-0.116
		(1.689)
it		-0.801
		(1.666)
mat		-0.504
		(1.867)
o.hc		0
		(.)
cstaples		-0.501
		(1.734)
cdisc		2.499
		(1.973)
tele		-0.810
		(2.513)
_cons	6.333***	6.810**
	(0.881)	(1.997)
N	33	33
R-sq	0.144	0.353
adj. R-sq	0.056	0.058
rmse	1.527	1.524

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Table A-8 Regression of strategy dummies on ROA controlling for industry.
yyear = dummy variable for each year, *ind* = Industry, *en* = Energy, *it* = IT, *hc* = Health Care, *mat* =Mmaterials, *cdisk* = Consumer Discretionary, *cstaples* = Consumer Staples and *tele* = Telecommunication

```
. xtreg roa active passive mix en it mat hc cstaples cdisc tele y2003 y2004 y2005 y2006 y2007 y2008 y2009 y2010, r

Random-effects GLS regression                   Number of obs      =       491
Group variable: isin                            Number of groups   =        56

R-sq:  within  = 0.0746                         Obs per group: min =         5
       between = 0.3311                                        avg =       8.8
       overall = 0.2567                                        max =         9

                                                Wald chi2(18)      =    247.52
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000

                                  (Std. Err. adjusted for 56 clusters in isin)
```

roa	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
active	-.0405943	.042649	-0.95	0.341	-.1241848	.0429961
passive	-.0748833	.1009123	-0.74	0.458	-.2726678	.1229012
mix	.0014865	.0505708	0.03	0.977	-.0976304	.1006035
en	.0288838	.0465243	0.62	0.535	-.0623022	.1200698
it	-.0711471	.0503314	-1.41	0.157	-.1697948	.0275006
mat	.0300143	.0324785	0.92	0.355	-.0336424	.093671
hc	-.3179607	.1499107	-2.12	0.034	-.6117803	-.0241412
cstaples	-.0144205	.0239515	-0.60	0.547	-.0613646	.0325235
cdisc	-.0012801	.0367835	-0.03	0.972	-.0733744	.0708143
tele	.0815837	.0404769	2.02	0.044	.0022505	.1609169
y2003	.0463035	.0162431	2.85	0.004	.0144675	.0781394
y2004	.0793024	.0248655	3.19	0.001	.030567	.1280378
y2005	.0874727	.0327782	2.67	0.008	.0232286	.1517167
y2006	.116749	.0337054	3.46	0.001	.0506877	.1828103
y2007	.1015327	.0321704	3.16	0.002	.0384799	.1645855
y2008	.0962	.0347058	2.77	0.006	.028178	.1642221
y2009	.0835301	.0407329	2.05	0.040	.003695	.1633652
y2010	.0926226	.0383857	2.41	0.016	.0173881	.1678572
_cons	.0303115	.0441794	0.69	0.493	-.0562785	.1169015
sigma_u	.16066903					
sigma_e	.12107117					
rho	.6378249	(fraction of variance due to u_i)				