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Some implications of a mandatory gender quota

for firms implementing at different points in time

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Abstract

This master's thesis examines some of the implications of the Norwegian gender quota for firms implementing it at different points in time. It is found that firms lose between 14% and 22% of their general board experience dependent on when they implement the quota. Firms implementing earlier lose on average less experience than firms adapting later. However, the earliest implementers nominate women, and the later adapters men with more previous board experience in the same sector of the economy, in the mandatory transition period. The later a firm adapts is also found to be casually related to the probability of the firm changing its board size in order to meet the quota. Further, firms implementing later has higher board turnover among both female and male members in the years prior to and after the quota became mandatory. The compensation offered the CEO increases sharply for the earliest adapters when they implement the quota. This could be consistent with either a stronger governance structure and better incentives, or weaker governance where the CEO utilizes a relatively enhanced bargaining position.

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1.0 Introduction

The Norwegian gender quota was the first of its kind, and was introduced to ensure gender balance on the Norwegian boards. The quota was proposed in 2003, passed in the Parliament in 2005 and came into law in 2007. Over the years it has become a relatively explored subject, and different conclusions have been drawn regarding how, if, and which firms are negatively affected by the quota. No consensus appears to be made about the implications of imposing a mandatory gender quota, as it obviously depends on what one is looking at. This thesis examines some of the implications of the quota, and whether firms adapting earlier is adversely affected from firms adapting late.

The reason why firms implement the quota at different points in time is not obvious. Dividing firms into groups conditional on when they choose to implement it perhaps could shed some light on the issue. One prediction is that the earliest firms to implement the quota do so because it is particularly easy for them. Another explanation can be that the perceived costs of adapting to the quota is thought to be smaller if adapting early. An alternative motive for adapting early is that it could increase the likelihood of appointing more experienced women to their boards. In the other end of the scale there could be several reasons for latest quota implementers to adapt late. One possibility is that they tried to implement early, having little information on what they embarked on, for then to realize that adapting was hard for them, and ultimately adapted late. Another explanation is that these firms knew beforehand that meeting the quota, was either going to be very easy, or very hard, but independent of when the firm choose to implement it, and therefore they waited. An ulterior motive to wait was to free ride on the earlier adapters education of new board members, for then to appoint women from these firms, when they in turn implement the quota. The ex-ante predictions of how the groups respond to the quota therefore are not clear.

Data from SNF and NHH's database (Samfunns- og næringslivsforskning og Norges handelshøyskole's database), comprising corporate information, accounting information and board information for all firms registered in the Norwegian entity database (Brønnøysundregisteret), are used in this thesis. The information from these data are used to examine how boards are affected by the gender quota, using a difference-in-difference estimator and utilizing the possibility that the quota inflicts exogenous changes to the board structures. Three treatment groups are constructed to examine if the timing aspect of when firms adapt to the quota matters. To increase the robustness of the findings two different control groups are constructed, and multiple quota-thresholds are tested.

All adapter groups lose approximately of 20% of the general board experience held by directors' relative to AS firms, and the increase in directress experience is not sufficiently large to prevent a loss of total board experience. The loss is smallest for the earliest adapters, which attain more experienced women than firms implementing later in the mandatory transition period. The incoming members to the adapters however, are in possession of more previous board experience in the same sector when the quota is implemented. Further, the earliest adapters appoint more experienced women, while the later implementers appoint more experienced men. Board members with CEO experience seems to be preferred by firms, and this appears to be independent of when they start implementing the quota. All firms adapting to the quota are more likely to change their board size in the implementation period than AS firms, although firms adapting later are more likely to do so. The turnover increases sharply around 2007 for the firms adapting last, and this turnover comprise both genders. The compensation offered the CEO in the firms adapting early shows a steep increase when they implement the quota, while the CEO's in firms adapting later are not found enjoy the same growth in compensation. Finally, all adapters appear to have lager problems reporting clean accounts after they implement the quota.

The structure of the thesis is presented in the following; In section (1) previous literature is reviewed and some key definitions and concepts are introduced, in section (2) different theories on why and how boards exists are presented, before some quota related facts and the hypotheses are declared. Section (3) encompass the data used, the construction of the control groups, the treatment groups and comprises also issues I have found in the data. In (4) the regression methods, and variables used are presented, and a more thorough review of the assumptions that must hold for inference to be valid is given. In section (5) the analysis is performed and the result are given. This section is ended with suggestions to future research. Last, section (6) presents the main conclusion.

1.1 Literature review

The Norwegian gender quota, being the first of its kind, has received considerable attention in academic research. Nygaard (2011) has investigated which effect the gender quota, and the corresponding increase in new female directors has on firm value, dependent on the firm specific information asymmetry. He finds that firms with low information asymmetry between insiders and outsiders on average have a positive valuation effect of the quota, while the high information asymmetry firms were negatively affected (Nygaard, 2011).

Ahern and Dittmar (2012) argue that the gender quota leads to a substantial decline in Tobins Q, defined as the ratio of market value of equity to total assets. The authors attribute this result to qualified board members being short in supply, which consequently leads to losses through empire building and increased acquisition activity,

and in turn results in lower accounting returns. Eckbo, Nygaard and Thorburn (2016) suggest a more value-neutral effect of the quota, as the experience lost when replacing male with female board members, is outweighed by the increase in director independence associated with a higher number of female board members.

Bøhren and Staubo (2016) find that the director independence in the boards of Norwegian publicly limited liability companies' increases substantially after the quota. They further find the costs of meeting the quota to be highest for small, young, un-listed firms. The proposed reason for the costs incurred is that these firms have more to gain from the advisory role of the board, than from having a board that monitors the management more intensely (Bøhren & Staubo, 2016).

1.2 Key concepts and definitions

Jensen & Meckling (1976) define an agency relationship as: "a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent". There will be costs associated with this delegation, referred to as **agency costs.** These costs arise due to hidden information about payoff relevant variables both before and after a contract is written. After a contract is written the principal cannot perfectly observe the actions taken by the agent, hence the agent will not always act in the principals' best interest. This is known as **moral hazard.** The agent usually knows more about his abilities before a contract is written that the principal. Nor can the principal fully observe the agent's information when making the decision. A situation where one part knows more than the other in a contacting relationship is called **adverse selection** (Pinkdyck & Rubinfeld, 2009)**.**

A **complete contract** is an agreement between two parties where an optimal contract is written, given limited knowledge of future preferences and the future set of alternatives (Tirole, 2001). In game theory a **Nash-equilibrium** refers to a situation, where each player's predicted strategy must be the player's best response given the predicted strategies of the other players. This equilibrium will be strategically stable and self-enforcing, meaning that no player will deviate from the strategy played, since it was optimally chosen given the actions of the other player(s). In a normal-form game a **dominant strategy** gives the player strictly higher returns than any other strategy, independent of the strategies chosen by the other players. A strictly dominant strategy will therefore always be played (Gibbons, 1992).

The general denoting of genders is: a **directress** is a woman, and a **director** is a man holding a directorship, while **board members** and **board of directors** comprise both genders. In the theory the notation of the authors' is used.

2.0 Theory

2.1 What is corporate governance?

The first known author to address the possible frictions that might arise due to the separation of ownership and control was Adam Smith (1776, p.700). In his work: "An Inquiry into the Nature and Causes of the Wealth of Nations ", Smith addresses the agency problem in these words:

"The directors of such [joint-stock] companies, however, being the managers rather of other people's money than their own, it cannot well be expected, that they should watch over it with the same anxious vigilance with which partners in a private copartnery frequently watch over their own. Like the stewards rich man, they are apt to consider attention to small matters as not for their master's honour, and very easily give themselves a dispensation from having it. Negligence and profusion, therefore, must prevail, more or less, in the management of the affairs of such a company."

The agency problem is a result of misaligned objectives after a principal-agent relationship has been established. A divergence in objectives may give the agent incentives not to act in the principals' best interest. According to Tirole (2001, p.1) it is by now a well-known problem that managers take actions that hurt shareholders' interests. Corporate governance could, in light of this be seen as the weave of institutions and mechanisms to protect shareholders from misconduct of the management, or as Tirole (2001) defines it, as the defense of shareholders' interest.

2.2 Agency costs

If complete contracting were possible, the agency problem would disappear, as it is a result of a world too complex for complete contracts ex ante. The problem of writing a complete contact is likely to be sufficiently high for the parties rather to write an incomplete contract (Hart, 1995). This in turn gives way for the agency problem. The principal cannot perfectly observe the actions of the agent, opening for moral hazard, nor does he know what action the agent should have taken in every possible contingency. This is due to the fact that the agent's information when making the decision is at least partly unobservable to the principal (Copeland, et al., 2005).

Jensen and Meckling provide some insights to the agency-problem in their paper from 1976. Their point of departure is that both the principal and the agent are utility maximizers. Therefore, instances where the agent is

not acting in the principal's best interest are likely to occur. The cost incurred by the principal to limit the extent of such activities and by establishing proper incentives for the agent, is defined as monitoring costs. They further argue that instances where the agent spend resources to restrict his possibilities of taking actions that hurt the principal will happen. Such actions are called bonding costs. Last they define the cost associated with the divergence of the actions the agent takes and the actions optimal for the principal as residual loss. Agency costs are defined as the sum of these monitoring and bonding costs, and the residual loss (Jensen & Meckling, 1976).

Further, a theory of ownership structure is introduced by the same authors, in a setting where the owner is also the manager of the firm. The model is however applicable to the governance discussion, as one of their extensions is the manager's incentives when giving up a part of the firm. For fixed firm size three variables are introduced:

S_i: The equity held by the manager

S_O: The equity held by outsiders

B: The debt, held by anyone outside the firm

The total market value of equity is defined as $S = S_i + S_o$, and the total value of the firm as $V = B + S$.

First the optimal ratio of outside equity to debt, $\frac{S_o}{B}$ is decided. Firm size is thus constant, while *V*, the value of the firm will depend on the agency costs incurred. *V** indexes the firm value for any given scale when the agency costs are set to zero. The agency costs is divided in two groups; the agency costs of debt, denoted $A_B(E)$, and the agency costs of outside equity $A_{so}(E)$, and $A_T(E) = A_{so}(E) + A_B(E)$ are the total agency costs.

Holding S_i fixed there are no incentives for the owner-manager to exploit outside equity if there are no outside equity, i.e. $E = \frac{S_o}{S_o+B}$, is zero. The manager's incentives to exploit the outside equity holders increases with an increase in the ratio of outside equity to debt. As the level of debt increases, the manager's incentives to reallocate wealth from bondholders to himself increases, and these costs are at a maximum where all funds are obtained through borrowing. Jensen & Meckling state that most of the firm's value reductions due to the agency costs of debt, comes from debt holders' increased monitoring costs. The manager's incentives to reallocate wealth increases with the level of debt, as more debt makes it easier to reallocate wealth to equity holders. It further falls with the level of outside equity, as the manager enjoys less of the reallocation when the level of outside equity is higher. As an extension the manager can choose his amount of outside financing, denoted by *K* where $K = \frac{B+S_0}{V^*}$.

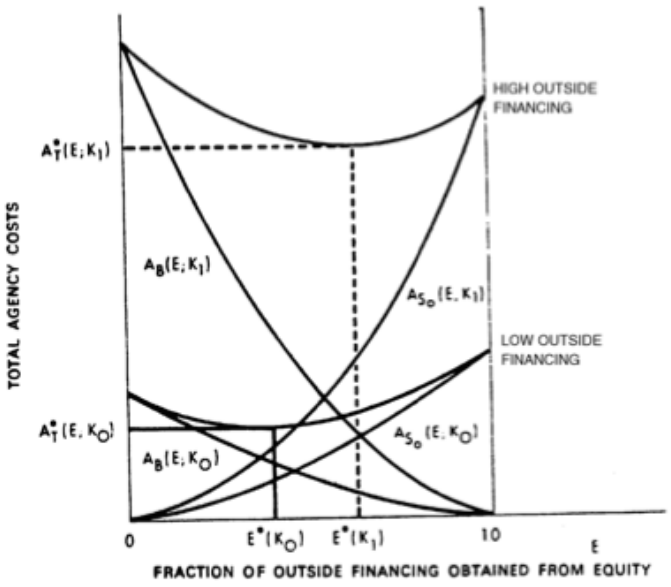

Figure 1 – The agency costs of outside financing. The fraction of outside financing that comes from equity is measured from left to right on the x-axis, while the fraction of debt is measured from right to left. The total agency costs are measured on the y-axis. Source **(Jensen & Meckling, 1976, p. 347)**

The total agency costs for low outside financing is $A_T(E, K_0)$. The optimal allocation is where the sum of the agency costs of outside equity $A_{s_0}(E, K_0)$ and outside debt $A_B(E, K_0)$ is minimized. Hence, the owner-manager uses $\mathrm{E}^*(\mathrm{K}_0)$ outside equity, and $1 - \mathrm{E}^*(\mathrm{K}_0)$ debt. However, if the manager chooses high outside financing, the total agency costs increase. The total agency costs is given by $A_T(E, K_1)$, where

$$K_1 > K_0$$

and

$$A_T(E, K_1) > A_T(E, K_0)$$

The manager here, because of the way the cost curves are drawn, chooses to use relatively more outside equity to debt, in the high outside financing scenario than in the low. There could however be instances where the outside equity to debt is reduced when the manager sells a part of his firm.

The reason for the increase in total agency costs from the low outside financing scenario to the high outside financing scenario happens for two reasons. First, a manager who sells of some fraction α of his equity-stake has stronger incentives of to enjoy non-pecuniary benefits. This is because when the owner-manager is the sole owner, he pays the full costs of any level of benefits consumed. When selling off a fraction α to outsiders, he will only pay (1- α), or one minus the fraction he sells. Since the non-pecuniary benefits have become relatively cheaper, he will enjoy more of them (Jensen & Meckling, 1976). In other words, selling off a fraction of the firm increases

the owner-mangers incentives to take actions that deviate from value maximization. This will in turn increase the marginal benefits of monitoring, and thus increase the optimal level of monitoring. Both the increase in monitoring and the additional non-pecuniary benefits consumed by the owner-manager will elaborate/raise the total agency costs. Second, the agency costs of debt will also increase with higher outside debt, simply because the total amount the manager could reallocate increases with the level of debt.

2.3 Legal protection

The Norwegian publicly limited liability companies [ASA] must follow the restrictions set by (almennaksjeloven) and the corresponding act for the limited liability [AS] companies is (aksjeloven). Both acts are instituted to protect shareholders from severe neglect by the management, as they both have a chapter regarding the accountability of management. The law does not put any restrictions on which legal form a firm may chose, however are the rules in the publicly limited liability companies act written in the belief that the shares are liquid, while the same is not true for the limited liability act (Woxholth, 2012). The latter further suggest that shareholder value in firms with disperse ownership may be better governed by the publicly limited liability companies act. Legal protection is an important aspect of corporate governance, but solely not sufficient to protect shareholder rights (Shleifer & Vishny, 1997). As agency theory suggests, it could be hard or often impossible to verify in court that the manager actually was acting in bad faith. Therefore, it will also be nearly impossible to punish the manager harder than limited liability suggest, i.e. at worst the manager will receive no salary (Jensen & Meckling, 1976).

2.4 Ownership

Shleifer and Vishny (1997) suggest that large share- and debt holders could get more effective controlling rights by being large. In particular, an owner of a substantial minority stake in a company, substantial being defined as at least 10 percent, could have incentives to monitor the management. The benefits from collecting the required information for the owner must however outweigh the personal cost of getting this information. An owner controlling more than 50% of the company, would both have interests in profit maximizing, and enough controlling rights to have to have their interests respected (Shleifer & Vishny, 1997). Such a large owner is nevertheless likely to create other types of agency costs. These costs could potentially be large if the owner also controls the company. In the situation where a large owner exists and he is in a position to utilize his rights, minor shareholders are expected to free ride on the information of the large owner ex ante, and the large owner is expected to transfer wealth from the minority ex post (Shleifer & Vishny, 1997) (Jensen & Meckling, 1976).

Naturally, debt holders as well are likely to monitor their investment more intensely when the amount lent is greater. The use of covenants in debt contracts could substantially reduce the management's action space. In particular, short-term debt obligations would make the borrower return for financing decisions at short intervals, giving the creditor an opportunity to influence the investment process, and partly determining which project to finance (Shleifer & Vishny, 1997). Jensen (1986) also suggests that more debt will reduce the agency costs in firms without sufficient investment opportunities. Hence, should larger more mature firms, where the present value of growth opportunities are expected to be lower, use more debt and pay higher dividends, than other firms (Jensen, 1986).

2.5 Why do boards exist?

Hermalin and Weisbach (2003, p.3) theorize that boards exist as a product of regulation. The Norwegian Limited Liability Companies Act (aksjeloven. asl, 1997:44) [asl] § 6-1, and the Norwegian Public Limited Liability Companies Act (allmenaskjeloven. asal, 1997:45) [asal] § 6-1, both state that the company must have a board. The law for the two different legal forms are similar, albeit sometimes stricter for the ASA than for the AS firms. The first subsection in both asal §6-1 and asl § 6-1 gives the minimum size of the board. Minimum board size is at least three persons for ASA companies, while single person boards are allowed for AS companies. Another important difference in the legislation is that the law prevents the CEO of an ASA to be part of the board, while AS firms do not have such a restriction.

Following Hermalin and Weisbach's (2003) argumentation, if this were the case, firms would minimize their costs by scaling their boards to the minimum size within regulation. This would imply that we should observe single person boards in AS companies and three person boards in ASA companies. Hermalin and Weisbach further conclude that firms choose to have larger boards than regulations impose, and legislation alone cannot be the reason for the existence of boards. Since the average AS company has a four-person board, and the average ASA board consists of approximately 5 members, legislation fails to tell the full story for the existence of Norwegian boards as well.

Another theory trying to explain why boards have emerged is that the mutual monitoring between the members of the board prevent each director to take actions that hurt shareholders. This in turn make shareholders' trust the directors with their money. Hermalin and Weisbach (2003) however, present a simple model in which the

shareholder's trust is misplaced. Imagine that there are S potential shareholder dollars that can be stolen, and that a penalty p is laid on the director if caught stealing, where $S > p > 0$. This penalty could be monetary, or even more realistic reputational. Further can each director at no cost, prevent theft from all directors. The latter is to model the mutual monitoring. In this game, N directors will "steal" if $S/N > p$, i.e. if the payoff from stealing exceeds the penalty for each director. Obviously an $N > 0$, could exist where stealing is a strictly dominant strategy for the directors. Hence, neither this model can completely explain the existence of boards.

Tirole (2001) points out that incentives alone not always are sufficient to protect shareholders against misconduct from the management. He therefore urges the need for active monitoring. Hermalin and Weisbach (2003) ask "who provides these incentives and who ensures that the incentive contracts are structured optimally?" That is, who should provide the manager with incentives, structure contracts and ensure compliance through monitoring, in such a way that the owners' and the managers' incentives are aligned? This is considering that shareholders on average lack incentives to monitor on their own. The latter is due to the fact that the monitor bears the full cost of this monitoring activity, while all shareholders profit. A dominant strategy for disperse shareholders is to free ride on other shareholders monitoring activities. A consequence of this is that too little monitoring finds place. Hence, shareholders will also be too uninformed to make decisions regarding the CEO (Hart, 1995). Hermalin and Weisbach ultimately conclude that the board of the directors is a second-best market solution to the agency problems that arises due to the separation of ownership and control.

2.6 What are the boards contributions?

The most important tasks of the board are giving advice, to discipline management, and to act if a crisis should occur (Mace, 1971, p. 178). The primary task of Norwegian boards, according to (NUES) is somewhat similar. Their recommendation emphasizes supervising the management and the firms' operations, and to set the strategic direction of the firm. Supervision of the management includes specifying duties, delegating authority and to set the borders of the managements action space. Further, the board is responsible that the business is conducted in a prudent manner, and that the financial statements are compiled after generally accepted accounting principles. In addition to make sure that the information given is representative for the factual circumstances of the firm (NUES, 2014).

The process of assessing management involving hiring, promoting and if required dismissal, can be thought of as two-folded (Adams, et al., 2010). One component is to monitor the actions of the management, and the other is

to determine the management's ability. The authors argue that expecting the board to be able to directly spot misconduct from the management, is perhaps too big of a demand. Therefore, they suggest the board of directors to rely on its choice of auditor, and its control over accounting and reporting practices in its protection of shareholders' interests.

Given that the board is expected to both give advice, and to monitor the management, there are likely to be a trade-off in the information sharing from the management (Adams & Ferreira, 2007). In their model the CEO is likely to get better advice when the board is better informed, and advice is valuable to the CEO. However, sharing information gives the board more precise knowledge, and thus increase the likelihood of its interference in decision-making. The CEO is therefore less likely to share information the more independent the board is from the CEO, since independent boards monitor more intensively. A consequence of this is the CEO forfeiting on valuable advice.

2.7 Is the board of directors capable of monitoring managers?

2.7.1 Rubber stamping

Aghion and Tirole (1997) define formal authority as the controlling rights of an asset, due to ownership or an implicit or explicit contract. Real authority is defined as the effective control over decisions. The one with the formal control can at any point withdraw the real authority, or test the decision of the subordinate. The authors provide a model where it is optimal for the principal to give away decision right, i.e. real authority if the agent is better informed, and their preferences are sufficiently congruent. A simplified version of their model reads as follows: the principal is denoted B, and the subordinate b, and there are three possible scenarios, or projects, *k*, that can be taken, $k = 1,2,3$. It is also assumed that the principal has the formal control, or authority. The payoff for the principal for each project is given by B_k, and the agent's payoff is given by b_k. One of the projects are disastrous for both parties, $B_k = b_k = -\infty$. The two other projects yield the payoffs:

(B,b) and (0,0) with probability p

(B,0) and (0,b) with probability 1-p

Higher p in the model indicates that the two parties have more coinciding interests. Initially is neither of the parties informed, and the principal will not allow any project to be taken. This is true as long as the infinitely

negative project can happen with a positive probability, since the expected payoffs then will always be less than zero. Both parties could also obtain additional information, to the cost $C_B(E)$, for the principal, and $C_b(e)$, for the agent. The principal gets full information regarding own B_k, with probability *E*, and no additional information with probability *(1-E)*. The agent gets full information b_k, with probability *e*, and no information with probability *(1-e)*. Tree possible scenarios are considered: (1) The principal is informed and chooses project B. (2) The agent is informed and proposes the project giving him b. The principal accepts this project as $pB + (1-p) * 0 > 0$. (3) Neither is informed and the principal stops all activity.

The expected values of obtaining additional information is given by:

$$U_B = E * B + (1-E) * epB - C_B(e)$$

$$U_b = E * pb + (1-E) * eb - C_b(e)$$

Both parties maximize their own utility, given the others' decision.

$$\frac{\partial U_B}{\partial E} = B - epB - C_B{}'(E) = 0$$

$$B(1-ep) = C_B{}'(E)$$

and

$$\frac{\partial U_b}{\partial e} = (1-E)b - C_s{}'(e) = 0$$

$$(1-E)b = C_s{}'(e)$$

That is both the principal and the agent in equilibrium gather information up to the point where the marginal benefit of these gathering activities equals the marginal costs of acquiring such information. This could be presented by the response curves shown in figure 2.

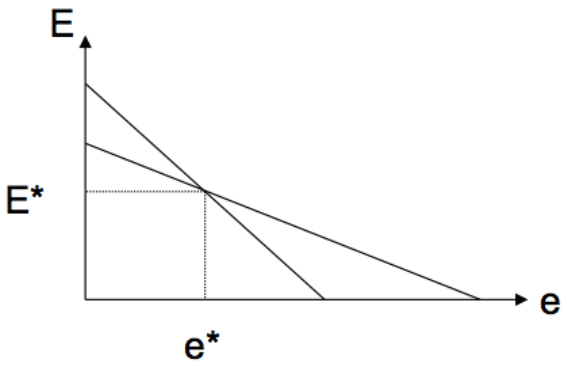

Figure 2 - Response curves showing the trade-off between loss of control for the board of directors and initiative from the CEO. The probability of the manager to acquire more information is shown on the x-axis, and the probability of the board gathering more information is shown on the y-axis.

As illustrated in figure 2, the board of directors (the principals) is best informed with probability *E** and acts on this information. With probability *(1-E*)e** however, the CEO (the agent) is the better informed, and the board rubber stamps the managers decision, leaving the real authority with the agent. The general idea in this model is that it could be optimal for the principal to give away real authority, if the preferences of the two parties are sufficiently aligned (Aghion & Tirole, 1997).

Other implications from the model is that the board is likely to monitor more as the payoff increases, higher B_k, and monitor less when their and the CEO's interests are more aligned, higher *p*. The boards' incentive to gather information falls with the strength of the signal at which the CEO gathers information, i.e. higher *e*. This is because the CEO is better informed when strongly incentivized to obtain information. The CEO takes more initiative with less interference from the principals, lower *E*, and puts more effort in gathering information the higher his private benefits b_k, in engaging in such activities (Aghion & Tirole, 1997).

2.7.2 Formal vs Real authority

Tirole (2001, p. 17) argues that leading theories sometimes inaccurately assumes that it is the manager of the firm, who possesses the formal right to decide upon several corporate actions. Such actions include, but is not restricted to; dividend policies, takeover defenses, or the CEO's successor. This is done despite the fact that a more common formal chain of decision-making implies that the top management must refer to a higher authority before taking such an action. Further, due to the manager's proprietary information, he will substantially influence these decisions, and sometimes even make them, and thus having the real authority. This however, is not the same as having the formal authority, as the allocation of these rights influences this. Tirole (2001, p. 17) ask: "Why

management must defer to shareholders for some decision, but not others?" Stating the extent of management control is dependent of the presence and incentives of active monitors and the divergence of objectives between shareholders, management and its monitors, for given formal control. Tirole suggests that a natural starting point is to assume that the formal control lies with the principals, i.e. the board, and then derive the conditions where management gets their way, either by contractual design, or due to the board's lack of opportunities.

2.7.3 Board independence vs CEO leeway

Hermalin and Weisbach (1998) model the board selection process as a bargaining game between the board and the CEO, under the assumption of no active role for shareholders. This game has multiple stages. In stage one, a CEO is appointed, with the commonly held assumption of the CEO's ability denoted α, which is normally distributed with a mean of zero and variance $1/\tau_0$, or $N \sim \left(0, \frac{1}{\tau_0}\right)$. In the second stage the first firm earnings, x_1, is distributed, dependent on the CEO's ability, α, and variance *1/r*. Then the board updates its beliefs regarding the CEO's ability based on x_1. The boards' a priori beliefs about the abilities of any replacement for the sitting CEO is also zero with variance $1/\tau_0$. In the fourth stage the CEO negotiates with the board over filling vacant seats, and her salary, *w*. If negotiations are unsuccessful, a replacement is hired, and the board negotiates with the newcomer over the vacant seats. The board could acquire a private signal *y*, about the CEO. The probability of acquiring this signal is increasing in the intensity at which the board monitors the CEO; the distribution of this signal is $N \sim \left(\alpha, \frac{1}{s}\right)$. If this signal is acquired the board updates its beliefs about the CEO's ability once again. Based on this new strengthened estimate of the CEO's ability the board might decide to replace, or keep the CEO. In the last stage, the second realization of earnings, x_2, is distributed $N \sim \left(\alpha, \frac{1}{r}\right)$.

In the final stage the CEO receives a control benefit, $b > 0$, if the CEO is dismissed before this stage he receives no such benefit. In addition, the sitting CEO is compensated with the wage, *w*, determined in the bargaining at the fourth stage. Further this wage is paid independent of the CEO reaching the last stage. The authors' also introduce limited liability, i.e. wages cannot be negative, $w \geq 0$. Further the CEO's ability is held fixed throughout her career, and the assumption that not even the CEO knows her own ability, only the distribution of this ability is introduced. This is justified because the CEO before taking the job, not necessarily knows if this will be a good job for her or not.

Hermalin and Weisbach let director *i's* utility be given by:

(1)

$$U_i = \theta_i x_2 - k_i d(p)$$

$\theta_i > 0$ is a constant denoting the marginal utility of receiving firm profits x_2. This utility differs between individuals, since the directors can have different shareholdings in the company they govern, and can have divergent concerns for keeping a good reputation. The variable *p*, defines the probability of the board obtaining the costly signal *y*, and is a measure of the intensity the board monitors the CEO. Finally k_i, is the directors' reluctance for monitoring.

The common disutility the board has of monitoring is given by the cost function $k_i d(p)$, where $k_i' d(p) > 0, and\ k_i'' d(p) > 0$. The costs of monitoring are strictly increasing, and strictly convex. The author's rewrite the utility function (1), since utility functions are defined up to an affine transformation, and thus can be scaled with a positive constant and still represent the same preferences.

(2)

$$U_i = x_2 - K_i d(p)$$

Where $K_i = \frac{k_i}{\theta_i}$, which is interpreted as the directors lack of dependence.

The model predicts that the intensity at which the board monitors the CEO is decreasing with higher ability of the CEO, higher α. This is because the benefit of replacing the CEO is falling with her ability, since the option to fire her becomes less valuable. The board will also have weaker incentives to monitor, when the precision of the ability estimate, $1/\tau_0$ is lower. This is because a noisier signal will create greater uncertainty about the true ability, and thus the marginal benefit of obtaining the signal also is lower. More noise in the firm's earnings realizations, $1/r$ will in this model make the board more uncertain about the ability of the CEO, and thus increase monitoring activities. Further, the board will monitor less intensely, when it is more certain it is about the CEO's ability. The incentives to monitor also fall with the lack of dependence, K_i, as a more dependent board will have greater disutility from monitoring. Monitoring however, is increasing with the strength of the signal, *y*, since the option to fire the CEO gets more valuable when the CEO's ability is better known (Hermalin & Weisbach, 1998).

Another prediction from the model is that a new CEO is more valuable, when there is greater uncertainty about her ability (higher $1/\tau_0$). This implies that a new CEO always is preferred over an incumbent ceteris paribus. The incumbent must prove that her ability is strictly higher than the ability of any replacement. Hence, only good or lucky CEO's will retain their job in the short run, and only good CEO's will keep their job over time. Finally, it is worth noting that a continuing CEO, i.e. one that has survived the bargaining rounds, leaves the board less

independent. This happens for two reasons. Firstly, the bargaining compromises both her wage in the next period, and new directorships. Secondly, the board will better know the ability of the CEO after many interactions, and as the board only keeps talented CEO's, the board will monitor the CEO less intensely over time. Both of the preceding arguments suggest that the board becomes less independent with the tenure of the CEO.

In the bargaining over compensation and new directorships, the board is more likely give up independence than to budge on compensation (Hermalin & Weisbach, 2003). The argument in favor of this is that a loss of independence only is a second order loss to the board, since there is no guarantee that the board will suffer a real monetary loss on the basis of this action. To give the CEO a pay rise on the other hand represents a first-order loss, or as the authors' state it: "the marginal cost of a dollar is always a dollar" (Hermalin & Weisbach, 2003, p. 66).

It is a commonly held assumption in economic literature that weak governance is associated with excessive CEO compensation (Hermalin & Weisbach, 2003). Core et al. (1999) find characteristics of the board indicating a weak governance structure to be associated with higher CEO remuneration. They conclude that board and ownership structures affect the level the CEO extracts compensation, in excess of what is predicted by economic determinants. Their findings suggest that firms with weaker governance structures have greater agency problems, perform worse and that the CEO's in such firms extract more compensation (Core, et al., 1999). The findings of Core et al. (1999) suggesting that CEO's extract more compensation in firms with a weaker governance structure, contradict the prediction of Hermalin and Weisbach's (1998) bargaining game. The latter indicating that highly talented CEO's are in a position to bargain not only for greater compensation, but also for less board intervention. The link between CEO compensation and what appears to be weak governance may nevertheless be spurious. In other words, high CEO compensation could also be the consequence of a highly successful CEO utilizing his bargaining position (Hermalin & Weisbach, 2003).

2.7.4 Can weaker boards create value?

Alzaman and Suarez (2003) propose three different governance structures, each optimal to govern shareholder value, in their specific operating environment. They show that there are instances where the shareholders would be better off with a weak governance structure than a strong one. This implies that is shareholders could gain on having a board that monitors less intensively, and thus increases the leeway of the CEO. A weak board is preferred when the CEO's investment decision is hard to monitor precisely, and the control rents are low. The reason for

this is that much noise regarding the performance of the CEO makes performance-based compensation costly. Having a weak board compensates the incumbent CEO with bargaining power over his dismissal, allowing the performance-pay to be lower. Severance pay (golden parachute), however is required to prevent the CEO from credibly threatening to oppose his replacement if such a decision is made.

However, if control rents make the CEO-entrenchment problem to severe, a strong board combined with severance pay is found to be optimal, because the CEO's investment decisions are likely to be a modest predictor of the CEO's performance. In this solution the board could fire the CEO, but at a cost, since the severance package protects the incumbent from being replaced by a slightly better candidate. The final structure is what Alzaman and Suarez (2003) states as "the perceived optimal one". This is where the firm has a strong board, and can fire the CEO at any point in time at no cost, i.e. there is no severance pay. This structure is found to be optimal only if performance is an accurate signal of the incumbent's investment decisions, and control rents are of such magnitude that entrenchment is a moderate problem.

2.7.5 Some board regularities

There are some empirical regularities regarding the board of directors. The ratio between inside- and outside directors does not seem to affect performance. Inside directors are generally regarded employees of the firm, while an outside director has no previous work history in the firm (Adams, et al., 2010). The distinguishing "gray" outside director is also common, meaning a director with indirect ties to the company, such as business- or personal relations. The board size is thought to affect performance, where firms with smaller boards outperform firms with larger boards.

The outside-to-inside ratio of directors appears to be related to the decisions of the board. Firms with higher fraction of outside directors and smaller boards make different decisions regarding acquisitions, CEO-compensation, CEO turnover, and poison pills, than larger- or less independent boards (Hermalin & Weisbach, 2003). It further seems to be a positive relationship between a smaller board and CEO turnover following poor firm performance (Yermack, 1996). This may also be consistent with Hermalin and Weisbach's (1998) model if large boards and the CEO are more dependent. Then given that an incumbent CEO bargains to increase the board size, a large board is likely to a greater extent than a small board, to ignore poor performance by the CEO (Adams, et al., 2010).

Boards change over time and this is found to be dependent upon the relative bargaining position of the incumbent CEO to the board of directors, firm performance, CEO turnover and changes in ownership structure (Hermalin & Weisbach, 2003). As a final concern, most of the variables determining board structure are likely to be endogenous. This is due to the fact that the variables in question usually are a product of both previous choices, but also a determinant of subsequent ones. Hermalin and Weisbach (2003, p. 2) use the board of directors' impact on firm performance as an example, stating that: "firm performance is both a result of the actions of previous directors and itself a factor that potentially influences the choice of subsequent directors". Further, the variables are plagued with reverse-causality concerns, such as: is the board size the sole reason that firms with small boards outperform firms with large boards, or do the best firms ceteris paribus happen to also have the smallest boards?

As a final note to the boards' contributions, the board of directors can be seen as the product of the agency problems they are instituted to solve (Adams, et al., 2010). Therefore, if one is to detect a firm with something signaling a weak governance structure, it should be questioned why this structure was chosen. As it both can be the result of a mistake, or it could be the appropriate, but an inadequate solution to the optimization problem the firm is faced with. The board composition can be seen as an equilibrium phenomenon, which makes it hard to explain how certain board actions could consistently increase firm value. If one however suspects that the board for some exogenous reason is pushed out of this equilibrium, the question of how this occurred must be addressed (Hermalin & Weisbach, 2003, p. 7).

2.2 The quota

The Ministry of Children and Family [Barne- og Familiedepartementet,], was the first to propose a gender quota for Norwegian public owned firms, and private public limited liability companies (Ministry of Children and Family, 2003). There however was a clause in the proposition, stating that there would be no mandatory quota if voluntary compliance were made before end of the year 2005. The decision regarding making the quota mandatory for all ASA firms would be made on the basis on how the gender representation evolved in these firms up to the 1st of July 2005. The proposition does however, not mention any specific sanctions for firms failing to comply with the quota at this time. On the 9th of December 2005, the quota became mandatory, as the voluntary compliance where way below the desired levels. All publicly limited liability companies were given two years to comply with the quota, and the sanction for non-compliers were forced liquidation. Newly registered ASA firm, or any company converting from AS to ASA, after the 1st of January 2006, had to comply (with the quota) when registering (Ikrafttr. av lov 2003:120, 2005).

2.2.1 Rationale behind the quota

The emphasis in the proposition from the Ministry of Children and Family was the imbalance between the genders represented on the boards of privately owned ASA's, since the share of female directors was 7,3% in April 2003. The government found this unfortunate, and intervened by fronting a societal development that recognizes the competence and abilities of both sexes. This was based on the grounds that women in Norway were both highly educated and active in the work force, but still very underrepresented at the very top of the Norwegian economy (Ministry of Children and Family, 2003).

2.2.2 Women in the boardroom

The female contribution to the board of directors has been highly debated in the aftermath of the quota. A list, though incomplete, of some of the most important contributions follows. First of all, women provide more diversity to the Norwegian boardrooms. One of the main arguments of the Ministry of Children and Family in favor of the quota was that firm value was likely to suffer from the unused talent among women, as men dominated the top layer of the Norwegian economy. Adams and Ferreira (2009, p.2), point at the same argument, suggesting that the boards, and thus firms can improve their effectiveness by choosing directors from a bigger pool.

Women on the board of directors in firms listed on the Standard and Poor's 500, S&P Mid-Caps and S&P Small-Cap firms, have better attendance records on board meetings (Adams & Ferreira, 2009, p. 301). Bøhren and Staubo (2016) found that the average share of independent directors on Norwegian boards increased from 46 to 67 percent, ensuring higher board independence, at least in the short run. Board independence however, are likely to fall as more "busy" board members are appointed, where "busy" implies holding three or more board seats (Fields & Keys, 2003). Eckbo et al. (2016) find the fraction of "busy" directors in Norway to be moderate also after the quota, increasing from 3 percent in the period 1998-2005, to 6 percent between 2008 and 2013. It therefore appears that the quota has increased the independence of Norwegian boards.

Adams and Ferreira (2009) find a positive effect in the male directors' attendance records, when female directors are on the board. They allocate this to a pure gender effect, as their test of peer-effects fails to be statistically significant at conventional levels. A peer-effect is the reason for better attendance when men behave differently if their peers are more dutiful, regardless of gender. A gender-effect is expected to be the cause of better male attendance if men are more dutiful in the presence of women (Adams & Ferreira, 2009, p. 298). They further find that women are more likely than men to engage in monitoring related activities. In the US firms in their sample,

there is a higher fraction of women in such committees than the fraction of women in boards in general, which implies a relative overrepresentation of women compared to men on monitoring committees, at least in the US.

Adams and Funk (2012), surveying all directors in publicly traded Swedish firms, find that women at the top of the corporate ladder differ from the general population of women in their attitudes towards risk. They find that women with directorships to be even less risk averse than their male counterparts, which oppose the accepted idea that females by nature are more risk averse. This also contradicting the general argument that women on boards destroys firm value, as risk aversion is generally considered a negative trait among corporate leaders (Adams & Funk, 2012). The gender equality is high, and at somewhat similar levels in Norway and Sweden (Jakobsson & Kotsadam, 2010), therefore the gender biases in Norway as in Sweden are expected to be low. Adams and Ferreira (2009) further find that men are more achievement orientated than females, but put less emphasis on universalism and benevolence, in line with the typical gender gaps. The female board members are also less scrutiny oriented, less traditional and care more about incentives than men. This may be consistent with women making more stakeholder oriented decisions.

2.2.3 Arguments against the quota

The main argument against the quota mostly originates from Hermalin and Weisbach (2003), stating that the board is a product of a highly endogenous selection process, and thus is being optimized in a fashion to best solve the agency problems they are faced with. Any restriction to or constraints put on the board structure, therefore should at best have a neutral valuation effect, but are more likely to be detrimental for firm value.

Greater interference may lead to breakdown in communication between management and the board (Adams & Ferreira, 2009). Suggesting a potential loss in shareholder value as a more heterogeneous board of directors could hamper communication, and thereby delay the decision-making process. Since this contradicts the Hermalin and Weisbach (1998) model, Adams and Ferreira (2009) argue that the ex-ante prediction of gender diversity's impact on firm value is ambiguous and that the net effect ultimately must be determined empirically.

Previous findings of the mandatory gender quota are spanning from detrimental for shareholder value Ahern and Dittmar (2012), to a neutral valuation effects, Ekcbo et al. (2016). Adams and Funk (2010) open for positive effects of a mandatory gender quota, at least from a stakeholder perspective. The implications of imposing more women to the board of directors, does not seem to be clear ex ante.

2.3 Hypotheses

This far we have presented a general theory of why and how boards seem to exist and some quota related facts. In the following a set of hypotheses are presented.

The first section of this thesis investigates how the experience of the boards of Norwegian publicly limited liability companies "ASA" firms were affected by the gender quota which leads us on to the first hypothesis,

H.1.a: The ASA firms on average lose experience as a result of the gender quota, and these losses are greater for the firms that meet the quota later.

The next section investigates whether the ASA firms in the aftermath of the quota are able to attract new board members with more sector experience than the AS firms. One could imagine if directresses where short in supply that only the earliest adapters would get the directresses with most experience. Firms that are unable to attract, or even find directresses with sector experience, is further expected to add different experts to their board. This leads us to the two hypotheses,

H.1.b: The timing of when the firm adapts to the quota matters for the experience level of the incoming directresses they attract.

H.1.c: The timing of when the firm adapts to the quota is part of determining the expertise the firm attracts post-quota.

The next section examines if the timing of when firms adapted to the quota matters for the actions they had to make to comply. It is expected that the gender quota is costless for firm already in compliance when the law was introduced, as they endogenously have chosen the structure they later are imposed to have. However, it is less certain that a firm with a highly different board structure than one the quota impose, can meet the quota with same ease.

H.2: Firms adapting to the quota later to a larger extent are forced to make substantial changes to their existing board structure.

The third and final part of this thesis examines how corporate governance is affected by the quota. Two of the main components within the area of responsibility is to negotiate over wages with the manger, and make sure the accounts are correct and righteously present the state of the firm.

H.3.a: The gender quota affects manger remuneration different for firms adapting earlier.

H.3.b: Firms adapting to the quota earlier have less audit remarks post-implementation.

3.0 Data

3.1 Data source

The data used in this thesis is provided by SNF and NHH's database of accounting and company information for Norwegian companies. The data delivered are from the Norwegian corporate entity registry, and comprises accounting data, separate accounting data for firms reporting consolidated accounts, corporate data, and board data for the years 1998-2014 for all firms registered in the Norwegian entity database (Brønnøysundregisteret) (Berner, et al., 2015). The availability of data regarding board members restricts the sample years from 1998 through 2014. All the data are collected at the end of the year, and thus the information about the firms' accounts and the board data is what is reported at the 31st of December. The exact date for when the corporate data is collected is not known. It is however collected at some point between the 31st of December and the 1st of July in the following year. Finally, it is a panel data set where there both are a cross-sectional and a time series dimension to the data. Panel data concern collected data about the same individuals over time (Wooldridge, 2013).

3.2 Sample selection

The corporate data comprises 2,814,700 firm-year observations over the sample period. The information collected from this data set are number of board members, including the distribution of gender, employee representatives, firms' legal form, whether the firm is listed or not, audit remarks, and the sector of the economy the firm operates in.

The board data contains information about the names, birth dates, addresses, company role, gender of the board members and the CEO. Further it contains partial information regarding the board members' election to the board. The latter information is important for this thesis as the primary focus is on the shareholder-elected board members, since the regulation mainly was meant to increase the number of shareholder-elected women. The board data are collected on annual basis, where the number of observations in a year spans from a low of 831,952 individual observations in 1998 to a high of 1,468,892 individual observations in 2014.

There are only 65,748 firm-years for firms reporting consolidated accounts, a far lower number of observations than in any of the other data sets. This data set contains a whole range of accounting fixtures, such as total revenues, total assets, total debt, EBIT, net income, and the CEO's compensation. The main reason for only including firms reporting consolidated accounts in the sample, is that by including all firms for which it could be obtained accounting data, I would be more likely to register some firms' accounts multiple times. The reason for this is where there exists a parent company, this firm's result will at least partly be explained by the results of the

daughter companies. The problem is increasing where the parent company is a holding company, as the result of such a company solely depends on its daughters' results.

One consequence of only keeping firms that report consolidated account is of course that much information is lost. As there exists a high number of Norwegian AS firms, this restriction is not likely to make these firms too few in numbers. However, some ASA firms also are dropped by this restriction. I am interested in information regarding as many ASA firms as possible, since they are less numerous than the AS firms. Therefore, to keep the number of ASA firms in the sample as high as possible, additional accounting data for ASA firms are appended to the consolidated accounts data. The data for these ASA firms are obtained from the data set containing accounts for all registered Norwegian firms. A total 4,048 firm-years, have the information required, however 1,690 of these firms are reported to have a parent company and therefore are dropped from the sample. In total, the sample is increased by 2,358 ASA firm-years by appending ASA firms that do not report consolidated accounts.

As the primary interest is firms reporting consolidating accounts, the data containing this information are merged with both the corporate data and the board data in two separate operations. Only observations for which it exists accounting data are kept in both merged data sets. Further only firms with limited liability are included, i.e. firms with legal form denoted as "ASA" or "AS". Of these all ASA firms, and AS firms that report consolidated accounts are included. In a second step the accounts-board data are merged with the accounts-corporate data constituting the preliminary data set for the analysis.

Of the 65,748 firm-year observations for firms reporting consolidated accounts, 50,649 satisfy the legal form criteria, and have the required corporate information. In the first step the only exclusion restriction from the corporate data is that we must know the sector in which the firm operates. In addition, there are 2,358 ASA firms that do not report consolidated accounts that have sector information. This makes the total sample size counting 53,077 firm-years. 47,271 firm-years are for 13,982 unique AS firms, 7,365 firms-years are from firms ever having the legal form ASA, and 5,806 of these firm-years are for 989 unique ASA firms. An overview over firm-years by legal form is presented in Figure (3). 1998 differs from the other years by having more than twice the number of independent AS firms than any other year. The most apparent reasons for the much higher number of AS firms reporting consolidated accounts in 1998, is that new regulation came into law the 2nd of July 1999, opening for an exception for firms obliged to report consolidated accounts in aksjeloven (asl) § 8-7 subsection three. This act no longer requires AS firms, which has a mother company in a state that is subject to the EEA-

agreement. Further the regulation in this country must be stricter than that of aksjeloven §§ 8-7 to 8-9, that benefits the daughter of such a mother company, if the daughter company is under the regulation mentioned and belongs to a country that is part of the EEA-agreement to report consolidated accounts (aksjeloven. asl, 1997:44).

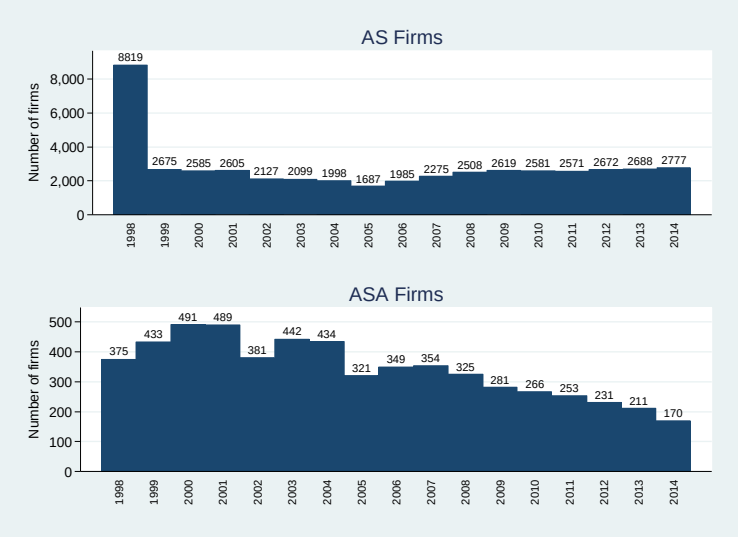

Figure 3 – The total number of stand-alone firms registered in the Norwegian company entity register, that reports consolidated account and have the legal form AS is shown in the higher section. All stand-alone firms ever registered with the legal form ASA is shown in the lower window. Source: SNF and NHH's database of accounting and company information for Norwegian firms.

3.2.1 The selection of data

3.2.1.1 Board data

The board data is mainly used to generate variables about board characteristics, regarding previous board-, CEO- and turn over. There are 53,983 firm-years in the sample for firms reporting consolidated accounts, and for which it exists board data. The careful reader will notice that the match here is slightly higher than between the corporate and accounting data. The 53,983 firm-years encompass 11,085 AS directors and 2,141 ASA directors in the average year. This average is not taking 1998 into account when there are 24,837 directors. The reason for the high number of board members in 1998 is the high number of AS firms reporting consolidated accounts this year. Further, not including 1998, the general trend is that the number of AS directors' increases steadily from almost 12,000 in the pre-millennium years, to 13,773 in 2014, or an increase of about 17%.

The number of ASA board members peak at 2,794 in 2001, up from 2,173 in 1998, before steadily decreasing to 1,284 in 2014. The average board size is fairly constant for the two groups throughout the period. AS boards have on average about 3.3 members, while the ASA firms have about 5 members. The number for active firms appear to be the cause of the increase in AS directorships and the decrease in ASA directorships. In total the data set

contains 224,851 director observations, of which 16,784 are employee representatives, 52,569 deputy directors, where 15,161 are employee representatives, and 37,118 CEO observations. The composition of director observations is divided between 188,446 AS directors and 36,405 ASA directors.

3.2.1.2 ASA firms

All the 7,365 firm-year observations for stand-alone firms ever being listed as ASA for which it exists sector information as mentioned are initially kept. Of the 7,365 firm-years 5,806 are registered with the legal form ASA. However, the primary interest is the effect of the gender quota. Therefore, as a second exclusion restriction, only firms that exist both prior to, and after the quota are kept in the sample. This also assures that we have panel data, and not a data set with independently pooled cross-sections. The second exclusion restriction leaves 4,626 firm-years for 482 unique firms that has the legal form "ASA" at some point in the time period. There are 3,984 observations for firms having the legal form ASA. These are spread over 2,035 firm-years for listed ASA firms, while 1,949 firm-years are for unlisted ASAs, and count respectively 239 and 363 unique firms. The remaining 642 firm-years are observations for firms with legal form AS, that either convert to ASA, or converts from ASA to AS during the sample period. The average number of operating years for the ASA's kept in the sample is in excess of nine and a half years.

3.2.1.3 Selection of control groups

Two different control groups are made. The first includes all of the 15% largest AS firms by total revenues that report consolidated accounts. The second is an attempt to make a control group with an ownership structure similar to that of the ASA firms, as well as more similar to the ASA firms in terms of revenue, and assets. The second control group therefore only include the 10% largest AS firms by total revenue. A common decision comprising both control groups is that all firm-year observations where a single-person or a zero-person board is detected, are dropped from the control group. A total of 10,624 firm-years are dropped because of this restriction.

Control group 1

In this control group only the 15% largest companies by revenue are kept in a first step, resulting in 20,559 AS firm-years being dropped. Further, 6,538 firm-years are for firms only existing prior to or after 2007, dropping these makes the group count 11,081 firm-years. The restriction that firms must exist both prior to and after 2007 however makes the curve of AS firms over the sample period highly bell shaped. The average ASA firm in the sample operates for 8 years, while the average life of a AS is 3.4 years. To make the groups more even, the 40%

smallest firms that have less than 5 firm-years of observations in 2007, are dropped. In this step we drop a total of 332 firm years, leaving 10,749 AS firm years in the control group. Last, all AS firms where the government holds a controlling proportion of the shares are dropped from the sample.

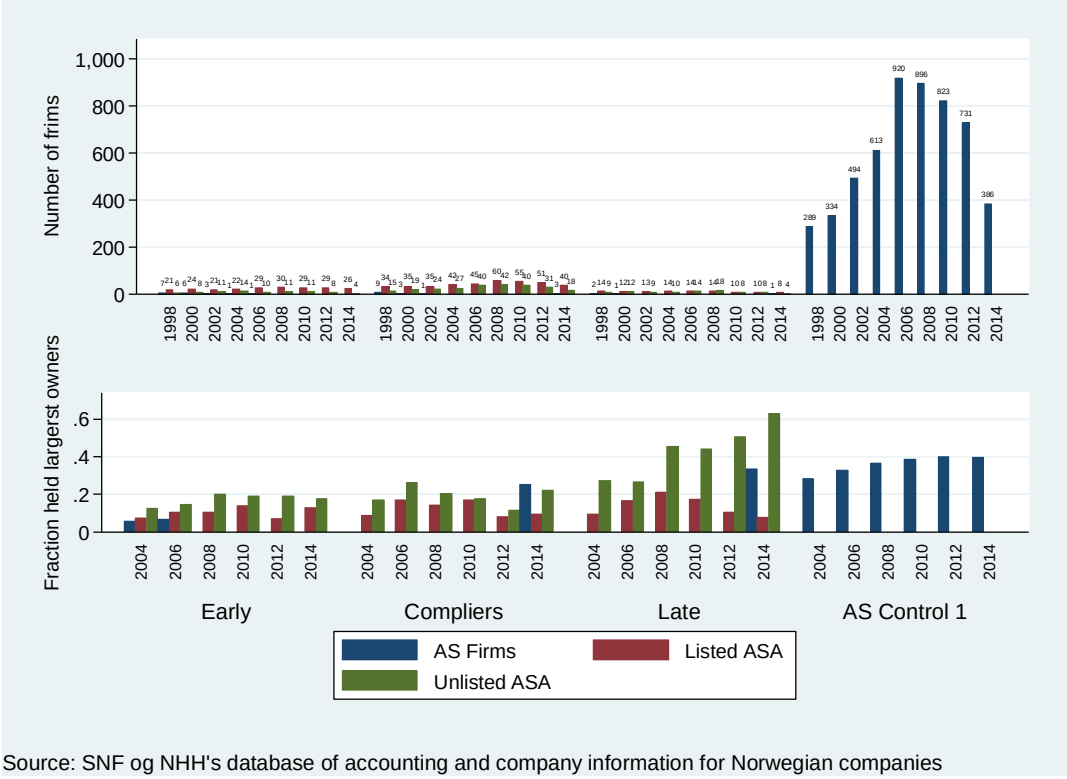

Figure 4 - Number of firms, are shown in the upper part, and ownership fraction is shown in the lower part. Firms are divided by legal form, and further by listed or unlisted if having the legal form ASA

Control group 2

The variable *Largest owner* only have observations from 2004 and onwards. The sample average for the fraction of shares held by the largest owner is 0.451 for all AS firms. For AS firms where the CEO is also part of the board, the largest owner control approximately 50,9% of the firm, while the average ownership fraction of the largest owner in ASA firms is about 18,3%.

There are three reasons why all AS firms where the CEO is also part of the board are dropped from the control group. First the Public limited liability companies act §6-1 prevents CEO's on ASA firms from being part of the board. To make the groups more similar, it is natural to drop AS firms having this practice. Second, NUES recommendation for good governance states that firms should avoid having the top management as members of the board (NUES, p. 27). Third, and perhaps most important, the average ownership fraction of the largest owner is particularly high for firms where the manager is part of the board. This could reduce the relevance of the board,

as Jensen & Meckling (1976) conjecture, a large owner, which also is the manager, could lead to weaker incentives to monitor and therefore reduce the need for a strong and experienced board. This is because the managers incentives to enjoy more non-pecuniary benefits increases as he sells of a fraction α, of his shares. An owner holding a large proportion of the firm therefore ceteris paribus is expected to manage the firm more efficient than an owner with a small owner ship stake. There is reason to believe that the manager also is the largest owner, as many of the firms where the manager also is on the board, often bear the managers last name. The fractions of shares hold by the largest owner drops to about 40.87 percent after dropping the firms where the CEO also member of the board.

Shleifer & Vishny (1997) propose that large owners could monitor more on their own, and therefore reduce the relevance of the board. Further, the agency problems in firms with a large owner are likely to differ from the agency problems in firms with more disperse ownership. In order to make a control group that resembles the treatment group, AS firms where a single owner holds more than 40% of the shares are dropped. This reduces the average ownership fraction of the largest owner in this control group to about 23.16%, which is much more similar to the average ownership fraction held by the largest owner in ASA firms. This also has the beneficial feature of excluding AS firms where the government holds a controlling proportion of the firm from the sample.

The steps in making the second control group is as follows; First 11,513 firms-years where the CEO is also part of the board of directors are dropped. Second, 3,462 firms are dropped due to the ownership fraction of the largest owner being larger than 40%. Third, the 10% largest of the remaining AS firms by total revenues are kept. Finally, all firms that do not have observations prior to and after 2007 are dropped. After the two last operations 4,106 AS firm-years remain in the control group, counting 516 unique firms. The latter implies that the average life of an AS firm in the sample is approximately eight years.

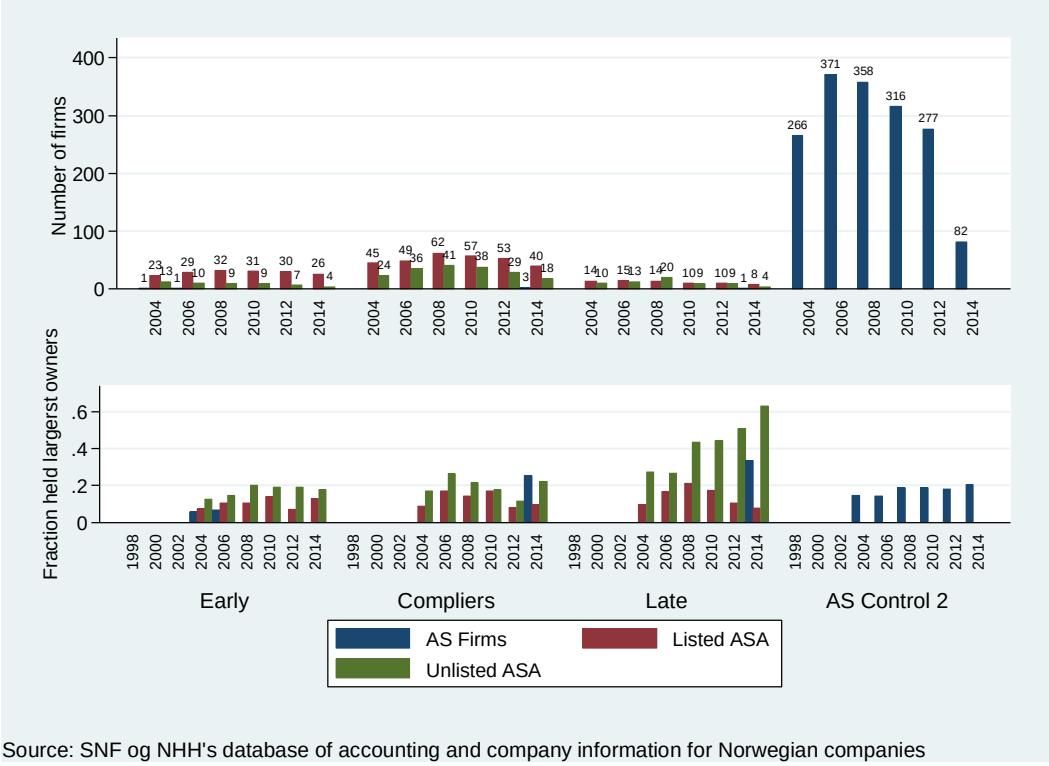

Figure 5 - Number of firms, are shown in the upper part, and ownership fraction is shown in the lower part. Firms are divided by legal form, and further by listed or unlisted if having the legal form ASA

3.3 The treatment groups

This section explains, which information that is used to create the treatment groups, and provide some insights about the different characteristics of these groups.

3.3.1 Information set

The information set used to create the groups are based on the quota related news collected by Nygaard (2011). The first news about a gender quota are from October 1999 when a public hearing regarding gender representation on private firms found place. A second hearing is held in July 2001, and in March 2002 the government for the first time release a statement saying they would continue to work towards a law proposal. The 13th of June 2003 the first law proposal regarding the quota is presented. It suggests a minimum requirement of 40% women on the boards of all government owned firms as well as all ASA firms (Publicly limited liability companies). The proposal also includes a deadline for voluntary compliance, and further a clause stating that if compliance is accomplished by the 1st of July 2005, the law will not be mandated. The law passes the upper chamber of the parliament on the 9th of December 2003, and is signed into law the 19th of December the same year. At this point in time the act does not have any sanction for non-compliance (Nygaard 2011).

On the 9th of December 2005 the law is put into effect by the government, which surprisingly proposed forced liquidation as the sanction for non-compliance. The sanction is likely to be a surprise, as the prime minister a week or so, earlier told the press that fines would be the most likely sanction for non-compliance. The 1st of January 2008 was set as a deadline to meet the quota. At this date, 77 firms still were not in compliance, and were given to February to meet the quota. No forced liquidations found place, and by April 2008 all ASA firms were in compliance (Nygaard 2011).

3.3.2 Adapter groups

The adapters are divided into five different groups based on the information set obtained by Nygaard (2011). Of the 3,984 ASA firm-years, only 8 unique firms meet the quota by the 31st of December 2004, of which five are government controlled. Therefore, to create a group of firms adapting to the quota news in 2003, is not feasible. There also are some firms that change their legal form in the sample period, two different criteria have been used for these firms. The first rule states that any firm changing its legal form from AS to ASA before 2004 is included in one of the adapter groups. Firms that register for the first time late in 2003, and converting to ASA early in 2004, also are included in the adapter groups. The second rule states that any firm that changes its legal form after 2003, either is an AS to ASA converter, or an ASA to AS converter, dependent on which way its last conversion went. If the firm changes its legal form back and forth, it is placed in the group it changed legal form to last. Finally, there are 33 unique firms that change legal form from ASA to AS before 2003, these are dropped from the sample.

It is assumed that the semi-strong form of the market efficiency hypothesis holds, i.e. that firms on average adapt to information once it is publicly known. The firms converting to ASA before 2004 therefore are included as one of the adapter groups based on the quota related news. This is done as the law did not pass before the 9th of December 2003, and therefore any conversions happening before the 31st of December the same year are likely to be independent of the law passing the upper chamber of the parliament. It is further unlikely that many firms cancelled their conversion plans on the grounds of the law proposal in June 2003, however I am not saying that this did not happen.

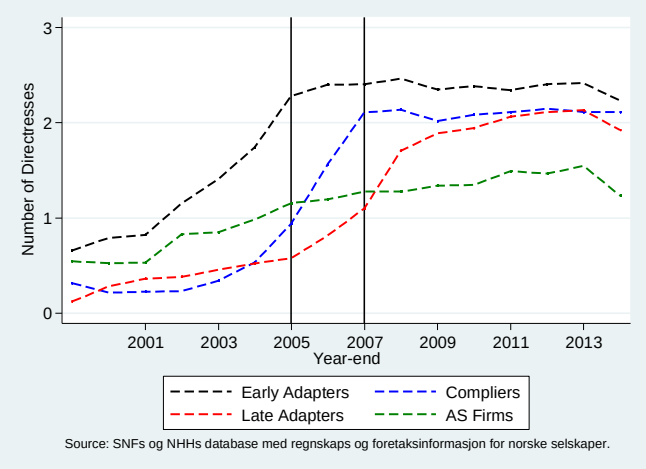

Figure 6- The average number of directresses by firm group, for a five person board is the quota met by having two directresses on the board.

3.3.2.1 Early adapters

The ASA firms that meet the quota before the 31st of December 2005 are called "Early adapters". There are 43 unique firms and 607 firm-years in this group. The cut-off is set to firms adapting before the 31st of December 2005. This is done realizing that board changes can happen fairly quickly, however the days between the 9th and the 31th of December are considered as to few for the firms in this group to act on the information that became available the 9th of December. Hence, the group is made under the assumption that these adapters acts on the information about the quota from 2003, and therefore comply by July 2005.

3.3.2.2 Compliers & Late adapters

The "Complier" group are those that are compliant with the law after it passes in the parliament. More accurate, it is the firms that meet the quota in 2006 or 2007. This group consists of 108 unique firms and 1,270 firm-years. They are assumed to act on the information on the 9th of December, and use the two following years to comply with the quota. The ASA firms that fail to meet the quota before it becomes mandatory is called "Late adapters". There are 37 unique firms comprising 385 firm-years for this group.

3.3.2.3 Converters

Last two groups consist of firms that change legal form during the sample period. The conversion year is defined as the first year when a firm has a legal form that differs from the preceding year. There are instances when firm-years are missing, for firms where only one year is missing, and the firms legal form is different in the data for two following firm-observations, the firm is set to convert in the later year. Therefore, there is some uncertainty about the exact year of the conversion. Further, there are some firms that we are unable to obtain the conversion year for, and the conversion year for these firms is set to missing. There are 73 firms comprising 505 firm-years,

in the sample that converts from AS to ASA. Among the ASA to AS converters, there are 229 unique firms, and 1,803 firm-years.

Finally, there are 86 firm-years for 40 unique adapters and converters where one- or zero-person boards are registered. Most of which are for converters that, reduce their board size to the minimum legal limit. This group encompass 28 unique firms and 63 firm-years. Some of the observations however are for inactive firms, either f firms registering or for firms being liquidated in the same year, as the law requires ASA firms to have at least three-person boards. These observations were necessary for the conversion calculations, but are in the further analysis dropped, as they are likely to have some characteristics that differ from the rest of the firm population.

3.3.3 Special cases

There are five government-controlled firms among the "Early adapters". These firms were required to comply with the quota before year-end 2005. The Norwegian government has a policy of gender equality in the society at large, and thus also forces this into all of its institutions and the firms they control. It can therefore be argued that these firms not necessarily change their board in an endogenous matter as a consequence of the problems they were faced. These firms are "Eksportfinans ASA", "KongsbergGruppen ASA"," Cermaq ASA", "YARA international ASA", and "Telenor ASA".

Among the adapters there are 24 firms that switches between meeting the quota and not. The rule for these is a firm that meet the quota in all years except for one, is allocated to one of the adapter groups "Early" or "Complier", if there is information that suggest that this one year of non-compliance were due to an unexpected change. An unexpected change is where a female director resigns from the board late in the year, and the firms fails to meet the quota due to this resignation. The group a firm is allocated to depends on when the firm meet the quota the first time. A firm meeting the quota for the first time before 2006, but fails to meet the quota in a later year prior to 2008, is an "Early adapters". A firm meeting the quota for the first time in 2006, but not in 2007, or 2008 is placed among the "compliers". Firms that meet the gender requirement in a single pre-quota year, but then fail to meet the quota until it becomes mandatory, and for which it seems likely that not meeting the quota in these years was an active choice, are placed among the "Late adapters". The information for these firms is collected from the Norwegian corporate entity register (Brønnøysundregistrene, 2016).

3.4 Data issues

SNF and Norges Handelshøyskole's database of accounts and corporate information have been updated and controlled several times, last by (Berner, et al., 2015), as part of a master's thesis. There are some instances of missing, and even misreported data in the sample. Of the variables most used in this thesis the board data are most prone to error. Especially false reporting or missing data in the variables "Board size", "Deputy members", "Directresses" and "Employee representatives", could impact the results. In the corporate- and accounting data missing observations results in loss of information, however the selection into the groups will not be affected by this.

3.4.1 Corporate data

The corporate data is collected before the 1st of July every year t, and is assumed to apply at the prior year-end, year t-1, although this assumption is imprecise (Berner, Mjøs, & Olving, 2015). What makes this assumption imprecise, is that the board exact date the corporate data is collected is unknown, and thus the reported data do not need to be from the previous year-end, but at a later point in time before the 1st of July. The implication of this is that the board composition reported not necessarily exactly is the same as it was at the previous year-end. This could matter for the selection into groups, since a firm could meet the quota in the first months of year t, but be registered meeting it in year t-1.

To reduce the potential problem of falsely reported board size in the corporate data, three variables are generated from the board data. These are, board size, women on the board and men on the board. More precise, these variables are generated by firm-year, as the sum of the members observed with one of the three possible board roles on Norwegian ASA boards: member, vice chairman or chairman. This is possible because law prevents ASA firms from combining the CEO with a directorship within the same firm. Further, the other board roles in the database are not part of the regular board. This definition however, is imprecise for AS firms, where the CEO is allowed to be part of the board. The yearly update of board changes also makes the turnover variable less accurate. In some boards several new directors may enter and leave within a year, while there is only one change reported in the data.

3.4.2 Missing & falsely reported data

There are observations in the data where the legal form appears to be falsely reported. For most of the firms, this is of no concern, because they never change their legal form. However, some firms converting are registered as

ASA in some years after its conversion, and in some instances the firms are registered with legal form AS to early. The exact year of the conversion therefore can be somewhat inaccurate.

Further there are instances of missing information regarding the status of employee representatives (EREP). The restrictions for employee representatives are somewhat milder than that for ordinary board members (asal)§ 6-11 subsection five, states that if the employee representatives count two or more, both sexes should be represented. However, this does not apply if one of the sexes is represented with less than 20 percent of the total number of employees in the company at the time of election. This can lead to boards where only one gender is representing the employees. Misreporting where an EREP is reported to be an elected member of the board, thus can lead to wrongfully registering regarding the quota status. There are three times as many male employee representatives as there are female in the sample. Given random misreporting, this on average should lead to more men than women being counted as ordinary members when actually being employee representatives. This in turn present less equal boards, and possibly fewer firms are reported to meet the quota early, than the factual number. This problem is reduced by assuming that if a person is an employee representative in year n-1 and n+1, then the person is also an EREP in year n, and the observation is filled in if missing. It is also unlikely that someone proceed from being an ordinary board member to become an employee representative within the same firm, therefore by individual and firm if EREP is reported in one year, all the previous years also is set to EREP.

There are few observations for deputy members between 1999-2003, and no observations in 2004. When comparing the number of board members in 2004 to the year prior and the year after it seems safe to assume that this stems from lack of reporting deputy members, rather than misreporting the election status of the deputy members. A more severe problem is that some of the board data has wrongfully implemented deputy members as ordinary members. Since the selection of deputy members follows the same quota restrictions as that of ordinary members, the only implication of misreporting, if done by firm, is that the board would appear larger than it actually is. If some member observations within a firm year is misreported this could, as with the employee representatives lead to wrong timing regarding when firms meet the quota. Unlike for the EREPs the variable total board size does not include deputy observations, and thus it is less likely that the “met quota” variable is affected by false reporting. There is no indication of systematically misreporting of deputy status, thus wrong plotting or lack of reporting is not likely to be a major issue. The lack of reporting is filled in the same manner as for the EREPs. If a person is a deputy in year n-1 and n+1, then it is assumed that person is also a deputy in year n and fill in such an observation if it is missing, or alter the status of the member to “deputy board member” if it is reported as (regular) “board member”.

The accounting data also are prone to missing observations. The data provided SNF and NNH's database in some years are inadequate, and further given different variable names in different years (Berner, et al., 2015). The data however are likely to be missing at random, since it is the third party, and not firms that deliver data of poor quality. The accounting data appears to be more complete for firms obliged to report consolidated accounts than for firms not obliged to do so. The variables that need to be complete are *total assets, total amount of debt, and CEO's compensation.* I control for that these variables in fact are complete, using a variable that sums the total equity and the total debt. If this observation differs from the total assets, all the accounting information for this firm-year is set to missing. Further some firms report consolidated accounts in some years, and ordinary accounts in other. When this is observed only the fixtures from the consolidated accounts are kept. The reason for this is that in years where a firm both reports consolidated and ordinary accounts the two often differ quite substantially. However, if an ASA firm only reports ordinary accounts, all fixtures for this firm is kept. There in total are 183 firms with negative equity if control group 2 are used, and 327 firms if we use control group 1.

3.4.3 Selection problems

Choosing a panel data structure, over two independently pooled cross-sections have the unfortunate effect of making the number of firms most numerous around the quota threshold. Mace (1986, p 178) and Nues (2014) recommendation, both consider taking charge if the case of a corporate crisis as one of the primary responsibilities of the board of directors. The use of panel data therefore may possibly skew the sample. This is because prominent or "good" boards, potentially handles negotiations with both equity and debt holders better than firms where the members are merely filling seats. This in turn may suggest that the firms with the weakest boards are the ones most likely to go bankrupt at any given point in time, and thereby possible tilt the sample towards the firms with the strongest boards. However, the panel data will correct for the potential biases associated with firms with weak boards, and that also go bankrupt induce.

4.0 Methodology

This section discusses the primary statistical tools used in the analysis. It presents the empirical specifications, and discusses the required conditions for performing regressions.

4.1 Estimation methods

Ordinary least squares (OLS) is an estimation method that minimizes the sum of squared residuals (Wooldridge, 2013). The simplest regression model from which one can derive OLS estimates is given below,

$$y_i = \beta_0 + \beta_1 x_1 + u_i \quad [3.5.0]$$

Without loss of generality one could assume that the expected value of *u* is zero. This could be done, because nothing is lost when assuming that average value of *u* in the population is zero, as long as the intercept β_0 also is included (Wooldridge, 2013). Formally,

$$E(u) = 0 \qquad [3.5.1]$$

OLS is based on the assumption that the independent variable x_1 and the error term u_i are unrelated. The crucial assumption is that the average value of *u* does not depend on the value of *x*. Mathematically,

$$E(u|x) = E(u) \qquad [3.5.2]$$

Combining the assumption that the expected value of the error term is zero [3.5.1] with the mean independence assumption [3.5.2] one derives at the zero conditional mean assumption, which can be written as,

$$E(u|x) = 0 \qquad [3.5.3]$$

The zero conditional mean assumption could be seen as breaking y_i, into two parts. Where the first part, $\beta_0 + \beta_1 x_1$ represents the systematic part, and thereby the part of *y*, that *x* can explain, while the second part *u* often is called the unsystematic part, which cannot be explained by *x* (Wooldridge, 2013). By minimizing the sum of squared residuals, OLS is the best linear approximation by which the fitted values for *y* could be explained from any $\widehat{\beta_0}$ and $\widehat{\beta_1}$. Formally,

$$\hat{y}_i = \widehat{\beta_0} + \widehat{\beta_1} x_1 \qquad [3.5.4]$$

The five Gauss-Markov assumptions must hold for OLS to be the best linear unbiased estimator of the regression model [3.5.0]. These are, the model must be linear in parameters, the observations must be randomly sampled, there cannot be perfect collinearity between any two variables, and the zero conditional mean assumption must hold. Given these four assumptions OLS will give an unbiased estimate, $\hat{\beta}_1$, however for inference to be valid, the data cannot exhibit heteroscedasticity. This means that the error term *u*, must have the same variance given

any value of the independent variable *x* (Wooldridge, 2013). If the variance in *u* is increasing in *x,* the standard errors will not be correct, and the significance of the coefficient estimates could be overestimated.

One of the main assumptions when estimating the effect of a treatment by OLS is that the treatment is randomly assigned. This is because random assignment to treatment will eliminate the selection bias if the sample size is sufficiently large (Angrist & Jörn-Steffen, 2015). If, however the treatment is not randomly assigned, OLS will no longer be "BLUE". When capturing the difference in group-means if the treatment is not randomly assigned we are by estimating with OLS both finding the average causal effect, plus an additional term referred to as selection bias. By estimating the effect of the gender quota in the event of non-random assignment, we are estimating the effect of a gender quota, plus the differences in the dependent variable before treatment between the firms that have more than 40% women on their boards, and those that have less than 40% women.

A natural experiment, or sometimes referred to as a quasi-experiment, occurs when an exogenous event changes the operating environment of the firms (Wooldridge, 2013). This exogenous event could for example be a policy change, where the parliament passes an act imposing one group to take some actions or to make some adjustments, whereas another group remains unaffected. A natural experiment must have a treatment and a control group. The fact that the treated group is not allowed to choose its treatment makes such a setting close to a randomized experiment. A reliable natural experiment is, according to Myers (1995) where the determination of the assignment of treatment originates from an obvious exogenous source of variation in the dependent variable.

Difference in difference is an approach where it is realized that groups with different characteristics are likely to differ in outcomes when the treatment is not randomly assigned. However, there could be instances where the outcomes for two groups move in parallel in the absence of treatment (Angrist & Jörn-Steffen, 2015). If outcomes of the two are parallel in absence of treatment and one of these groups gets the treatment while the other does not, the group not receiving the treatment is likely to be a good control group. The regression model we want to estimate using the difference in difference estimator could on its simplest form be written as,

$$y_{it} = \beta + \delta * Post_t + \alpha * Treatment_i + \gamma * post_t * Treatment_i + u_{it} \quad [3.5.5]$$

Where β the intercept also contains the control group pre-treatment, δ denotes that we are in the post-period. α is a dummy indicating that observation *i*, belongs in the treated group, and γ the coefficient of interest, gives the effect on the treated post-treatment. [3.5.5] could be written as,

(1) Control group pre-treatment: β

(2) Control group post-treatment: $\delta + \beta$

(3) Treated pre-treatment: $\alpha + \beta$

(4) Treated post-treatment: $\alpha + \delta + \beta + \gamma$

The difference in difference estimator is given by,

$$\big((4) - (3)\big) - \big((2) - (1)\big)$$

$$= ((\alpha + \delta + \beta + \gamma) - (\alpha + \beta) - ((\delta + \beta) - (\beta)) = \gamma$$

Where the parameter γ gives the average effect of the policy on the treated.

4.2 Variables

The analysis part of this thesis is divided in three different parts, and it therefore contains three different sets of dependent variables; (1) variables regarding board characteristics, (2) variables about board size, and (3) includes a set of proxies to examine how corporate governance is affected by the gender quota. The set of independent variables used is highly overlapping, and therefore are presented as one group.

4.2.1 Dependent variables

The dependent variables are presented by the order they are used in the analysis.

4.2.1.1 Board experience

The dependent variables in the following are constructed to examine, which effect the gender quota has on overall board experience.

The first set of dependent variables are concerning the average previous experience of the board. These variables also include years cumulated by the members on the current board, as this experience also must be said to be valuable for a firm. The variables are generated using the board data from SNF and NHH's database, and are constructed as follows.

The previous experience each member *i*, of the board has from year t-3 to year t-1, are summed over the total members of the board, *n*, in year *t*, and divided by the total number of members, *n*, in the same year. It thus reflects the average previous experience the board has cumulated over the preceding three years. This variable is called "*Average experience"*. Further are two more variables constructed. The first, "*Average directress experience"*, is

constructed including only female board members in the denominator, and the average experience they possess in the numerator. The second variable *"Average director experience"*, is constructed in the same way for male board members.

$$Average\ experience_t = \sum_{t-3}^{t-1} \frac{\sum_{i=1}^{n} Experience_{it}}{Board\ Members_t}$$

Where $Board\ Members_t = n_t$

The second set of dependent variables, are constructed to examine the experience of incoming members. Board experience in the same sector in the of the economy is included in the main part of the thesis.

The sector experience for incoming members in year t, is defined as the total number of outside directorships the board member has from year t-3 to year t-1 in the same sector of the economy. The variable *Incoming directresses,* sums the average sector experience over the preceding three years shared among the directresses entering the board in year t. Corresponding for directors do the variable *Incoming directors* sum the average sectror experience among the incoming directors.

$$Incoming\ experience_t = \sum_{t-3}^{t-1} \sum_{i=1}^{n} Incoming\ experience_{it}$$

Where, $i = 1,2,..,n$, and *Incoming experience,* either is for *directresses, or directors.*

The board data only tracks back to 1998, therefore the experience variables are expected to steadily increase up to 2001, before it flattens, as the experience thereafter will be calculated as the average sum of directorships over three full years. In the analysis these variables are only looked at from 2001 and onwards.

4.2.1.2 Board size

Three different indicator variables are constructed to examine how the quota affected board size. The first variable *Reduced board* is an indicator variable taking the value 1, if one or more new women are added to the board in the same year as the total board size is reduced, and zero otherwise. The second variable *Increased board,* takes the value 1, if the board size is increased in the same year as one or more women are added to the board, and zero otherwise. The last board size variable, *Sum board change,* takes the value 1, if the existing board structure is changed as one or more women are added, and zero if the board size is held constant.

4.2.1.3 Governance proxies

The first dependent variable is intended to proxy for corporate governance, as Core et al. (1999) find evidence that CEO remuneration tend to be greater in firms with weaker governance structures. The variable *CEO salary* is reported in the accounting data, and is denoted in *1000's NOK*. It is however uncertain if the variable only includes the salary of the CEO, or if it includes the total benefits the CEO enjoy (Berner, et al., 2015). The advantage of using salary as a measure of board performance is at least two-folded. Firstly, CEO compensation is likely to be less negatively affected by the financial crisis than ROA (return on assets). This is because wages often are agreed upon in advance, and even when performance pay is present, it may or may not be connected to ROA, the compensation offered is expected to be conditional on performance relative to peers. However, I am not saying that the wages do not fall in recessions, I say that wages are likely to be less volatile than ROA in the event of a recession. Second, the board members bargain with the manger over compensation, and therefore to much greater extent can influence this outcome than they influence ROA.

The next governance proxy is *Audit remarks*. More precisely it is an indicator variable taking the value 1 if the firm has an audit remark in the data in year t, and zero otherwise. According to "NUES" (2014), one of the primary tasks of the board is to ensure that the accounts reported show a correct, and just picture of the actual state of the firm. A firm receiving an audit remark cannot be said to fulfill this criterion. I further tried to construct a dummy indicating that a firm changed audits from one of the audit world's "big four", to a less reputable audit firm. Such a change could be interpreted as a negative signal. It however appears that no ASA firm in the sample do this.

Last three variables describing characteristics of the CEO are introduced. These are used to supplement the analysis were manager remuneration is the dependent variable. The first *CEO tenure*, is defined as the tenure the CEO has accumulated since 1998 independent of firm managed in the full sample, i.e. all firms reporting consolidated accounts. The second *CEO tenure at current firm*, is the tenure accumulated in the firm the CEO currently manages. Last, *Tenure of incoming CEO*, is defined as the previous CEO experience the entering CEO has accumulated during her career.

4.2.2 Independent variables

The characteristics, quality, incentives and the career concerns of an CEO approaching retirement, are likely to be different from those of an CEO in his 50's given the same tenure (Gibbons & Murphy, 1992). Therefore, I construct a variable to proxy for CEO quality, as done by Bhagat and Bolton (2008). The CEO quality proxy is

defined as the ratio of CEO tenure, to the age of the CEO, where a higher ratio indicates better perceived quality.

$$CEO\ tenure - to - age = \frac{CEO\ tenure}{CEO\ age}$$

Return on assets defined as ratio of earnings before interest and taxes [EBIT] to total assets, is included in the estimations where CEO compensation is the dependent variable. This is done for the same reason as Core et al. (1999) include ROA in their estimations when they examine if wages and governance structure are casually related. Namely that ROA is meant to pick up that pay is increasing in good performance.

$$ROA\ = \frac{EBIT}{Total\ Assets}$$

Return on equity (ROE) is defined as the ratio of net income to total equity. This measure is included as firms' may evaluate their managers by this measure rather than ROA, and further shareholders' primarily are expected to be concerned by the return on their investment. ROE is defined as,

$$ROE = \frac{Net\ Income}{Total\ Equity}$$

The natural logarithm of assets, *Total assets*, is included as proxy for firms having different sizes and, that the complexity of their operations could differ. A firm with a high level of assets is here believed to be more complex than a firm with fewer assets ceteris paribus. It is expected that both the experience variables and CEO compensation are increasing in total assets.

Further, *Leverage* is defined as the ratio of total amount of debt to total assets. The effect of more leverage on the dependent variables is ambiguous. On one hand, it could be argued that a more experienced board is better at negotiating over covenants, and their reputation makes them obtain greater levels of debt. On the other hand, financial distress is more likely to occur under the control of an inexperienced board. The arguments in favor of that CEO compensation is increasing in leverage is that better CEO's could be needed if a firm is in financial distress, and to obtain such a CEO market salaries are necessary. However, firms' leeway to pay high wages are expected to be negative in leverage, as a result of debt covenants. On the basis of this am I not sure which sign to predict for *Leverage* in any of the estimations.

$$Leverage = \frac{Total\ debt}{Total\ Assets}$$

CEO turnover is an indicator variable that takes the value 1 if the CEO is replaced during the year. A weakness in this variable is that the only information derived from it is whether or not the CEO has been changed, i.e. it says nothing about the circumstances of the change. Particular valuable information would be if we knew whether the turnover was forced or voluntary, as the implications from the two are likely to differ substantially. The variable nevertheless is included as a control as one of the predictions from Hermalin and Weisbach's (1998) model is that CEO turnover is positively correlated with board turnover. When CEO compensation is the dependent variable, this variable is likely to pick up severance packages given to leaving managers, or signing bonuses offered to entering managers.

The next set of independent variables are the number of directors and directresses entering in a given year, denoted *Incoming directresses* and *Incoming directors,* dependent on gender. The primary reason for including these variables is that the sector experience variables are dependent on the number of members that enter the board. Not controlling for the numbers of members entering potentially leads to wrong conclusions regarding the experience incoming members possess.

The three month Norwegian interbank rate offered *Nibor 3 months,* is included in some of the regression where CEO compensation is the dependent variable. This is done to control for booms and recessions in the sample period. *Nibor* is likely to follow the evolution in the Norwegian economy, and therefore is expected to be higher in booms to cool down the economy, and lowered in recessions to keep up momentum. Wages to some degree are expected to follow a similar path.

The variable *Firm age* is included to control for any asymmetries that might exist between newly started and more mature firms. For instance, more mature firms could have far more experienced boards, than start-up firms. Further this could be perfectly consistent with value maximization, because having an experienced board in a start-up might slow down the manager's decision making process in a start-up, while the board in a more mature firm is vital for monitoring the manager.

Board size is included as a control variable in the regressions where it is not itself the dependent variable. Yermak (1996) finds small boards to outperform larger boards, and suggests more free riding in larger boards as a possible

explanation for this. Hermalin and Weisbach (2003) suggest that markets see smaller boards as more efficient. The size of board, in other words may influence the wages offered to the CEO. A large board, to keep its size must also add more members as incumbent members are replaced, which directly influence the experience variables. Last, sector controls and year-fixed effects are included in all estimations. The first is included to pick up any asymmetries that may exist between the sectors of the economy. The year fixed effects are included as some of the dependent variables, like CEO salary is expected to increase as time passes.

4.2.3 Other variables

From 2004 to 2014 there are data containing information of the ownership fraction held by the largest owner. Since this variable not exist for all sample years it cannot be included as a control variable in the regressions. Control group 2 nevertheless is constructed using this information to best make a control with similar ownership structure as the ASA firms in the sample. The variable *Turnover* is the proportion of the board members that is replaced in the year. The variable is constructed from the board data, and a member is "turned over" if registered as a member of the board in year t, but not in year t+1. *ASA to AS conversions* is an indicator variable that takes the value 1 if the firm changed its legal form from ASA to AS in the current year. Last, the variable *Proportion of members with previous CEO experience* is the ratio of board members with CEO experience to total shareholder elected board members. Similar variables also are constructed for each of the genders.

4.3 Model specifications

4.3.1 The logistic probability model

In the second section of the analysis I examine if the adapters are more likely to make changes to their board structures than AS firms in the quota-implementation years. p in the logistic model denotes the probability of success. What is regarded as a success depends, on the estimation we look at, and is specified in the analysis. The regression model used is,

$$logit(p)_{it} = log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 Early + \beta_2 Complier + \beta_3 late + \beta_4 X_{it} + u_{it}$$

The indicator variables *Early*, *Complier* & *Late* indicate that firm *i*, is either part of the "Early", the "Complier", or the "Late" adapter group. The vector X_{it} of independent variables include *total assets* and *leverage*.

4.2.2 The Difference in difference estimator

The difference in difference estimator used when estimating by OLS, are highly similar for all regressions, the only difference lies in the groups included. In the first section I only look at the adapter groups, while in the following sections the converters also are included. The specification of groups is presented in the data section. However, there are different variables included in the vector of independent variables $X_{i,t}$.

4.3.2.1 The regressions estimated in the first section

In the first section of the analysis the dependent variable is some of the board experience variable, which is presented in section 3.2.1.1. I estimate the following regression for firm *i* in year t, by OLS,

$$Board\ characteristc_{i,t} = \alpha + \beta_1 Early_{i,t} + \beta_2 Complier_{i,t} + \beta_3 Late_{i,t} + Post_t + \beta_4 Early\ x\ Post_{i,t} + \beta_5 Comlpier\ x\ Post_{i,t} + \beta_6 Late\ x\ Post_{i,t} + \beta_7 X_{i,t} + \varepsilon_{it}$$

The groups dummies are the same as in the logistic model. *Post* is a dummy taking the value 1 for all firms after the post-period threshold chosen. The interaction terms with the variable *Post*, capture the effect of the quota implementation on the different groups. X_{it}, is a vector of control variables similar to those used by Eckbo et al. (2016). The vector includes the following variables; F*irm age*, the natural logarithm of total assets (*Total Assets*), the ratio of book value of total debt to total assets (*leverage*), a dummy indicating whether the firm is OSE-listed or not (*listed*), and finally we include an indicator variable for whether the CEO has been replaced or not (*CEO change)*. When the dependent variable is either one of the variables regarding incoming experience is also the number of incoming members by gender added in X_{it}. Standard errors are clustered on firm-level.

4.3.2.2 The regressions with governance proxies

In the third section of the analysis when the emphasis lies on how corporate governance is affected, the biggest difference is that also the converter groups are included in the estimations. The dependent variable now is either CEO remuneration, audit remarks or board size, here referred to as “Governance proxy”. I estimate the following regression for firm *i* in year t, by OLS,

$$Governance\ proxy_{i,t} = \alpha + \beta_1 Early_{i,t} + \beta_2 Complier_{i,t} + \beta_3 Late_{i,t} + \beta_4\ AStoASA_{i,t}, + \beta_5 ASAtoAS_t + \beta_6 Post_t + \beta_7 Early\ x\ Post_{i,t} + \beta_8 Comlpier\ x\ Post_{i,t} + \beta_9 Late\ x\ Post_{i,t} + \beta_{10} AStoASA\ x\ Post_{i,t} + \beta_{11} ASAtoAS\ x\ Post_{i,t} + \beta_{12} X_{i,t} + \varepsilon_{it}$$

The groups dummies, interactions terms with the treatment groups, and post period, are the same as in the previous models. *ASAtoAS* means the firm is in the group of firms converting to AS, while *AStoASA* indicates that a firm is in the group that converts in the opposite direction. The vector X_{it} here includes the following variables; F*irm age*, the natural logarithm of total assets (*Total Assets*), the ratio of book value of total debt to total assets (*leverage*), and a dummy indicating whether the firm is OSE-listed or not (*listed*). Further, we include the ratio of the current CEO's previous tenure to the CEO's age (*CEO tenure-to-age),* a dummy indicating whether the CEO has been replaced or not in the year (*CEO change),* return on equity (ROE), return on assets (*ROA),* and ROA lagged one period, included, and in some regressions are also the Norwegian interbank rate offered included (*Nibor 3 months).* Standard errors are clustered on firm-level.

4.4 Threats to internal validity

Threats to internal validity refers to the validness in which the inference drawn on the observed differences in the dependent variable actually is due to the differences in the relevant independent variables (Myers, 1995).

4.4.1 Parallel trends

The main assumption that needs to be satisfied for valid inference using difference in difference is that the trend in the dependent variable is the same for the treatment and the control group in absence of treatment (Angrist & Jörn-Steffen, 2015). If the trends in outcome differ before treatment, we could end up with a spurious estimate when we think we are finding a causal effect. However, one could control for different trends before treatment by adding a group specific time-trend. A problem with inducing such a trend is that if the treatment effect emerges only gradually, the treatment effect may be hard to distinguish from the differential trend.

4.4.2 Omitted variable bias (OVB)

The difference in difference approach, using pooled cross-sections is a way to control for omitted variables (Wooldridge, 2013). By in the first place assuming that the characteristics of the two groups stay fixed over the pre and post-treatment period, and secondly that the only change is that the treated group receives the treatment, it is ideally controlled for firm specific-effects that may affect the outcome variable. This does not mean that the

estimator is immune to OVB, since there could be events other than the experimental treatment occurring at the same time as the gender quota, and thus render different explanations for the results (Myers, 1995).

There are two critical events happening approximately at the same time as the gender quota came into effect. The first is the financial crisis of 2008, occurring in the first post-period year, or the last year in the pre-period, dependent of which post-quota threshold one chooses. The chosen threshold is discussed further, later in the thesis. If the financial crisis has adverse effects on AS and ASA firms, these differences are likely to be picked up as well as any other difference that may occur due to the gender quota. Hetland and Mjøs (2016) find that the most financially constrained firms ex ante, not necessarily are the ones ending up as the marginal borrowers in a financial crisis. In particular, the firms in Norway that are the least financially constrained pre-crisis are most likely to suffer most from post-crisis credit rationing (Hetland & Mjøs, 2016). Suggesting that the least constrained firms' pre-crisis will forfeit more positive NPV (net present value) projects post-crisis, and thus are likely to have more negative repercussions from the crisis. Eckbo et al. (2016) hold better access to equity markets and outside financing as one of the most important reasons for choosing the legal form ASA over AS. The findings of Hetland and Mjøs (2016) therefore suggest that ASA firms on average are more negatively affected by the financial crisis than AS firms, since they should have easier access to capital in normal times.

The second event occurring at the same time as the gender quota was a law change in 2006, allowing financial firms to change their legal form to AS. Financial firms were up to this point required to have the legal form ASA. This in turn makes the reason for any conversion in legal form, from ASA to AS even more uncertain. Many ASA to AS conversions in the quota implementation years, could as suggested by both Nygaard (2011) and Bøhren and Staubo (2014), indicate that the costs of meeting the quota was high enough for some firms that they would rather incur the costs of delisting (Bøhren & Staubo, 2014) .

Political endogeneity

Myers (1995) further emphasis that governmental responses to variables associated with past or expected future outcomes could be a threat to internal validity. The most apparent treat is that the government impose a 40% gender equality standard that encompass the management of all institutions and firms it controls at the same time as the gender quota is proposed. This also applies to the boards of such firms. In turn this potentially could affect both the compensation of the CEO, and the board experience of directresses. However, this is not regarded as a major issue, for the wages offered the CEO, as these are expected to be determined by the market. The proposal will clearly affect the choices the government controlled firms make in regards to add women to their boards from 2003. This would be a problem if there were many government-controlled AS firms' in the sample, and is taken

into account when the control groups are constructed. This is done by dropping firms where the largest owner holds more than 40% of the shares in control group 2. Further it is not regarded a problem that this also apply for the government-controlled ASA firms, since they will receive the treatment, although possibly earlier than the rest of the firms. They would however be included in a group that meet the quota early, and this should be considered when we look at this group.

Selection

Firms always had the option to change their legal form, the most likely to do this were the ones having most to lose by meeting the gender quota. Therefore, the estimates for the quota costs are likely to be biased downwards if biased in any direction. The remaining ASA firms cannot choose their treatment, but they can choose when to receive the treatment. This constitute a selection problem in the timing of when firms chose to adapt to the quota. For firms already in compliance before the quota became mandatory, the costs are perceived to be very low, or non-existent, while a firm with a large all men board in 2005 are likely to incur larger cost of adapting to the quota. One explanation for why some firms adapted early is that it was easy for them to do so. Another explanation could be that it was costly for the early adapters to meet the quota as well, but they perceived the costs (of adapting to the quota) early as smaller than the costs likely to occur by adapting late. A third explanation, the least likely one, but the only one satisfying the exogenous criteria, is if the firms adapting early did so by pure luck. The timing problem is part of what I am examining in this thesis as the ASA firms are divided into different adapter groups.

Simultaneity

Simultaneity is an endogeneity problem where the explanatory variables are jointly determined with outcomes (Myers, 1995). Simultaneity is typically encountered when the dependent variable and one of the explanatory variables are determined through an equilibrium mechanism (Wooldridge, 2013). The wage paid to the CEO, and the supply of managers, and the increasing demand for experienced directresses, both may be endogenously determined. To see why this potentially is a problem, consider a firm that obtains a highly qualified board both in regards to monitor and incentivize its manager. This would in turn increase the firms demand for high quality mangers. If we further expect either less risk averse, or managers with more belief in own abilities to prefer more performance pay over less, and these managers also happen to be the of the highest quality, the supply for high quality managers for the firms best to incentivize also increase. In other words, we might see a large scale shift in high quality managers from firms that remain status quo after the quota, to firms getting better at incentivizing its managers, and that this affect the wage gap that might exist between firms.

4.4.3 Specification of variance

The firm year observations are likely to be serial correlated. If good performance is observed by a firm in one year, and this increases the likelihood of good performance the following year, one can say that the data exhibit serial correlation (Angrist & Jörn-Steffen, 2015). In many of the variables used in this thesis the value of a variable in year t, can at least to some degree be predicted by the value for the same variable in year t-1. When looking at average board size, or fraction of the board of directors with CEO experience, knowing that the total turnover rate is about 25% in a given year, these variables are likely to be serially correlated. Wages are also likely to exhibit high positive autocorrelation (Bertrand, et al., 2004).

The difference in difference estimates and their standard errors are derived from panel data, and therefore often are subject to serial correlation (Bertrand, et al., 2004). Further, they find that positive serial correlation in the dependent variable, and if there also is little variation in the variable over time, the standard errors of the coefficient estimates are likely to be severely understated. For inference to be valid is correct specification of variance necessary (Myers, 1995). An omission of a group error term, and thereby ignoring that individual observations may be correlated, this could lead to overstatement of significance as the standard errors are likely to be too low. If the data exhibit serial correlation, do each observation hold less information than it would if sampling was truly random. One way to control for serial correlation within groups, or clusters, is to use the formula for clustered standard errors (Angrist & Jörn-Steffen, 2015). Using clustered standard errors, no longer requires the assumption of randomly sampled data. It is however required that the firms be randomly sampled, i.e. that firm *i* and *j* do not have correlated errors.

Stata (Statistics data analysis) has an option an option where clustered standard errors could be specified at an aggregate level. Other possible corrections for auto correlation suggested by Bertrand et al. (2004) are to: (1) specify an autocorrelation structure (2) Block bootstrap, a variant of bootstrap that maintains the autocorrelation structure by clustering observations in groups. (3) Ignore the time dimension when estimating standard errors. A way of doing this is to take the average of the observations before and after the gender quota. The last two solutions presented by Bertrand et al. are two different co-variance matrix approaches.

4.5 Threats to external validity

External validity refers to the generalizability of the effects found in the experiment (Myers, 1995). For instance, the findings of the quota are likely to be similar in different countries, for different firm types, or for different points in time.

One of the main drawbacks with the difference in difference estimator is that it is generally not applicable to different settings or different areas. This is because it uses the implied fixed-effect assumption, and that other firms and other countries are likely to differ from the ones we are looking at. The threats to external validity according to Myers (1995) divided in three sub-categories by Cook and Cambell (1979). These are: (1) Interaction of selection and treatment, (2) Interaction of setting and treatment, (3) the effect of the treatment across time periods.

Regarding the interaction between selection and treatment, it should be noted that the ASA firms are by far the largest, and those with the most disperse ownership in Norway. Therefore, one should not expect that the results for the ASA firms can be of use to predict outcomes for other firm types in Norway. The interaction with setting however, is more likely to be satisfied. This is because the results of the gender quota may be generalized to apply in countries with approximately the same governance structure, female participation in the work force, female educational level, and firms with roughly the same ownership structure. Such a country could be hard to come by, as the level of education and participation in the work force is particularly high for Norwegian women on world basis. The most likely countries to satisfy these criteria, that have yet to implement a gender quota, are our Scandinavian neighbors. Finally, is it also unlikely that the outcomes of the quota would yield similar results if the quota came at a different point in time. The reason for this is that the gender equality in Norway has been gradually evolving over the past century.

4.6 Discussion of the natural experiment

Nygaard (2011) and Eckbo et al. (2016) argues that the quota came as a surprise on Norwegian firms. In particular, did the penalty of forced liquidation come as a surprise. Nygaard (2011) points to the fact that the largest newspaper in Norway at the time, “VG”, released an article a week or so before the quota, with the Minister of Finance saying that the penalty for non-compliance is most likely to be fines. From the information set presented in section (4.3.1), which is collected by Nygaard (2011), the first public hearings about a gender-quota goes all the way back to 2001. Further the law of 40% gender representation on boards was passed in the parliament in December 2003. At the same time government-controlled firms was given two years to meet the quota. This suggests a very long implementation period, since full compliance is not reached before 2008. The quota may be

exogenous of nature, and thereby satisfying the natural experiment criterion, the long implementation period nevertheless is likely to bring endogenous responses. The latter hampers the opportunity to obtain true ceteris paribus effects of the quota.

There are imperfections in using the implementation of a gender quota as a natural experiment, but it is perhaps the closest we can get to an out-of-equilibrium situation for the Norwegian boards. At least the compliers and late adapters, (also evidence that the early adapters meet the quota early due to government influences) alters their boards in what could be considered an exogenous fashion. Thus, we may have arrived at an out-of-equilibrium situation.

4.7 The choice of post period

The first year with mandatory gender-quota was in 2008, which also constitute a natural starting point for the post-period. However, Eckbo et al. (2016) set the first post-period year to 2009, as this is the first year of full compliance. They also argue that this reduce the impact of the financial crisis. Further it is regarded good Latin to exclude the implementation years to better isolate the effect on the difference in difference estimator, since including a transition year may induce noise to the estimation (Angrist & Jörn-Steffen, 2015). The government-controlled firms are obliged to comply with the quota by year-end 2005, thus this is a natural starting point of the post-period for these. The early adapters start making changes towards more gender equal boards already in 2002, and meets the quota by the last of December 2005. Therefore, I consistently test for different post-periods, if only to see if it matters.

Eckbo et al. (2016) drop the implementation period altogether, when having different adapter groups however, the implementation years could be interesting in themselves. A significant experience loss among board members may not be disastrous for firm value if the loss is temporary. For instance, it could be a learning effect by being on the board, where new members gradually learn the rules of the game, and thereby become more efficient members as time passes.

5.0 Analysis

As a general note regarding the analysis, I realize that given any change, as long as the corresponding action is interpreted as a response to this change, there is a possible endogeneity problem. Therefore, I am also careful in the assessment of changes. However, there is a difference in an action taken by choice and a forced action. The action itself may be endogenous either way, but the latter cause could be exogenous. It is important to try to separate between the two, and to recognize that if forced changes are present, this could potentially weaken the board rather than strengthen it.

5.1 Board experience

Simply choosing AS firms as the control group, because they are unaffected by the gender quota, may be a hasty assumption. The pool of eligible board members in Norway is potentially too shallow for the groups to be isolated, therefore a restriction imposed on ASA firms could indirectly affect AS firms. In particular, if high quality directresses are short in supply, a consequence of the quota could be that the perceived "best" directresses are transferred from AS to ASA firms. The data, however, gives no indication that AS firms suffer a drastic loss in directress experience when it comes to the variables examined. AS directresses do not lose much overall board experience, neither are incoming members in possession of less relevant sector experience, and the proportion with CEO experience is slightly increasing over time.

A further concern of an unaffected control group, is that the "board overlap" must be sufficiently low for AS firms nearly unaffected by the quota. A considerable proportion of members holding seats on both ASA and AS boards, implies that the development in one group at least partly affects the other. For instance, a directress who happens to sit in an AS board pre-quota, automatically increases the experience of this board when taking a directorship in an ASA firm. To further address this concern, the proportion of board members, directresses and directors holding seats in both firm types in same year are examined. This is done for the sample, and for all firms reporting consolidated accounts in Figure (29) and (30). Figure (29) shows that the proportion of directresses on the boards of both firm types increase to approximately 5 percent in 2005, and thereafter falls. I therefore consider the "board overlap" sufficiently low for the AS firms to be almost unaffected by the quota.

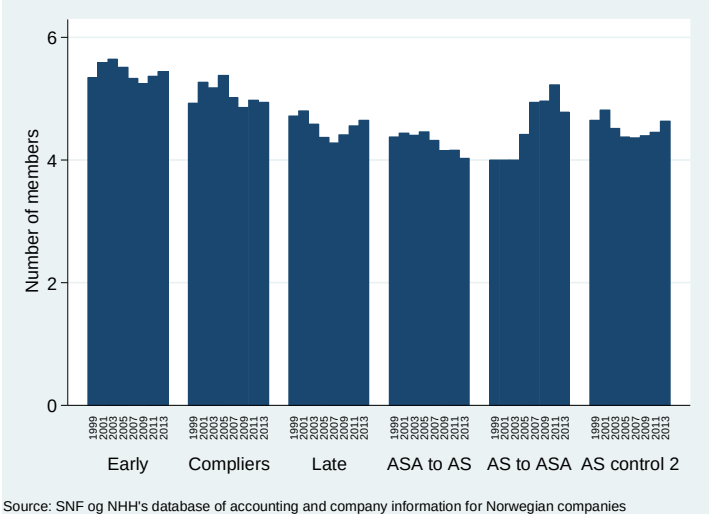

Figure 7- Bi-annual board size by firm group, only including shareholder elected board members

As a first notion regarding the quota, firms could diminish the possible negative consequences of it by adding women to their boards up to the threshold where the quota was met. Figure (7) shows that the board size of the adapter groups remains fairly constant over the sample period, and hence, an extensive increase in board size to meet the quota seems unlikely. The changes for the converters also are as expected. Firms converting to ASA increases their boards to a structure more similar to that of ASA firms, while firms converting to AS reduce their board size. The AS firms in the control group differ from the general population of AS firms by having larger boards, as one-person boards are dropped from the control group. The average board size in the sample is 4.7 members. A summary of board size is presented in Table (12) in the Appendix. Further, a full table containing summary statistics for the variables used are to be found in Table (22) in the Appendix.

5.1.1.1 Average experience of the board

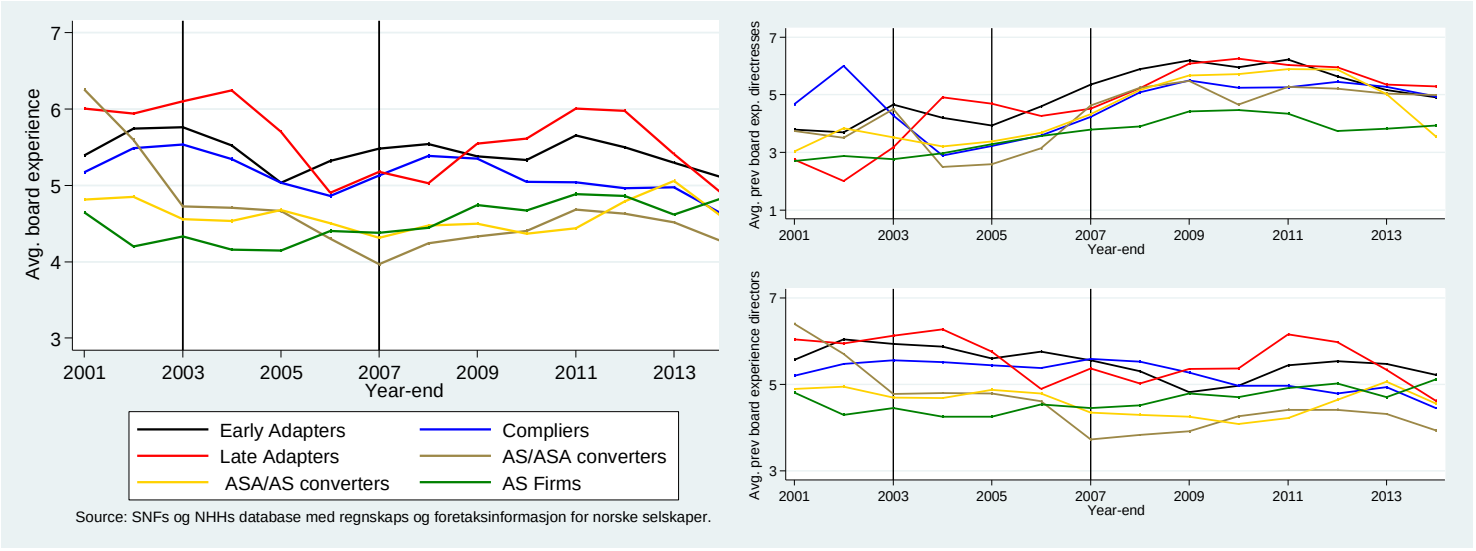

Figure 8 - The Average cumulative board experience among the (current) board members, also including experience on the current board are shown in the left window. Reference lines are placed either at year-end 2003, 2005, or 2007, as a mark of when the post-period starts. Directresses previous board experience is shown in the upper right part of the figure, and likewise for (male) directors in the lower right window.

The average board experience for all members is presented in the left part of Figure (8). It shows relatively parallel trends in experience before 2003. Unlike the other groups, the AS to ASA converters lose much experience prior to 2003. Because their board size remains fairly constant, this is attributed to a loss of experience rather than to a reduction in board members. The late adapters appear to have most experienced boards pre-implementation, their experience loss comes later, and is larger in magnitude than for the other adapters.

As a consequence of few firms with female board members, the lines showing directress experience are volatile before 2004. The number of firms with one or more women in their board is presented in Figure (9). It shows a low number of firms with women among the compliers and the late adapters prior to 2004. The compliers experience loss from 2002 to 2004, seems to come from a sharp increase in firms' adding new directresses, and these appointments have less experience than the directresses already holding seats in 2002. Table (13) in the Appendix provides an overview of the average experience and number of firms with directresses in their board. The parallel trend assumption looks as if it is satisfied for the directors, albeit it is less obvious that this is the case for the directresses. From 2004 until the quota becomes mandatory, it looks like the assumption may hold for directresses as well.

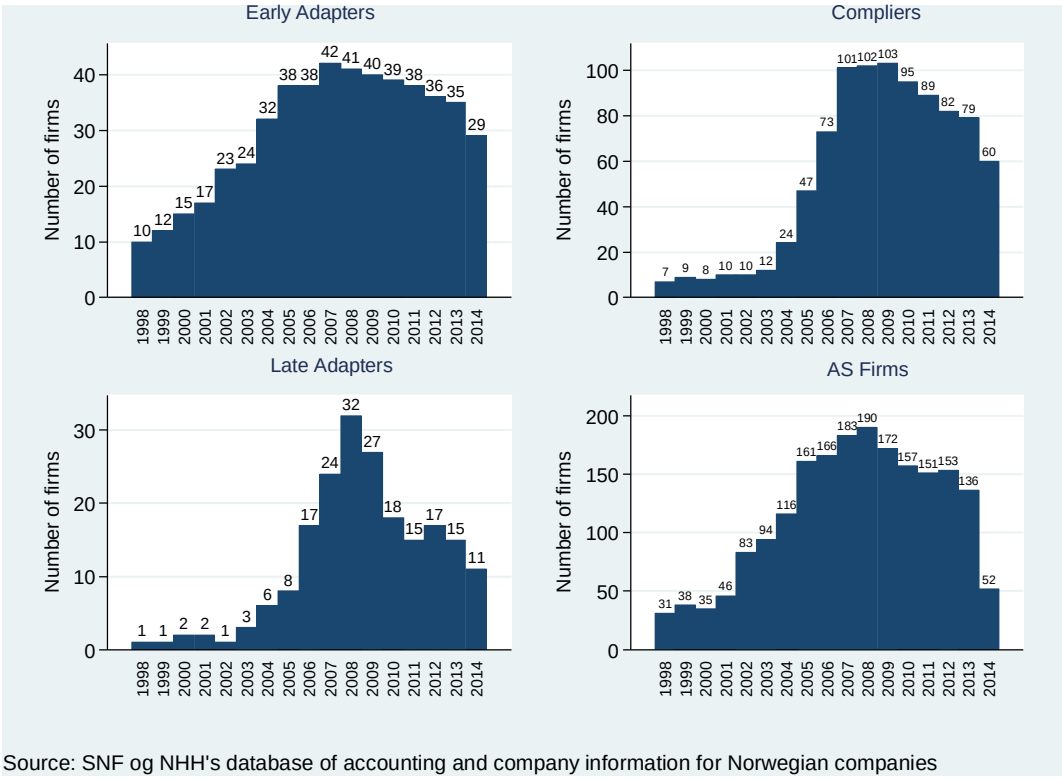

Figure 9 - The number of firms that have more than zero women on the board at time t, by firm type and year.

The boards have directresses with on average 3.26 years of experience between 2000 and 2003. In the years after 2008 this experience has increased to 4.82 years. Prior to implementation the late adapters have directresses with less experience than the other adapters, but the most experienced boards when both genders are accounted for. This could in turn indicate that experience is important for these firms. It also could be a consequence of a large proportion of firms having members that on average hold seats longer. The average director experience for all adapters is reduced with approximately half a year, while AS firms have a slight increase in director experience between the periods.

Firm group	Total Board		Directresses		Directors	
	2001-2003	Post 2008	2001-2003	Post 2008	2001-2003	Post 2008
Early	5.63	5.39	4.08	5.72	5.84	5.23
Complier	5.4	5.03	4.93	5.29	5.41	4.94
Late	6.01	5.62	2.83	5.89	6.04	5.51
AS Firm	4.36	4.76	2.79	4.15	4.47	4.84
Total	4.8	4.91	3.26	4.82	4.91	4.93

Table 1 - Average cumulative board experience by firm group, and gender

5.1.1.2 Regressions average board experience

The regression output from the estimations, in which the dependent variable is either average experience for all board members, or average experience for each of the genders, is presented in table (2). The converter groups are dropped from the first set of regressions, since their pre-quota trends in outcome differ substantially from that of the AS control group. In estimation (1), (3) and (5) in table (2), the post-period is set to start at the 1st of January 2004, while it is set to start two years later in (2), (4) and (6). The regression output is shown on the next page.

Table 2 - Average Experience$_{i,t}$ = $\alpha + \beta_1 Early_{i,t} + \beta_2 Complier_{i,t} + \beta_3 Late_{i,t} + Post_t + \beta_4 Early \times Post_{i,t} + \beta_5 Comlpier \times Post_{i,t} + \beta_6 Late \times Post_{i,t} + \beta_7 X_{i,t} + \varepsilon_{it}$. The early adapters meet the quota before 2006, the compliers meet it in 2006 or 2007, and the late adapters do so in 2008. Post is a dummy taking the value 1 for all firms after the post-period threshold chosen. The interaction terms with the variable Post capture the effect of the quota implementation on the different groups. The vector of independent variables X_{it}, includes; Firm age, the natural logarithm of total assets (Total Assets), the ratio of book value of total debt to total assets (leverage), a dummy indicating whether the firm is OSE-listed or not (listed), and finally I include an indicator variable taking the value 1 in the year the CEO is replaced (CEO change). Last sector and year-fixed effects are controlled for. Constant term is suppressed. Cluster robust standard errors in parentheses. Source: SNF and NHH's database of accounting and company information for Norwegian companies. Stars indicate significance levels:(* p < 0.10, ** p < 0.05, *** p <0.01)

Dependent variable:	Board experience		Directress experience		Director Experience	
	Post 2003	Post 2005	Post 2003	Post 2005	Post 2003	Post 2005
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Early Adapters	0.70	0.75*	1.13**	0.81**	0.74	0.96**
	(0.46)	(0.42)	(0.49)	(0.38)	(0.49)	(0.47)
Compliers	0.79*	0.80**	2.32**	1.11	0.69	0.79*
	(0.41)	(0.39)	(1.09)	(0.79)	(0.43)	(0.41)
Late Adapters	1.69**	1.81**	0.54	2.17**	1.60**	1.73**
	(0.82)	(0.75)	(0.68)	(0.95)	(0.81)	(0.76)
Post	-0.21	-0.10	1.32***	1.06***	-0.27	-0.06
	(0.27)	(0.27)	(0.30)	(0.31)	(0.29)	(0.29)
Early x Post	-0.57	-0.79*	-0.11	0.32	-0.70	-1.23**
	(0.48)	(0.46)	(0.54)	(0.54)	(0.56)	(0.57)
Complier x Post	-0.92**	-1.11***	-1.73	-0.46	-0.90**	-1.25***
	(0.39)	(0.41)	(1.09)	(0.85)	(0.41)	(0.44)
Late x Post	-0.92	-1.31**	1.21	-0.46	-1.00	-1.47**
	(0.63)	(0.65)	(1.07)	(1.11)	(0.62)	(0.63)
Board Size	-0.14*	-0.15*	-0.09	-0.09	-0.10	-0.11
	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)	(0.09)
Firm Age	-0.00	-0.00	-0.01	-0.01	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Total Assets	0.41***	0.41***	0.24***	0.24***	0.42***	0.42***
	(0.06)	(0.06)	(0.07)	(0.07)	(0.08)	(0.08)
Leverage	-0.42	-0.39	-0.43	-0.43	-0.40	-0.36
	(0.38)	(0.38)	(0.60)	(0.60)	(0.42)	(0.42)
CEO change	0.09	0.10	-0.24	-0.24	0.18	0.20
	(0.18)	(0.18)	(0.21)	(0.21)	(0.20)	(0.20)
Sector controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year Fixed-effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
R^2	0.137	0.141	0.148	0.146	0.126	0.132
Adjusted R^2	0.126	0.130	0.131	0.129	0.115	0.121
Observations	2901	2908	1928	1928	2896	2895

The first column of Table (2) shows that the average board experience declines for the compliers relative to AS firms after 2003. The compliers' experience loss in the post-period is estimated to almost 11 months, or equivalent to approximately 16.5% of their pre-quota level. Further, the estimate is significant at the 5% level. The two other adapter groups' level of board experience is not adversely affected from the board experience in AS firms' after 2003.

The compliers are estimated to have 10 months, or about 18.32% more experience among its board members than the AS firms prior to 2003, the estimate is significant at the 10% level. The late adapters have in excess of 20 months, or 28 % more experienced boards than the AS firms' pre-quota. The estimate is significant at the 5% level. The early adapters however, do not have significantly more experience at conventional levels prior to 2003. *Board size* enters with a negative and statistically significant coefficient at the 10% level, although the effect is of marginal importance. Adding another member reduce board experience with less than two months. The estimate for total assets is highly significant, providing evidence that firms with more total assets, also have more experienced boards. An economic interpretation of this is that more assets also implies higher complexity in the firms' operations, and thereby triggering the need for more experience. The effect in real terms however is small, a 1% increase in assets lead to 0.0041% more experienced boards. Increasing the total assets by one standard deviation from the sample average of 983,665,800 NOK, implies that less than two months of experience is added to a five-person board.

The coefficient estimate for leverage is insignificant, thus failing to prove correlation between experience and leverage. A CEO replacement, or one that chose to leave, does not seem to affect the overall experience of the board. There is no separation between the two in the data, if such a separation was present this may have yielded different results. Neither firm age seems to have a cross-sectional relationship with experience, indicating that newly started firms in the sample have the same average experience as more mature firms.

In the second column the post-period is set to start in 2005. The dependent variable still is average board experience. Here I find that all adapters lose experience after 2005 relative to AS firms. The compliers lose 20.7% and the late adapters lose 21.7%, of their average board experience when they implement the quota. The estimates are significant at the 1% and the 5% level, respectively. These losses are larger in magnitude, and more significant than when the post-period is set to start in 2004, suggesting that the experience loss is largest in the years they adapt to the quota. The early adapters are estimated to lose 14% of their pre-implementation level of experience,

and this loss is also larger than when the post-period is set to 2003. Replacing a woman with a man, given that men on average are more experienced than women in the pre-period should reduce the average experience of the board. 2005 is the last year the early adapters implement the quota, and the reduction could be due to firms replacing their oldest (most experienced) members. Another explanation is that members with general experience is less prioritized when appointing new members. The interaction term *Early x Post,* might also be spurious, this is because the trends in experience differs substantially for the early adapters and AS firms between 2003 and 2005. Further, the early adapters' reduction in experience is relative to AS firms, which increase their average board experience after 2005. The negative estimate for *Early x Post*, therefore also could be due to the increased experience of AS boards, rather than a reduction in experience of the early adapters' boards. Whether this is quota related or not remains uncertain. Nevertheless, all adapter groups have more experienced boards than AS firms' pre-implementation, while their experience is reduced relative to AS firms when they implement the quota, which makes this reduction likely to be quota related.

The dependent variable is the average directress experience in column (3). It shows that early adapters have boards with approximately 27.7% more experienced women than AS firms' pre-implementation, the estimate is significant at the 5% level. The compliers have 71% more experienced women on their boards than AS firms prior to the quota implementation. The estimate for *Post* indicate that women in general have 16 months more experience post-implementation, corresponding to an experience increase of 27.8%. The coefficient estimate is significant at the 1% level. The increase in experience of women as a result of the quota hardly is surprising. It is more remarkable that the interaction terms with the post-period all are insignificant, indicating that ASA firms' do not increase the average directress experience of their boards more than AS firms' when they implement the quota.

By examining column (4) in Table (2), I find that no adapter group increases the average directress experience of their board in excess of AS firms, and this appears to be independent of when the post-period starts. Note however that the interaction term with *Early* is positive, while the two other groups have negative interaction terms. It is the low precision of the estimates that makes them statistically indistinguishable from zero. The early and late adapters appear to have more experienced women than the AS control prior to 2005. The compliers lose the great experience advantage over AS firms that is present when the post-period threshold is set to 2003. This can be explained by the fact that very few women are on the compliers boards before 2004, as shown in Figure (9). The same explanation holds for the late adapters before 2005. Since the number of firms with women on their boards is very low, will board changes in relatively few firms result in large impacts on experience.

In column (5) and (6), the dependent variable is the average experience among the directors of the board. Only the compliers have a reduction in the experience level of their directors' relative to the experience of AS directors when the post-period is set to start in 2004 in column (5). When post-period starts in 2006, in column (6) I find that all adapters lose director experience relative to AS firms. The early adapters are estimated to lose 15 months, or 21% of their board experience. The complier group lose 23.1%, and the coefficient estimate is significant even at the 1% level. Finally, the late adapters lose 24.3% of their overall director experience. This suggests that the biggest loss in director experience occurs after 2005, and that all groups are affected. Further it confirms that the reduction in overall board experience in column (2) is mostly a loss of director experience. Finally, all adapter groups are estimated to have more experience than AS firms' prior to implementation, and the vector of control variables is almost identical to those estimated in (1) through (5).

The estimates from (1), (2) and (3) are compared with estimations where the implementation years are dropped in Table (11) in the Appendix. The approach is similar to that of Eckbo et al. (2016). However, there are two reasons for choosing a shorter implementation period. Firstly, starting the implementation period in 2002 would leave only one year of observations in the pre-period. This is because the experience variables are constructed using data lagged three years from the observation, and the first year of data is 1998. Secondly, 2004 may also be a natural starting point to the quota implementation period, as the law passed in December 2003. The estimations with dropped implementation years are similar to those of their comparable in estimation (1), (3) and (5). The most noteworthy change is that the interaction terms with the post period for director experience all becomes insignificant at conventional levels. When controlling for a time trend, it is implicitly a test for divergent paths of the adapters and the AS firms (Lechner, 2010). That no adapter follows a different path from AS firms after 2008, suggests that the loss of experience among directors' as a result of the quota was temporary, and restricted to the implementation years. However, all of the adapters pre-period estimates are positive, and significant indicating that they have more experience prior to implementation than AS firms.

5.1.1.3 Robustness of findings

The R-squared from all the estimations in Table (2) lie around 14%, thus much of the variation in experience is not explained by the variation in the independent variables. However, this not a big concern. A bigger concern is that the error terms are likely to be serial correlated. A test for autocorrelation shown in Figure (17) in the Appendix, reveals evidence of positive correlation in the residuals for average experience. Since board turnover is about 20%, and the average experience of the board accumulates over the preceding three years, this hardly is surprising. As addressed in the methodology part, the coefficient estimates are accurate in the presence of serial

correlation, but inference will no longer be valid. Hence, OLS is no longer “BLUE”. Since the problem of auto-correlated residuals occurs more than once in this thesis, a more general approach to the problem therefore is taken in this section.

In general, the variables I use are dependent on the value of the variable in the preceding years. Hence, it is likely that the error terms of these variables are serial correlated. One consequence of this is that every observation contains less information than it would have if it was truly independent. A way of correcting for this in Stata is to use the option cluster robust standard errors (CRSE). In every estimation executed standard errors are clustered on firm-level, as the highest level of autocorrelation is likely to be present here. Nonetheless, there are problems of using CRSE as well, and these are proposed largest in an uneven set of clusters, or where relatively few clusters exist. In particular, if the number of clusters is lower than 50, the use of CRSE could do more harm than good. With fairly many clusters of roughly equal size, inference is likely to be accurate (Kézdi, 2004). (Rogers, 1993, p. 22) concludes with similar verbalization: “So, if no cluster is larger than 5% or so of the total sample, the standard errors will not be too far off because each term will be off by less than 1 in 400.” The regressions estimated always exceed 200 clusters and the largest cluster is never more than 1% of the sample. CSRE therefore is likely to induce a small sample bias if the autocorrelation only is at firm level.

There is no guarantee that the data do not exhibit higher levels of autocorrelation, i.e. higher order of dynamic misspecification. For instance, average salary, one of the dependent variables may have correlated residuals on sector-level in addition to firm-level. To see why this might be the case, we could consider the appointment of a new CEO as a game. It is likely that firms compete for managers, and the appointment of a new CEO only happens if the terms promised the manager are at least equally good as those promised by competitors’. Given imperfect information we could assume that firms rely on backward-looking information, and thus the wage-level among peers in the preceding period is likely to be a good predictor of the wage offered a new, or incumbent CEO in this period. This effect also can be present in the experience variables. The board might find it necessary to increase its experience to be competitive if all other firms in the industry for some reason starts adding new members with much experience to their boards. Hence, clustering on firm-level still could overestimate the significance of the coefficient estimates. The sectors in the Norwegian economy are too few to make it sensible to cluster on sector level and I regard the work load as out of the scope for this thesis to cluster on peers in the economy. I further believe the CRSE estimates to be fairly accurate, as the biggest measurement error is removed by clustering on firm-level.

Much space is devoted inference in this section, the main objective of the thesis nevertheless is to get as accurate coefficient estimates as possible. Alike the inference issue, this too is a reoccurring problem, and also here a more general review is presented. The leading threat against obtaining ceteris paribus effects of the quota, is to assume parallel trends when this condition fails to be met in reality. The AS control group then not necessarily represent the unobserved counterfactual outcome for the ASA firms, which we assume that it does. Thus, it no longer makes sense to compare the two in a pre and a post-period, as the development in one group do not represent the likely evolution in the other. Since the quota implementation period is fairly long it could be a problem to find an exact time to set the post-period, and further to separate the quota related changes to changes that occur for other, not quota related reasons. The panel data structure controls for unobserved characteristics of the firms, and I only include firms that have at least one observation prior to and one observation after the period-threshold that is set. Therefore, when the parallel trend assumption also holds, the estimates should be fairly accurate.

It is not obvious that the parallel trend assumption holds for the average experience for all members. The trends look relatively parallel before 2003, but not after. It appears that the groups start implementing the quota already before 2003, and that much of the experience loss happens before 2005. It therefore seems plausible that the losses observed nevertheless are quota related. The trends in boards' average directress experience cannot be said to be parallel in the pre-implementation period, the high volatility in the curves, and the low number of firms that have women on their board may be the reason for why I fail to find a causal link between the quota and directress experience. The director experience appears to move laterally for all groups to 2005, thus the parallel trend assumption should be satisfied. In regards to the concern of the control group remaining unaffected by the treatment, it could be argued that the average experience among directresses in AS firms tend to follow the evolution in ASA firms to close for the groups to be completely separated. However, as previously discussed, the proportion of directresses part of both an ASA and an AS board is not abnormally high in the post-period years, so this should not be a major issue.

5.1.1.4 Summary of board experience

There is evidence that the total board experience of all the adapters is reduced when they implement the quota. All adapter groups lose in excess of 20% of their director experience relative to AS firms. The increase in directress experience is not sufficient to prevent the adapters from losing total board experience.

Neither group is found to have more directress experience, relative to the control group regardless of when the post-period starts. The reason for this is that directress experience in AS firms appears to increase at the same rate as in the ASA firms. This in turn cannot be explained by higher board overlap among directresses, by this I mean that women not are more likely than men to sit on both AS and ASA boards. Therefore, it appears that AS firms also have an increase in directress experience, albeit with different directresses from ASA firms. Of course the directresses entering AS firms could be leaving ASA firms, thus the experience increase in AS firms nevertheless is quota related. However, the increase in experience in AS firm is not due to directresses to a large extent are on the boards of both firm types.

The reduction in total board experience is largest for the compliers followed by the late adapters. In the context of Aghion and Tirole's (1997) model, may an experience loss decrease the boards' capacity to collect information, which makes it more likely to rubber stamp the decisions of the CEO. Adams and Ferreira (2007), suggest that a less experienced board could be less able to provide the management with advice, which may reduce the CEO's incentives to share information with the board. Alzaman and Suarez (2003) argue that in some instances, a weaker board is preferred, because the incentives through performance pay can be lower if the CEO has more power over his own dismissal. This could be true for firms, where governance is of no profound importance anyway.

The trends in the experience variables are slightly increasing for the adapters prior to 2003, however they start losing experience in 2004. This is consistent with replacing a man with a woman, since men on average are more experienced prior to implementation. The circumstances of the reduction in experience therefore appears to be quota related, and thereby exogenous. The timing of the losses also suggests that most experience is lost in the years where the groups adapt to the quota. Starting the implementation early may have been an advantage, since this makes the experience loss less abrupt. Nevertheless, all adapter groups have higher levels of experience before they start the implementation, which could suggest that the boards were weakened as a result of the quota. We do not see a widespread increase in experience in the years after 2007, which may indicate that the experience losses were of minor significance after all.

5.1.2.1 Sector experience among incoming board members

The next section examines whether firms appoint incoming members with different amounts of previous relevant sector board experience, as a result of the quota. From now on this is referred to as experience in this section. The boards should ideally be independent of the management and have good knowledge about their branch of the industry, two combined traits it might be hard to find.

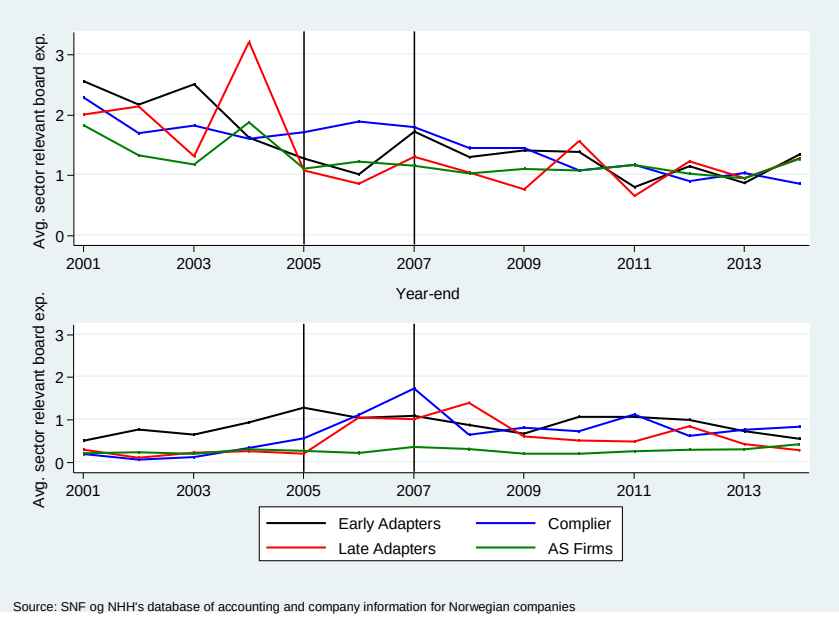

Figure 10 - Average previous relevant sector experience for incoming directors is shown in the top part, and incoming experience among directresses is shown in the lower part of the figure.

The top part of Figure (10) shows that the experience of incoming directors' declines over the sample period. The reason for the late adapter's spike in incoming director experience in 2004, is a new firm registering that year. This firm appoints five directors with 43 years of cumulative experience amongst them. If this firm is disregarded, the average experience of incoming directors drops to 1.48 years, or approximately at the same level as the previous and following year.

The lower part of Figure (10) shows that the adapter groups increase their share of directresses with experience relative to the level the AS firms have in stages. The early adapters start first, as expected, already adding experienced female directors at the start of the period. The compliers start appointing directresses with experience after the law was proposed in 2003, while the late adapters start after the law was passed in 2005. The two groups implementing the quota last, add most women with experience in the years they implemented the quota. This could indicate that many, albeit not very experienced directresses are appointed. The early adapters appear to have a more stable recruitment of new directresses.

Table 3 - Average cumulative relevant sector experience for incoming members. The table only includes firm-years where a new board member enters the board.

Firm group	Directresses				Directors			
	2001-2003	N	Post 2008	N	2001-2003	N	Post 2008	N
Early	0.62	99	0.84	219	2.4	99	1.15	219
Complier	0.11	178	0.8	510	1.92	178	1.1	510
Late	0.2	70	0.53	111	1.81	70	1.03	111
AS firm	0.2	599	0.25	1,506	1.32	599	0.99	1,506
Total	0.23	946	0.44	2,346	1.59	946	1,03	2,346

Some back-of-the-envelope calculations, taking into consideration that average turnover is 22% and the average board counts 4.7 persons, I find that almost one board member is replaced every year. The early adapters therefore on average add one woman with 14 months of experience every second year in the pre-quota period. Another way to see it, is that half of the firms among the early adapters every year appoint directresses with 14 months of secto experience. The compliers have the largest increase in experience among their incoming directresses after the quota. Where about every 5th firm add one woman with one year of experience on annual basis pre-quota, 4 out of 5 do so post-implementation, i.e. after 2008. Figure (10) indicates that the experience among the incoming directors declines, while the experience among directresses increases post-quota. Figure (21) and (22) in the Appendix, show the general board experience for incoming members. When comparing Figure (10) to Figure (21) and (22) in the Appendix, it looks like that new members with general experience follow the development observed for incoming members with sector experience. In all groups more directresses with experience are appointed while the cumulative experience among the directors' added is declining.

5.1.2.2 Regression output: Sector experience incoming board members

Experience in (4) is defined as the ratio of previous relevant sector experience of incoming members to the total number of members entering. "Members" here is either directresses, or directors. The post-period is set to start in 2006. I regard the changes happening after 2005 to be a response to the quota, which came into law in December 2005, and makes 2006 a natural starting point. Setting the post-period to 2007 has been tested and yields similar results, output from these regressions can be found in the appendix table (15).

Table 4 - Incoming $\text{Experience}_{i,t} = \alpha + \beta_1 \text{Early}_{i,t} + \beta_2 \text{Complier}_{i,t} + \beta_3 \text{Late}_{i,t} + \text{Post}_t + \beta_4 \text{Early x Post}_{i,t} + \beta_5 \text{Comlpier x Post}_{i,t} + \beta_6 \text{Late x Post}_{i,t} + \beta_7 X_{i,t} + \varepsilon_{it}$. The early adapters meet the quota before 2006, the compliers meet it in 2006 or 2007, and the late adapters do so in 2008. Post is a dummy taking the value 1 for all firms after the post-period threshold chosen. The interaction terms with the variable Post capture the effect of the quota implementation on the different groups. The vector of independent variables X_{it}, includes; Firm age, the natural logarithm of total assets (Total Assets), the ratio of book value of total debt to total assets (leverage), a dummy indicating whether the firm is OSE-listed or not (listed), an indicator variable for whether the CEO has been replaced or not (CEO change), the number of incoming directresses (# directresses), the number of incoming directresses lagged one period, the number of incoming directors (# directors) and the number of incoming directors lagged one period. Last sector and year-fixed effects are controlled for. Constant term is suppressed. Cluster robust standard errors in parentheses. Source: SNF and NHH's database of accounting and company information for Norwegian companies. Stars indicate significance levels: (* p < 0.10, ** p < 0.05, *** p < 0.01)

Dependent variable:	Experience incoming directresses	Experience incoming directresses	Experience incoming directors	Experience incoming directors
Independent variables	(1)	(2)	(3)	(4)
Early	0.42***	-0.20**	0.05	-0.06
	(0.10)	(0.08)	(0.28)	(0.25)
Complier	-0.08	-0.07	-0.03	-0.38
	(0.07)	(0.11)	(0.26)	(0.24)
Late	-0.10	-0.02	0.87	-0.72*
	(0.08)	(0.30)	(0.63)	(0.41)
Post 2005	0.00	-0.12	-0.89***	0.15
	(0.10)	(0.11)	(0.33)	(0.24)
Early x Post	0.13	0.26**	-0.27	0.10
	(0.14)	(0.10)	(0.31)	(0.28)
Complier x Post	0.64***	0.14	-0.01	0.53**
	(0.09)	(0.11)	(0.28)	(0.26)
Late x Post	0.52***	-0.01	-1.12	0.78*
	(0.14)	(0.33)	(0.69)	(0.44)
Board Size	0.10***	-0.01	0.26***	-0.01
	(0.02)	(0.02)	(0.06)	(0.03)
Total Assets	0.00	0.01	0.01	0.02
	(0.01)	(0.01)	(0.03)	(0.02)
Leverage	-0.15	-0.19*	0.08	-0.15
	(0.11)	(0.10)	(0.23)	(0.16)
CEO change	0.23***	-0.07	1.26***	-0.53***
	(0.06)	(0.08)	(0.17)	(0.17)
# incoming directresses		1.47***		0.20**
		(0.07)		(0.09)
L.# directresses		0.01		0.11
		(0.03)		(0.08)
# incoming directors		0.04		1.63***
		(0.04)		(0.08)
L.# directors		0.01		-0.08**
		(0.02)		(0.04)
Sector controls	*Yes*	*Yes*	*Yes*	*Yes*
Year fixed-effects	*Yes*	*Yes*	*Yes*	*Yes*
R^2	0.118	0.586	0.070	0.499
Adjusted R^2	0.107	0.575	0.059	0.486
Observations	2901	1597	2901	1597

Table (4) column (1) shows that the compliers and late adapters appear to appoint more experienced directresses after 2005. Yet, after controlling for the number of incoming members, this seems to be a consequence of appointing a greater number of women, rather than more experienced. The early adapters are the only group found to add more experienced directresses to their boards than AS firms after 2005. In column (1) the interaction terms *Complier x Post* and *Late x Post*, show that both groups add directresses with half a year more experience as a result of the quota, and the estimates are significant at the 1% level. Column (2) shows, by contrast, that these adapters are not appointing more experienced women, they only add a greater number of directresses with experience. The estimate for *Early x Post* shows that this groups increases the experience of their incoming directresses by approximately 96% relative to AS firms after 2005. The coefficient estimate is significant at the 5% level. Adding one more directress increases the board experience with approximately one and a half years, and is significant on the 1% level, suggesting that the average incoming woman holds one and a half year of sector experience.

By including the number of incoming members in column (2), the number of observations is lowered. Further, the incoming member variables are positively correlated with among others board size. Both the lower number of observations and multicollinearity, should reduce the precision of the regressions. However, the high explanatory power the number incoming members have on the dependent variables, makes the standard errors fairly similar in the two columns. The potential bias when omitting the *incoming members* variables, due to their high correlation with the independent variables *CEO change* and *Board size* as well as the interaction terms, nevertheless is regarded as a bigger issue.

Further, the first column shows that replacing the CEO increases the average directress experience with almost three months, and the coefficient estimate is significant at the 1% level. However, after controlling for incoming members in column (2) this apparent correlation disappears. This is congruent with Hermalin and Weisbach's (1998) model where CEO turnover is found to be positively correlated with the number of incoming members. The positive correlation between CEO turnover and the number of new members entering, here bias the coefficient for CEO turnover upwards when the *new member* variables are omitted. The insignificant estimate obtained after controlling for incoming members, indicates that the manager is separated from the decision to add directresses to the board.

The early adapters are in column (1) estimated to have five months more experienced women entering their boards than AS firms' pre-quota, and the estimate is significant at the 1% level. The coefficient estimates for both the compliers and the late adapters in the pre-quota period, show that the experience of incoming directresses to firms in these groups not are different from the experience of incoming AS directresses. Further, the experience level of incoming directresses does not appear to be higher after firms start to implement the quota, as shown by the insignificant estimate for *Post.* Increasing the board with one additional member increase the experience of incoming directresses with a month, implying that one out of 12 entering the board is a woman with one year of sector experience. Notwithstanding, when including the number of incoming members in column (2) the increased experience from expanding the board loses its precision, and becomes insignificant. The likely explanation for this is that the positive correlation between board size and incoming members bias the estimate for *Board size* upwards when the number of incoming member variables are omitted.

The estimate for leverage is significant at the 10% level in column (2), and enters with a negative coefficient. This indicates that firms in with more debt, ceteris paribus add less women with experience. Adding another director do not seem to have an effect on the experience, neither do adding a woman one year prior to the current year. Implying that both the number of men entering the board in the same year, and the number of women appointed one year prior to the present year, are independent of the choice to add women with sector experience in the present year.

Column (3) and (4) show that the compliers and late adapters appoint more experienced directors than AS firms' after 2005. In (3), before controlling for the number of incoming members it looks as if all firms appoint less experienced directors in the post-period. However, in column (4) this is found to be due to a reduction in the number of men appointed to the boards. The compliers and late adapters are estimated to appoint six and nine months more experienced directors after 2005. Column (4) further shows that the decision to add a directress is positively related to the experience of incoming men. This is after the number of incoming men is controlled for, thus it suggests that men with more experience is appointed at the same time as a directress is entering. The estimate is further significant at the 5% level.

The estimate for *CEO change* in column (3) indicates an increase in the experience among incoming directors in excess of a year when the CEO is replaced. Notwithstanding, when adding incoming members in column (4) the coefficient become negative and highly significant. This in turn presents evidence that incumbent CEO's may be

part of recruiting new board members and in particular, are better at recruiting more experienced male members. A larger network among incumbent CEOs' could be part of the explanation. More interesting, this suggests some degree of board dependence between the CEO and the incoming male board members. The insignificant estimate from a CEO change on directress experience in column (2), implies higher independence from the CEO among incoming directresses than their male peers.

Appointing a new director increases the experience of incoming members by almost 20 months, somewhat more than adding another woman in column (2), the two estimates however, are not significantly different from each other at the 5% level. Thus, we cannot say that incoming directors have more experience than incoming directresses. Finally, it seems to be a negative relationship between the number of directors added to the board in year t-1 and the experience of the members entering in year t. This could be because members are replaced on bi-annual basis, and therefore if members with sector experience enters in year t, members with other experience, for example CEO experience are expected to be appointed in year t+1.

5.1.2.3 Robustness of findings

It is not as clear as for the average experience variables, that the residuals here are serial correlated. A simple test fails to reveal autocorrelation in the residuals in all estimations in this section. Figure (26) in the Appendix shows a plot over residuals and the residuals lagged one period. Nevertheless, it is likely that some firms are better at attracting better candidates, and that this is persistent over time. Therefore, cluster robust standard errors are applied here as well.

The main identifying assumption is parallel trends in the outcome variable, conditional on the vector of independent variables. Therefore, it is assumed that the independent variables not are influenced by the treatment. I have included the number of incoming members for both genders, and it is likely that these variables are affected by the quota. However, it is shown in Figure (25) in the Appendix that the main assumption of parallel trends is likely to hold, also after the experience variables are divided by the number of incoming members. Hence, the main assumption of parallel trends still should hold. Further, conditioning on an endogenous variable, one will estimate the causal effect of the treatment that is not already captured by the endogenous variable. It is in Table (4) interesting to include the number of incoming members even if these variables are endogenous, as they show whether the experience of the members that enters have increased. Any changes to in the composition of incoming members, is here assumed to be quota related. The explanatory power of the model, indicated by the measure R-

squared, increases by much when we include the number of incoming members. This is because the number of incoming members in a year explains much of the variation in the average experience amidst the incoming member.

The trend in experience for incoming directresses among the early adapters appears to be increasing already from 2003, thus we could obtain a spurious estimate for this group. However, the experience increase we see could be quota related, since this group already start implementing the quota around 2003. For the two other groups the parallel trend assumption appears to hold. The experience among incoming directors fall for all groups towards the end of sample period, for to then flatten. The reason for the spike in incoming directors are as mentioned in the descriptive statistics of this section due to a firm registering late in 2003, and therefore adding a full board in 2004. Dropping this observation, makes the evolution in director experience for the late adapters similar to that of the AS group. Different post-periods have been tested yielding similar results. These are presented in Table (15) in the Appendix. Firms further add fewer members sector experience, although more experienced. In these estimations I therefore regard the pool of eligible members deep enough for the groups to be completely separated.

5.1.2.4 Summary experience incoming members

The early adapters appoint directresses with more sector experience relative to AS firms after the quota. The later implementers add directors with more experience, albeit fewer in numbers post-quota. These changes appear to be quota related, since firms start appointing women when they start implementing the quota. I also find that all firms add more experienced directors whenever they appoint a new directress. The difference between the early adapters and the two other groups in regards to appointing women may not be voluntary. Thus, this opens for the possibility that the compliers and late adapters have larger problems finding experienced women. Further, if this difference is a result of larger problems finding women, rather than the compliers and late adapters having preferences for men in possession of sector experience, it still is uncertain why the early adapters attract more experienced women. One reason is that they were early, and therefore could pick the most experienced directresses. Another explanation is the company name being Statoil, and that the prestige of having a seat on their board would make them attract the most experienced directresses independent of when they adapt to the quota. Hence, it is not clear if it is the company name or the fact that the firm adapts earlier, that makes it attract more experienced women. Figure (24) in the Appendix shows the experience of the incoming directresses to the early adapters and to seven of the largest Norwegian firms by market capitalization. It appears as the firms mentioned last also attract directresses with most experience in the quota implementation period. However, after the quota becomes mandatory, this difference no longer is present.

There is evidence suggesting that an incumbent CEO is part in the recruitment of board members with sector experience. Further, the coefficient estimate only is significant for directors, indicating some extent of dependence among directors and the CEO. The insignificant estimate for directresses, implies that the boards' independence increase by choosing to appoint a woman rather than a man. This is consistent with Bøhren and Staubo's (2016) findings, that the quota increased board independence. Hermalin and Weisbach's (1998) model suggests that more independent boards are better at monitoring the CEO, thus firms appointing women with sector experience could be strengthening their governance.

It looks as if the decrease in average experience among incoming directors starts already before firms implement the quota, which may imply that a shift away from industry experts is independent of the quota. Regardless of reason, the absolute experience loss does not appear to be disastrous, since the experience level among incoming directors' increase after the quota, when we control for the number of incoming members. In turn this is a likely consequence of the least experienced directors that were appointed pre-quota, post-quota rather are directresses with sector experience. The increase in directresses experience seems to be a direct result of the quota, although more experience, on average, hardly could be regarded as something negative. Further, Adams and Ferreira (2009) find that men have better attendance records when there are women on the board, and Adams and Ferreira (2008) find that women are more likely than men to engage in monitoring activities. The incoming directresses are especially among the early adapters, both in possession of sector experience and sufficiently independent of management, which potentially enhances the boards' capacity to monitor the management.

5.1.3 Proportion of the board with CEO experience

Previous CEO experience may be highly relevant for performance as a board member. In particular, a manager with tenure in the same industry is likely to be a valuable board member, and highly so if the concerned is sufficiently independent of the sitting management. Eckbo et al. (2016) point out a tendency to replace directors not possessing previous CEO experience, with directors having such experience. This section merely shows the trends in proportion of members with CEO experience.

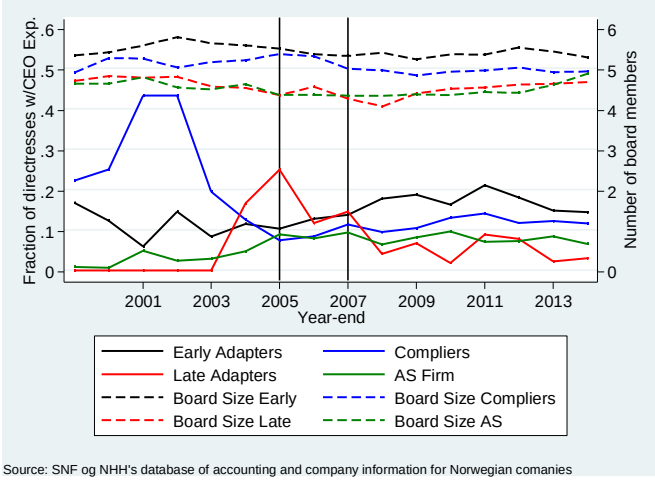

Figure 11 - The proportion of directresses with CEO experience to total number of directresses on the board at time t, is shown by the solid lines. The dashed lines show the number of members on the board of the different firms

Figure (11) shows that the proportion of directresses among the early adapters stay relatively stable between 10 and 15%, although increasing slightly from 2005 towards 2011. AS firms increase their share of directresses in possession of the same experience from approximately zero to a little under 10% at the end of the period. The more extreme changes in the two remaining groups is a result of few observations. Figure (9), which shows the number of firms with more than zero women on the board at time *t*, reveals this. When approaching 2007 it looks as if the lines are more aligned for all, but not for the late adapters. For this group the proportion of directresses having previous CEO experience appears to be lowered as more firms add directresses. A reason for this could be that there are few female board members with CEO experience left for this group available to appoint.

The high proportion of directresses holding CEO experience among the compliers in 2002 can be explained because only 10 firms have women in their boards this year. All but one of these firms have one woman among its members, the last firm has three. Further, four of the firms have a directress with previous CEO experience, and one of the women in the firm with three directresses possess the same experience. A similar explanation holds for the late adapters, in 2004 there is one single woman in one firm that has CEO experience. In the following year one more firm add a sole woman with CEO experience. The way the treatment groups are constructed, and the scarcity of directresses with CEO experience makes the lines in Figure (11) to appear more dramatic than the real world suggests. An alternative way of sorting adapter groups could be by the distance they have from meeting the quota at some point in time. Considering the information set of Nygaard (2011), it looks like 2003 or 2005 are natural starting points. However, this would yield groups quite similar to the ones constructed in this thesis.

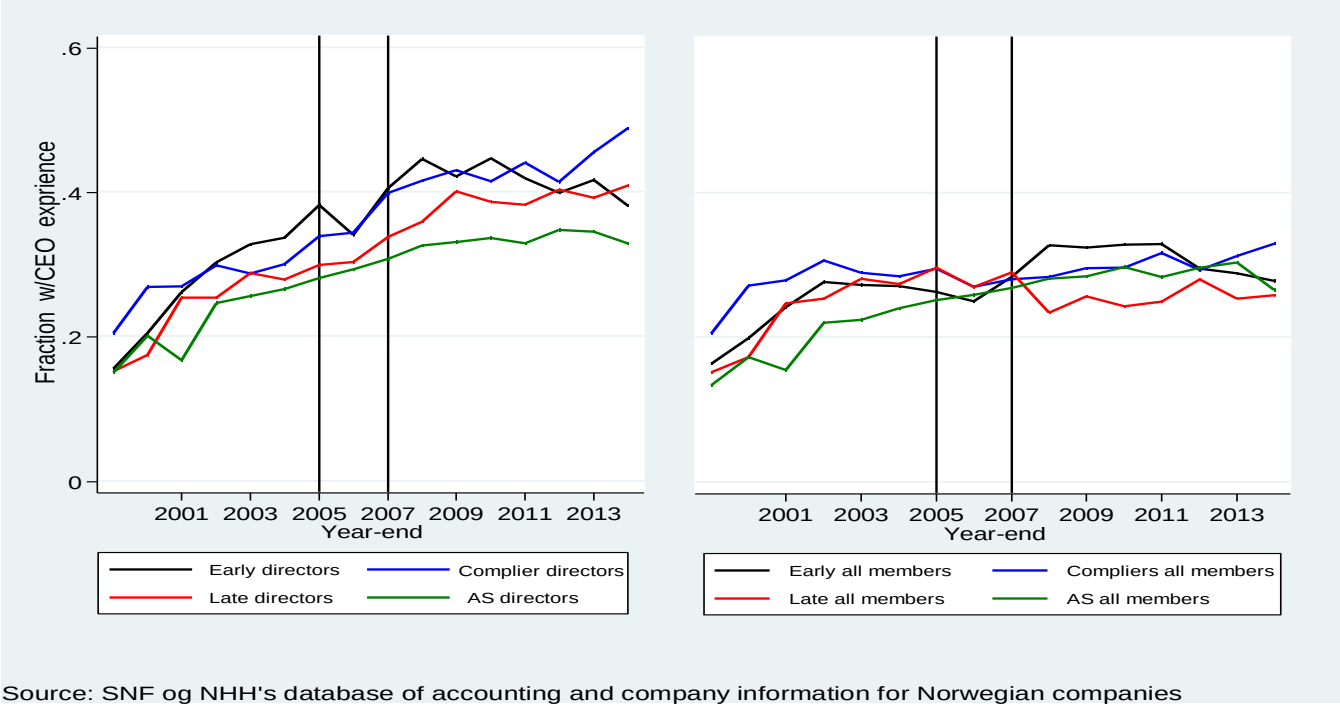

Figure 12 - The proportion of directors (male board members) with CEO experience to total number of directors (male board members) on the board at current time to the left, and the ratio of members (independent of gender) with CEO experience to total number of board members(independent of gender) at time t to the right.

The proportion of directors with CEO experience to the total number directors on the board, is shown in the left part of Figure (12). The fraction of directors with experience increases for all groups. The complier group has the highest fraction at the end of the sample period, but also have a higher starting point, which could suggest that CEO knowledge is especially valuable for this group. The proportion of directors with CEO experience, however, does not appear to differ from that of AS firms. The ratio of board members with CEO experience to the total number of members is shown in the right part of Figure (12). The proportion of board members holding CEO experience have increased from approximately 20% to about 35% between the start and the end of the sample period. No adapter group appears to follow a very different slope from that of AS firms at any point in the sample period.

An increase in the number of directors with CEO experience is likely to reduce the average board experience for two reasons. In the first place, both directorships and the CEO position are time consuming tasks, a current CEO is therefore not expected to have time left for board activities. This leads on to the second reason, in which interlocks, where a member of the board also is a current CEO within the same sector, is likely to be avoided by firms. The complier group, which is the only adapter with significantly less average experience post-quota, also

have the highest fraction of CEO's at the end of the period. The reason for this could be that board experience is lower on the pecking order of desirable traits when choosing a new member.

The increased proportion of directors with CEO experience implies that the average ASA board have 1.2 directors with CEO experience. Since some directresses also possess such experience, about 1.65 board members in the ASA boards are previous CEOs. Fahlenbach et al. (2010) find evidence that the first member with CEO experience appointed to the board on average results in better firm performance, however they fail to find a positive effect of adding a second or third member with such experience. Adams and Ferreira (2009) suggest a peer-effect where CEOs compensate their peers more generously. In other words, the increased CEO experience of the boards is not uniformly associated with stronger governance.

5.1.4 The overall impact on board experience

There is evidence that the quota reduces the total experience of the board somewhat. All adapter groups lose more than 20% of director experience relative to AS firms, and is not sufficiently compensated by the increase in directress experience. Especially the experience loss among directors nevertheless should be seen in the context of the increase in directors with CEO experience, and the reduced absolute number of incoming directors with sector experience. The firms appear to appoint more experienced new members as a result of the quota. The early adapters add directresses with more sector experience, and the late and complier groups add directors with more experience, presenting modest evidence that the compliers and late adapters have larger problems finding experienced women. There is also evidence of higher board dependence between the CEO and incoming directors than there is between the CEO and incoming directress. The increased proportion of board members with CEO experience, is likely to come at the expense of general board experience, and is not necessarily increasing the board's ability to govern shareholder interest.

5.2 Difficulties of meeting the quota

5.2.1.1 Board size

Eckbo et al. (2016) suggest that ASA firms on average not merely expand their boards to meet the quota. Here a slightly more refined version of board size changes is used, as the board either could be increased, held constant or be reduced in order to meet the quota. To better get the idea, consider a board consisting of four men. To meet the quota this firm could either add three women, or they could drop two men and add a woman. The latter may be seen as a particular drastic measure, as one gives up two directors to give room for one directress. A full

overview over the number of women required to meet the quota for different board sizes is shown in Table (22) in the Appendix. This section uses a logistic probability model to investigate if the board change was changed in order to meet the quota. I look at three different scenarios, in the first I investigate if any group is more likely to reduce its board to meet the quota. In the second I look at the firms' probability of merely adding a woman. Last, I examine whether the probability of the adapter groups to do either one of these two actions is higher than it is for the AS control group.

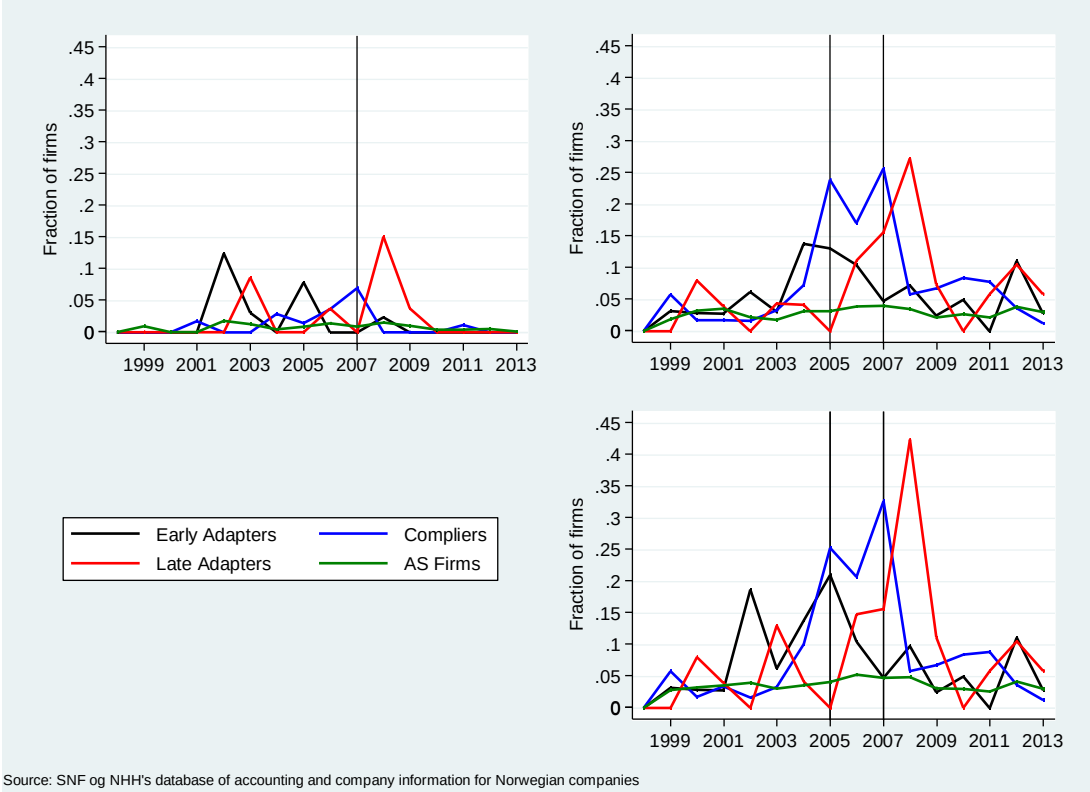

Figure 13 - The upper left corner shows the proportion of firms that reduce the absolute board size when adding a new directress. The upper right corner shows the proportion of firms that increase the absolute board size when adding a new directress. The bottom right corner of the figure shows the proportion of firms that change absolute board size when adding a new directress.

Figure (13) shows the proportion of firms reducing the size of the board while adding one or more women. The early adapters have two spikes where around 10% take such an action. Remembering that these firms comply by year-end 2005, and the fact that we do not see any spikes thereafter, indicates that at least 1 out of 10 firms in this group had to make quite drastic changes to meet the quota. The late adapters do most board reductions in 2008, their first year in full compliance with the quota. The compliers as well appear to make most board reductions in the years they implement the quota. These spikes are as expected absent among AS firms.

The upper right corner of Figure (13) shows the proportion of firms that increase their board size when adding one or more women. Again we see that both the complier and the late adapter group have fairly high spikes around 2007, in comparison with the AS firms. Maybe more convincing that something unusual occurs, is the fact that the spikes are high relative to earlier and later years for the same groups. The bottom right corner of Figure (13) shows the proportion of firms that either reduced or increased the size of the board when adding a directress. Since this figure shows the sum of the two previous figures, the sightings are highly similar, albeit with higher peaks. It is worth noting that approximately 40% of the late adapters changed their board structure when adding a woman in 2008, while roughly 30% of the compliers did the same in both 2005 and 2007. This is hard to explain by regular board changes, since we then should observe equivalent changes in the years prior to and after the quota implementation period.

5.2.1.2 Logistic regression on board changes

Table 5 - The regression $\text{logit}(p)_{it} = \log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 \text{Early} + \beta_2 \text{Complier} + \beta_3 \text{late} + \beta_4 X_{it} + u_{it}$. The indicator variables Early, Complier & Late indicate that firm i, is either part of the "Early", the "Complier", or the "Late" adapter group. The vector X_{it} of independent variables include total assets and leverage.. Cluster robust standard errors in parentheses. Source: SNF and NHH's database of accounting and company information for Norwegian companies. Stars indicate significance levels: (* p < 0.10, ** p < 0.05, *** p < 0.01)

Dependent variable:	Reduce board	Increase board	Change board
	Sample period	Sample period	Sample period
	1999-2009	1999-2009	1999-2009
Independent variables	(1)	(2)	(3)
Early Adapter	0.64	1.26***	1.14***
	(0.51)	(0.30)	(0.27)
Complier	0.70	1.80***	1.59***
	(0.45)	(0.25)	(0.22)
Late Adapter	1.22**	1.61***	1.58***
	(0.51)	(0.28)	(0.25)
Total Assets	0.15*	0.10**	0.12***
	(0.08)	(0.04)	(0.04)
Leverage	-0.20	0.01	-0.00
	(0.79)	(0.04)	(0.05)
Constant	-5.72***	-5.34***	-5.53***
	(1.69)	(0.89)	(0.89)
R^2	0.091	0.123	0.125
Pseudo Log-likelihood	- 176.857	- 455.997	- 546.962
Observations	2130	2452	2452

The interpretation of the coefficient estimates in a logistic model differs from the interpretation of OLS estimates. When estimating by OLS, we obtain the ceteris paribus effect a one unit change in the explanatory variable has on the dependent variable. The coefficients estimated using the logistic model gives the odds of one of the adapters to change its board size when adding a woman, over the odds of an AS firm doing just this, holding leverage, and total assets fixed. In other words, is $\widehat{\beta_1}$ the change in log-odds when comparing early adapters to AS firms. *p* in the logistic model denotes the probability of success. What we regard as a success depends on the estimation we look at in table (5).

The "success" in column (1), is when a reduction in board size is observed the same time as a woman is added. It is considered a failure when the board size either is held constant or increased as a new directress is appointed. The early adapters and the compliers are not given significantly higher odds to reduce their board size when adding a directress than AS firms. The late adapters, however are given 3.38 times higher odds than AS firms to do such a change, the coefficient estimate is significant even at the 1% level. It appears as the probability of making a board reduction in the quota-implementation period is positively related to the total assets. Holding all the other variables fixed, if one doubles the amount of total assets, the log-odds of reducing the board when adding a woman increase by approximately 11%. The amount of debt looks to be independent of the likelihood that a firm reduce the total board size when adding a woman.

In column (2) the inverse situation of column (1) is examined. The "success" is now when the board size is increased the same time as a woman is added. A failure is when the board size is either held constant or reduced when a new directress is appointed. In other words, we estimate the likelihood of adding one or more women to an existing board structure. All adapter groups are more likely than AS firms to simply add a woman to the board in the implementation years. Further, the coefficient estimates for all the groups are significant at the 1% level. The early adapters are 3.52 times more likely to add a woman to a current structure than AS firms. The same odds for the compliers and late adapters are respectively, 6.05 and 5.

The last column (3) sums the two previous ones, i.e. regarding a "success" when a woman is added while the board structure is changed. A failure is thus when a woman is added and the board size is held constant. The odds of an early adapter to add a woman while changing the current board structure is 3.13 times higher than that for an AS firm. The compliers and late adapters are roughly 5.9 times more likely than AS firms to do the same. Again, all coefficient estimates are statistically significant even at the 1% level.

5.2.1.3 Summary board changes

The adapters' board structure is affected by the quota, and the compliers and late adapters encompass the firms most likely to make board changes. The timing of the events indicates that these changes largely are exogenous, as no attempt to change the board structure is observed prior to or after firms implement the quota. The scenario where firms reduce the overall board size while adding women, must be seen as a more drastic action than simply adding a woman to the existing board structure, and also is the action occurring least frequent. Filling seats also is partly indicative that the quota is not easily met for some firms, albeit it less likely that such an action is enough to change status quo of how the board operates.

The results obtained in this section may also partly explain the moderate loss of experience found in the preceding sections. The compliers and late adapters, which are suggested to have largest problems of meeting the quota in the first section, are the ones most likely to expand their board when they appoint new directresses. As Adams and Ferreira (2009) argue, this could lead to boards in these groups becoming more inefficient, as opinions are likely to be greater in numbers, and possibly more heterogeneous. Yermack (1996) finds evidence that smaller boards are more efficient, thus the firms increasing their boards face potential losses. Hermalin and Weisbach's (1998) argue that the causality might go in the opposite direction, i.e that better CEOs bargain for larger boards, and the dependence between the incumbent and the board is the reason that firms with larger boards to a larger extent ignore bad performance of the CEO. Since the change in board size appears to be exogenous rather than derived through a bargaining process, the implications of a larger board are unclear. It is here far from obvious that a board reduction should enhance the boards' ability to monitor the CEO, and that a larger board augment the CEO's leeway.

5.2.2.1 Turnover

This section examines how turnover is affected by the gender quota. Solely looking at the event window around 2007, it is not likely to capture what I would like to examine, since firms had to make board changes prior to the quota in order to meet it. The post-quota period nevertheless could point in the direction to what extent the adapters are satisfied with their board changes. If turnover is abnormally high in the post-quota years, this could indicate that the newly added members were a bad match. That said, we would still expect the turnover to fall even in the bad match scenario in the post-quota years. This is because turnover in excess of new incoming members must imply that also incumbent members are replaced, which is unlikely to happen for two reasons. First, firms are expected to be happy with incumbent members, as a dissatisfaction should have led to an earlier release of these members. Second, if a new member is revealed as a bad match, then we expect the board to be

reluctant to let go of the board members they apparently are satisfied with, as good members are regarded to be a rare commodity.

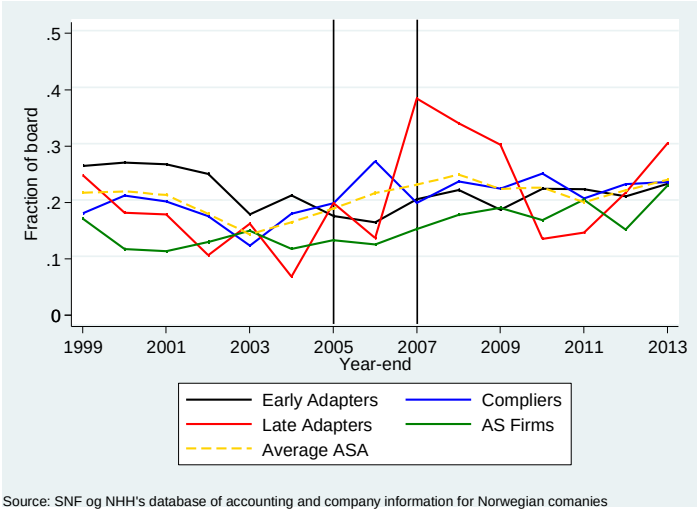

Figure 14 – Board turnover for all members. The variable is constructed as the ratio of members leaving to the total number of board members. A member is regarded as leaving in year t, if on the board in year t, but not in year t+1.

The late adapters' turnover increases sharply from 2006, and stays abnormally high through 2009, in Figure (14). The turnover among the early adapters and AS firms appears to be relatively stable, while the compliers turnover increases from around 12% in 2003 to roughly 25% in 2006.

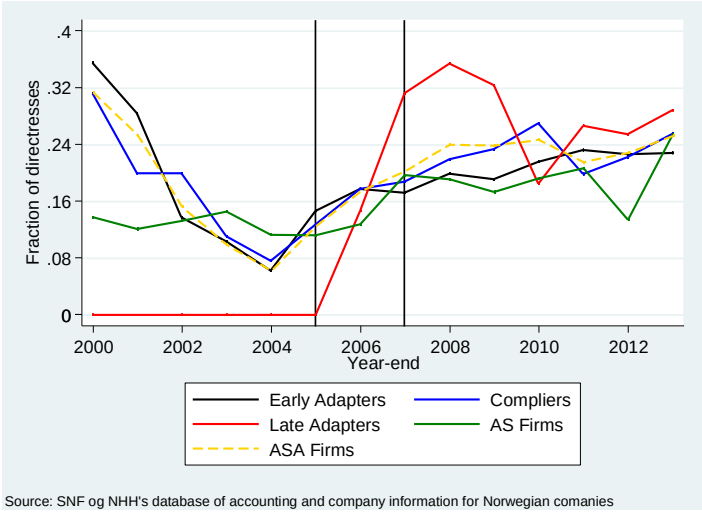

Figure 15 – Board turnover among directresses. The variable is constructed as the ratio of directresses leaving to the total number of directresses on the board by firm and year. A directress is regarded as leaving in year t, if on the board in year t, but not in year t+1.

Figure (15) shows the ratio of directresses leaving to the total number of directresses on the board. Recall from Figure (11) that there are few women on the board of directors for all adapter groups up to 2004. This results in relatively high turnover for these groups in the early years of the sample period. The most striking feature in Figure (15) is the increase in directress turnover among the late adapters, from 2005 and onwards. In 2005 this partly can be explained by few firms with directresses on the board, but thereafter a substantial proportion of the

firms in this group have at least one directress on their board. A similar, albeit weaker and longer lasting trend is present in the complier group. High directress turnover is consistent with firms having problems finding women who are a "good match" either with the firm, the board or both. A trial and error approach to find such a match, would result in higher directress turnover in the adaption years.

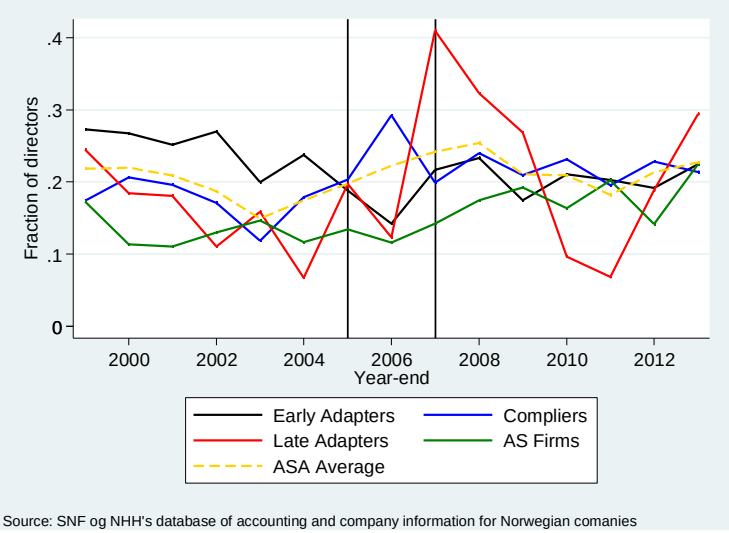

Figure 16- Board turnover among directors. The variable is constructed as the ratio of directors leaving to the total number of directors on the board by firm and year. A director is regarded as leaving in year t, if on the board in year t, but not in year t+1.

The director turnover is increasing towards 2007 for both the compliers and the late adapters as shown in Figure (16). The most likely explanation for this is to make room for incoming directresses. The increase in director turnover is largest for the late adapters. This is expected, since this group postponed the implementation of the quota the most, and thereby got the full effect over a short time span. The high turnover among the late adapters' directors is also partly explained by the 15% of firms that reduced their boards to meet the quota in 2008. In order to make this possible, at least two directors had to leave, resulting in very high director turnover for some firms.

5.2.2.2 Summary board turnover

Total board turnover increases sharply for the late adapters as we approach 2007. When looking at each gender separately, we see that this increased turnover to comprise both men and women. Further, directress turnover for this group stay abnormally high throughout 2009, which is consistent with these firms having a matching problem in regards to find good replacements for the directors they lose. This seen in connection with the findings from section 5.2.1, where I find the late adapters likely to increase their board size when appointing women to meet the quota, indicates that some firms have problems implementing it. One reason for why some firms choose higher turnover, and not simply increasing their board, as proposed by Hermalin and Weisbach (2003), could be because markets see smaller boards as more efficient, to be observed with a large board might in particular for listed firms be costly.

The increase in board turnover among the compliers relative to AS firms, is more moderate. Further, the director turnover explains more of the total turnover than for the late adapters. However, the directress turnover for this group appears to be higher in the first years after they implement the quota, which could indicate problems with finding good replacements. The turnover among the early adapters, does not seem to increase more than that of AS firms at any point of time. This can be explained by the board size of the early adapters and at what time they implemented the quota. The average board counts 5.5 members, with a turnover rate of almost 30% the quota could be met within two years. Considering that these firms on average started adapting already in 2001 (see Figure 6) there is no reason to expect any drastic changes in turnover in this group, even though some firms may have had problems finding good replacements for the board members that left.

5.2.3 The public limited liabilities company Act

The public limited liability company act (asal) § 6-11 subsection two, has an escape clause allowing firms with less than 20% employees of one gender to deviate from the general rule, stating that both genders should be represented if the firm has a corporate assembly. I utilize this to examine how many firms in each adapter group that has zero women on their corporate assembly. The numbers are presented in Table (6). We see that the proportion of firms with zero women on its corporate assembly is highest for the complier group, followed by the late adapters. Since the observations for employee representatives often are missing in the data, the proportions in Table (6) are too high. Given that the data are missing at random, the foregoing proportions still provide an indication about the gender mix among the employees in the adapter groups. Therefore, the compliers followed by the late adapters could have bigger problems finding women with sector experience, as there are fewer women working in these firms.

Table 6 - Proportion of firm-years (left) and firms (right) with zero women on their corporate assembly.

Adapter	Proportion of firms years	Proportion of firms
Early	0.44	0.51
Complier	0.82	0.82
Late	0.75	0.62

5.2.4 Conversions

The ASA to AS converters have this far been given little consideration, although this possibly is the group that would be most interesting to look at. However, two circumstances make this a particular hard task. First, the firms always had the option to convert from ASA to AS, and thereby avoid the quota. The converters therefore present

a severe endogeneity problem, because the firms most likely to convert are the ones for which it is costliest to meet the quota. The costs of delisting are likely to differ from the costs of meeting the quota, the costs found therefore are not necessarily due to the quota, even if the quota was the reason for them in the first place. If, however a firm converts and the reason for this is the quota, then the perceived costs of foregoing the possibility to obtain equity through public offerings must be lower than the costs of meeting the quota, given rational agents. Further, finance firms were allowed to convert from ASA to AS for the first time in 2006. A large number of conversions from finance firms could thus be independent of the quota. This section therefore makes no attempt to address these issues, it merely presents the data available on the issue. Eckbo et al. (2016) use a binomial logistic model, where they control for variation in shortfall of women. Shortfall is an indicator variable, taking the value of one if the firm had women on the board by year-end 2001, and zero otherwise. When excluding finance firms, they find no evidence that firms systematically converted because of the quota.

5.2.4.1 ASA to AS conversions

The conversion year is defined as the first year when a firm has a legal form that differs from the preceding year. There are a total of 229 unique firms, and 1,803 firm-years amidst the ASA to AS converters, of these do 57 unique firms, or approximately 25.8% meets the quota in some year post conversion. Further, only 20 firms meet the quota in all post-quota years for which it exists observations for the firm. Last, 48 of the 167 or 28.7% of the firms I was able to find the exact conversion year for, met the quota in the same year they converted. Table (16) in the Appendix contains a complete list over firms converting, also firms from the other groups, and all stand-alone ASA firms. Only looking at the sample firms could easily lead to wrong conclusions, since the sample encompass most unique firms in the years around 2007.

Figure (17) shows the proportion of directresses to the total number of members for ASA to AS and vice versa converters. The solid lines are the average directress proportion for all firms in the groups, while the dashed lines show the average fraction for firms yet to convert. The green line shows the evolution in fraction of directresses to board total for ASA to AS converters, while the blue dashed line shows this group's pre-conversion proportion of directresses. As expected, since obliged by law, the directress fraction for this group is approximately 40% pre-conversion, or at the level required to meet the quota for a 5-person board. The relatively dramatic fall in the proportion of directresses post-conversion is more unforeseen. The line stops in 2013, because all the converters in this group are registered with the legal form AS in 2014. The firms converting to ASA have fairly low

proportions of directresses before converting, but as they convert the fraction of women on these boards increase. When all firms have converted in 2014, the proportion of women is close to 0.4.

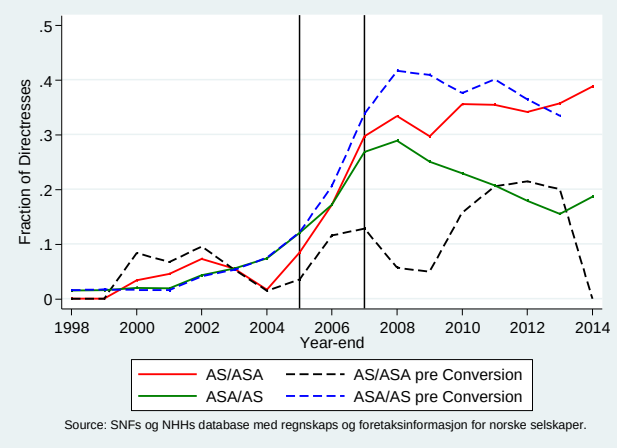

Figure 17 – Proportion of directresses to board total for AS to ASA converters and ASA to AS converters both pre and post quota.

When only examining the firms in the final sample in (7) through (8), Table (16) in the Appendix, it appears that a relatively large number of firms convert around 2007 compared to the other years. When examining all firms this looks to be a consequence of the sample size, simply being larger in these years. In the full sample the highest frequency of conversions occur in 2001 and 2007. One explanation for the high conversion rate in 2001 could be the dot-com bubble. The reasons for this might be that financial distress make firms easier takeover targets, further firms in the sample often are registered with the legal form AS in the year they are liquidated. Even after controlling for liquidations and mergers, the conversion rate is high in 2001, so the dot-com bubble cannot tell the whole story. I find the conversions to be relatively largest in numbers in 2009, when controlling for the number of registered ASA firms in every year. This is the first year after the financial crisis, and abnormally many liquidations occurred. After excluding liquidated, acquired, merged, and finance firms, the relative largest number of conversions happens in 2007, followed by 2012 and 2008 respectively.

5.2.4.2 Conversions a summary

The low fraction of women in ASA to AS converters post-conversion is puzzling. Of the firms allocated to this group, the firms having the required number of women on its board post-quota is surprisingly low. Especially considering that many of these firms meets the quota pre-conversion. This opens for the possibility that some firms in fact convert as a result of the quota. However, it is not a large number of firms converting around the quota years relative to other years in the sample period.

5.3.1 Manager compensation

Partial descriptive statistics comprising the mean values of the dependent and independent variables by firm groups are to be found in Table (7). A full summary statistics of the variables used is found in the Table (22) in the Appendix.

5.3.1.1 Evolution in CEO compensation

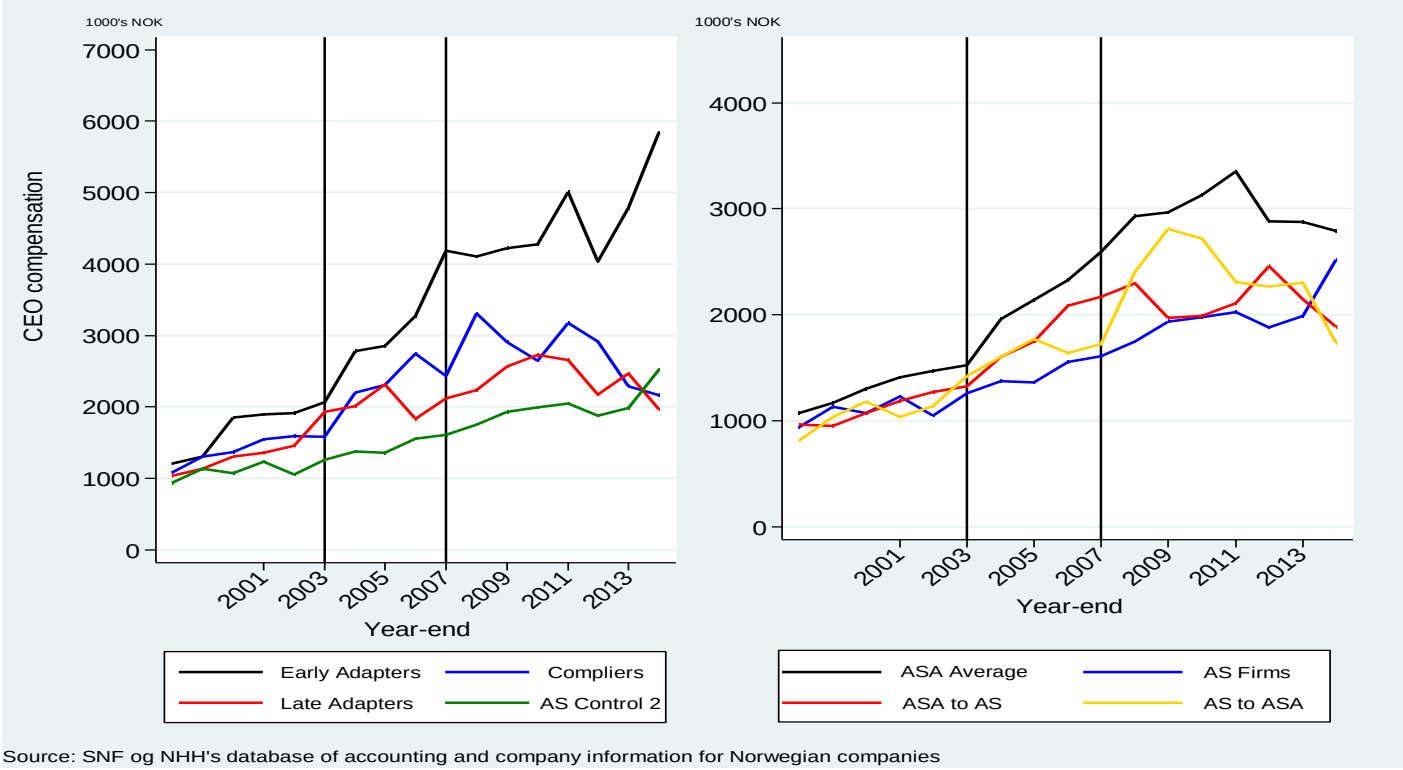

Figure 18- Evolution in CEO compensation over time in 1000's of NOK. Adapter groups vs AS is shown in the left window, converters vs AS and ASA average is shown to the right.

The evolution in salaries showed in Figure (18) appears to be growing as a linear function of time, wages in general however, are expected to grow as an exponential function of time. How the salary evolves over time determines if it should be included in levels or logs in the estimation model. To choose between the two, I use the R-squared of the two models where the post-period is set to start in 2008. More precisely I predict the explained variation, $\widehat{y_{it}}$ in the log model, and obtain the correlation between salary and the predicted value. The square of this correlation is about 0.417, which is a measure of how much of the variation in salary the log model can explain. The R-squared from the level model, is 0.404, and thus a clear favorite does not emerge from this test. I therefore estimate the model in both levels and logs to see if they differ.

Table 7 - Descriptive statistics comprising the mean values and the number of observations for CEO compensation, audit remarks, some corporate information and some accounting fixtures, for the different adapter groups and AS firms included in control group 2. The accounting fixtures is denoted in 1000s of NOK.

	Early Adapters				Compliers			
	Pre-quota		Post-quota		Pre-quota		Post-quota	
Dependent variables	N	mean	N	mean	N	mean	N	mean
CEO compensation	301	2,268	195	3,832	594	1,647	482	2,006
Audit remarks	347	0.0087	219	0.032	659	0.0137	509	0.0766
Independent variables								
# Shareholders	131	77,367	192	90,046	258	17,969	424	16,828
Fraction largest owner	131	0.106	192	0.145	258	0.152	424	0.159
CEO quality	347	0.0672	219	0.116	659	0.0567	509	0.109
Firm age	318	41.71	196	40.79	579	29.52	432	27.51
OSE-listed	347	0.715	219	0.808	659	0.628	509	0.613
CEO turnover	318	0.154	196	0.184	579	0.161	432	0.185
in thousands' NOK								
EBIT	319	2,944,000	193	6,542,000	525	665,603	422	394,041
Net income	319	1,401,000	193	2,481,000	525	357,664	422	201,820
Leverage	319	0.625	193	0.62	566	0.547	477	0.584
Total assets	319	46,390,000	193	113,000,000	566	11,177,000	478	13,950,000
Return on assets	319	0.036	193	0.036	566	-0.042	477	-0.045

	Late Adapters				AS control 2			
	Pre-quota		Post-quota		Pre-quota		Post-quota	
Dependent variables	N	mean	N	mean	N	mean	N	mean
CEO compensation	226	1,293	100	1,573	2,026	1,068	1,464	1,459
Audit remarks	248	0.0161	106	0.0566	2,248	0.00133	1,506	0.0073
Independent variables								
# Shareholders	100	7,063	94	4,869	458	470.1	487	761.6
Fraction largest owner	100	0.196	94	0.301	458	0.146	487	0.199
CEO quality	248	0.0677	106	0.102	2,248	0.0806	1,506	0.134
Firm age	237	24.48	94	30.71	1,138	27.12	500	32.48
OSE-listed	248	0.544	106	0.547	2,248	-	1,506	-
CEO turnover	237	0.16	94	0.255	1,138	0.102	500	0.084
in 1000's NOK								
EBIT	169	49,707	88	103,204	2,238	106,000	1,505	164,597
Net income	169	17,640	88	45,939	2,238	73,463	1,505	83,198
Leverage	180	0.556	98	0.577	2,248	0.661	1,506	0.645
Total assets	180	1,324,000	98	2,546,000	2,248	1,694,000	1,506	2,923,000
Return on assets	180	-0.055	98	-0.162	2,248	0.072	1,506	0.060

Table 8 - $CEO\ compensation_{i,t} = \alpha + \beta_1 Early_{i,t} + \beta_2 Complier_{i,t} + \beta_3 Late_{i,t} + \beta_4\ AStoASA_{i,t}, + \beta_5 ASAtoAS_t + \beta_6 Post_t + \beta_7 Early\ x\ Post_{i,t} + \beta_8 Comlpier\ x\ Post_{i,t} + \beta_9 Late\ x\ Post_{i,t} + \beta_{10} AStoASA\ x\ Post_{i,t} + \beta_{11} ASAtoAS\ x\ Post_{i,t} + \beta_{12} X_{i,t} + \varepsilon_{it}$. The vector X_{it}, include; F*irm age*, the natural logarithm of total assets (*Total Assets*), the ratio of book value of total debt to total assets (*leverage*), and a dummy indicating whether the firm is OSE-listed or not (*listed*), a proxy for CEO quality (*CEO tenure-to-age)*, a dummy indicating whether the CEO replacements (*CEO change), return on equity*, defined as ROE/100, return on assets (*ROA)*, and return on lagged one period, as well as sector controls and year-fixed effects. The Norwegian interbank rate offered (*Nibor 3 months) included in (3) and (4). Constant term is suppressed*. Cluster robust standard errors in parentheses. Source: SNF and NHH's database of accounting and company information for Norwegian companies. Stars indicate significance levels: (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$)

Dependent variable:	CEO salary	Natural logarithm of CEO salary		
	Post 2007	Post 2007	Post 2005	Post 2003
Independent variables	(1)	(2)	(3)	(4)
Early	221.99	0.09	0.05	0.00
	(255.06)	(0.10)	(0.09)	(0.09)
Complier	58.02	-0.06	-0.07	-0.12
	(210.69)	(0.10)	(0.10)	(0.10)
AS to ASA	158.06	0.04	0.12	0.24***
	(196.37)	(0.09)	(0.10)	(0.09)
ASA to AS	692.88***	0.13	0.13	0.14
	(240.99)	(0.10)	(0.10)	(0.11)
Late	275.50	0.05	0.04	-0.01
	(271.02)	(0.13)	(0.15)	(0.15)
Post	231.17	0.43***	6.52	5.64
	(348.19)	(0.13)	(10.04)	(10.08)
Early x Post	1365.91***	0.26***	0.25***	0.27***
	(448.71)	(0.09)	(0.09)	(0.09)
Complier x Post	829.14***	0.30***	0.24**	0.26***
	(264.16)	(0.10)	(0.10)	(0.10)
Late x Post	355.94	0.14	0.10	0.15
	(354.82)	(0.17)	(0.19)	(0.16)
AS to ASA x Post	403.83	0.08	-0.07	-0.21*
	(394.12)	(0.12)	(0.13)	(0.11)
ASA to AS x Post	122.42	0.11	0.07	0.05
	(223.01)	(0.10)	(0.10)	(0.10)
Board Size	113.03**	0.05**	0.05**	0.05**
	(46.77)	(0.02)	(0.02)	(0.02)
Total Assets	494.18***	0.16***	0.16***	0.16***
	(66.69)	(0.02)	(0.02)	(0.02)
Firm Age	3.11	0.00	0.00	0.00
	(2.18)	(0.00)	(0.00)	(0.00)
Leverage	-273.36	-0.12	-0.12	-0.11
	(315.92)	(0.10)	(0.10)	(0.10)
OSE-listed	-2.09	0.12*	0.12*	0.12*
	(175.40)	(0.07)	(0.07)	(0.06)
CEO tenure-to-age	3314.35**	0.84**	0.83**	0.81**
	(1350.22)	(0.39)	(0.39)	(0.39)
CEO change	350.21**	0.05	0.05	0.05
	(146.93)	(0.04)	(0.04)	(0.04)
Return on Equity	4052.08*	1.20*	1.17*	1.23*
	(2113.99)	(0.69)	(0.69)	(0.70)
Return on Assets	-19.58	-0.01	-0.01	-0.02
	(184.44)	(0.07)	(0.07)	(0.07)
L.Return on Assets	-43.35	0.04	0.04	0.04
	(218.08)	(0.08)	(0.08)	(0.08)
NIBOR 3 months			118.72	101.53
			(199.49)	(200.34)
R^2	0.417	0.453	0.452	0.454
Adjusted R^2	0.402	0.439	0.438	0.440
Observations	1946	1947	1947	1947

5.3.1.2 Manager compensation the results

Column (1) and (2) in Table (8) show that the compensation offered to the manager of an early adapter or a complier to increase relative to the salaries offered CEOs in AS firms after the quota becomes mandatory. In the first column of Table (8) I find the compensation offered the manager to increase by on average 1,365,910 NOK more among the early adapters than among AS firms. The compensation of a CEO among the compliers increase by 829,140 NOK relative to the manager compensation in AS firms. Both coefficient estimates are significant at the 1% level. When compensation is specified in logs in column (2), the compensation paid to the CEO of an early adapter increase by 26% and compensation among compliers increase by 30% relative to AS firms. Again, both estimates are significant at the 1% level. There is no evidence in column (1) or (2) that the CEO remuneration in the late adapters or the two converters increase more than in AS firms.

Further from column (1) and (2) I find that adding another board member increase the salary of the CEO with about 113,000 NOK, estimating in levels, or 5% using logs. Both coefficient estimates are significant on the 5% level. This may as Yermak (1996) suggests be a consequence of free-riding in larger boards, and thereby weaker incentives for the board to negotiate over the managers' compensation. However, it could also be that larger boards on average are better at providing the CEO with proper incentives, and advice. In the first column there is no indication that the average compensation offered to the CEO increases after 2007, relative to the previous years. Column (2) shows that, by contrast the salaries increase by 43% between the periods. Further, the coefficient estimate is significant at the 1% level. It seems likely that the salaries, even after holding the whole set of independent variables fixed, increases with time. Further, it appears to be a strong relationship between the total assets of a firm and the compensation offered to the manager. A 1% increase in total assets, increases the compensation to the manger by about 4,900 NOK in the level estimation, and 0,16% in the log model. Both coefficients are significant at the 1% level. Leverage enters both estimations with a negative coefficient, although not statistically different from zero in either. Neither the age of the firm seems to be related to manager remuneration.

The coefficient estimate for *OSE-listed* is insignificant in the level estimation, while significant at the 5% level in the log-estimation. The estimate from the log-estimation perhaps is more credible here, it seems reasonable that salaries are higher in listed firms. The variable *CEO tenure-to-age*, appears to be positively related to manager compensation, the estimate is significant at the 5% level in both models. This variable is included to mitigate the potential omitted variable bias in the equations, if the groups systematically hires CEOs with potentially differing career concerns. Increasing *CEO tenure-to-age* with one in the level-estimation, however is not possible, unless

a CEO hold multiple top positions for more than half of his life. No such person exists in the data, but for an average aged CEO, which is 47 years, a sitting CEO for the past 10 years is estimated to on average earn 705,000 more than a CEO taking over a firm at the age of 47. In the log-estimation the difference in the compensation of the two CEOs is approximately 17.8%.

Both ROA and ROA lagged one period, somewhat surprising do not seem to affect CEO remuneration. The estimate for return on equity however, is positive albeit only significant at the 10% level. This may indicate that managers more often are evaluated by ROE than ROA. Increasing ROE with 1 percentage point, increases manager compensation with 40,520 NOK in the level estimation, and 1.20% in the log estimation. *CEO turnover* enters with a positive and significant coefficient in the level estimation, while it is insignificant in the log-estimation. It is reasonable that severance packages and signing bonuses could imply higher salaries in the year a CEO is replaced.

The two models are very much alike in their estimated interactions terms, further the significance in the vector of independent variables is similar between the two. The log-estimation perhaps is more in line with what one would expect from an economical perspective. Since salaries are expected to grow over time, and listed firms with the privilege to access capital markets, which is likely to involve more complexity should be reflected in the compensation.

Column (3) and (4) show that manager remuneration increases by more among early adapters and compliers relative to AS firms, independent of when the post-period is set to start. The coefficient estimates for interaction terms between *Early x Post* is highly similar across the columns, and all estimates are significant at the 1% level. The CEOs of the compliers also are estimated receive higher compensation after all post-period thresholds. However, the interaction term between *Complier x Post* lose some of its predicative power when the post-period is set to start after 2005. Note that the estimated standard errors are equal in all columns. The reduction therefore is likely to be the result of a slightly lower compensation growth among the CEOs in this group in 2006 and possibly 2007. Column (4) shows that the compensation for managers in firms converting from AS to ASA appears to fall after 2003. However, this reduction must be temporary, as the interaction terms with the two later post-periods both are insignificant. Further the estimate is only significant at the 10% level. There is no evidence of salaries among CEOs in late adapters, and firms converting to AS to increase more than in AS firms for any post-period.

The vector of independent variables is similar across the columns. The only new control variable included in column (3) and (4) is the 3 month Norwegian interbank offered rate (NIBOR). This is meant to pick up any booms or recessions in the economy, as this rate tends move with the general state of the economy. More precisely it is likely to be increased in a boom, and lowered in a recession. When ROA and ROE are not controlled for in Table (17) in the Appendix, the estimate for NIBOR is positive and significant. That an increase in the internal rate offered is associated with higher levels of CEO compensation, is in line with what we expect from economic theory. When the economy blossom, bigger rents are shared with the employees of the company. When also controlling for ROE and ROA, *Nibor 3 months* still is positive but not significant at conventional levels, suggesting that firms compensate their managers according to performance in good times as well.

5.3.1.3 Robustness of results

The lines showing manager compensation are parallel for all groups when the post-period is set to start after 2003. The parallel trend assumption therefore should hold when 2003 marks the post-period threshold. This also is the most interesting time to start the post-period, as it tests if the compensation increases when the firms start to implement the quota. Further the same estimations as in Table (8) are performed using another control group, denoted "AS control 1". These estimations yield similar, albeit less significant results when the dependent variables are in logs. Nevertheless, the early adapters are found to increase the wages offered their CEOs relative to the control group when they implement the quota, independent of what control group that is chosen. When the dependent variables are in levels, the results are highly congruent with the ones from Table (8). The output from these regressions are to be found in Table (18) in the Appendix.

I am also here concerned that there might be autocorrelation in the error terms. Figure (28) in the Appendix shows that this concern was well founded. The data exhibit significant positive autocorrelation. Also here, it is assumed that the correlation is strongest on firm-level, and cluster the standard errors on firm level. However, I realize that it is likely to be correlation at a higher level as well, for example at industry-peers.

5.3.1.4 A summary of CEO compensation

This section presents evidence that the early adapters and compliers post-implementation compensate their managers in excess of what we would expect from the evolution observed in wage-level for AS firms. Further, the timing of these increases coincide with the time the groups start to implement the quota. It therefore seems possible that the compensation increases and the quota implementation is causally related. The compensation offered CEO's among the late adapters is not found to be different post-quota.

Hermalin and Weisbach (1998) argue that higher manager compensation is a result of a high quality CEO taking advantage of his bargaining position. An implicit assumption in the model is that the CEO bargains over both compensation and the appointment of new board members. It is uncertain if the CEO is in a position to bargain over new directresses, when the objective of the firm is to meet the quota. However, we cannot discard that the concerned is in such a position. Nonetheless, there is no evidence of differences in CEO tenure between the early adapters and the AS firms. Further, there is evidence of the compliers having significantly less tenure among their CEOs, and that this holds for both for all previous tenure, and tenure at the same firm.

Another explanation is that the CEO bargains against a less experienced counterpart in the first years after the quota, and thereby can take advantage of a relatively elevated bargaining positon. This is consistent with Core et al.'s (1999) findings, that weaker governance structures are associated with higher manager compensation. However, the gender quota, on average implies at most two women to replace two men, potentially leaving 60% of the board unaffected, and it should be questioned if these changes affect the status quo.

The estimations in Table (9) below, presents evidence that the early adapters take in new CEOs with higher ratio of previous CEO tenure-to-age, and longer previous CEO tenure than AS firms in the post-period. This relationship is more significant the later we "start" the post-period. The latter leads to ambiguity in the reason for the incoming CEO's increased tenure. It may be due to a shift towards more experienced CEOs, but also be the result of a database only dating back to 1998. The significant estimate *CEO tenure-to-age* nevertheless indicates that the early adapters employ managers with potentially different career concerns than AS firms. The lack of data prior to the quota may be the reason why this estimate becomes more significant over time. There is also weak evidence in column (5) that CEOs with longer tenure provides better return on assets. This is consistent with higher salaries among the early adapters, since they appoint CEOs with longer previous tenure.

Alzaman and Suarez (2003), find a strong governance structure and no severance pay optimal if firm performance is a strong predictor of the managers' investment decisions. If the CEO's performance is easy to measure, and further good performance is observed, this would make higher compensation consistent with the firm having a strong board. One consequence of the quota, may be that governance is strengthened, and that boards' capacity to monitor, and incentivize managers are enhanced. It is likely that managers in firms listed on the OSE, partly are compensated on the basis of the evolution in market value, as this is the markets assessment of the firms' investment decisions. Roughly 80% of the early adapters and 60% of the compliers are listed on the OSE, the

steep increase in market value for these firms in the implementation period, therefore partly could explain the increased CEO compensation in the groups. The evolution in the market value of OSE-listed firms over the last 20 years is shown in Figure (27) in the Appendix. Table (20) in the Appendix shows that the average return on equity between 2003 and 2007 is 17.95% for the early adapters, 7.69% for the compliers, while AS firms average 33.71%. It is uncertain to which extent managers are compensated by the preceding performance indicators, or if firms use them at all. Further, firms are likely to put different weights at different measures. Therefore, if the main determinant of wages in listed firms are market capitalization, higher manager compensation could be justified despite the lower ROE relative to AS firms. Anyhow looking at these measures, one cannot exclude the possibility that higher wages are conforming with stronger governance.

In the preceding sections I have found that firms appoint less members with general experience, and more directors with CEO experience in the post-period. The peer-effect suggested by Adams and Ferreira (2009), could lead to increases in the compensation offered to the CEO. However, none of the adapters appear to increase their proportion of directors with CEO experience in excess of AS firms, thus generous compensations from peers is not a likely explanation for the wage increases.

The early adapters on average lose least experience, they are the only group that attracts directresses with more sector experience than the AS firms in the post-period. There also is evidence of a higher degree of board independence among incoming directresses. Indicating that governance could be strengthened, as the board may be better equipped to monitor and provide the manager with incentives. This group perform well in the years with the most evident wage increase when evaluated by ROE, and approximately 80% of the firms in this group are listed on the OSE, which had a substantial increase in the same period. All of which suggest that the increase in CEO remuneration may be due to stronger incentives and better performance.

The compliers lose most board experience, and to a greater extent than the early adapters struggle to find new women with sector experience. They are more prone to add directors with sector experience, for which there exist evidence of a lower degree of independence from the CEO, and have the highest proportion of board members with CEO experience in the sample. The compliers have the lowest ROE among the groups, and are most likely to change board size to meet the quota. All of which is consistent with managers taking advantage of a relatively strengthened bargaining position. However, in this group wage increases starts in 2003, i.e. before these firms implemented the quota, which could mean that the increase is independent of the quota.

Table 9 - CEO characteristics $_{i,t} = \alpha + \beta_1 Early_{i,t} + \beta_2 Complier_{i,t} + \beta_3 Late_{i,t} + \beta_4\ AStoASA_{i,t}, + \beta_5 ASAtoAS_t + \beta_6 Post_t + \beta_7 Early\ x\ Post_{i,t} + \beta_8 Comlpier\ x\ Post_{i,t} + \beta_9 Late\ x\ Post_{i,t} + \beta_{10} AStoASA\ x\ Post_{i,t} + \beta_{11} ASAtoAS\ x\ Post_{i,t} + \beta_{12} X_{i,t} + \varepsilon_{it}$. *In (5) and (6) is the regression estimated by OLS:* CEO tenure $_{i,t} = \alpha + \beta_1 Early_{i,t} + \beta_2 Complier_{i,t} + \beta_3 Late_{i,t} + \beta_4\ AStoASA_{i,t}, + \beta_5 ASAtoAS_t + \beta_6 X_{i,t} + \varepsilon_{it}$ *Constant term is suppressed.* Cluster robust standard errors in parentheses. Source: SNF and NHH's database of accounting and company information for Norwegian companies. Stars indicate significance levels: (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$)

Dependent variable:	Tenure incoming CEO		Tenure-to-age incoming CEO		All years of	CEO tenure at
	Post 2005	Post 2007	Post 2005	Post 2007		
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Early adapters	-0.24	-0.29	-0.00	-0.01	-0.44	-0.26
	(0.27)	(0.25)	(0.01)	(0.01)	(0.32)	(0.39)
Compliers	0.01	-0.07	0.00	-0.00	-0.69***	-0.88***
	(0.26)	(0.23)	(0.01)	(0.00)	(0.26)	(0.34)
Late adapters	-0.14	-0.19	0.00	-0.00	-0.33	0.17
	(0.32)	(0.29)	(0.01)	(0.01)	(0.43)	(0.73)
ASA to AS	0.06	0.10	0.00	0.00	-0.71***	-0.69**
	(0.30)	(0.27)	(0.01)	(0.01)	(0.23)	(0.29)
AS to ASA	0.59	0.47	0.01	0.01	-1.78***	-1.82***
	(0.41)	(0.43)	(0.01)	(0.01)	(0.25)	(0.37)
Post 2003	0.36	0.01	0.01	0.00		
	(0.47)	(0.47)	(0.01)	(0.01)		
Early x Post	0.94	1.49**	0.02	0.03*		
	(0.60)	(0.75)	(0.01)	(0.02)		
Complier x Post	0.26	0.67	0.00	0.01		
	(0.40)	(0.48)	(0.01)	(0.01)		
Late x Post	-0.84**	-0.59	-0.02**	-0.02**		
	(0.39)	(0.40)	(0.01)	(0.01)		
ASA to AS x Post	0.50	0.65	0.01	0.01		
	(0.42)	(0.48)	(0.01)	(0.01)		
AS to ASA x Post	-0.38	-0.19	-0.01	-0.01		
	(0.58)	(0.57)	(0.01)	(0.01)		
Board Size	0.02	0.02	-0.00	-0.00	0.02	-0.08
	(0.05)	(0.05)	(0.00)	(0.00)	(0.05)	(0.07)
Total Assets	0.17***	0.16***	0.00**	0.00**	-0.03	0.15*
	(0.06)	(0.06)	(0.00)	(0.00)	(0.05)	(0.08)
Firm Age	-0.01**	-0.00**	-0.00**	-0.00**	0.01***	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	-0.53	-0.53	-0.01	-0.01	-0.20	-0.37
	(0.33)	(0.32)	(0.01)	(0.01)	(0.19)	(0.23)
OSE-listed	0.17	0.20	0.00	0.01	0.05	-0.04
	(0.20)	(0.19)	(0.00)	(0.00)	(0.19)	(0.25)
Return on assets	-0.23	-0.23	-0.00	-0.00	0.25**	0.20
	(0.22)	(0.21)	(0.00)	(0.00)	(0.12)	(0.13)
Sector controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year fixed-effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
R^2	0.171	0.176	0.159	0.164	0.247	0.257
Adjusted R^2	0.107	0.113	0.094	0.100	0.240	0.251
Observations	628	628	628	628	4417	4417

5.3.2 Board size re-visited

To further investigate the impact board size has on manager compensation, I utilize the possibility that the compliers' and late adapters' increased board size in the years surrounding the quota is exogenous rather than endogenous. The idea is that an increase in board size, is likely to be an endogenous response to some apparent change. However, when the compliers and late adapters in the years surrounding the quota, add women (to meet the quota), this may be an exogenous change, since the most apparent reason for this change was to meet the quota, see Figure (13) for context.

5.3.2.1 The approach

There are some complications using this approach. The main problem is how to construct a good control group. Using all AS firms will pick up much noise, as board sizes are expected to change over time, at least to some extent. Controlling with other adapters that did not increase its size is likely to pick up any asymmetries, which may exist between the firms that chose to increase its board size, and the ones that do not. This could be interesting in itself, and is done in estimation (1), Table (10). Finally, regressing only over the ones making a change is likely to give spurious estimates, as salary increases with time.

In column (2), I investigate if a forced increase in board size affects CEO compensation adversely from a voluntary increase of the board. The AS firms are accepted as a control if they increase their board size between 2005 and 2008. A firm is dropped if it reverses its decision to increase the board in one of the following years. For this group, no restriction regarding the board is imposed, a decision to increase the board size, thus is expected to be endogenous. Thus, this section investigates whether a forced board increase affects the compensation in a different manner that a voluntary one, and if the adapters that increase the absolute size of the board compensates managers more after this increase. This is done by regressing CEO remuneration over the vector X_{it} of independent variables, and in turn applying adapters not increasing the absolute board size, and AS firms that increase their board size in the control group.

Table 10 - In (1) the regression is $CEO\ compensation_{i,t} = \alpha + \beta_1 Increase\ board_{i,t} + \beta_2 Comlpier\ x\ Post_{i,t} + \beta_3 Late\ x\ Post_{i,t} + \beta_4 Increase\ board_{i,t}\ x\ Post_t + \beta_5 X_{i,t} + \varepsilon_{it}$. Increased board x post, give the increase in salary for the firms increasing their board over the firms that do not increase their board. The late adapters and compliers that do not increase board size is left in the intercept. Increased board is a dummy taking the value 1 if the firm increase board size while adding a woman. The interaction terms between complier and late, and post indicates the wages for these groups after adaption, it "rolls out" as the firms adapt. In (2) the regression is: $CEO\ compensation_{i,t} = \alpha + \beta_1 Increase\ board_{i,t} + \beta_2\ Post_{i,t} + \beta_3 Increase\ board_{i,t}\ x\ Post_t + \beta_4 X_{i,t} + \varepsilon_{it}$. The only difference from (1) is that AS firms increasing the board size is left in the intercept, post starts the post-period. The vector X_{it}, include; An indicator variable taking the value 1 if a new woman is added to the board (*New woman),* the natural logarithm of total assets (*Total Assets*), the ratio of book value of total debt to total assets (*leverage*), and a dummy indicating whether the firm is OSE-listed or not (*listed*). Further do we include the variables, a proxy for CEO quality (*CEO tenure-to-age).* Cluster robust standard errors in parentheses. Cluster robust standard errors in parentheses. Source: SNF and NHH's database of accounting and company information for Norwegian companies. Stars indicate significance levels: (* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$)

Dependent variable:	Log(salary)	
	Sample period 1998-2010	Sample period 1998-2010
Independent variables	(1)	(2)
Increased board	0.01	0.14
	(0.17)	(0.11)
Complier x Post	0.77***	
	(0.14)	
Late x Post	0.90***	
	(0.19)	
Post		0.54***
		(0.19)
Increased board x Post	0.20*	-0.03
	(0.12)	(0.10)
New Woman	-0.01	0.05
	(0.07)	(0.05)
Total Assets	0.19***	0.16***
	(0.03)	(0.03)
Firm Age	0.00*	0.00***
	(0.00)	(0.00)
Leverage	-0.28	-0.13
	(0.20)	(0.14)
OSE-listed	-0.06	0.04
	(0.12)	(0.08)
CEO tenure-to-age	0.14	0.75*
	(0.73)	(0.45)
Constant	4.44***	4.40***
	(0.46)	(0.50)
R^2	0.449	0.416
Adjusted R^2	0.405	0.390
Observations	428	877

5.3.2.2 Board changes the results

Table (10), column (1) shows that the salary of the general manager increase by 20% for the adapters that increase their boards in excess of the adapters that kept or reduced their board size. The coefficient estimate is significant at the 10% level. It appears as the decision to appoint a woman to the board is independent of the compensation offered the manager, as indicated by the insignificant coefficient for *woman.* This suggests that the reason for the general managers' increased compensation is that the firms increase their boards. One explanation for this could be more free riding by members in a larger board. However, it could also reflect asymmetries between the companies that increase their boards and the firms that do not. Hence, an increase in wage may have occurred for the firms increasing their boards independent of the decision to add more members. Nevertheless, this wage

increase would be consistent with the firms increasing their boards having larger problems of adapting to the quota. The estimate for *increased board* captures the population of firms that increase their board size in the period. The complier and late adapter group pre-quota, are left in the constant term. The intercepts between post and both the complier and the late adapters indicate that salaries are higher in the post-period. Total assets in the estimation is positive and significant at the 1% level, indicating that salaries are higher in firms with more assets.

In column (2) AS firms that endogenously increase their board constitute the control group. There is no evidence of the compensation offered the CEO among the compliers and the late adapters that expand their boards to be different from the wages offered by AS firms that also increase their boards. Hence, the wage offered a CEO here appears to increase independent of the change being "forced" or voluntary. The reason for the compensation increases nonetheless might differ substantially. The coefficient estimate for *Post* is highly significant indicating that the salaries in general is higher in the post-period. We further see that more total assets are associated with higher salaries, and the same is true if the CEO has longer tenure relative to age.

5.3.2.3 Robustness of result

The choice of sample period in these regressions affect the result. I fail to find significant differences in column (2) independent of period chosen. In estimation (1) the most significant estimate for *Increase board x Post* is obtained by letting the sample period last to 2012, the p-value is then 0.082. The p-value increase to 0.167 by extending the sample period to 2014. It exists a trade-off here regarding the choice of period, extending the period includes more observations however, moves us further away from the experiment. Over the longer period firms do more changes to their boards, and we are no longer testing what we initially intended. The post-period in these regression is set when firm *i*, changes its board size. Hence, every firm is in the "pre-period group" until the board size is increased, and in the "post-period group" thereafter. This should control for the potential wage increases in the period if the firms changing their board size is spread out evenly in time. Looking at Figure (13) this appears to be the case for the adapters. Roughly equally many firms increase their boards from 2005 to 2008. A further problem here is the small sample size. There are few firms in each group and the number of observations is low, which in turn makes the estimates imprecise.

5.3.2.4 Summary board changes

There is weak evidence that firms among the compliers and late adapters that also increase their boards as a result of the quota pays somewhat higher wages post-adaption than the firms not expanding their boards. I fail to find evidence that the compliers and late adapters that increase their boards pays higher wages than AS firms, which also increase their boards.

5.3.3 Linear probability model

Estimating by OLS when the dependent variable is discrete, may have implications for inference. I therefore estimated audit remarks in a model without interaction terms, by a logistic probability model and OLS, to find that the results were similar. The output from these regressions are to be found in Table (21) in the Appendix. Wooldridge (2013), acknowledges the use of OLS estimation to discrete outcomes as the statistics not are likely to be far off from the true estimates. Hence, in this section a linear probability model is used to examine whether the adapters have larger problems meeting the required audit standards post-quota. Athey and Imbens (2006) show that under the assumption of invariance in the distribution of the unobservable variables captured in U_i within each group, and in addition allowing for weak monotonicity, the difference in difference estimator could be used to compare groups over time without the assumption of parallel trends in the outcome variable (Athey & Imbens, 2006).

5.3.3.1 Descriptive statistics audit remarks

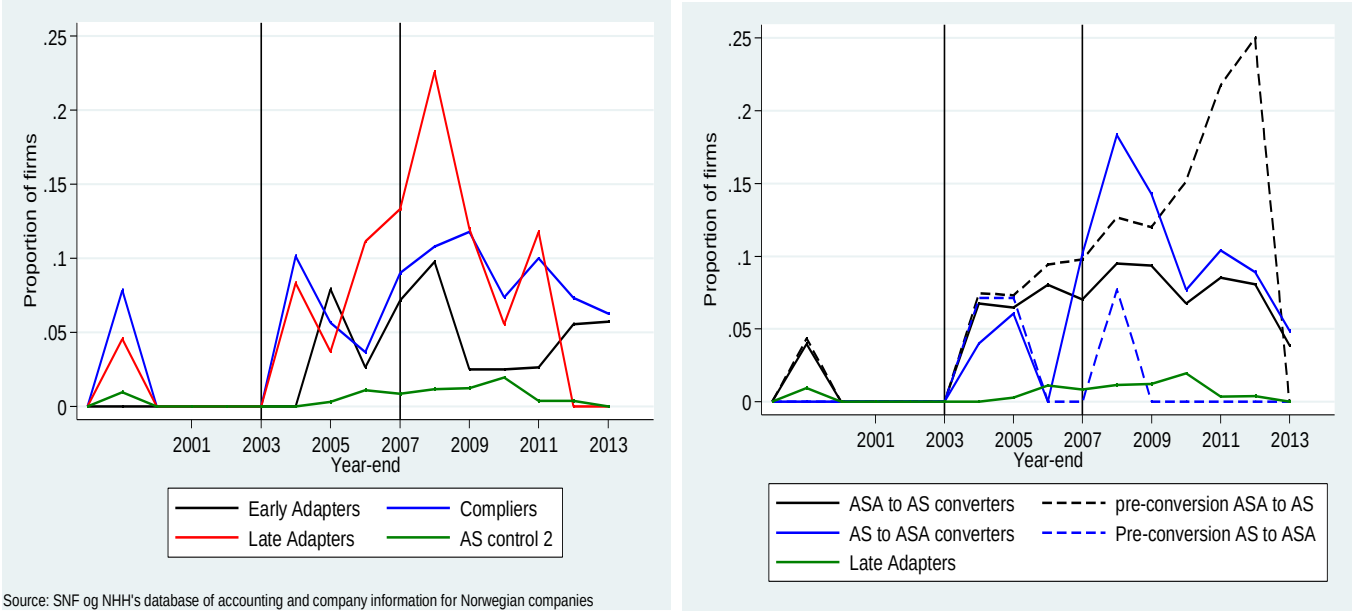

Figure 19 - Proportion of firms getting an audit remark in year t. Adapters vs AS to the left, and converters vs AS to the right

The proportion of firms in the adapter groups that get an audit remark in a year increase by much relative to the AS firms after 2003, as shown on the left hand side of Figure (17). The late adapters have most remarks in 2008, which happens to be the year of the financial crisis, and the year they implement the quota. That no firms get audit remarks between 2000 and 2003 is remarkable. Further, this makes it hard to know whether the trends in outcome are parallel or not. Either, the trends are highly parallel, or an equally likely explanation is that the observations is missing altogether. However, in both 1999, and 2004 there are observations, but the early adapters still leave "clean" accounts, and thus are not getting audit remarks in these years. On the right hand side of Figure (19) the ASA to AS converters appear to have a high frequency of firms getting audit remarks in the years before conversion. The opposite seems to be true for AS to ASA converters, for these remarks are most frequent post-conversion.

5.3.3.2 Regressions audit remarks

I (somewhat paradoxical) define it a success when the firm receives an audit remark in year t. The estimates therefore measure the change in probability of getting an audit remark, holding other factors fixed. In column (1) the post-period is set to start after 2003, while in column (2) the implementation years are dropped. This is done to examine whether the effects found in (1) were temporary. The regression output is shown on the next page.

Table 11 - Probability of Audit $remark_{i,t} = \alpha + \beta_1 Early_{i,t} + \beta_2 Complier_{i,t} + \beta_3 Late_{i,t} + \beta_4\ AStoASA_{i,t}, + \beta_5 ASAtoAS_t + \beta_6 Post_t + \beta_7 Early\ x\ Post_{i,t} + \beta_8 Comlpier\ x\ Post_{i,t} + \beta_9 Late\ x\ Post_{i,t} + \beta_{10} AStoASA\ x\ Post_{i,t} + \beta_{11} ASAtoAS\ x\ Post_{i,t} + \beta_{12} X_{i,t} + \varepsilon_{it}$. The vector X_{it}, include; Firm age, the natural logarithm of total assets (Total Assets), the ratio of book value of total debt to total assets (leverage), and a dummy indicating whether the firm is OSE-listed or not (listed), a proxy for CEO quality (CEO tenure-to-age), a dummy indicating whether the CEO replacements (CEO change), The Norwegian interbank rate offered (Nibor 3 months), a dummy indicating if the firm reports by IFRS, and a dummy indicating that the firms auditor is one of the "big 4". Constant term is suppressed. Cluster robust standard errors in parentheses. Source: SNF and NHH's database of accounting and company information for Norwegian companies. Stars indicate significance levels: (* p < 0.10, ** p < 0.05, *** p < 0.01)

Dependent variable:	Audit remarks	
	Post 2003	Post 2008
Independent variables	(1)	(2)
Early	0.01	0.04*
	(0.02)	(0.02)
Complier	0.03	0.05*
	(0.02)	(0.02)
AS to ASA	0.01	0.05*
	(0.02)	(0.03)
ASA to AS	-0.02	-0.00
	(0.02)	(0.02)
Late	-0.00	-0.02
	(0.01)	(0.01)
Post	5.02***	4.12**
	(1.78)	(1.77)
Early x Post	0.05*	0.06**
	(0.03)	(0.02)
Complier x Post	0.07*	0.07**
	(0.04)	(0.03)
Late x Post	0.04	0.06**
	(0.03)	(0.03)
AS to ASA x Post	0.13***	0.06*
	(0.04)	(0.04)
ASA to AS x Post	0.03**	0.02
	(0.01)	(0.02)
Board Size	0.00	-0.00
	(0.00)	(0.00)
Total Assets	-0.01***	-0.02***
	(0.00)	(0.01)
Firm Age	-0.00	-0.00
	(0.00)	(0.00)
Leverage	0.08***	0.12***
	(0.03)	(0.03)
OSE-listed	-0.01	0.01
	(0.02)	(0.01)
CEO tenure-to-age	-0.07	-0.12*
	(0.07)	(0.07)
CEO change	0.00	0.00
	(0.01)	(0.01)
NIBOR 3 months	115.72***	94.00**
	(40.99)	(40.79)
IFRS	-0.02	-0.04*
	(0.02)	(0.02)
The big four	-0.00	-0.01
	(0.01)	(0.01)
Sector controls	*Yes*	*Yes*
Year fixed-effects	*Yes*	*Yes*
R^2	0.093	0.160
Adjusted R^2	0.077	0.146
Observations	2872	2834

Both the early adapters and the compliers are more likely to get an audit remark when they implement the quota. Further the adapters are more likely to get audit remarks also after the quota becomes mandatory than AS firms. Column (1) shows that the early adapters are estimated to have an increase in the probability of receiving an audit remark of 5% relative to the AS firms after they implement the quota. The interaction term *Early x Post* however, only is significant at the 10% level. The probability for the compliers to get remarks are estimated to be 7% higher when the post-period is set to 2003. The firms converting from AS to ASA appears to have the largest problem reporting "clean" accounts in the post-period, the coefficient estimate is significant even at the 1% level. This could be because different accounting standards apply to ASA firms, and that firms find it hard to meet these standards in the years after they convert. Since most of the auditor problems occur after conversion, Figure (19), this explanation seems to be likely. We further obtain a positive and significant estimate for *ASA to AS x Post*, indicating that also the firms converting from ASA to AS have a higher probability than the control group to get an audit remark. Looking at Figure (19) the ASA to AS firms yet to convert appears to have the biggest problems of delivering "clean" accounts, suggesting that these firms may have had some quota-related problems.

The estimate for *Total assets* is negative, and highly significant. This is somewhat surprising, as the complexity and scale in the accounts are expected to increase with the assets, and thereby also increase the probability of making an error somewhere in the reported statements. Firms with more assets therefore appear to have better accounting procedures. An increase in debt is associated with a higher probability of receiving an audit remark, the estimate for leverage is positive and significant at the 1% level. This is more expected, as one of the ways to get a remark is by losing equity, and the probability of this should increase with leverage. Last an increase in the interbank rate offered is associated with more audit remarks. A 1 percentage point increase in NIBOR increases the probability of receiving an audit remark by 1.16%. The positive sign is interesting, the reason for it could be that firms have more projects in a boom, and that increased activity increases the probability of making a reporting error.

Column (2) presents similar output as column (1). The probability of one of the adapters' getting an audit remark is approximately 6% in higher than this probability for AS firms. All estimates are significant at the 5% level. We see that the interaction terms for the converters are lower and less significant than those found in column (1). This is consistent with ASA to AS converters having quota related problems, as we are less likely to see problems in this group as time passes, and more firms have converted. The lower, and less significant estimate for the interaction terms for the AS to ASA converters, further this is consistent with the increased probability of receiving a remark being a consequence of new routines rather than the quota.

The vector of independent variables is highly similar to that in column (1). However, the estimate for *CEO tenure-to-age* are negative and significant at the 10% level, indicating that having a more experienced CEO reduces the probability of getting a remark. Last, firms reporting accounts after the international financial reporting standards appear to have a lower probability of getting an audit remark.

5.3.3.3 Robustness of results

A major weakness in these estimations is that we cannot be certain that the parallel trend assumption holds, since it is unclear if the observations between 2000 and 2003 are missing or if the audit remarks are non-occurring. That the observations are missing however, appears as the most likely reason. Further, the assumption of invariance within each firm group also is troublesome. Taken literary the unobservable characteristics of firms within each group should be the same independent of time period. The distribution of these characteristics however is allowed to vary between the groups. In other words, the expected value of the unobserved characteristics given group assignment and treatment, because of linearity and the mean independence assumption is zero. This in turn gives a constant treatment effect (Imbens & Wooldridge, 2007). The problematic part here is that the unobserved characteristics within groups not necessarily are constant over time. The adapter groups consist of fairly many firms, and differences in unobserved characteristics is likely to be present also within groups. For example, we are not controlling for the selection into the groups, other than the timing aspect of it. The motives for early adapter to meet the quota could be highly divergent, some firms already meet the quota, while others may perceive the costs to be lower by adapting early. There is a difference between these firms, however this difference may not be constant over time.

The probability of receiving an audit remark for most firms still is low after the quota. The very low occurrences of audit remarks in the pre-period make small increases in remarks post-quota appear tremendous. Another concern is that the results for the late adapters to a great extent is driven by the financial crisis, since audit remarks is expected to increase because of the financial crisis. This impression in strengthened by all adapter groups having more remarks in 2008. To better examine what is going on, restructuring of the dependent variable and using a Poisson regression model, or a logistic probability model with interaction terms both could be alternatives. However, this is not done in this thesis.

5.3.3.3 Summary audit remarks

All adapter groups have more audit problems than AS firms post-quota. I find significant differences at the 5% level for all groups when the implementation years is excluded. However, data issues, the timing of the financial crisis and the estimation model makes these evidence at best weak. The higher probability, in particular for the late adapters to get an audit remark around the year they implement the quota suggests that some of these firms have problems meeting it. Although the high occurrence of audit remarks also could be due to firms in this group having severe repercussions from the financial crisis. The findings for the adapters further, may not be a sign of prolonged weakened governance, but rather troubles of adapting to the quota in some transition years. That the estimates become more significant when the implementation period is dropped, could be due to the data issues. The lines in Figure (19) appears to have highest peaks in the implementation years. Lastly, the high occurrence of ASA to AS converters that get audit remarks prior to conversion, makes it possible that some of these firms converts for quota-related reasons.

5.4 Further research

I had to limit my activities writing this thesis, therefore many things are left unexplored. The most interesting part to look more into are the reasons for the sharp increases in manager remuneration observed for the firms adapting to the quota early. The higher wages here are found to be consistent with both weaker and stronger governance, finding the real cause of the higher compensation would be highly interesting. Further, it would be interesting to better examine whether the reason for the earliest adapters attracting more experienced new female members is because they are early, or if it is due to the company name. A third thing to examine could be how the death of a board member affects the gender of the person entering both prior to, under and after the quota implementation. The data contains information regarding the death of board members however, a larger sample than the Norwegian ASA firms might be needed. Finally, the selection into groups in itself could be interesting to look more into, moving some firms that here are defined as “compliers” to “the early adapters” and vice versa, potentially both could enlarge, or erase the differences between the groups, dependent on which firms one choose to transfer.

6.0 Conclusion

It appears as all adapters are affected by the quota, independent of when they start implementing it. One consequence is that all adapter groups lose approximately of 20% of the general board experience held by directors' relative to AS firms. Further, the increase in directress experience is not sufficiently large to prevent a loss of total board experience. However, firms appoint new members with more board experience in the same sector of the economy as a result of the quota. The earliest implementers appoint more experienced women, while the later implementers add men. Furthermore, members with CEO experience appears to be preferred by all firms post-implementation, although this not necessarily increases the board's ability to govern shareholders' interests. All adapters in some way make changes to their board structure, and the most apparent reason for this is the quota. The complier and late adapter groups include more firms that change their board size in ways that ex ante doubtfully are performance enhancing. There is evidence in favor of firms that increase their boards, also compensate their CEOs more generously ex post. The turnover among the latest adapters increases sharply in their compliance year, and both women and men are replaced. Their directress turnover is abnormally high in the years after the quota, which could indicate a problem in finding good replacements for the talents they lose. The manager remuneration increases drastically for the two earliest adapter groups when they implement the quota. This could be consistent with either good performance in combination with stronger incentives, or a CEO utilizing an enhanced relative bargaining position over a more inexperienced board. Further, all adapters appear to get more audit remarks post-implementation, the financial crisis and data issues however, make these findings uncertain. Finally, the low proportion of women in the firms converting from ASA to AS post conversion, and the escalating audit remarks prior to conversion, opens for the possibility that some of these firms converted for quota related reasons.

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7.0 Appendix

7.1 Board Characteristics

Table 12 –Average board size by firm group and year

	Firm group							
Year	Early	Complier	Late	AS to ASA	ASA to AS	AS control 1	AS control 2	Total
1998	5.24	4.92	4.65	4.60	4.90	4.07	4.48	4.70
1999	5.52	4.96	4.91	4.59	4.86	4.22	4.68	4.80
2000	5.59	5.29	4.84	4.61	4.80	4.33	4.67	4.84
2001	5.80	5.28	4.80	4.58	4.62	4.32	4.87	4.90
2002	5.81	5.05	4.82	4.56	4.33	4.30	4.58	4.72
2003	5.72	5.15	4.65	4.49	4.47	4.24	4.55	4.68
2004	5.67	5.23	4.54	4.50	4.80	4.22	4.68	4.76
2005	5.58	5.38	4.37	4.46	4.79	4.04	4.40	4.61
2006	5.47	5.32	4.52	4.36	4.75	4.02	4.39	4.58
2007	5.33	5.06	4.37	4.47	5.05	4.11	4.37	4.60
2008	5.41	5.00	4.16	4.48	4.88	4.08	4.36	4.57
2009	5.25	4.88	4.36	4.32	5.02	4.08	4.41	4.57
2010	5.38	4.95	4.39	4.44	4.98	4.09	4.39	4.60
2011	5.37	4.98	4.53	4.46	5.23	4.13	4.47	4.68
2012	5.47	5.05	4.50	4.82	5.02	4.13	4.46	4.72
2013	5.40	4.94	4.65	4.42	4.78	4.16	4.63	4.73
2014	5.30	4.95	4.82	4.29	4.75	4.20	4.90	4.89
Total	5.48	5.07	4.56	4.50	4.89	4.14	4.49	4.68

Table 13 - Average female experience level, and number of firms with one or more directresses on their board at time t.

	Firm group						
Year	Early	Complier	Late	AS to ASA	ASA to AS	AS control 1	AS control 2
1998	1.30	2.86	1.00	1.50	.	1.21	1.12
n	10	7	1	5	0	84	31
1999	2.63	2.44	2.00	2.42	.	2.12	2.33
n	12	9	1	6	0	92	38
2000	3.74	3.88	2.00	3.08	1.50	2.98	2.93
n	15	8	2	12	1	97	35
2001	3.78	4.67	2.75	3.04	3.75	2.86	2.70
n	17	10	2	14	2	118	46
2002	3.70	6.00	2.00	3.84	3.50	2.89	2.88
n	23	10	1	25	4	181	83
2003	4.66	4.28	3.17	3.52	4.50	2.89	2.76
n	24	12	3	33	4	193	94
2004	4.20	2.90	4.92	3.20	2.50	2.82	2.97
n	32	24	6	45	2	251	116
2005	3.93	3.22	4.69	3.37	2.59	3.15	3.29
n	38	47	8	65	11	329	161
2006	4.60	3.59	4.26	3.69	3.14	3.31	3.56
n	38	73	17	75	22	388	166
2007	5.36	4.23	4.52	4.32	4.63	3.61	3.79
n	42	101	24	90	45	415	183
2008	5.89	5.09	5.22	5.17	5.24	3.78	3.90
n	41	102	32	84	49	417	190
2009	6.19	5.49	6.08	5.67	5.48	4.09	4.42
n	40	103	27	69	36	386	172
2010	5.95	5.25	6.26	5.72	4.66	4.07	4.48
n	39	95	18	52	43	381	157
2011	6.22	5.25	6.03	5.88	5.28	4.02	4.34
n	38	89	15	46	40	354	151
2012	5.64	5.44	5.95	5.87	5.21	3.73	3.74
n	36	82	17	30	37	350	153
2013	5.16	5.28	5.36	5.02	5.04	3.68	3.82
n	35	79	15	23	36	346	136
2014	4.92	4.95	5.29	3.56	4.99	3.48	3.94
n	29	60	11	9	23	197	52
Total	4.97	4.78	5.23	4.48	4.81	3.48	3.65
n	509	911	200	683	355	4579	1964

7.2 Average experience

Table 14 - Regression output when regressing average previous board experience for the total board (1), and for both of the genders separately (2) women and (3) men. over the independent variables: board size, firm age, the natural logarithm of total assets, the ratio of total debt to total assets, leverage, if there has been a CEO change, the fraction of women on the board, and both year and sector fixed-effects. The post period is starting after 31st of December 2003 in (1), (3) and (5). In (2), (4) and (6) are the implementation years 2004-2008 excluded altogether, starting the post quota in 2009. Cluster robust standard errors in parentheses. Source: SNF and NHH's database of accounting and company information for Norwegian companies. Stars indicate significance levels: (* p < 0.10, ** p < 0.05, *** p < 0.01)

Dependent variable:	Board experience		Directress experience		Director Experience	
	Post 2003	Post 2008	Post 2003	Post 2008	Post 2003	Post 2008
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Early Adapters	0.70	0.92**	1.13**	0.79*	0.74	1.17**
	(0.46)	(0.44)	(0.49)	(0.43)	(0.49)	(0.50)
Compliers	0.79*	0.80*	2.32**	0.90	0.69	0.86*
	(0.41)	(0.41)	(1.09)	(0.59)	(0.43)	(0.45)
Late Adapters	1.69**	1.42*	0.54	2.57**	1.60**	1.31
	(0.82)	(0.84)	(0.68)	(1.21)	(0.81)	(0.85)
Post	-0.21	0.15	1.32***	1.10**	-0.27	0.10
	(0.27)	(0.23)	(0.30)	(0.44)	(0.29)	(0.24)
Early x Post	-0.57	-0.41	-0.11	0.10	-0.70	-0.84
	(0.48)	(0.43)	(0.54)	(0.67)	(0.56)	(0.54)
Complier x Post	-0.92**	-0.50	-1.73	-0.45	-0.90**	-0.71
	(0.39)	(0.38)	(1.09)	(0.73)	(0.41)	(0.44)
Late x Post	-0.92	-0.42	1.21	-0.94	-1.00	-0.51
	(0.63)	(0.74)	(1.07)	(1.02)	(0.62)	(0.81)
Board Size	-0.14*	-0.12	-0.09	-0.16	-0.10	-0.07
	(0.08)	(0.11)	(0.09)	(0.11)	(0.09)	(0.11)
Firm Age	-0.00	-0.00	-0.01	-0.00	-0.00	0.00
	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Total Assets	0.41***	0.27***	0.24***	0.22***	0.42***	0.27***
	(0.06)	(0.07)	(0.07)	(0.08)	(0.08)	(0.08)
Leverage	-0.42	0.07	-0.43	-0.24	-0.40	0.14
	(0.38)	(0.49)	(0.60)	(0.73)	(0.42)	(0.56)
CEO change	0.09	-0.13	-0.24	-0.39	0.18	-0.04
	(0.18)	(0.19)	(0.21)	(0.26)	(0.20)	(0.21)
Constant	-0.30	1.09	-0.64	0.81	-0.61	0.91
	(0.93)	(0.96)	(1.24)	(1.46)	(1.22)	(1.35)
Sector controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year fixed-effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
R^2	0.137	0.143	0.148	0.157	0.126	0.137
Adjusted R^2	0.126	0.133	0.131	0.141	0.115	0.127
Observations	2901	2032	1928	1367	2896	2027

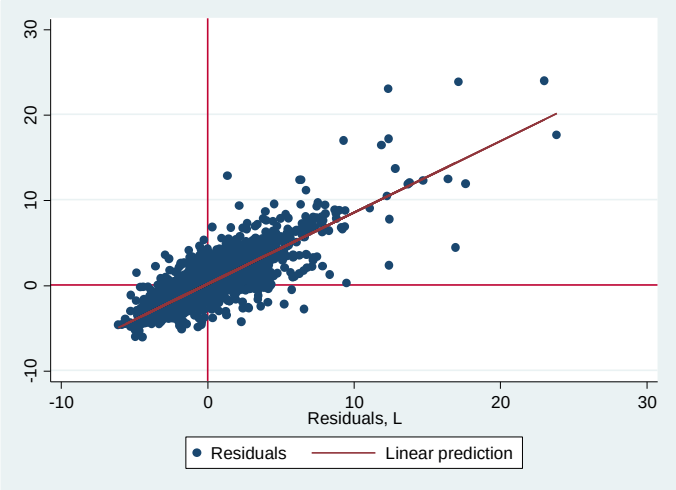


Figure 20 –Positive autocorrelation in the residuals of average board experience.

7.2 Experience incoming members

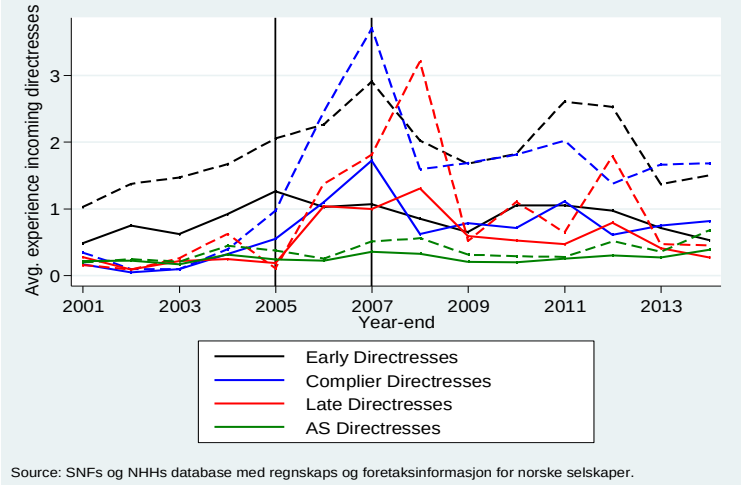


Figure 21 – Average board experience incoming directresses is shown by the dashed lines, while average relevant sector experience is shown by the solid lines.

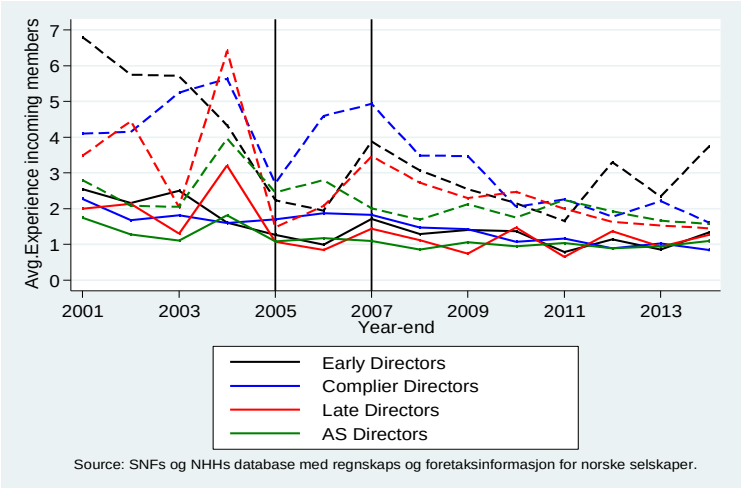
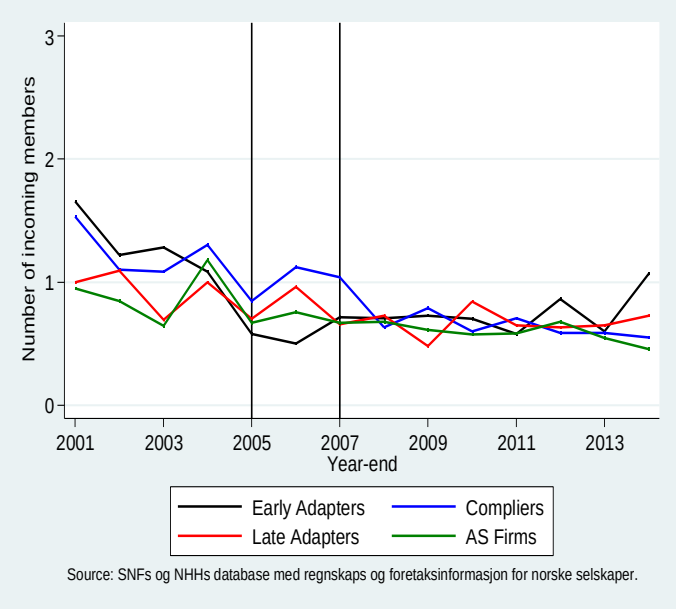


Figure 22- Average experience incoming directors is shown by the dashed lines, while average relevant sector experience is shown by the solid lines.



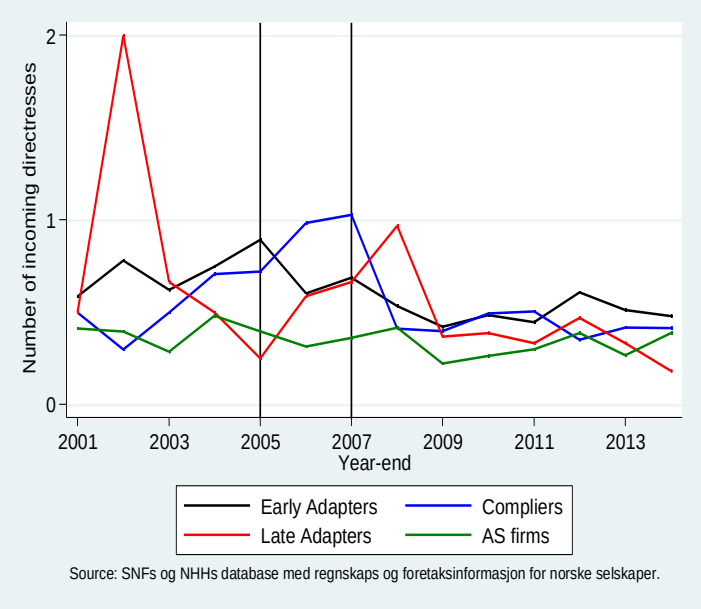


Figure 23 – Average number of incoming directors (male board members) to the left, and number of incoming directresses to the left. The lines are a bit decisive for directresses in the early years for the late adapters and the compliers as the number of firms with women are near zero.

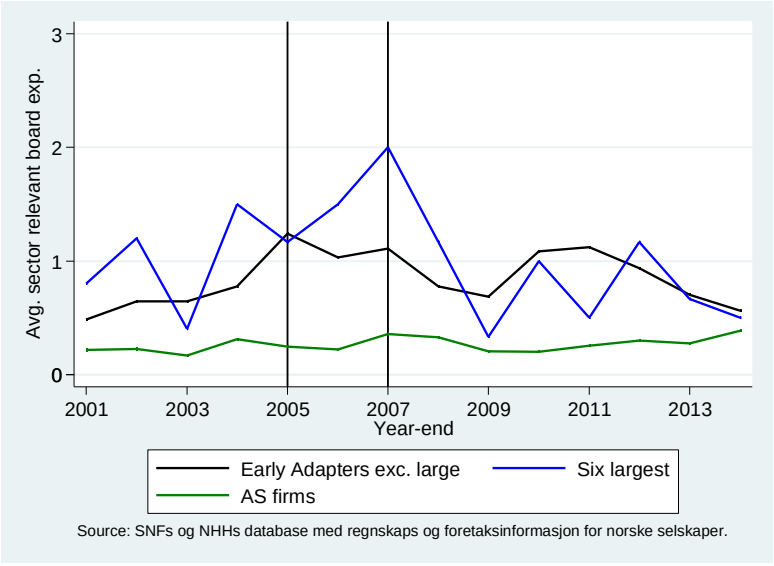


Figure 24 - Incoming experience directresses, (seven of the largest firms by market capitalization included as an own group. These firms are: Norsk Hydro, Yara international, Statoil, DNB, Telenor and Orkla)

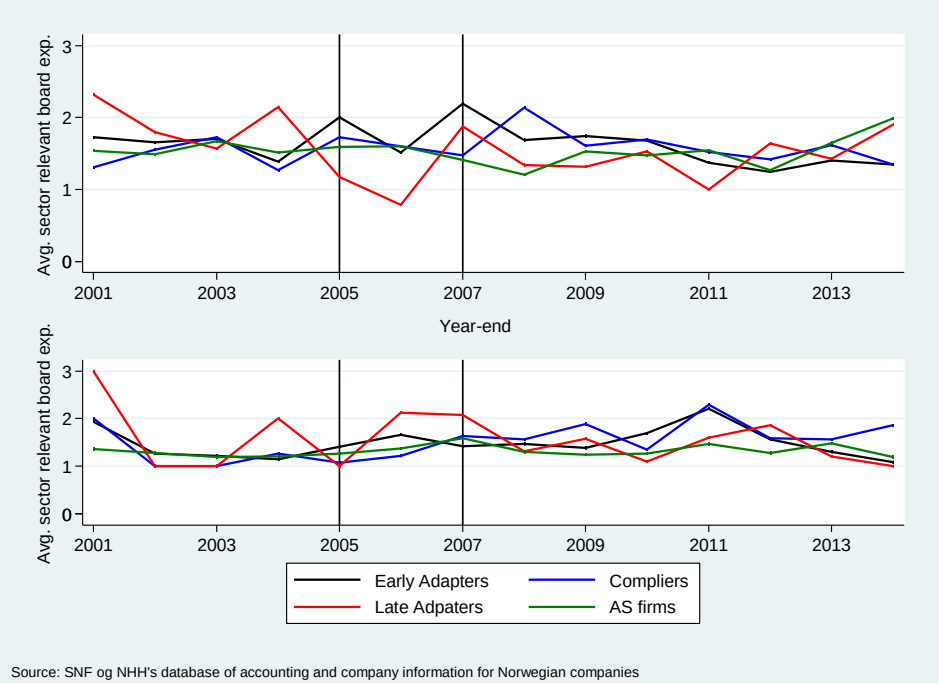


Figure 25 - The previous sector experience (individual experience) for incoming directors is shown in the top part of the figure, and the previous sector experience for incoming directresses is show in the lower part of the figure

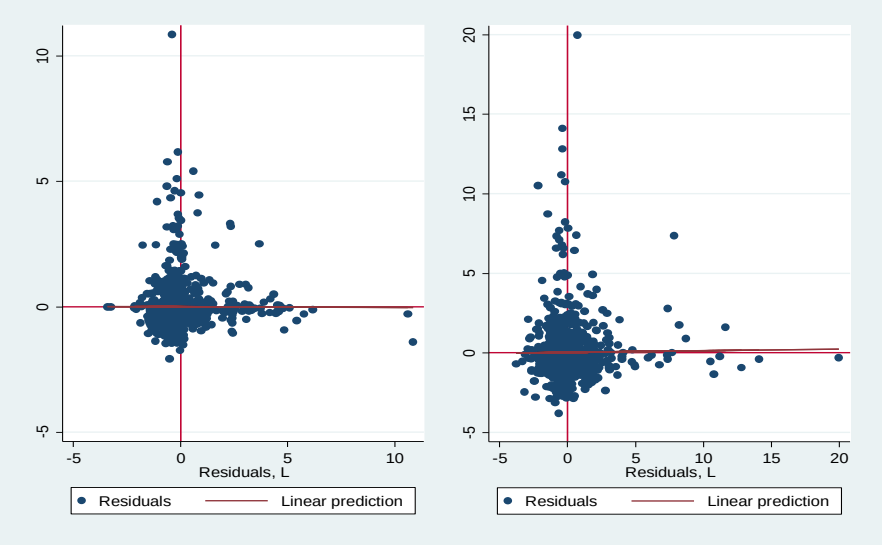


Figure 26 - Test for autocorrelation among incoming directresses to the left, Check for autocorrelation among incoming directors

Table 15 - $\boldsymbol{Incoming\ Experience_{i,t} = \alpha + \beta_1 Early_{i,t} + \beta_2 Complier_{i,t} + \beta_3 Late_{i,t} + Post_t + \beta_4 Early\ x\ Post_{i,t} + \beta_5 Comlpier\ x\ Post_{i,t} + \beta_6 Late\ x\ Post_{i,t} + \beta_7 X_{i,t} + \varepsilon_{it}}$. The early adapters meet the quota before 2006, the compliers meet it in 2006 or 2007, and the late adapters do so in 2008. Post is a

dummy taking the value 1 for all firms after the post-period threshold we chose. The interaction terms with the variable Post capture the effect of the quota implementation on the different groups. The vector of independent variables $\boldsymbol{X_{it}}$, includes; Firm age, the natural logarithm of total assets (Total Assets), the ratio of book value of total debt to total assets (leverage), a dummy indicating whether the firm is OSE-listed or not (listed), an indicator variable for whether the CEO has been replaced or not (CEO change), the number of incoming directresses (# directresses), the number of incoming directresses lagged one period, the number of incoming directors (# directors) and the number of incoming directors lagged one period. Last sector and year-fixed effects are controlled for. Cluster robust standard errors in parentheses. Source: SNF and NHH's database of accounting and company information for Norwegian companies. Stars indicate significance levels: (* p < 0.10, ** p < 0.05, *** p < 0.01)

Dependent variable:	Sector relevant experience incoming directresses				Sector relevant experience incoming directors			
	Post 2005	Post 2005	Post 2007	Post 2007	Post 2005	Post 2005	Post 2007	Post 2007
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Early Adapters	0.42***	-0.20**	0.51***	-0.12	0.05	-0.06	-0.06	0.08
	(0.10)	(0.08)	(0.11)	(0.08)	(0.28)	(0.25)	(0.22)	(0.20)
Compliers	-0.08	-0.07	0.33***	0.04	-0.03	-0.38	0.03	-0.30*
	(0.07)	(0.11)	(0.08)	(0.09)	(0.26)	(0.24)	(0.22)	(0.17)
Late Adapters	-0.10	-0.02	0.18	0.01	0.87	-0.72*	0.41	-0.35
	(0.08)	(0.30)	(0.12)	(0.14)	(0.63)	(0.41)	(0.43)	(0.22)
Post	0.00	-0.12	0.19*	-0.07	-0.89***	0.15	-0.92***	0.22
	(0.10)	(0.11)	(0.10)	(0.11)	(0.33)	(0.24)	(0.33)	(0.24)
Early x Post	0.13	0.26**	-0.04	0.20**	-0.27	0.10	-0.13	-0.15
	(0.14)	(0.10)	(0.13)	(0.09)	(0.31)	(0.28)	(0.24)	(0.23)
Complier x Post	0.64***	0.14	0.05	0.00	-0.01	0.53**	-0.09	0.50***
	(0.09)	(0.11)	(0.10)	(0.09)	(0.28)	(0.26)	(0.25)	(0.18)
Late x Post	0.52***	-0.01	0.09	-0.06	-1.12	0.78*	-0.57	0.44
	(0.14)	(0.33)	(0.19)	(0.15)	(0.69)	(0.44)	(0.50)	(0.29)
Board Size	0.10***	-0.01	0.10***	-0.02	0.26***	-0.01	0.26***	-0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.06)	(0.03)	(0.06)	(0.03)
Total Assets	0.00	0.01	0.01	0.01	0.01	0.02	0.01	0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)	(0.03)	(0.02)
Leverage	-0.15	-0.19*	-0.12	-0.19*	0.08	-0.15	0.07	-0.17
	(0.11)	(0.10)	(0.11)	(0.10)	(0.23)	(0.16)	(0.24)	(0.16)
CEO change	0.23***	-0.07	0.24***	-0.08	1.26***	-0.53***	1.26***	-0.53***
	(0.06)	(0.08)	(0.06)	(0.08)	(0.17)	(0.17)	(0.17)	(0.17)
# incoming directresses		1.47***		1.48***		0.20**		0.20**
		(0.07)		(0.07)		(0.09)		(0.09)
L.# directresses		0.01		0.01		0.11		0.11
		(0.03)		(0.03)		(0.08)		(0.08)
# incoming		0.04		0.04		1.63***		1.63***
		(0.04)		(0.04)		(0.08)		(0.08)
L.# directors		0.01		0.01		-0.08**		-0.08**
		(0.02)		(0.02)		(0.04)		(0.04)
Constant	-0.26	-0.03	-0.38	-0.05	0.19	-0.26	0.21	-0.33
	(0.32)	(0.24)	(0.32)	(0.23)	(0.51)	(0.50)	(0.51)	(0.49)
R^2	0.118	0.586	0.106	0.586	0.070	0.499	0.069	0.501
Adjusted R^2	0.107	0.575	0.095	0.575	0.059	0.486	0.057	0.488
Observations	2901	1597	2901	1597	2901	1597	2901	1597

7.3 Conversions

Table 16 - The number of ASA firms that is registered with a change in legal form between year t-1 and t. The firm is then assumed to convert in year t. Therefore, are only firms with observations in all years surrounding the conversion included. (The data are prone to have falsely reported legal form with one or two years). (1) show all firms for which it exists data for all years preceding conversion. (2) show the percentage of firms converting to the total number of ASA firms registered in the year. (3) Exclude firms where there exists evidence that the firm was acquired or that merged, with another frim, or that was liquidated in year t. (4) Excludes finance firms in addition to those in (3), and (5) show the percentage of firms converting in (4). In (6) through (8) are we only looking at the firms in the final sample. The years prior to 2003 are firms that has been allocated to one of the adapter groups. (6) includes all firms, (7) exclude all firms that was liquidated, merged or acquired. (8) Excludes finance firms in addition to those in (6) and (7). Source: SNF and NHH's database of accounting and company information for Norwegian companies.

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1999	11	2.54 %	11	11	2.54 %	.	.	.
2000	17	3.46 %	17	17	3.46 %	2	2	2
2001	31	6.34 %	31	30	6.13 %	2	2	2
2002	17	4.46 %	17	15	3.94 %	1	1	.
2003	26	5.88 %	26	24	5.43 %	4	4	3
2004	21	4.84 %	21	21	4.84 %	10	10	10
2005	17	5.30 %	17	16	4.98 %	16	16	15
2006	25	7.16 %	25	20	5.73 %	17	14	10
2007	35	9.89 %	33	27	7.63 %	26	25	23
2008	30	9.23 %	28	21	6.46 %	23	21	17
2009	29	10.32 %	20	17	6.05 %	20	17	16
2010	17	6.39 %	17	12	4.51 %	14	13	11
2011	17	6.72 %	13	12	4.74 %	10	8	7
2012	17	7.36 %	17	16	6.93 %	10	10	10
2013	15	7.11 %	13	11	5.21 %	12	10	9
2014	6	3.53 %	6	6	3.53 %	6	5	5
Total	331	5.70 %	312	276	4.75 %	173	158	140

7.4 CEO compensation

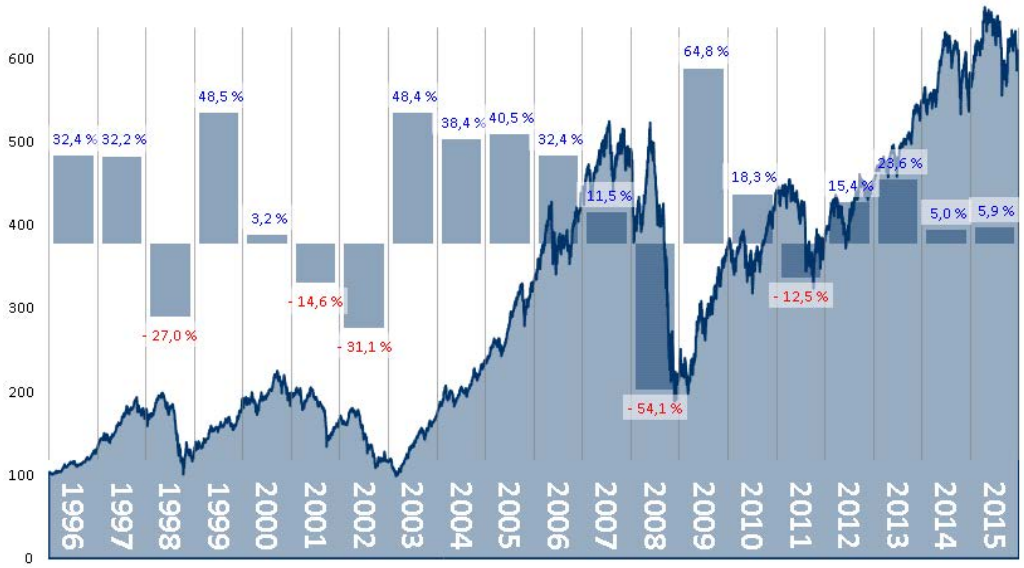


Figure 27 - Evolution in market value for firms listed on OSE-index from 1996 to 2015. Source: Oslo Børs **(Oslo Børs, 2015)**

Table 17 **– Control group 2 -** $CEO\ compensation_{i,t} = \alpha + \beta_1 Early_{i,t} + \beta_2 Complier_{i,t} + \beta_3 Late_{i,t} + \beta_4\ AStoASA_{i,t}, + \beta_5 ASAtoAS_t + \beta_6 Post_t + \beta_7 Early\ x\ Post_{i,t} + \beta_8 Comlpier\ x\ Post_{i,t} + \beta_9 Late\ x\ Post_{i,t} + \beta_{10} AStoASA\ x\ Post_{i,t} + \beta_{11} ASAtoAS\ x\ Post_{i,t} + \beta_{12} X_{i,t} + \varepsilon_{it}$ .The dummy variables Early, Complier & Late indicate that firm i, is either part of the "Early", the "Complier", or the "Late" adapter group. ASAtoAS is an indicator variable indicating if the firm i convert to AS, while AStoASA indicates a convertion in the opposite direction. Post is a dummy taking the value 1 for all firms after the post-period threshold we

chose. The interaction terms with the variable Post capture the effect of the quota implementation on the different groups. The vector $\boldsymbol{X_{it}}$, include; Firm age, the natural logarithm of total assets (Total Assets), the ratio of book value of total debt to total assets (leverage), and a dummy indicating whether the firm is OSE-listed or not (listed). Further do we include the variables, a proxy for CEO quality (CEO tenure-to-age), a dummy indicating whether the CEO replacements (CEO change). Return on equity is defined as ROE/100. Further is return on assets (ROA), and return on lagged one period is included in (1) and (2). The Norwegian interbank rate offered (Nibor 3 months) is included in (3) and (4), Constant term suppressed. Cluster robust standard errors in parentheses. Source: SNF and NHH's database of accounting and company information for Norwegian companies. Stars indicate significance levels: (* p < 0.10, ** p < 0.05, *** p < 0.01)

Dependent variable:	CEO salary	Log(salary)	Natural logarithm of CEO salary			
	(1)	(2)	(3)	(4)	(5)	(6)
Independent variables	Post 2007	Post 2007	Post 2005	Post 2005	Post 2003	Post 2003
Early	177.48	0.08	-0.00	-0.01	0.04	0.04
	(250.17)	(0.10)	(0.08)	(0.09)	(0.08)	(0.09)
Complier	-24.97	-0.09	-0.11	-0.14	-0.07	-0.09
	(203.60)	(0.10)	(0.09)	(0.10)	(0.09)	(0.10)
AS to ASA	128.98	0.01	0.19**	0.24***	0.11	0.11
	(190.13)	(0.09)	(0.08)	(0.08)	(0.09)	(0.10)
ASA to AS	666.70***	0.12	0.12	0.12	0.11	0.12
	(231.32)	(0.10)	(0.09)	(0.11)	(0.09)	(0.10)
Late	193.19	0.04	0.08	0.02	0.11	0.05
	(274.69)	(0.13)	(0.13)	(0.15)	(0.13)	(0.15)
Post	287.00	0.42***	16.75**	7.44	17.20**	8.14
	(303.68)	(0.12)	(8.51)	(8.89)	(8.46)	(8.83)
Early x Post	1360.39***	0.26***	0.27***	0.27***	0.24***	0.24**
	(453.94)	(0.09)	(0.08)	(0.09)	(0.08)	(0.09)
Complier x Post	689.11***	0.25***	0.17*	0.22**	0.14	0.19*
	(249.59)	(0.09)	(0.09)	(0.10)	(0.09)	(0.10)
Late x Post	248.59	0.10	0.04	0.07	-0.01	0.03
	(336.68)	(0.16)	(0.15)	(0.16)	(0.16)	(0.19)
ASA to AS x Post	400.45	0.08	-0.17	-0.23**	-0.07	-0.09
	(355.54)	(0.12)	(0.11)	(0.11)	(0.13)	(0.13)
AS to ASA x Post	181.06	0.14	0.04	0.07	0.07	0.10
	(216.38)	(0.09)	(0.08)	(0.09)	(0.09)	(0.09)
Board Size	119.66**	0.05**	0.05***	0.05**	0.05***	0.05**
	(46.66)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Total Assets	479.71***	0.16***	0.15***	0.16***	0.15***	0.16***
	(63.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Firm Age	2.11	0.00	0.00	0.00	0.00	0.00
	(2.18)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	-188.45	-0.08	-0.07	-0.07	-0.07	-0.07
	(272.09)	(0.09)	(0.08)	(0.09)	(0.08)	(0.09)
OSE-listed	101.67	0.14**	0.14**	0.14**	0.15**	0.14**
	(172.50)	(0.07)	(0.06)	(0.07)	(0.06)	(0.07)
CEO quality	2469.29**	0.73**	0.72**	0.78**	0.73**	0.80**
	(1172.05)	(0.35)	(0.36)	(0.38)	(0.36)	(0.38)
Return on Assets	-51.75	-0.02		-0.03		-0.02
	(170.09)	(0.07)		(0.06)		(0.07)
Lagged ROA	9.23	0.06		0.07		0.06
	(196.77)	(0.08)		(0.08)		(0.08)
CEO change			0.02	0.04	0.02	0.03
			(0.04)	(0.04)	(0.04)	(0.04)
NIBOR 3 months			375.32*	137.43	385.32*	151.14
			(197.20)	(176.58)	(196.20)	(175.34)
R^2	0.404	0.445	0.451	0.446	0.450	0.444
Adjusted R^2	0.391	0.432	0.441	0.433	0.439	0.431
Observations	2054	2055	2440	2055	2440	2055

Table 18 - Control group 1. $\boldsymbol{CEO\ compensation_{i,t} = \alpha + \beta_1 Early_{i,t} + \beta_2 Complier_{i,t} + \beta_3 Late_{i,t} + \beta_4\ AStoASA_{i,t}, + \beta_5 ASAtoAS_t + \beta_6 Post_t + \beta_7 Early\ x\ Post_{i,t} + \beta_8 Comlpier\ x\ Post_{i,t} + \beta_9 Late\ x\ Post_{i,t} + \beta_{10} AStoASA\ x\ Post_{i,t} + \beta_{11} ASAtoAS\ x\ Post_{i,t} + \beta_{12} X_{i,t} + \varepsilon_{it}}$. The early adapters meet the quota before 2006, the compliers meet it in 2006 or 2007, and the late adapters do so in 2008. *Post* is a dummy taking the value 1 for all firms after the post-period threshold we chose. *ASAtoAS* are firms converting to AS after 2004, while *AStoASA* are firms converting in the opposite direction. *Post* is a dummy taking the value 1 for all firms after the post-period threshold we chose. The interaction terms with the variable *Post* capture the effect of the quota implementation on the different groups. The vector $\boldsymbol{X_{it}}$, include; F*irm age*, the natural logarithm of total assets (*Total Assets*), the ratio of book value of total debt to total assets (*leverage*), and a dummy indicating whether the firm is OSE-listed or not (*listed*), a proxy for CEO quality (*CEO tenure-to-age)*, a dummy indicating whether the CEO replacements (*CEO change)*. Return on assets (*ROA)*, and return on lagged one period. The Norwegian interbank rate offered (*Nibor 3 months) is included in (3) and (4),* Cluster robust standard errors in parentheses. Source: SNF and NHH's database of accounting and company information for Norwegian companies. Stars indicate significance levels: (* p < 0.10, ** p < 0.05, *** p < 0.01)

Dependent variable:	Salary	Natural logarithm of Salary		
	Post 2007	Post 2007	Post 2005	Post 2003
Independent variables	(1)	(2)	(3)	(4)
Early	13.19	0.12	0.08	0.04
	(235.23)	(0.10)	(0.09)	(0.09)
Complier	-194.53	-0.02	-0.02	-0.07
	(181.58)	(0.09)	(0.10)	(0.10)
AS to ASA	-146.86	-0.02	0.03	0.15
	(180.82)	(0.10)	(0.12)	(0.10)
ASA to AS	391.35**	0.17*	0.16	0.21*
	(188.36)	(0.09)	(0.10)	(0.11)
Late	74.86	0.10	0.08	0.02
	(242.57)	(0.13)	(0.14)	(0.13)
Post	413.03***	0.51***	0.51***	0.49***
	(142.42)	(0.06)	(0.06)	(0.06)
Early x Post	1274.52***	0.13*	0.16**	0.21***
	(449.76)	(0.08)	(0.07)	(0.07)
Complier x Post	604.65***	0.11	0.09	0.14*
	(227.06)	(0.08)	(0.09)	(0.08)
Late x Post	195.58	-0.03	0.02	0.12
	(369.46)	(0.17)	(0.16)	(0.13)
AS to ASA x Post	-183.85	-0.05	-0.11	-0.23*
	(236.71)	(0.12)	(0.16)	(0.13)
ASA to AS x Post	30.77	0.05	0.04	-0.03
	(166.65)	(0.09)	(0.10)	(0.10)
Board Size	92.46***	0.05***	0.05***	0.05***
	(26.96)	(0.01)	(0.01)	(0.01)
Total Assets	394.36***	0.15***	0.15***	0.15***
	(53.87)	(0.02)	(0.02)	(0.02)
Firm Age	1.26	0.00	0.00	0.00
	(2.06)	(0.00)	(0.00)	(0.00)
Leverage	-182.19	-0.08	-0.08	-0.08
	(238.48)	(0.08)	(0.08)	(0.08)
OSE-listed	222.35	0.17**	0.17**	0.17**
	(171.99)	(0.07)	(0.07)	(0.07)
CEO tenure-to-age	2859.51***	1.06***	1.05***	1.04***
	(921.84)	(0.31)	(0.31)	(0.31)
CEO change	236.07**	0.04	0.04	0.04
	(112.75)	(0.04)	(0.04)	(0.04)
Return on equity	1092.47	0.47**	0.47**	0.47*
	(733.05)	(0.23)	(0.24)	(0.24)
Constant	-5014.49***	4.26***	4.27***	4.28***
	(687.49)	(0.23)	(0.23)	(0.23)
R^2	0.383	0.457	0.458	0.459
Adjusted R^2	0.375	0.450	0.450	0.452
Observations	3466	3468	3468	3468

Table 19 - **CEO characteristics** $_{i,t} = \alpha + \beta_1 Early_{i,t} + \beta_2 Complier_{i,t} + \beta_3 Late_{i,t} + \beta_4$ **AStoASA**$_{i,t}$, $+\beta_5$**ASAtoAS**$_t + \beta_6 Post_t + \beta_7$**Early x Post**$_{i,t} + \beta_8$**Comlpier x Post**$_{i,t} + \beta_9$**Late x Post**$_{i,t} + \beta_{10}$**AStoASA x Post**$_{i,t} + \beta_{11}$**ASAtoAS x Post**$_{i,t} + \beta_{12} X_{i,t} + \varepsilon_{it}$. In (5) and (6) is the regression estimated by OLS: **CEO tenure** $_{i,t} = \alpha + \beta_1 Early_{i,t} + \beta_2 Complier_{i,t} + \beta_3 Late_{i,t} + \beta_4$ **AStoASA**$_{i,t}$, $+\beta_5$**ASAtoAS**$_t + \beta_6 X_{i,t} + \varepsilon_{it}$ Constant term is suppressed. Cluster robust standard errors in parentheses. Source: SNF and NHH's database of accounting and company information for Norwegian companies. Stars indicate significance levels: (* p < 0.10, ** p < 0.05, *** p < 0.01)

Dependent variable:	Tenure incoming CEO		Tenure-to-age incoming CEO		All years of CEO tenure	CEO tenure at current firm
	Post 2005	Post 2007	Post 2005	Post 2007		
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
Early	-0.19	-0.25	-0.00	-0.00	-0.41	-0.26
	(0.28)	(0.25)	(0.01)	(0.01)	(0.32)	(0.38)
Complier	0.06	-0.02	0.00	-0.00	-0.73***	-0.87**
	(0.25)	(0.23)	(0.00)	(0.00)	(0.27)	(0.35)
Late	-0.13	-0.19	0.00	-0.00	-0.13	0.39
	(0.33)	(0.30)	(0.01)	(0.01)	(0.44)	(0.71)
ASA to AS	0.06	0.12	0.00	0.00	-0.75***	-0.69**
	(0.30)	(0.27)	(0.01)	(0.01)	(0.25)	(0.31)
AS to ASA	0.64	0.58	0.02*	0.01	-1.76***	-1.65***
	(0.42)	(0.46)	(0.01)	(0.01)	(0.26)	(0.39)
Post 2003	0.43	0.12	0.01	0.01		
	(0.51)	(0.50)	(0.01)	(0.01)		
Early x Post	0.96	1.53**	0.02	0.03*		
	(0.60)	(0.75)	(0.01)	(0.02)		
Complier x Post	0.20	0.52	0.00	0.01		
	(0.38)	(0.46)	(0.01)	(0.01)		
Late x Post	-0.86**	-0.69	-0.02**	-0.02**		
	(0.41)	(0.43)	(0.01)	(0.01)		
ASA to AS x Post	0.60	0.69	0.01	0.01		
	(0.42)	(0.49)	(0.01)	(0.01)		
AS to ASA x Post	-0.28	-0.18	-0.01	-0.01		
	(0.62)	(0.60)	(0.01)	(0.01)		
Board Size	0.02	0.02	-0.00	-0.00	0.01	-0.11
	(0.05)	(0.05)	(0.00)	(0.00)	(0.05)	(0.07)
Total Assets	0.15**	0.14**	0.00**	0.00**	-0.00	0.19**
	(0.06)	(0.06)	(0.00)	(0.00)	(0.05)	(0.09)
Firm Age	-0.00**	-0.00*	-0.00**	-0.00*	0.01***	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Leverage	-0.55	-0.54	-0.01	-0.01	-0.31*	-0.50**
	(0.37)	(0.36)	(0.01)	(0.01)	(0.18)	(0.25)
OSE-listed	0.15	0.19	0.00	0.01	-0.07	-0.17
	(0.21)	(0.20)	(0.00)	(0.00)	(0.19)	(0.25)
Return on equity	3.47	3.19	0.06	0.06	0.49	0.27
	(2.49)	(2.56)	(0.05)	(0.05)	(0.81)	(1.06)
R^2	0.163	0.169	0.156	0.162	0.240	0.255
Adjusted R^2	0.094	0.100	0.087	0.093	0.232	0.247
Observations	590	590	590	590	4062	4062

Table 20 - Return on Assets by firm group between 2003 and 2007.

Period	2003- 2007			
	Early	Complier	Late	AS firms
Return on Assets %	7.29	-1.32	-4.99	7.85
Return on Equity %	17.95	7.68	109.5	33.71

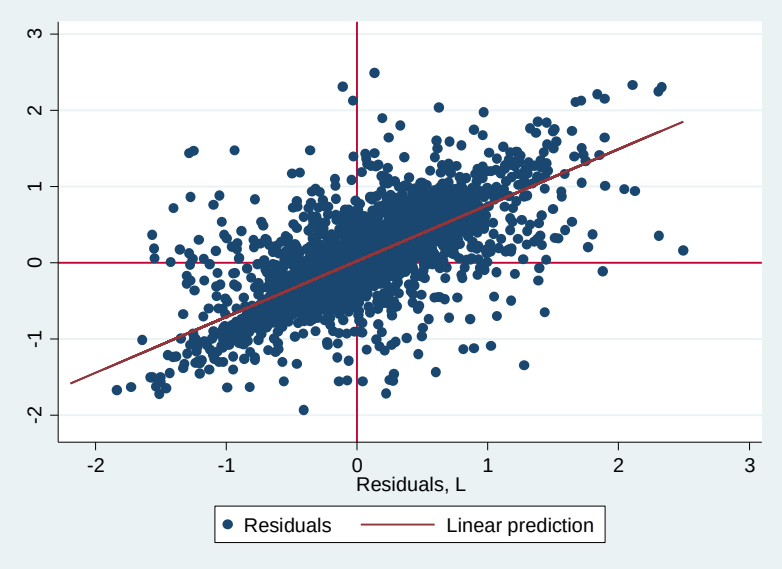


Figure 28- serial correlation CEO compensation when AS control 2 is used.

7.5 Audit remarks

Table 21 - **Probability of Audit remark$_{i,t}$ = $\alpha + \beta_1 Early_{i,t} + \beta_2 Complier_{i,t} + \beta_3 Late_{i,t} + \beta_4$ AStoASA$_{i,t}$, $+\beta_5$ASAtoAS$_t + \beta_6 Post_t + \beta_7$Early x Post$_{i,t}$ + β_8Comlpier x Post$_{i,t}$ + β_9Late x Post$_{i,t}$ + β_{10}AStoASA x Post$_{i,t}$ + β_{11}ASAtoAS x Post$_{i,t}$ + $\beta_{12} X_{i,t} + \varepsilon_{it}$** . The early adapters meet the quota before 2006, the compliers meet it in 2006 or 2007, and the late adapters do so in 2008. Post is a dummy taking the value 1 for all firms after the post-period threshold we chose. ASAtoAS are firms converting to AS after 2004, while AStoASA are firms converting in the opposite direction. Post is a dummy taking the value 1 for all firms after the post-period threshold we chose. The interaction terms with the variable Post capture the effect of the quota implementation on the different groups. The vector $\mathbf{X_{it}}$, include; Firm age, the natural logarithm of total assets (Total Assets), the ratio of book value of total debt to total assets (leverage), and a dummy indicating whether the firm is OSE-listed or not (listed), a proxy for CEO quality (CEO tenure-to-age), a dummy indicating whether the CEO replacements (CEO change), The Norwegian interbank rate offered (Nibor 3 months), a dummy indicating if the firm reports by IFRS, and a dummy indicating that the firms auditor is one of the "big 4". Cluster robust standard errors in parentheses. Source: SNF and NHH's database of accounting and company information for Norwegian companies. Stars indicate significance levels: (* p < 0.10, ** p < 0.05, *** p < 0.01)

Dependent variable:	Audit remark	
	Logistic probability model	OLS
Independent variables	(1)	(2)
Early	0.85	0.05**
	(0.57)	(0.02)
Complier	1.45***	0.06**
	(0.56)	(0.03)
Late	1.48***	0.06**
	(0.55)	(0.03)
ASA_AS	0.71	0.02
	(0.44)	(0.01)
AS to ASA converter	1.25***	0.06**
	(0.47)	(0.02)
Total Assets	-0.45***	-0.02***
	(0.07)	(0.00)
OSE-listed	-0.08	-0.00
	(0.38)	(0.02)
Leverage	2.17***	0.15***
	(0.36)	(0.02)
CEO quality	-3.36*	-0.17***
	(1.73)	(0.06)
Constant	2.22**	0.19***
	(1.08)	(0.06)
Sector controls	*Yes*	*Yes*
R^2		0.153
Pseudo R^2	0.27	
Log-likelihood	-595.353	
Observations	3114	4789

Table 22 - Summary statistics

Dependent variables	(1) N	(2) mean	(3) sd	(4) min	(5) max
CEO compensation	6,173	1,875	1,791	300	17,827
The boards avg. experience	8,721	4.648	2.826	0.333	30.25
The boards avg. directress experience	4,611	4.297	3.160	0	27
The boards avg. director experience	8,706	4.702	3.064	0.333	30.25
Relvant sector experience incoming directors	8,721	1.590	3.038	0	50
Relvant sector experience incoming directresses	8,721	0.419	1.074	0	24
CEO tenure-to-age	8,721	0.0880	0.0706	0	0.466
Tenure of sitting CEO	8,156	3.902	2.949	1	17
All tenure CEO	8,156	4.798	3.742	1	28
Previous tenure incoming CEOs	1,997	0.777	1.942	0	15
Audit remark	8,721	0.0310	0.173	0	1
New woman reduced board	8,721	0.0112	0.105	0	1
New women increased board	8,721	0.0499	0.218	0	1
New woman and board change	8,721	0.0611	0.240	0	1

Independent variables	(1) N	(2) mean	(3) sd	(4) min	(5) max
Board Size	8,721	4.677	1.512	1	13
CEO change	8,721	0.103	0.304	0	1
NIBOR 3 months	5,609	0.0441	0.0211	0.0170	0.0753
IFRS accounting standard	5,609	0.230	0.421	0	1
# of directresses entering the Board	4,611	0.503	0.730	0	5
# of directors entering the board	8,706	1.052	1.620	0	12
Total Assets	8,183	8.082e+06	7.223e+07	0	2.649e+09
Total debt	8,183	6.168e+06	6.446e+07	0	2.491e+09
Firm age	5,609	24.59	30.09	0	167
Ratio of debt to assets	8,181	0.622	0.286	0	9.345
Retur on equity	7,753	0.132	3.920	-161.8	117.9
Return on Assets	7,753	-0.0117	0.510	-26.80	0.926
Big 4 Auditor firm	8,721	0.410	0.492	0	1
OSE-listed	8,721	0.233	0.423	0	1

Other variables	(1) N	(2) mean	(3) sd	(4) min	(5) max
Number of shares largest owner	3,494	14,454	80,830	1	1.687e+06
Fraction of shares held largest owner	3,495	0.186	0.171	0.000784	1
Total turnover	8,721	0.221	0.304	0	1
Directress turnover	4,611	0.248	0.384	0	1
Director turnover	8,706	0.219	0.313	0	1
Fraction of women in the board	8,721	0.190	0.204	0	1
Age of the sitting CEO	8,721	46.90	14.66	0	85.26
Fraction of board with CEO experience	8,721	0.261	0.236	0	1
Fraction of the directresses w/CEO exp.	4,611	0.0928	0.235	0	1
Fraction of the directors w/CEO exp.	8,706	0.307	0.282	0	1

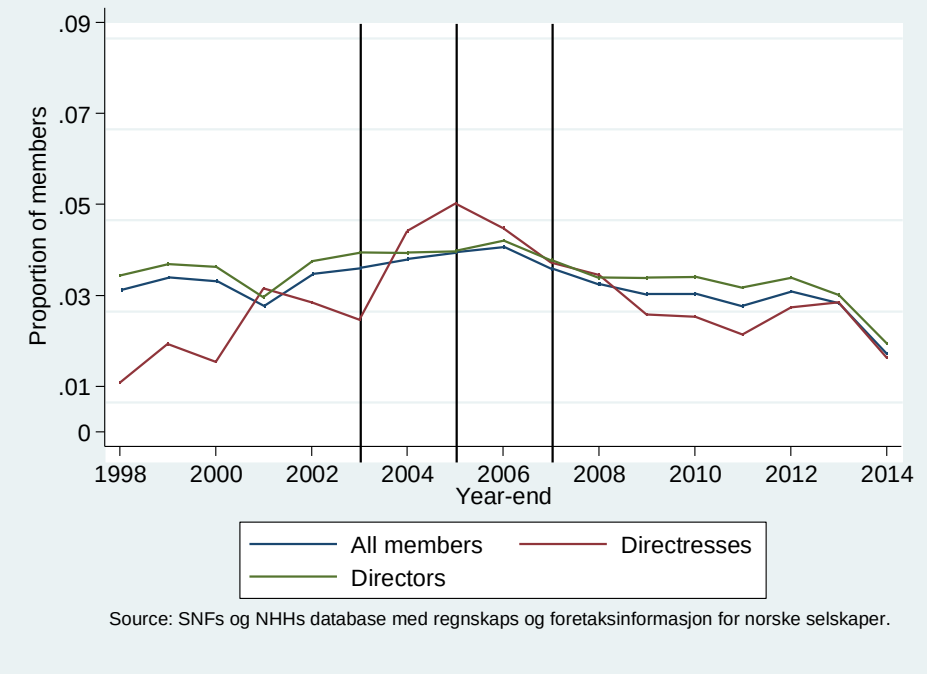


Figure 29 - The proportion of board members that sit on both an AS and an ASA board in a given year in the sample, for respectively, all members, directresses, and directors.

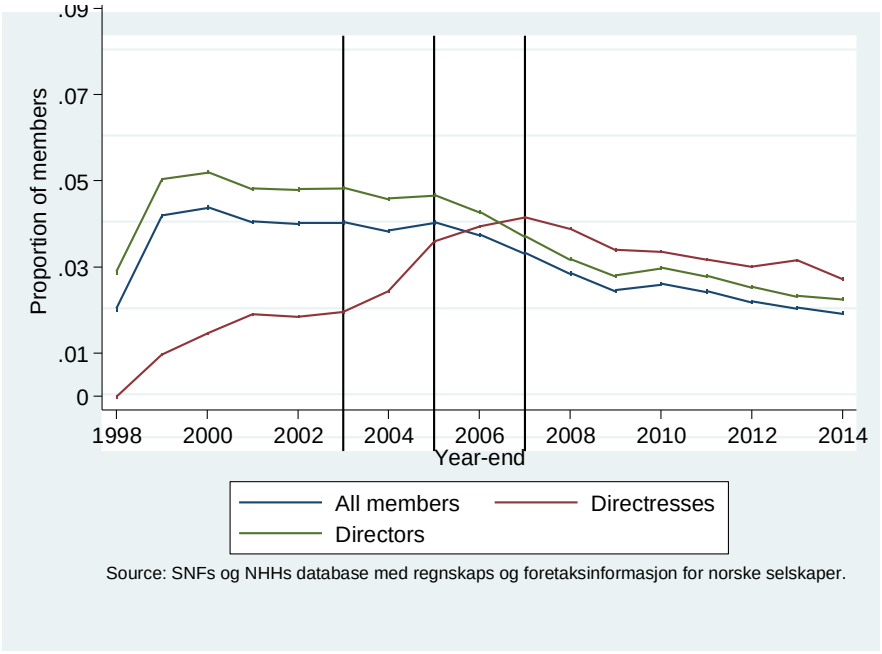


Figure - 30 The proportion of board members that sit on both an AS and an ASA board in a given year all firms reporting consolidated accounts, for respectively, all members, directresses, and directors.