THE CHANGING OF THE BOARDS: THE VALUE EFFECT OF A MASSIVE EXOGENOUS SHOCK*

KENNETH R. AHERN† AND AMY K. DITTMAR‡

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† University of Michigan, Ross School of Business, Room R4312, 701 Tappan Street, Ann Arbor MI 48109-1234. E-mail: kenahern@umich.edu.

‡ University of Michigan, Ross School of Business, Room R4436, 701 Tappan Street, Ann Arbor, MI 48109-1234. E-mail: adittmar@umich.edu.

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Abstract

We investigate the relationship between board structure and firm value using a large-scale natural experiment to overcome endogeneity problems. In 2003, a new law required that 40 percent of Norwegian firms' directors be women – at the time only nine percent of directors were women. The constraint imposed by the law resulted in a significantly negative impact on firm value, consistent with the idea that firms choose boards to maximize value. The value loss was not caused by the sex of the new board members, but rather by their younger age and lack of high-level work experience, providing insight into which characteristics of board members affect firm value.

Though an extensive literature exists on the relation between board structure and firm value, the endogenous nature of corporate boards has limited our understanding of even the most basic questions (Hermalin and Weisbach, 2003). For instance, in equilibrium it is difficult to distinguish if knowledgeable board members increase firm value through their actions, or alternatively, highly valued firms simply attract knowledgeable board members. Generally, this endogeneity problem makes it hard to distinguish which characteristics of boards and board members affect firm value. Even further, some research argues that boards are merely cosmetic, with no effect on firm value (Westphal, 1998; Romano, 2005). The disagreement about fundamental issues in corporate governance can only be resolved with clear empirical evidence that is not confounded by endogeneity issues.

In this paper, we present new evidence on the relationship between firm value and board characteristics by exploiting a natural experiment in board structure created by an unprecedented exogenous change to corporate boards. In December of 2003, the Norwegian Parliament passed a first-of-its-kind law requiring all public-limited firms to have at least 40 percent representation of women on their boards of directors by July of 2005; at the time women held only 9 percent of board seats. After voluntary compliance failed, the law became compulsory January 1, 2006, with a two year transition period. Firms that did not comply by January of 2008 would be forced to dissolve. Notices to comply were given to 77 delinquent firms in January 2008, and by April all public limited firms were in compliance with the law. Figure 1 presents the time series of this dramatic transformation in the composition of Norwegian boards of directors. Though more women were elected to boards, the numbers of women serving as chairman and CEO remained steadfast at less than five percent, consistent with press reports of the unpopularity of the law among existing board members and executives (Goldsmith, 2002).

The massive scale and exogenous nature of the Norwegian law provides a unique opportunity to overcome the endogeneity problem described above because board characteristics are changed substantially and independently from other firm choices. The changes are substantial because the law requires that approximately 30 percent of the members of an average board must change to be in compliance with the 40 percent quota. The changes are independent because they are not motivated by a desire to improve performance but rather to increase "equality

between the sexes," in order to create a "fairer society" (Øie, 2007). Though gender-equality was the focus of the law, it is *not* the focus of this paper. Our focus is the natural experimental setting of the rule change, which allows us to avoid the problems that arise when using either instrumental variables or structural models to address endogeneity (Angrist and Krueger, 2001; Coles, Lemmon, and Meschke, 2007).

The first question we ask is whether firm values improve or decline as a result of the new board structure mandated by the law. A finding of any effect, positive or negative, would be important evidence that boards affect value. We examine several hypotheses. First, if firms choose their board structures to maximize firm value, imposing binding legal constraints on their choices will lead to declines in firm values (Demsetz and Lehn, 1985). In contrast, the new law may lead to increases in value if firms choose their board structures to maximize the private benefits of management, an argument known as the 'captured boards hypothesis' (Bebchuk and Fried, 2005). To the extent that the forced addition of women directors reduces a CEO's influence over the board, the 'captured boards' hypothesis predicts that firm values will increase because agency costs are reduced. One may argue that the law change could allow CEOs to appoint additional 'captured' directors, which would reduce firm value. However, a self-interested CEO would have appointed captured female directors regardless of the law if it allowed the CEO to capture greater private benefits. A third hypothesis predicts that the diversity enforced by the law change itself would increase firm value (Higgs, 2003; Page, 2007). Finally, if boards are merely 'window-dressing,' the forced change in board characteristics will have no effect on firm value (Westphal, 1998; Helland and Sykuta, 2004; Farrell and Hersch, 2005).

Using a panel of 166 publicly listed Norwegian firms from 2001 to 2008, we find a negative impact of the mandated board changes on firm value. We show this in two ways: 1) differences-in-differences tests of the change in Tobin's Q in the year that the change in the board is implemented and 2) an event study on daily stock returns around the announcement of the new law. To examine the change in Q, we first separate firm-years into treatment and comparison groups. We do this in two ways, where the treatment group is defined either as the firm-years

that begin at the first 10 percentage point increase in the proportion of women or as the firm-years that begin when compliance with the quota is reached. We find that Tobin's Q drops by roughly 8 to 15 percent for the treatment group compared to the comparison group, controlling for firm and year fixed effects as well as changes in firm characteristics. Moreover, the results hold in multiple robustness tests of reverse causation and endogenous timing.

In the event study, we calculate the stock price reaction in the three days surrounding the date of the announcement of the new law (February 22, 2002). We show that the average stock return for firms with no women directors on the announcement date was -1.6%, compared to 2.1% for firms with at least one female director. The difference of 3.7% is economically and statistically large and robust to various controls. These results confirm that the constraint imposed by the law had a large negative effect on firm value, commensurate with the massive reorganization of corporate boards imposed by the gender quota.

Though the law only imposed gender quotas on boards, other characteristics of directors were likely to be forced to change as well. At the introduction of the new law, the Norwegian business community argued that there would not be enough 'qualified' women to meet the gender quota. Indeed, there were few women who had prior experience as directors at the time when firms needed women board members. Given the large demand shock for board candidates, the pool of potential women directors with similar backgrounds as the existing directors may have been quickly exhausted. The fact that the government of Norway in conjunction with NHO, a large employers' organization, established an online database of women candidates for election to boards supports this conjecture. In light of this, we argue that the characteristics of the new women directors are likely to be different than existing directors. Consequently, we can regard the changes in these other board characteristics as exogenous as well.

Given the likely exogenous change to multiple board characteristics following the new law, we provide new answers to our second question: Which characteristics of directors affect firm value? Fama and Jensen (1983) propose that boards add value by monitoring and advising the CEO. We investigate characteristics shown to affect these roles by prior research. First, board size may be important for monitoring and advising (Jensen, 1993; Yermack, 1996). Second, prior studies have shown both a negative effect of insiders on a board (Hermalin and Weisbach, 1991;

Shivdasani and Yermack, 1999), as well as a positive effect (Adams and Ferreira, 2007; Harris and Raviv, 2008; Klein, 1998).[1] In addition to size and independence, we also investigate several characteristics of boards that have been less examined in the literature, but are likely to affect its ability to monitor and advise the CEO, including age, gender, education, ownership stakes, and professional employment.

We find that new women directors are in fact substantially different than the existing directors. Compared to men, women directors have significantly less CEO experience and are younger, more highly educated, more likely to sit on other boards, and more likely to be a non-executive manager. At the firm level, we find that CEO experience, share ownership, and tenure of directors are decreasing over 2001 to 2008 for the average firm. We also find that before the introduction of the gender quota, the women that were elected to corporate boards were more similar to their male counterparts in age and experience than were the women elected after the law was passed.

To examine how board structure impacts value, we run fixed effects regressions of board characteristics on Tobin's Q, controlling for a number of other factors. Firms that have directors with more CEO experience or whose primary occupation is a full-time board member have higher Qs. In addition, the average age of the members of the board has a positive effect on value. These results are consistent with a board that adds value through advising the CEO: older board members with more high-level experience and knowledge provide value to a firm. The percentage of women directors on a board, however, has no marginal effect on firm value. In other words, after controlling for other board characteristics, the gender effect is insignificant, indicating that it is the difference in non-gender characteristics driving the previous results of a decline in value. This supports the data in Farrell and Hersch (2005), but contradicts the argument that gender diversity increases firm value as reported in Carter, Simkins, and Simpson (2003) and the negative effect of gender diversity reported in Adams and Ferreira (2008). Our unique setting also provides evidence that insiders increase firm value, consistent

[1]Research shows that affiliated directors also affect firm value (Fich and Shivdasani, 2006; Boone, Field, Karpoff, and Raheja, 2007; Dahya, Dimitrov, and McConnell, 2008). Our data do not allow us to separately identify affiliated from outside directors.

with the recent theoretical models of Raheja (2005), Adams and Ferreira (2007), and Harris and Raviv (2008).

Given the constraint on qualified board candidates, firms could choose to avoid the law by becoming a private limited firm or incorporating outside of Norway. We present suggestive evidence that the law change had an impact on the incorporation decisions of firms. Starting in 2003, after the passage of the law, the number of public limited firms in Norway falls substantially to about 77 percent of the number of firms in 2001. In contrast, the number of private limited firms increase by about 27 percent. Second, using data on U.K. incorporations from Becht, Mayer, and Wagner (2008), we show that the number of Norwegian firms that choose to incorporate in the U.K., while still maintaining residency in Norway, increases substantially from 2003 through 2006 compared to 1997 to 2002 and compared to Finnish and Swedish firms. Since there are multiple unobserved reasons behind the decision to go private or incorporate in a foreign country, we do not claim to show proof of a causal relationship between the gender quotas and the rate of Norwegian incorporations. However, the timing and scale of the changes in Norwegian incorporation patterns is highly suggestive that the gender quotas may have impacted more than just those firms that we observe in our sample.

The main contribution of this paper is to present clean evidence on the value of board characteristics from a natural experiment. Other papers have examined the effect of regulatory changes to boards due to the Sarbanes-Oxley Act of 2002 (Chhaochharia and Grinstein, 2007; Duchin, Matsusaka, and Ozbas, 2010), the Cadbury Committee Report in the UK (Dahya and McConnell, 2007), and a 1999 Korean law requiring more outside board members and an independent audit committee (Choi, Park, and Yoo, 2007). Our study is unique because the scale of the enforced changes to the board and the exogeneity of the regulatory change provides a massive change across multiple dimensions. This paper is also related to a recent line of research on corporate governance that shows that since board structure is normally an endogenous choice, the optimal structure will vary by firm according to its needs (Lehn, Patro, and Zhao, 2003; Boone, Field, Karpoff, and Raheja, 2007; Linck, Netter, and Yang, 2008). Our results control for endogeneity, but apply to the average firm. Further, other papers have examined board member characteristics, but none of these papers look at as many characteristics or do so in

an exogenous setting (Agrawal and Knoeber, 2001; Kroszner and Strahan, 2001; Helland and Sykuta, 2004; Farrell and Hersch, 2005; Fich, 2005; Byrd and Mizruchi, 2005; DeFond, Hann, and Hu, 2005; Adams and Ferreira, 2008; Fahlenbrach, Low, and Stulz, 2010).

Finally, our results inform the debate surrounding the increased movement of national legislatures towards boardroom gender quotas. Table 1 presents a summary of laws that regulate the gender of directors by country. As of the most recent draft of this paper, Spain, the Netherlands, France, and Iceland have each passed gender quota laws, while Belgium and Finland have pending quota laws. Both Australia and the US have instituted laws that require firms to disclose diversity practices, and the United Kingdom has a similar law pending. The legislatures of Canada, Sweden, and Italy are each discussing various gender laws as well. In developed economies around the world, gender quotas are quickly becoming the norm, not the exception. Our results suggest that though these rules are effective at creating gender diversity, there is a substantial cost to shareholders if the new female directors lack the experience of the exiting male directors. Thus, our paper highlights the importance of understanding why there are relatively few women with comparable top-level management experience as men, which is addressed in Bertrand, Goldin, and Katz (2010), Herr and Wolfram (2009), and Kuhnen (2010).

The paper proceeds as follows. Section 1 describes the board and governance structures in Norway. Section 2 describes the data and methods. Section 3 investigates if the gender quotas had any affect on firm value. Section 4 presents results as to why board structure impacts value. Section 5 concludes the paper.

1. Corporate Governance in Norway

In December 2003, the Norwegian Parliament passed a law stating that all public limited companies should have gender equality on their boards of directors. The legal organization of public limited companies in Norway is similar to U.S. corporations. These are firms that may offer shares to investors, though they are not necessarily traded on public stock exchanges. The law allowed companies to voluntarily comply but stated that if the desired gender representation did not occur by July 2005, the law would be mandated for all firms. As of July 2005, only 13.1 percent of the firms complied. The parliament therefore passed a law that forced

compliance by January 2006 allowing for a two-year transition period, with the threat of dissolving firms that did not comply. The law specifically states the number of board members by gender and effectively imposes a requirement that firms achieve approximately 40 percent board representation by women.[2]

The stated and primary purpose of this law was to reach a balanced participation for democracy and equality. Except that diversity may impact firm performance and value, the purpose of the law was not to improve or change the performance of the firms. Therefore, both the language of the law and press reports indicate that the change is exogenous to firm performance. In the stated law, the government acknowledges that there may be less information about potential women directors and thus board choice may be constrained. In response, it created a database of women interested in being a board member "to make women's competence more visible."[3] The language of the law makes it clear that there were potential constraints in filling these seats given such a massive change.

How do boards in Norway compare to those in the U.S.? Norwegian boards are roughly the same size as U.S. boards, but tend to have more independent directors. In Table 2, we report that the average board in Norway has between 6 or 7 members. Since our study covers the entire universe of publicly traded firms in Norway, we compare our data to the most comprehensive U.S. data available as reported in Linck, Netter, and Yang (2008). In their sample of 6,931 U.S. firms, which includes many small firms, they report an average board size of 7.5 members. They also report that insiders account for 34.3% of board members in U.S. firms, compared to our sample which is about 7% of insiders in Norwegian boards. Additionally, though higher than the U.S., the concentration of ownership in Norway is lower than any other country in Europe with the exception of the U.K..

One difference between Norwegian and U.S. boards is that if a Norwegian firm has over 200 employees, the employees have the right by law to elect one-third of the board. Since the average board is six-members, this essentially amounts to two of six board members being employee-

[2]Specifically, if you have 2-3 members both sexes should be represented; 4-5 members both sexes must have 2 representatives from each sex; 6-8 members both sexes must have 3 representatives from each sex; 9 members must have 4 representatives of each sex; and more than 9 members must have 40 percent of each sex. Rules on gender representation are reported at www.regjeningen.no

[3]See the Norwegian Ministry of Children, Equality, and Social Inclusion webpage: http://www.regjeringen.no/en/dep/bld/Topics/equality/rules-on-gender-representation-on-compan.html.

rather than shareholder-elected. The gender equality law stipulates that where two or more board members are elected by the employees, both genders must be represented; thus a firm can not simply include female employees to be in compliance with the quota law.[4]

In addition to these firm specific characteristics, country measures also indicate that Norway has strong corporate governance. Despite not being a common law country, Norway's anti-director index is four out of six (La Porta, Lopez-de-Silanes, Shleifer, and Shleifer, 1998). This is relative to an average of four for English-origin countries and five for the U.S. and the U.K.. Further, both Norway and the U.S. get a 10 in the Rule of Law index that measures law and order traditions in the country. Political risk is also quite low in Norway, similar to the U.S. and U.K.. Using the risk of expropriation measure of La Porta, Lopez-de-Silanes, Shleifer, and Shleifer (1998), Norway scores a 9.88 (higher is better) compared to 9.98 in the U.S. and 9.71 compared to the U.K.. Using the measures from the International Country Risk Guide, similar to Pinkowitz, Stulz, and Williamson (2006), Norway has less political risk and corruption than both the U.S. and the U.K. with a political risk (corruption) measure of 84.55 (9.58), relative to 79.62 (8.26) in the U.S. and 80.36 (8.31) in the U.K.. In addition, Nenova (2003) presents evidence that the laws governing takeovers in Norway are similar to the laws in the U.K.. In summary, though no two countries are perfectly comparable, Norway is similar to both the U.S. and the U.K. in its governance and thus the results in this paper are generalizable.

2. Data and Summary Statistics

The law requiring 40% representation of women on the boards of companies applied to all public limited firms in Norway. However, to identify the effect of the law on firm value, we must have publicly observable share prices. Second, since the gender quota became mandatory in early 2008, we restrict our attention to firms that were publicly traded at the end of 2007. Therefore, we collect the names of all Norwegian firms that traded on the Oslo Stock Exchange (OSE) in 2007 and were available in the CompuStat Global database. From this list of firms, we collect accounting and stock price data from CompuStat from 2001 through 2008. Since different firms report data in U.S. dollars, Norwegian Kroner, and Euros, we convert all currencies to U.S.

[4]In all of our analyses we use the shareholder-elected board members. For robustness we use all board members and find that our qualitative results hold.

dollars using monthly exchange rates from CompuStat Global Currency and Global Financial Data databases. All dollar amounts are then converted to December 2008 dollars using the monthly Norwegian Consumer Price Index from Statistics Norway. We include financial and utility firms in our sample for completeness, but our results hold if they are omitted.

Following prior research on firm value and governance, we compute yearly Tobin's Q as a measure of firm value (Hermalin and Weisbach, 1991; Yermack, 1996; Coles, Daniel, and Naveen, 2008). Tobin's Q is computed as the sum of total assets and market equity less common book equity divided by total assets. Market equity is the aggregate market value (price times shares outstanding) for all share classes listed on Compustat Global Securities database.[5] Following Coles, Daniel, and Naveen (2008), we also compute leverage, durable assets, R&D, and capital expenses over assets as controls in our tests. All variable definitions are reported in the appendix.

In 2005, Norwegian firms were required to report financial statements according to International Financial Reporting Standards (IFRS). Before 2005, most firms listed on the OSE followed Norwegian Generally Accepted Accounting Principles (NGAAP). The change in accounting rules makes an analysis of the time-series of accounting measures of performance, such as return on assets (ROA), less reliable than market value performance measures, such as Q. Restricting attention to 2005 and later is also problematic because the law was announced in 2002. For these reasons we focus our attention on Tobin's Q, rather than accounting performance. We also repeat our analysis on the post 2005 data to ensure a change in accounting standards does not drive the effect. We find similar results with this later and shorter time period.

To measure changes in the board of directors following the law change, we hand-collect board of director and CEO information from annual reports filed by the sample firms starting as early as 2001 and going through 2008. For each board member and CEO, we record the person's name, gender, nationality, age, board title (e.g., Chair, Deputy-chair, etc.), education, if the person has prior experience as a CEO, current external job and employer, share holdings in

[5]Multiple classes of stock were used to attract foreign investors in Norway. In 1999 the OSE discouraged their use and the number of firms with multiple share classes diminished (Ødegaard, 2007). Only seven firms out of 177 had multiple classes of stock in 2001, decreasing afterwards.

the firm, year first elected to the board, and whether the board position is elected by the shareholders or the employees of the firm. These data, when reported, are in the biographical section of the annual report. Shareholdings are reported in the accounting statements.

We identify the gender of the board member and CEO using the following rules. First, we use a photograph of the person in the annual report. If a photo is not available, we search whether the biographical information uses identifying pronouns such as 'she' and 'her,' or 'he' and 'his.' If these are not available, we base our gender identification on the first name of the person, using the First Names database from Statistics Norway. For every name recorded in Norway, this database lists how many men and how many women have the first name.

We supplement our hand-collected data with data from the Boardex database where available if our data are missing. The Boardex database records the same biographical information as we collect by hand, but it does not cover as many firms as we do. Finally, if we are unable to find the date of birth of a board member or CEO using the above procedures, we hand collect the year of birth from the Skattelister, a publicly available database of tax records for every taxpayer in Norway, which also includes each person's year of birth. If a search of the tax records produces more than one person who is at least twenty years old and shares the same name, we record the person's age as missing. We complete our database by backfilling demographic information when available for later dates and from the reports of other firms.

Following these procedures yields one of the most comprehensive databases used for academic research on directors in a single country. In 2007, according to Statistics Norway, there were a total of 437 public limited companies in Norway, all of which were subject to the gender quota. Of these, 241 firms were listed on the OSE in 2007 and Compustat reports stock price and accounting data for 185 of these. Recall that public limited firms in Norway are legally similar to U.S. corporations, which means they can offer shares to the public, though they may not be publicly traded. Of these 185 firms, we were able to find annual reports for 177 firms to allow us to hand-collected data (Boardex data supplemented 78 of these same 177 firms). If more than half of a firm's board has missing data, we drop the firm-year observation, which leaves us with 166 firms. This means we have data on 38 percent of the universe of firms affected by the law change and 69 percent of the firms traded on the OSE. Of these, we have complete information

about the number and gender of board members, and age data for 87 percent of the CEOs and board members in our sample. The sample consists of 1,062 firm-year observations over 2001 to 2008 for the 166 unique firms. There are 7,773 person-year observations from 561 women and 1,613 men directors and CEOs.

Using the board member data, we aggregate to the firm level to calculate the number of board members, the percentage of women board members, the average age, board tenure, percentage of members in different types of external job roles, shareholdings as a percent of shares outstanding, and the total shareholdings of the board as a percentage of outstanding shares, and the percentage of members with an MBA, a post-baccalaureate degree, prior or current CEO experience. Because media reports indicate that the shortage of women board members led to women sitting on multiple boards simultaneously, we also calculate the number of board and CEO positions among our sample firms. These are recorded at the personal-level, as the number of overlapping board members and CEOs, and at the firm-level, as the number of firms that share members or a CEO with each sample firm.

2.1. Summary Statistics

Table 2 presents cross-sectional mean values of firm and board characteristics from 2001 to 2008. On average, Tobin's Q ranges from 2.94 to 1.12 over 2001 to 2008. This is slightly higher than the Q reported in Coles, Daniel, and Naveen (2008), but consistent with the smaller average firm size in Norway compared to the larger U.S. firms in the Coles et al. study. The average also reflects the fluctuations in Q over time. In later analysis, we use firm and year fixed effects to control for these fluctuations. Table 2 also presents the time series of leverage and investments. Leverage increases from 2004 to 2008, R&D increases substantially from 2004 to 2008 and capital investments are relatively constant over the sample period.

Next, Table 2 reports mean characteristics of the boards of directors of the sample firms. The average size of the board is roughly constant at about 6.5 members. This is slightly less than the 7.5 average board size for the large sample of U.S. firms studied in Linck, Netter, and Yang (2008). The relatively constant number of board members suggests that firms replace rather than add board members to comply with the law. Not surprisingly, the proportion of women

board members increases dramatically for our sample firms, just as shown in Figure 1 for the sample of all public limited firms, and the average tenure and board retention decrease. The proportion of directors with CEO experience on an average board peaks in 2004 with 41.8%, declines through 2007 by about three percentage points and rebounds in 2008. The proportion of board members with MBAs declines slightly over the sample period, but board members with other post-baccalaureate degrees increases from 20.9% in 2001 to 26.2% in 2008. The average age of the board members in our sample is roughly constant over time at 50–51 years old.

Other notable time trends in board characteristics from 2001 to 2008 are the decrease in the number of board members that are nationals of Norway from about 95 percent to 91 percent as well as the increase in the number of additional board and CEO positions an average board member holds. The number of positions rose from 1.6 in 2001 to 2.3 in 2008. Also of interest is that the percentage of board members who share a common last name with other board members or the CEO of the firm has remained relatively constant, or gone down, suggesting that firms did not use family members to comply with the law.[6]

Panel C of Table 2 presents the occupations of the outside board members as listed in the annual reports. CEOs and directors are the most common occupation of board members in an average firm, accounting for about half and a quarter of members. Directors whose primary occupation is a principal or partner account for about 14% of board members. Over the sample period, the percentage of directors who list board member as their external occupation increased, whereas the proportion of CEOs decreased. Non-executive managers, vice-presidents, and CFOs have become more prevalent, whereas partners and principals have become less common. Since firms did not all fully comply with the law simultaneously, the calendar time averages of board characteristics do not reveal the heterogeneity in firm transformations that occurred from 2001 to 2008. Even still, the calendar time series reveal a pattern of changing board characteristics on average.

Finally, we present additional evidence that supports our argument that the law was exogenously imposed on firms, a necessary condition to rule out reverse causation. Table 3 compares the percentage of women board members and chairpersons of the board for public and private

[6]These women directors are most likely wives or unmarried daughters or sisters of existing directors, as about 80% of married women in Norway use their husbands surname (Noack and Wiik, 2008).

limited firms from 2004 to 2008.[7] The data are from Statistics Norway and cover all public firms (who must comply with the law), as well as all private firms in Norway, not just publicly traded firms. Panel A reveals that private limited firms have a greater percentage of women board members in 2004 than public limited firms. This is primarily because private limited firms are mostly family-run businesses. More importantly, the percentage of women board members in private firms increases by two to five percentage points over 2004 to 2008, depending on the size of the firm, compared to increases of 23 to 34 percentage points for public limited firms. This indicates that businesses in Norway were not adding women directors in large numbers voluntarily during this period. In Panel B, we show that the percentage of women chairpersons of the board is highly stable over 2004 to 2008 for both public and private firms. These results are evidence that the law was exogenously imposed on firms in Norway.

3. Does the Structure of the Board of Directors Affect Firm Value?

To identify whether the introduction of the gender quotas caused a change in firm value, we take two complementary approaches. First, we estimate a classical difference-in-difference (DID) model using firm and time fixed effects. Second, we calculate an event study on the stock price reaction at the day of the first announcement of the law.

3.1. Difference-In-Difference Estimates

In a classical DID model, the causal effect of an event, such as a regulatory change, is estimated by analyzing the change in pre- and post-event outcomes for a sample of firms that are affected by the event (the treatment group) against the change in pre- and post-event outcomes for a sample of firms that are unaffected the event (the comparison group). Thus, it is necessary to define both a treatment group and a comparison group as well as pre- and post-event time periods. The advantage of the DID approach is that it controls for time-series variation in the outcome variable that is common to all firms and separately identifies the effect of the event.

[7] 2004 is the first year that data in this series are available.

To identify the effect of the gender quota on firm value, we estimate the following equation:

$$\log(Q_{it}) = \alpha + \gamma G_{it} + \beta X_{it} + \theta_i + \tau_t + \varepsilon_{it}, \tag{1}$$

where i indexes firms and t indexes time. $\text{Log}(Q_{it})$ is the log of Tobin's Q, X_{it} are time varying firm-level control variables, θ_i and τ_t are firm and time fixed effects, and ε_{it} is an error term. The firm fixed effects control for any observed or unobserved firm characteristics that are constant over time that may affect a firm's Q. The year effects control for any aggregate fluctuations of Q, such as recessions or expansions. Our variable of interest is G_{it}, a dummy variable that equals one if firm i has experienced a significant change in the gender of its board by year t. Since firms may have complied with the law gradually, we specify two measures of G_{it}. The first measure of G_{it} equals one in year t and all following years if the representation of women on the board of directors increases by at least 10 percent in year t to indicate the first major step toward compliance with the law.[8] The second measure of G_{it} equals one if firm i is fully in compliance with the gender quota by year t as defined in Section 1 (roughly 40 percent women). Using both relatively weak and strong definitions of board changes provides more assurance that our results are robust to different timing of compliance with the quota. The weaker, though likely earlier, change in board composition also accounts for expectations formed by the market in advance of final compliance with the law and is where would expect to see a larger effect.

To identify the effect of the gender quota law on firm performance, we rely on the staggered timing of firms' compliance with the law. This is the same approach used in Bertrand and Mullainathan (2003) to identify the effect of state antitakeover laws on the performance of U.S. firms. If all firms were forced to comply at exactly the same time, we would not be able to control for the common time series variation in firm value using a comparison group of Norwegian firms. Instead, we would have to use a comparison group from another country, such as Sweden, which may not be comparable. Therefore, the staggered compliance of the law allows us to form a comparison group of firms that are likely to experience the same aggregate shocks as the treatment group.

[8]In untabulated results, we have also examined the impact of a 15, 20, and 25 percent change in the representation of women on the board and obtained qualitatively similar results.

However, in contrast to Bertrand and Mullainathan (2003), the staggered dates of compliance with the law in our setting are at least partly endogenously determined. Though certain firms or industries may have had larger difficulties finding experienced women board members to meet the 40 percent quota, it was ultimately up to the firm's management *when* it chose to comply. This means that the comparison group for those firms that complied with the law soon after its introduction may be different than the comparison group for the firms that complied later. One may worry that this could bias our results. For instance, those firms that complied early may be better managed and thus have higher Qs than the firms that complied later. However, since all of the regressions include firm-fixed effects, we are comparing *within* firm variation over time which means that the time-constant *level* of a comparison group's average Q will not bias our results either way. The only possible problem with endogenous timing is if the *changes* in average Q of the comparison group for the early firms is different than the changes for the later comparison group. We address this in three ways. First, we include firm-level variables related to Q to control for these possible differences. Second, we identify the marginal impact of compliance with the law using lagged and leading years in event time to account for possible reverse causation. Third, we run separate regressions that identify the impact of the percentage of women board members in 2001 on the change in Q from 2001 to 2008, thus avoiding endogenous timing.

3.2. Difference-In-Difference Results

We report the coefficient estimates of Equation 1 in Table 4. Columns 1 through 3 use the first year that the percentage of women increased by at least 10 percent as the treatment effect. Columns 4 through 6 use the first year that a firm reaches full compliance with the law. In all specifications, we denote this variable as 'Treatment G.' All regressions include firm and year fixed effects. In addition, in this and all other regressions we compute standard errors by clustering observations at the firm level. This accounts for the serial correlation in the time-series of within-firm variation commonly observed in difference-in-difference variables (Bertrand, Duflo, and Mullainathan, 2004; Petersen, 2009).

Column 1 presents the impact of the weaker, though earlier, 10 percent increase in women board members without time-varying firm level controls. We find that Tobin's Q significantly decreases by about 15 percent for an average firm after the shift in board composition. We investigate the robustness of this result to various controls. In column 2, we include time-varying firm-level variables that may also affect Tobin's Q. To measure size, we use the log of employees, rather than book or market values since both are used to construct the dependent variable Q. Following Coles, Daniel, and Naveen (2008), we include the additional control variables of R&D, leverage, durable assets, and capital expenditures. Log(employees) is significantly and negatively related to Tobin's Q and capital expenditures are positively related in all specifications. However the inclusion of these variables does not decrease the significance or level of the treatment effect.

Column 4 of Table 4 estimates the effect of complete compliance on Tobin's Q. The effect is a 8.2% decline in firm value (significant at the 12 percent level). The magnitude of the result is smaller than the earlier 10 percent increase in women directors and insignificant at standard levels, consistent with the forward looking nature of Tobin's Q. Column 5 adds additional control variables, which reduces the magnitude and significance of the treatment effect. These results likely represent the market anticipation of the effect of reaching the quota in later years, following the initial change in board composition.

Though our difference-in-difference tests reveal that average Tobin's Q in the post-treatment years is significantly lower than in the pre-treatment years, controlling for firm and calendar year fixed effects, the reader may be concerned that either the results are driven by event-year effects or that the results are driven by a large drop in Q in the event year that is subsequently reversed. Figure 2 presents Tobin's Q and the percentage of women board members in event time relative to the year when complete compliance with the law was achieved. The values of Q and the percentage of women board members in the figure control for firm fixed effects by using values that are demeaned by firm-level time series averages. In addition, since the figure is in event time, calendar-year changes in aggregate Q are not driving the observed patterns.

Figure 2 shows that Tobin's Q falls from year -1 until year 0, when compliance with the law was achieved. Moreover, Tobin's Q continues to decline in the following two years after full

compliance. This implies that the negative impact on firm value was not a temporary reaction to the disruption of the board caused by the forced change in directors, but rather a long-term impact on value. Second, average Tobin's Q is actually rising slightly in the years before firms comply with the law. This means that our difference-in-difference results are not simply picking up a downward trend in event time that is unrelated to the event. When we calculate event time using the year that a firm increases its percentage of women directors by at least 10 percentage points, the figure looks very similar.

In columns 3 and 6 of Table 4, we address the same issue statistically. Following Bertrand and Mullainathan (2003), we replace the treatment effect variable with four dummy variables. Before^{-1} is a dummy variable that equals one in the year prior to the treatment, either an increase of 10% or full compliance. Before^{0} is a dummy for the year of the treatment. After^{1} is a dummy for the year following the treatment, and After^{2+} is a dummy equal to one for treatment effects that were realized at last two years before. These variables allow us to determine if Tobin's Q was declining before a firm chose to comply with the law and whether the effect persists beyond the first year of the board change. If Before^{-1} is negative and significant, it would indicate reverse causation: firms changed their boards following poor performance. The estimated coefficients for Before^{-1} for both treatments are statistically insignificant and small. In contrast, the coefficients on Before^{0}, After^{1}, and After^{2+} are negative and significant, increasing in magnitude over time. These results provide additional evidence for a causal relationship between Tobin's Q and the forced change in governance. The persistence in the results also contradicts the idea that only disruption caused by the large change in board composition is causing the decline in value.

To further address the endogenous timing of compliance with the law, we perform an additional test. Though we have shown that firm value is not dropping before firms comply with the law, it is possible that CEOs with inside information about their firms' prospects choose to add women directors in a particular year to coincide with poor performance. Additionally, a CEO could add friendly directors to 'capture' the board. The managers could then blame the change in directors for the poor performance, rather than the true reason. This would produce the same pattern of Tobin's Q and board composition as we have shown. However,

this argument requires that CEOs can forecast their firms' values many years in the future in order to wait until a year of declining value. In contrast, Jenter, Lewellen, and Warner (2009) finds that CEOs' ability to predict returns is limited to just 100 days in the future. Second, the persistence in low valuations, also makes it implausible that CEOs are choosing to change the board to coincide with the first year of the value drop.

Nevertheless, to address this concern as well as any other endogenous timing concerns, we investigate the marginal impact of the percentage of women directors in 2001 on the change in Tobin's Q from 2001 to 2008. Those firms with more women directors in 2001, before the announcement of the law, have less constraints on their board imposed by the quota. In untabulated firm-fixed effects regressions, we find a positive and significant effect of the percentage of women directors in 2001 on the change in Q from 2001 to 2008. This removes any effect of the timing of the change in directors and is again consistent with a causal link between the forced change in directors and a decline in firm value. The drop in Q following the forced change in directors is also inconsistent with the 'captured board' hypothesis, since the timing of the change is irrelevant for the results.

Overall, the difference-in-difference results present a consistent finding, robust to endogenous timing and reverse causation: the gender quota for directors led to a severe decline in firm value of 8 to 15 percent, on average. This finding is most consistent with the theory that boards are chosen to increase shareholder wealth. Though these magnitudes may appear large, it should not be forgotten how substantial is the change in board composition. These firms are undergoing a massive reorganization of their shareholder representatives, where over 30 percent of their board of directors are changing, on average. Given the unprecedented nature of the change required by the gender law, we have no clear comparison to which we can directly measure these magnitudes.

3.3. Stock Price Effects of the Announcement of the New Law

To further investigate whether board composition affects firm value, we examine the stock price reaction of our sample firms to the first announcement of the new law on February 22, 2002. The public announcement was the top story in Norway's largest newspaper, *Verdens*

Gang, (VG) with the headline (translated from Norwegian), "Sick and Tired of the Old Men's Club!" In the article, the then Minister of Trade and Industry, Ansgar Gabrielsen, stated that the government would impose a 40 percent quota for women directors. Though the issue had been discussed in Parliament in prior years, this public announcement was highly unanticipated. We know this from later interviews where Gabrielsen describes his strategy to implement the law. According to an interview in the *Sunday Times* of London on June 8, 2008, "Gabrielsen had bumped into Alf Bjarne Johnsen of [VG] in February 2002, and on the spur of the moment, he offered the veteran journalist the biggest story of his career if he would come to his office to meet with him within the hour" (Toomey, 2008). Though Gabrielsen had not consulted with other key members of the Norwegian government before making the announcement, he goes on to state that it was purposefully done:

> *"If I had told them before, the initiative would have been killed by one committee after another," he says. "No, I had to employ terrorist tactics. Sometimes you have to create an earthquake, a tsunami, to get things to change," he says, laughing at his own daring. "If a left-wing feminist had come out with something like that it would have been dismissed as just another scream in the night," he continues. "But because I said it, I knew that people would take notice."*

We emphasize the way this regulatory change was announced because it is unusual to find such an unanticipated announcement of such a large change in government policy. The quote from Gabrielsen also reinforces the evidence that the law change was not brought about by firms. This means reverse causality (from Tobin's Q to the implementation of the law) is highly unlikely.

To interpret the impact of the announcement, we compare the difference of the stock price reaction for firms that will face larger constraints as a result of the law versus firms with smaller constraints, namely, firms with no women on their board versus firms with at least one woman on their board, at the date of the announcement. Since the announcement day for all firms is the same, we do not calculate abnormal stock returns by subtracting a market-wide stock return, as it will simply shift the levels, but not the difference, of the returns. To be conservative, we only include firms that are still listed on the OSE in 2007, even though it reduces our sample

to 51.[9] This restriction is conservative because those firms with greater negative reactions are also the ones that are most likely to either go private or change their country of incorporation to avoid the constraints imposed by the law. The results of the the analysis are presented in Table 5.

The first column of Panel A in Table 5 shows that the mean (median) of the sum of the stock return over the three days around the announcement date is 0.284% (0.262%) and is insignificantly different than zero. Columns 2 and 3 divide the sample into those firms with no women on the board at the time of the announced law change and those with at least one woman on the board. We hypothesize that the constraint imposed by the new law will be most binding for those firms that have no women and hence will require a more dramatic change to comply with the law. Panel A illustrates that this is true. Firms with no women directors experience a -1.615% (-0.308%) mean (median) three-day return at the announcement of the law. Those firms with at least one woman director experience a 2.109% (0.596%) mean (median) return. The firms with no women board members experience a return that is a significant -3.7 percentage points lower than those firms with at least one woman director. We can not interpret the individual magnitudes of the stock returns because other factors likely affected all the returns on the announcement day, but the large difference in returns by the presence of women board members is consistent with the hypothesis that the law imposed significant and costly constraints on Norwegian firms. Taken in conjunction with the value decline shown in the difference-in-difference analysis, these results indicate that investors partially anticipate the impact of the board change at the announcement of the law. However, at that time, only the current and not the newly chosen board members are known. Thus, the announcement return reflects the ex-ante expectation of the impact and the change in Tobin's Q represents the effect of the implementation and choice of board members.

In Panel B of Table 5, we regress the announcement returns on the percentage of women directors as well as firm size and board size controls.[10] In each specification, the regression

[9]The sample of 51 firms is also smaller than our yearly sample because some stocks are thinly traded and are missing stock price data for the announcement period.

[10]Though we do not explicitly adjust returns by market-wide risk factors since it will likely introduce estimation error in thinly traded stocks, firm size alleviates much of the concern that announcement effect is driven by risk characteristics.

results show that the greater was the percentage of women on a firm's board at the time of the announcement, the less negative was its stock price reaction. Though we have only a small sample, the results hold after controlling for board size and the number of employees of the firm.

Much of the exogeneity of our analysis relies on the notion that the quota law imposed a binding constraint on firms' board choices. To test this assumption, in the lower half of Panel B, we report estimated coefficients from regressions of the first year that a firm had at least 20% women board members on the firm's announcement return. We expect that the more binding was the constraint imposed by the gender quota, the longer it will take a firm to reach this threshold of the percent of women directors. The results show that firms that suffered worse announcement returns reached the 20% threshold significantly later in time than did the firms with better announcement returns. This indicates that the negative effect of the announcement of the gender rules for firms with no women directors in 2002 reflects a binding constraint on a firm's choice of board members.

4. How Does Board Structure Affect Firm Value?

In this section of the paper, we attempt to identify the changes to board characteristics that may lead to the loss of firm value. The time series averages presented in Table 2 indicate that some board characteristics are changing, but others are not. However, since the time series are aggregated over all firms, the firm-level changes may be less obvious. Since women are being added to boards of directors in large numbers, we separately identify changes over time in women versus men board members at the person-level to provide insight into how board structure evolved during our sample period.

4.1. The Time Series of Men and Women Director Characteristics

Table 6 presents person-level data on average characteristics of men and women board members in our sample. In 2001, there were 419 men directors compared to 41 women directors. By 2008, men accounted for 438 directors and women accounted for 271. For each entry in Table 6, we report whether the row variable mean is significantly different between women and

men directors. We also include a time trend coefficient to test if there is a linear trend in the variable over time.

Men directors are significantly more likely to have CEO experience, to be older (by about six or seven years on average), to have a longer tenure as a director in the firm, and to be an inside director. Some characteristics are significantly different between men and women in the earlier years of our sample, which then become more similar over time. Others display the opposite pattern. For instance, in 2001 male directors had significantly more higher education than female directors. By the last years in our sample, the reverse is observed. Likewise, in early years, men and women directors are equally likely to be Norwegian, but by 2008, 76 percent of women directors are Norwegian citizens compared to 90 percent of men directors. These changes over time are also revealed in the outside employment of board members. Compared to men, women directors increasingly are vice-presidents and non-executive managers, and less likely to be CEOs and partners or principals in firms.

Two anecdotal observations are also supported in the data. First, the number of positions that women directors hold increases significantly over the sample period, with women holding significantly more board and CEO positions on average than do men. This is consistent with the shortage of women directors. We investigate the frequency distributions of the number of board positions held by men and by women and find that this result is not driven by a few women with a large number of positions but rather the average woman holds more board seats. Also, the percentage of women directors who have the same last name as a board member or CEO in any of the years is significantly less than men from 2001 to 2004, but by the end of our sample period, the percentages of women who share a common last name are indistinguishable from the percentages of men. This suggests that firms may employ women family members in order to meet the gender quota.

The greatest difference between men and women directors is CEO experience. In the years before the introduction of the law, women directors were not significantly less likely to have prior CEO experience, but by 2008, there is a wide gap, with 57 percent of male directors with CEO experience, compared to 30 percent for female directors. These patterns reveal that when women were chosen without constraints, they more closely resembled their male counterparts in

many demographic attributes and outside employment. By imposing the extreme quotas, the shortage of women directors led Norwegian firms to elect directors that differed along multiple dimensions beyond gender.

4.2. The Difference Between New, Retained, and Exiting Directors

To provide further understanding how the characteristics of boards are changing, Table 7 compares the characteristics of newly elected board members with directors that are retained and with directors that exit the board. Recall from Table 2 that board size did not significantly change, indicating that (on average) new female board members replaced existing (often male) board members. The values in the table present averages over within-firm differences. Clearly, new directors are more likely to be women compared to exiting directors (43% vs. 19%). However, the fact that almost 20% of exiting directors are women is intriguing. This time-series average is driven by high percentages of exiting women directors in later years: 22% in 2007 and 28% in 2008, compared to 9% in 2002. It suggests that in the massive transformation of boards that occurred during this time, there was a lot of turnover and shuffling of directors, including newly hired women directors. This is consistent with a rush to hire women to comply with the law and then a movement to replace the newly hired directors with other women directors who may be better suited for the firm on some dimension.

The high turnover is also consistent with women directors voluntarily leaving their initial board appointments for better directorships. However, the evidence does not support this conjecture. Of the 720 male directors who leave an appointment, 75% exit the sample completely, having no other concurrent or future position, compared to a statistically indistinguishable 71% for the 174 female directors who leave an appointment. Thus, the majority of directors, male or female, who exit a board position do not continue to be directors in our sample. When a director does either retain an appointment or add a new directorship after exiting a firm, the retained or new firms are not measurably different than the old firm, for men or women. Specifically, neither the total revenues, the number of employees, nor Tobin's Q of the firm that is being exited is statistically different than the new or retained firms. The difference-in-difference

between the old and the new firms for men and women directors is also not statistically significant. Thus, most directors who leave a firm, male or female, do not go to a new appointment or retain another existing appointment and of those that do, there is not a noticeable difference in the size or value of the old firms versus the new or existing firms.

The new board members differ significantly from the exiting and retained members across many dimensions other than gender. The average new director is less likely to have prior CEO experience, is younger, owns fewer shares and is less likely Norwegian compared to exiting and retained directors. It is also interesting to note that firms are not randomly choosing which directors will exit the board. Instead, the exiting directors have significantly fewer shareholdings, are less educated, and are less likely to be Norwegian compared to the directors that remain on the board.

Panel B of Table 7 also reveals that new members are much more likely to be a VP, a non-executive manager, or a CFO, compared to the retained and exiting directors. Retained directors are much more likely to be a board member of another firm or a partner or principal compared to exiting directors. We interpret the results in this table as additional evidence that the small supply of women directors leads to boards that are substantially different, notably boards that have younger directors with less high-level experience.

4.3. Regressions to Identify the Effects of Boards on Firm Value

The evidence presented in the prior sections suggest that there are multiple and related changes occurring in the board of directors over time. Thus, to control for the many possible influences on firm value we run panel regressions of Tobin's Q on board composition. As argued in the introduction, and as the results presented so far indicate, the changes in the board are in large part exogenous. Thus, using firm fixed effects regressions controls for time-constant firm heterogeneity and isolates the effects of the changing board characteristics. Given the quasi-experimental nature of our setting, we are less concerned with reverse causation and assume that the changes we identify in the fixed effects regressions are largely exogenous.

Table 8 presents estimated coefficients from panel regressions of changes in Tobin's Q on changes in board characteristics. All regressions include firm and year fixed effects as well as

the firm-level control variables and all standard errors are clustered at the firm level. Column 1 includes the percentage of women board members and finds a statistically negative result, consistent with the prior results, though using a different measure of the gender change in the boards. We include the percentage of women on the board rather than the treatment dummy variables that we used in prior tests to be consistent with the other measures of board characteristics. Columns 2 and 3 add additional variables to describe the board. In both cases, the point estimate of gender is diminished and become statistically indistinguishable from zero. Thus, controlling for additional board characteristics, the gender composition of a firm's directors has no direct effect on firm value. This result indicates that it is not the gender, but rather other characteristics that drive the previously documented negative value impact.

Column 2 of Table 8 includes board size, average tenure, age, shareholdings, higher education, and prior CEO experience. First, we find that board size is negatively related to Tobin's Q on average. Since board size may have only changed in order to meet the quota, this is not surprising. However, since firms did not need to increase firm size by law to meet the quota this may have various interpretations. For example, it may identify those firms whose board members are the most difficult to replace and hence who add new board members to accommodate the new law without replacing existing directors.

Second, CEO experience of the board is positively and significantly related to firm value. As expected, the gains are diminishing, as each additional board member that has CEO experience adds less value to the firm. The positive relation between CEO experience and firm value and the prior evidence that boards had fewer members with CEO experience following the imposition of the quota law help explain the overall loss in value that resulted from the quota. In unreported tests, we interact the percentage of women directors with the CEO experience of the board. We find a negative and significant coefficient on the interaction with the linear effect and positive and significant effect on the interaction with the quadratic, while none of the other coefficients change. This implies that the CEO experience of women directors is less value-increasing than men directors. This may be caused by CEO experience at smaller or unrelated firms, consistent with a constrained choice of directors.

Column 3 of Table 8 presents regression coefficients when dummy variables for the presence of board members who work in various occupations are included. We drop higher education and CEO experience as they are highly correlated with some of the occupation dummies. After including these variables, the coefficient on average age of the board is positive and significant. Given the younger boards that are observed after firms comply with the quota law, this result is consistent with age partly explaining the previously documented negative effect on value. In addition, board members whose primary outside occupation is a board member or insiders on the board also add value to the firm. Though our data are quite comprehensive on age, gender, and board size, we lose a number of observations when we include board members' outside occupations, which may explain why many of the occupations are insignificantly related to firm value. In unreported tests, we also include the average nationality of the board and the number of additional board seats directors have and find insignificant results, though without changing the main results.

In summary, the regression results suggest that boards do affect firm value in ways consistent with an advisory role. Boards that have older members with high-level business experience increase firm value. These results are also consistent with the substantial changes we observe in board characteristics over time. Since these changes are in large part exogenous, we feel confident that the relations presented in the regressions are not caused by selection or endogeneity between value and board characteristics. The constraint imposed by the 40% women quota led firms to recruit women board members that were younger and had different career experiences than the existing directors. It is reasonable to suggest that these changes led to decreases in firm value because directors did not have the same monitoring or advising capabilities of the directors before the imposed change, regardless of their gender

4.4. The Effect of the Gender Quota on Incorporation Rates

If the negative effects of the gender quota on firm value were as large as our evidence suggests, we would expect to see firms try to avoid the law altogether. There are at least two ways that firms could do this. First, existing firms could change their form of legal organization to private limited, rather than public limited. Second, firms could incorporate in another country. In this

section, we provide suggestive evidence that both things occurred following the introduction of the law.

Using data from Statistics Norway, Figure 3 presents the time series of the number of all public limited and private limited firms in Norway from 2001 to 2008. There are, of course, many more private limited firms, so we normalize the time series to 1 in 2001. We also present the time series of total employment in Norway over this time period for comparison.

The figure shows that there is a steady decline in public limited firms starting in 2003 and continuing throughout the period. By 2008, there are only 77 percent as many public limited firms in Norway as there were in 2001. In contrast, the number of private limited firms increases beginning in 2003 and continues throughout, ending in 2008 with 27 percent more private limited firms than existed in 2001. In addition, employment is increasing throughout the sample period. This indicates that while the economy was growing, firms were more likely to choose to organize as a private limited firm rather than a public limited firm starting in the years after the announcement of the gender quota law, which only affects public limited firms.

Next, we present data from Becht, Mayer, and Wagner (2008) on the incorporation of Norwegian firms in the United Kingdom. In a series of rulings from 1997 to 2002, the European Court of Justice (ECJ) allowed European firms to choose their country of incorporation independently from their real location. Thus, firms could choose legal systems of governance from a wide array of countries. The Becht et al. paper focuses on reincorporations in the U.K. by firms whose real seat is in any of 25 different European countries.

Figure 4 presents the time series of the legal incorporations in the U.K. by Norwegian, Swedish, and Finnish firms, where origin is determined by where the majority of directors of the firm reside. We normalize these data in two dimensions. First, from Table 3 in Becht et al., we take the number of each of the three Scandinavian countries as a percentage of the total incorporations in the U.K. in each year. This accounts for aggregate fluctuations in U.K. incorporations following changes in macro-economic conditions. Second, we normalize each time series to equal one in 1997, to account for the level differences between the three countries. This accounts for fixed differences between the nations, such as the different costs of incorporating in each country.

There is a clear difference in the time series of Norwegian firms incorporating in the U.K., compared to Swedish and Finnish companies beginning in 2003. This again coincides with the introduction of the gender quota laws in Norway. We should note that these data are for private firms, not public firms, which are not reported in Becht, Mayer, and Wagner (2008). However, it is plausible that there may have been uncertainty about whether the laws in Norway would be extended to private limited firms, or that new entrepreneurial firms may wish to start in the U.K. as private firms which may make the transition to a U.K. public organization less costly.

In both figures, there is a strong coincidence between the introduction of the law change in Norway and the occurrence of unusually high numbers of firms choosing legal organizations that avoid the gender quotas. Though this evidence is not statistical proof of such an occurrence, it does provide very suggestive evidence that the law change imposed a significant cost to public limited firms in Norway. Moreover, though we do not control for the selection bias this trend may cause for our results, it is most likely that if we included those firms that avoided the law by changing their incorporation status, our main results would only be strengthened.

4.5. The Effect of the Gender Quota on Firm Policies

Though our results provide strong evidence that experienced boards add value to firms, it would interesting to identify the mechanism through which this occurs. For instance, do experienced board members attract bigger customers? Do they better evaluate important investments? Or, do they monitor the CEO more effectively? The challenge to identify these mechanisms is that they are typically not observable and are likely to be found in future long-run changes. Nevertheless, we run difference-in-difference regressions on leverage, research and development expenditures, capital expenditures, dividend and share repurchase policies, and stock price volatility. We find no significant effects. We also test whether the likelihood of CEO turnover increases following compliance with the law and find no effect. We do find some evidence that diversifying mergers are slightly more common after the law change than before. Overall, we are not surprised to find that we can not identify a systematic change in particular firm policies surrounding the new law. The value of experience is likely manifested

in idiosyncratic ways across firms. Thus, the marginal impact of experience on value is clear, but the impact of experience on any one firm policy is too small to be detected.

Finally, some may argue that the effect on firm value is not real but due to investor bias, particularly if the gender quota was not 'popular' with investors. Though this argument may impact the value drop at the announcement of the law, we find it doubtful it can explain the change in Tobin's Q because, as we show, the change in Q is explained not by the gender of the new board members but rather their limited experience. Thus, any bias that would drive our effects would not be against gender but against experience.

5. Conclusion

In this paper, we exploit a natural experiment in corporate board structure to identify which, if any, characteristics of boards affect firm value. Following a law change to Norwegian firms that required the average firm to change 30% of its board members, we document a substantial change in the characteristics of board members, including age, gender, and experience. Arguing that these changes are largely exogenous, we show that the imposed changes decrease Tobin's Q. This is consistent with the idea that board members are chosen in an attempt to maximize shareholder wealth. The constraint imposed by the law led to less optimal boards, and hence a decrease in firm value.

Next, we identify a number of well-known and new board characteristics that may affect firm value. Using fixed-effects regressions, we find that the presence of board members with CEO experience or directors whose primary occupation is to be a board member increase firm value. Older board members and insiders on the board also add value. Finally, the gender of the board members does not affect value once we control for other demographic characteristics. In summary, we find evidence consistent with advisory and monitoring roles for the board of directors. Boards that are composed of older members with more high-level experience provide value to a firm.

The results we present are relevant to academics, executives, investors, and also policy makers. This paper presents the first evidence on the effect of the groundbreaking quota rules adopted in Norway. Other countries have recently passed or are currently considering similar

laws. For example, Spain, the Netherlands, and France have passed similar quota laws, while Finland and Belgium have pending laws. Though our main interest in these laws is the natural experiment in corporate governance they provide, our results quantify the costs of such laws borne by shareholders. Moreover, our results on the characteristics of value-increasing boards may provide policymakers guidance on how to maintain value while providing greater gender equality in the boardroom.

Finally, due to limited years of observation, we focus on immediate changes in firm value in the year of and shortly after implementation in this paper. Future research will be able to exploit the natural-experiment of the law change to address a number of other important issues. For instance, do boards affect CEO turnover, dividend policy, capital structure, or acquisitions? Also, since only boards were required to change, the setting of our paper may allow future research to better understand how alternative governance devices, such as inside ownership and compensation contracts, interact with each other. Lastly, given the motivation for the law is gender equality, it would be interesting to examine if these board changes impact gender equality in hiring and employment. These are each important issues, but beyond the scope of this paper.

Appendix A. Variable Definitions

Accounting ratios	
Tobin's Q	Total assets - common equity + market equity/Total assets
Leverage	Book liabilities/Book assets
R&D/Assets	R&D/Book assets
Durable Assets	Property, Plant, & Equipment/Assets
Capex	Capital expenditures/Assets
Board of directors variables	
Size	Total number of directors
Female (%)	Percentage of board members that are women
CEO Exp. (%)	Percentage of board members that have work experience as a CEO or owner
MBA (%)	Percentage of board members that have an MBA
Higher Educ. (%)	Percentage of board members that have a post-baccalaureate degree including M.A., M.S., M.D., J.D., and PhD. From a university in the U.S.
Age	The age of the board member
Tenure	Number of years since a board member joined the board of directors
% Shares owned	The number of shares of stock owned or owned by a holding company that is controlled by the board member divided by the total number of shares outstanding
Total % shares owned	The sum of all shares owned by a firm's board members divided by the total number of shares outstanding
Insider	A board member of a firm that is employed full-time by the same firm
Board or CEO position/person	Total number of CEO and board positions held in any given year
Norwegian	Percent of board members that are Norwegian
% Same Name	Percent of board that share the same last name as another board member in the same firm
% Retained from prior year	Percentage of board members in year t that were board members in the same firm in year $t-1$
Board of directors external primary occupation	
VP	Vice President of any kind (i.e., Senior VP, Executive VP, etc.)
Consultant	Consultant, advisor, counsellor, bedriftsrådgive
Board member	Member, chair, deputy chair
Professor	Professor
Union rep.	Union representative, convenor, representative
CEO	CEO, President, Managing Director, General manager, Adm. Direktør
Attorney	Attorney, lawyer, advocate
Non-Exec. Manager	Manager, head of (sales, HR, etc.), management, COO, Marketing, General secretary
CFO	CFO, Finance director, Treasurer, financial director, investment manager
Partner/Principal	Partner, Owner, Principal, Self-Employed, Independent, Founder, Investor
Accountant	Accountant, Payroll, Controller, Controlling
Other	Any job position not classified above

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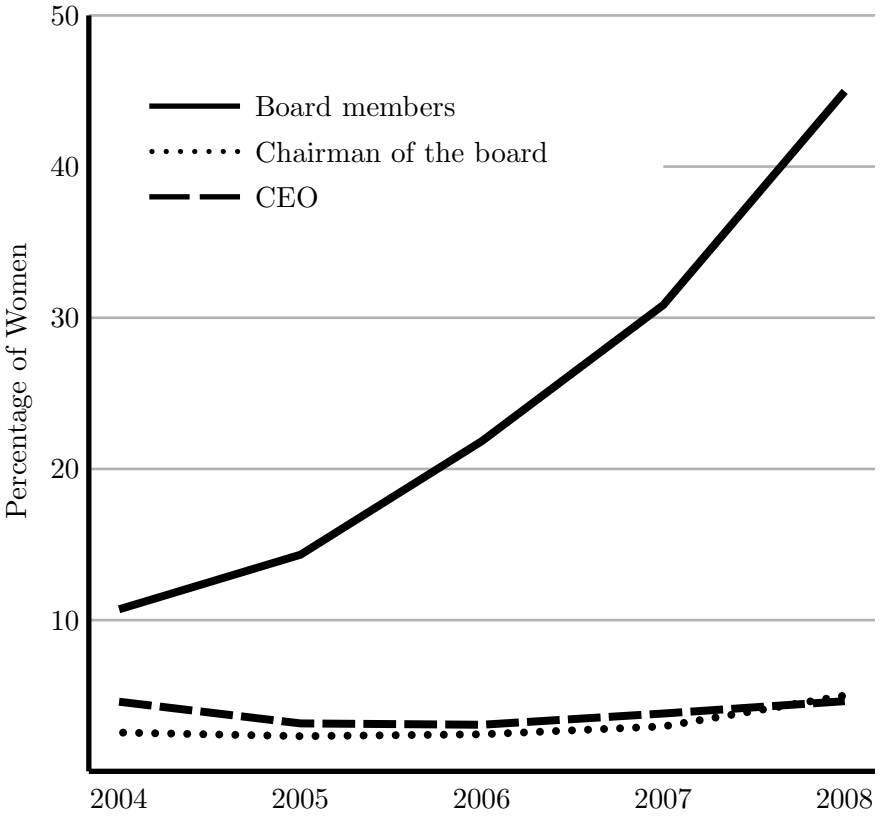

FIGURE 1
Percentage of Women on the Board of Directors of Norwegian Public Limited Firms
This table presents the percentage of women on the board of directors in Norwegian firms from January 1, 2004 to January 1, 2008. In 2004 there were 432 public limited companies with 2,813 individuals on the boards of directors. In 2008, there were 459 companies with 2,486 individuals. Data are from Statistics Norway (Statisisk sentralbyrå)

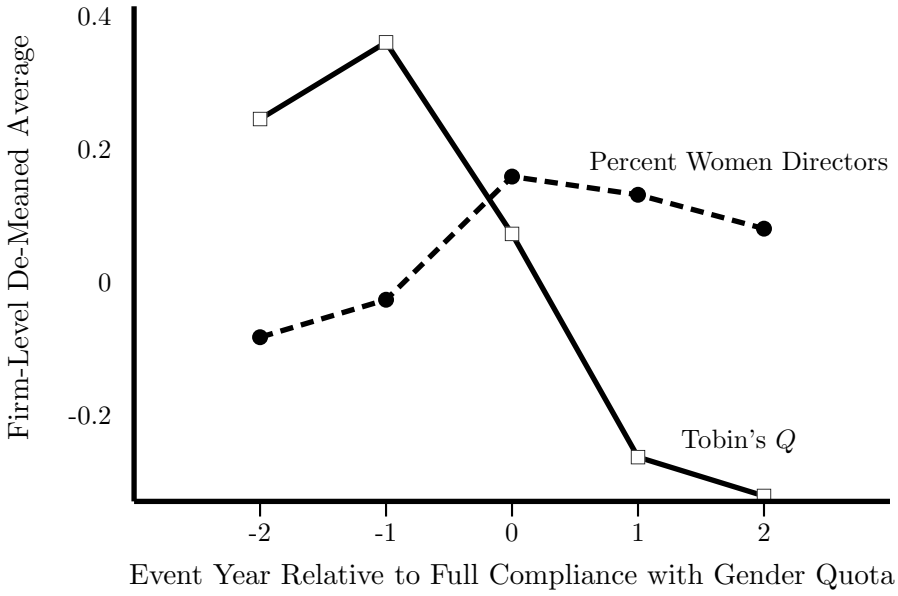

FIGURE 2
Event-Time Relationship of Tobin's Q and Women Board Members
This figure presents the average of firm-level demeaned Tobin's Q and percent women on the board of directors in event time relative to the first year that the 40% gender quota was reached. Demeaned values are formed by subtracting the firm-level time series average from each firm's yearly Tobin's Q and percentage of women directors. Data are from 166 Norwegian firms over 2001–2008.

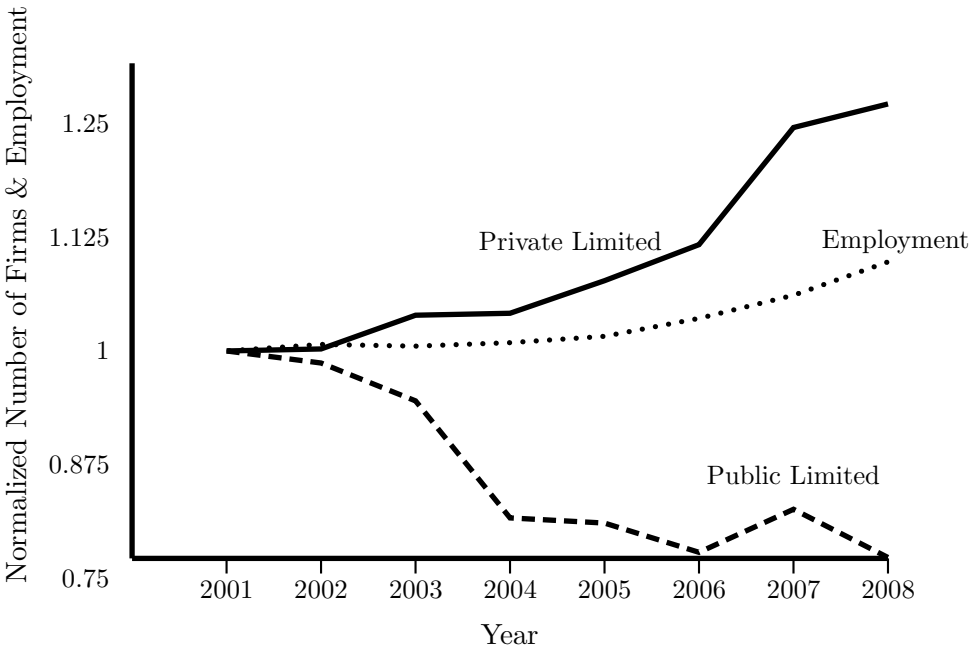

FIGURE 3
Number of Firms by Organizational Status in Norway
This figure presents the normalized number of private limited firms versus the number of public limited firms in Norway from 2001 to 2008, as well as total employment. Each series is normalized to start at 1 in 2001. Data are from Statistics Norway.

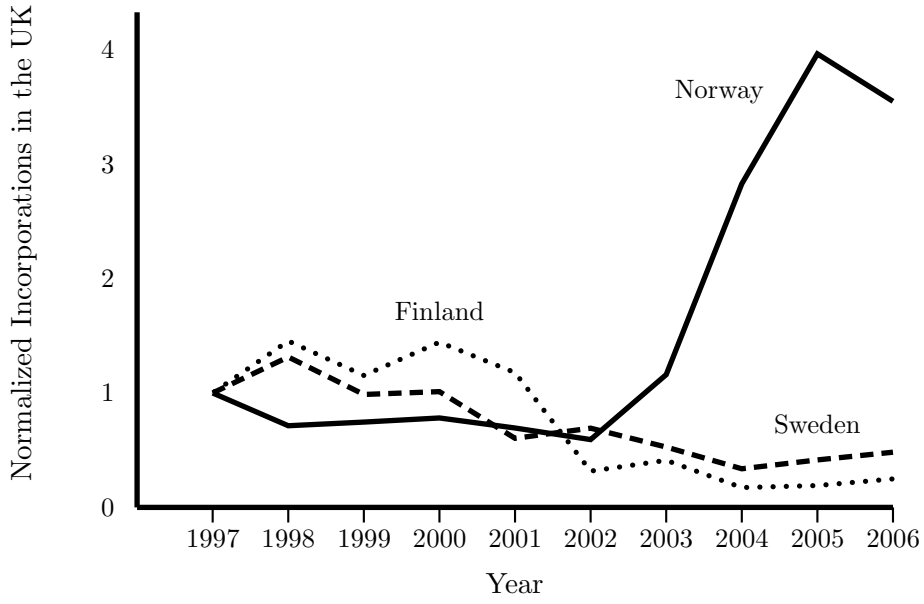

FIGURE 4
Number of U.K.-Incorporated Firms Where the Directors Reside in Scandinavia
This figure presents the normalized number of private limited firms incorporated in the U.K. where the majority of the directors reside in Norway, Sweden, or Finland. For each country, the percentage of yearly total foreign-based U.K. incorporations across 25 European nations is normalized to equal 1 in 1997. All data are from Becht, Mayer, and Wagner (2008).

TABLE 1
Boardroom Gender Quota Laws by Country
Average percent of women on the board of directors in 2008 is from the following sources: a: European Professional Women's Network (2008), b: EOWA (2008), c: Catalyst (2008), d: Jonsdottir (2009), e: Catalyst (2007). Pending indicates that a law has been proposed. Speculation indicates that news media have reported that a law has been discussed.

Country	Year Passed	Gender Requirement	Compliance Year	Average Percent of Women on Board in 2008
Norway	2003	40%	2008	44.2[a]
Spain	2007	40-60%	2015	6.6[a]
Australia	2009	Set own target and disclose	2011	8.3[b]
US	2009	Disclosure only	2010	15.2[c]
Netherlands	2009	30%	2016	12.3[a]
France	2010	40-50%	2014	7.6[a]
Iceland	2010	40%	2013	8.0[d]
Finland	Pending	40%	2014	25.7[a]
Belgium	Pending	30%	2017	7.0[a]
UK	Pending	Disclosure only	N/A	11.5[a]
Canada	Pending	N/A	N/A	14.0[e]
Sweden	Speculation	N/A	N/A	26.9[a]
Italy	Speculation	N/A	N/A	2.1[a]

TABLE 2
Firm and Board of Directors Summary Statistics by Year
This table presents averages of firm characteristics and averages of average board of director characteristics across firms for Norwegian companies that were listed on the Oslo Stock Exchange in 2007. All variable definitions are in the appendix. Outside occupations are not mutually exclusive and so do not add to 100%

	2001	2002	2003	2004	2005	2006	2007	2008
Panel A: Firm Characteristics								
Tobin's Q	2.94	1.59	1.66	1.95	2.18	2.05	1.88	1.12
Sales (billions 2008 USD)	5.19	16.26	14.15	8.41	1.38	1.55	1.64	1.62
Leverage	0.67	0.55	0.69	0.55	0.55	0.57	0.56	0.61
R&D/Assets (%)	8.20	3.49	0.40	0.92	0.52	0.98	1.75	4.31
Durable Assets (%)	31.67	25.29	25.12	28.23	24.97	25.03	25.74	28.25
CAPEX/Assets (%)	9.31	7.65	5.40	10.47	7.52	8.71	8.94	8.55
Panel B: Board Characteristics								
Size	6.54	6.63	6.68	6.56	6.56	6.71	6.72	6.54
Female (%)	8.05	9.69	11.49	14.93	20.80	27.52	36.95	37.61
CEO Exp. (%)	37.66	39.36	40.62	41.82	41.72	39.74	38.96	41.56
MBA (%)	25.32	24.10	24.12	25.20	23.90	22.94	24.14	22.06
Higher educ (%)	20.88	21.10	20.99	25.58	25.19	27.81	28.59	26.27
Age	50.00	50.28	50.46	50.74	50.21	50.26	50.64	50.51
Tenure	3.63	3.24	3.27	3.60	3.58	3.44	3.02	3.14
Average % shares owned	2.86	2.92	2.72	2.63	2.31	2.34	2.08	2.27
Total % shares owned	13.96	14.20	13.94	13.96	12.50	12.50	11.02	11.77
Insider (%)	11.04	7.93	6.83	5.74	5.12	5.59	4.34	5.43
Std. dev (age)	8.00	8.43	8.61	8.46	8.00	8.03	7.94	7.94
Std. dev. (tenure)	2.98	2.68	2.67	2.61	2.68	2.89	3.04	3.13
Std dev. (% shares held)	5.34	5.40	4.95	4.92	4.54	4.61	4.12	4.67
% retained from prior year		79.19	77.36	83.01	80.86	78.47	70.53	76.47
Norwegian (%)	94.26	95.36	94.52	93.61	93.28	92.05	91.17	91.36
Same name as other on board (%)	3.84	3.65	3.55	4.15	2.93	3.37	3.05	3.17
Board or CEO positions/person	1.55	1.70	1.71	1.92	2.42	2.75	2.98	2.32
Positions/Board size	1.25	1.47	1.53	1.74	1.93	2.20	2.58	2.07
Panel C: Outside Occupation of Shareholder Elected Directors (%)								
VP	8.32	8.03	10.80	8.21	9.74	11.49	10.17	10.44
Consultant	4.63	5.34	5.40	4.95	4.92	4.54	4.61	4.12
Board member	45.16	49.82	49.39	55.11	53.81	55.22	62.33	57.53
Professor	0.82	0.81	1.09	2.16	3.63	2.25	2.31	3.71
CEO	26.77	30.74	27.78	29.41	32.78	28.93	24.14	25.00
Attorney	1.99	1.73	2.45	2.87	2.71	2.54	2.25	3.07
Manager	6.18	3.41	3.45	7.55	10.10	8.83	7.58	7.16
CFO	2.11	3.65	3.06	2.83	3.39	4.96	3.84	5.83
Partner/Principal	15.05	16.53	19.08	15.65	20.12	15.74	15.16	17.37
Accountant	0.34	0.87	1.11	1.03	0.87	0.76	0.87	0.96
Other	29.74	30.97	29.06	25.80	22.22	24.89	22.25	24.22
Observations	92	97	104	118	143	154	166	145

TABLE 3
Women Directors in Private Versus Public Firms
Data are from Statistics Norway and covers all public and private limited firms registered in Norway.

		2004	2005	2006	2007	2008
Panel A: Women Board Members (%)						
Private Limited Firms	All	19.6	20.2	21.0	21.7	21.8
	100-249 Employees	15.4	16.7	18.6	19.8	20.6
	250 Employees and more	17.7	19.2	20.7	22.7	23.0
Public Limited Firms	All	10.7	14.3	21.8	30.8	45.0
	100-249 Employees	16.9	19.9	29.9	33.7	48.1
	250 Employees and more	25.1	28.4	36.7	41.0	47.9
Panel B: Women Chair (%)						
Private Limited Firms	All	10.2	10.4	10.7	11.0	11.1
	100-249 Employees	4.4	4.6	5.1	5.7	5.6
	250 Employees and more	3.0	5.2	6.2	4.6	5.1
Public Limited Firms	All	2.6	2.3	2.4	3.0	5.0
	100-249 Employees	9.4	8.8	3.1	3.4	3.4
	250 Employees and more	0.0	0.0	4.3	0.0	0.0

TABLE 4
Effects of Board Member Gender Quotas on Tobin's Q

This table presents coefficients from OLS fixed effects regressions. Treatment G indicates the first and subsequent years following a 10 percentage point increase in women directors for a firm in columns (1)-(3), or the first and subsequent years when the percentage of women directors complied with the quota law (at least 40%, approximately) in columns (4)-(6). Tobin's Q = Total assets - common equity + market equity/Total assets; Leverage = (Book liabilities)/(Book assets); R&D = R&D/Book assets; Durable Assets = Property, Plant, & Equipment/Assets; Capex = Capital expenditures/Assets. Sample period is 2001 to 2008 where firms are all firms listed on the Oslo Stock Exchange in 2007 with available data. $p-$values (in parentheses) are corrected for clustering at the firm level. Statistical significance at the 1%, 5%, and 10% levels are indicated by ***, **, and *.

	Dependent Variable: Log(Q)					
	$G = +10\%$ Women Directors			$G =$ Full Compliance		
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment G	-0.149^{***}	-0.148^{***}		-0.082	-0.054	
	(0.001)	(0.001)		(0.118)	(0.408)	
Before^{-1}			0.009			-0.053
			(0.862)			(0.199)
Before^{0}			-0.126^{*}			-0.137^{*}
			(0.051)			(0.068)
After^{1}			-0.229^{***}			-0.282^{***}
			(0.006)			(0.003)
After^{2+}			-0.338^{***}			-0.377^{***}
			(0.005)			(0.001)
Log(Employees)		-0.106^{***}	-0.147^{***}		-0.106^{***}	-0.098^{***}
		(0.001)	(0.001)		(0.002)	(0.004)
Capex		0.411^{***}	0.346^{**}		0.398^{***}	0.454^{***}
		(0.008)	(0.029)		(0.010)	(0.007)
R&D		-0.041	0.009		-0.032	-0.062
		(0.787)	(0.951)		(0.835)	(0.623)
Leverage		0.148	0.129		0.148	0.120
		(0.394)	(0.515)		(0.389)	(0.484)
Durable assets		-0.181	-0.361^{*}		-0.165	-0.321^{*}
		(0.307)	(0.088)		(0.360)	(0.097)
Firm fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
Adusted R^2	0.199	0.178	0.183	0.188	0.164	0.226
N	956	778	643	956	778	670
Firms	171	161	125	171	165	132

TABLE 5

Stock Returns at the Announcement of the 40% Quota Rule

Panel A presents means and medians of cumulative stock returns over the three day window surrounding the date of the first announcement of the new law requiring 40% representation by women (February 22nd, 2002). Panel B presents coefficient estimates from ordinary least squares regressions. The sample size is 47 in all regressions. Women Directors (%) is the percentage of a firm's directors that are women in 2002. Year % women>=20% takes on the value 2001 to 2008 to indicate which was the first year that the board of directors of a firm had at least 20% women directors. Statistical significance is reported as $p-$values from robust standard errors ($t-$tests for the mean and sign and rank-sum tests for the medians) and indicated at the 1%, 5%, and 10% levels by ***, **, and *.

	All Firms	No Women Directors	Women Directors> 0	Difference
	(1)	(2)	(3)	(2)-(3)
Mean	0.284	−1.615	2.109***	−3.723**
	(0.759)	(0.334)	(0.009)	(0.046)
Median	0.262	−0.308	0.596***	−0.903**
	(0.236)	(0.340)	(0.003)	(0.042)
Observations	51	25	26	

Panel B: Multivariate tests

Dependent Variable	Explanatory Variables				
	Constant	Women Directors (%)	Log(employees)	Board size	R^2
Stock Return$_{-1,+1}$	−1.282	12.411**			0.075
	(0.378)	(0.048)			
Stock Return$_{-1,+1}$	−2.255	16.412**	−0.421		0.088
	(0.197)	(0.049)	(0.300)		
Stock Return$_{-1,+1}$	−9.430**	13.023*	−1.068	1.030**	0.144
	(0.044)	(0.082)	(0.117)	(0.050)	
	Constant	Return$_{-1,+1}$	Log(employees)	Board size	R^2
Year % women >= 20%	2003.626***	−15.501***			0.239
	(0.000)	(0.000)			
Year % women >= 20%	2005.634***	−12.624***	−0.335**		0.324
	(0.000)	(0.000)	(0.014)		
Year % women >= 20%	2006.270***	−12.104***	−0.130	−0.262	0.362
	(0.000)	(0.000)	(0.522)	(0.157)	

TABLE 6

Board of Directors Characteristics by Gender and Year

This table presents averages of personal characteristics of the directors of Norwegian firms listed on the Oslo Stock Exchange in 2007 when available. The trend and $p-$value columns report the β coefficient and its $p-$value from the following regression: $Variable = \alpha + \beta(Year - 2000) + \varepsilon$. Statistical significance between men and women for each variable and year is from a two-sample $t-$test assuming unequal variances and is indicated on the Women entry for each variable. Statistical significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *. All variables are defined in the appendix.

		2001	2002	2003	2004	2005	2006	2007	2008	Trend	$p-$value
Panel A: Demographics											
CEO experience	Men	42.58	43.89	45.40	48.51	50.60	48.25	50.69	56.70	1.68***	0.00
	Women	29.27*	34.00	40.00	34.83**	30.52***	34.30***	30.15***	30.07***	−0.76	0.28
MBA	Men	24.68	24.22	26.03	25.33	25.06	24.76	26.61	26.02	0.20	0.57
	Women	24.00	31.25	26.00	28.77	25.00	24.09	23.99	22.03	−0.94	0.22
Higher Educ.	Men	24.04	22.36	21.14	25.58	26.00	25.10	25.44	26.02	0.50	0.15
	Women	12.00*	25.00	32.00	32.88	34.71*	36.29***	34.08**	31.52	1.01	0.22
Age	Men	50.95	51.68	52.18	52.51	52.76	53.24	53.91	53.66	0.40	0.00
	Women	47.46**	47.28***	47.34***	46.89***	46.48***	46.65***	46.96***	47.66***	0.05***	0.66
Tenure	Men	3.84	3.47	3.43	3.89	4.03	4.39	4.22	4.31	0.13	0.02
	Women	1.64***	1.48***	0.99***	1.46***	1.57***	1.54***	1.45***	1.90***	0.07***	0.08
Insider	Men	10.65	8.86	8.67	8.78	8.59	9.84	7.35	6.35	−0.39*	0.08
	Women	2.15***	1.85***	1.26***	0.94***	1.44***	1.36***	1.65***	1.63***	0.02	0.92
Norwegian	Men	93.77	93.94	93.45	92.55	89.63	86.78	88.04	89.67	−1.01***	0.00
	Women	90.00	85.19	85.37	88.89	91.55	87.84	83.13	75.64**	−1.65**	0.05
% Same Name	Men	6.01	6.30	6.67	6.75	5.42	6.00	5.57	6.70	−0.03	0.85
	Women	1.63**	1.33***	1.03***	3.00*	3.68	3.33*	3.57	4.18	0.41	0.13
No. of Positions	Men	1.12	1.13	1.14	1.15	1.19	1.18	1.17	1.13	0.00	0.15
	Women	1.07	1.18	1.17	1.19	1.16	1.24	1.27**	1.23***	0.02***	0.02
Panel B: Shareholder Elected Directors' Primary Outside Occupation											
Vice President	Men	6.79	5.62	6.91	4.65	5.21	7.03	7.49	8.70	0.28	0.15
	Women	6.45	16.67*	16.98*	15.49**	14.66***	16.04***	14.15**	12.02	−0.24	0.69
Consultant	Men	4.82	6.39	5.92	5.94	6.93	7.67	7.13	11.05	0.63***	0.00
	Women	3.23	4.17	2.83	3.99	6.64	7.39	10.91	9.40	1.23***	0.01
Board Member	Men	31.12	32.51	32.43	35.64	38.15	36.81	38.55	37.43	1.07***	0.01
	Women	45.16	50.00*	43.40	49.77**	43.28	37.74	37.66	42.09	−1.22	0.15
Professor	Men	1.16	0.82	1.08	1.33	1.30	1.02	1.34	1.38	0.05	0.60
	Women	3.23	2.78	1.89	4.23	5.17*	3.14	2.83	2.79	−0.11	0.72
CEO	Men	22.69	22.79	24.71	25.11	27.65	27.28	28.92	31.72	1.24***	0.00
	Women	35.48	38.89*	28.30	23.94	26.01	27.25	22.13*	22.67**	−1.73**	0.02
Attorney	Men	3.03	3.01	2.85	4.39	4.07	3.93	3.61	4.14	0.16	0.28
	Women	0.00***	0.00***	0.00***	5.63	5.17	4.87	4.26	5.77	0.70**	0.04
Non-exec. Manager	Men	5.06	3.70	3.39	5.32	4.62	5.44	5.08	4.56	0.11	0.50
	Women	16.13	11.11	14.15**	14.79**	17.24***	16.98***	15.09***	14.07***	−0.02	0.97
CFO	Men	2.02	2.74	3.34	3.41	2.37	3.40	2.94	5.52	0.29**	0.04
	Women	9.68	2.78	3.77	3.29	5.34	4.72	5.90	6.05	0.20	0.60
Partner/Principal	Men	12.40	13.15	15.49	16.14	17.37	17.84	20.12	20.81	1.21***	0.00
	Women	13.98	13.43	15.72	13.15	13.22	11.22**	8.29***	9.51***	−1.01*	0.06
Accountant	Men	0.14	0.41	0.68	0.98	1.44	1.49	1.76	2.76	0.33***	0.00
	Women	3.23	0.00	0.00*	0.00**	0.86	0.63	1.42	0.93*	0.05	0.76
Other	Men	54.43	54.75	52.64	49.93	52.09	52.83	50.58	50.83	−0.50	0.21
	Women	45.16	36.11**	41.51	38.73*	45.26	48.32	50.20	49.55	1.78**	0.04
Observations	Men	419	431	442	459	504	524	470	438		
	Women	41	50	65	89	154	208	280	271		

TABLE 7
Characteristics of New, Retained, and Exiting Directors

This table presents averages of personal characteristics of the directors of Norwegian firms listed on the Oslo Stock Exchange in 2007 when available. 'New' refers to directors that are new hires to a board. 'Retained' are directors that were on the board in the prior year. 'Exiting' are directors that were on the board in the prior year, but not in the following year. Statistical significance is reported by $p-$values from two-sample $t-$tests assuming unequal variances. Statistical significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *. All variables are defined in the appendix.

	New	Retained	Exiting	Differences		
	(1)	(2)	(3)	(1)−(2)	(2)−(3)	(1)−(3)
Panel A: Demographics & Background						
Female (%)	43.16	21.78	18.88	21.37***	2.90***	24.28***
				(0.000)	(0.010)	(0.000)
CEO Exp. (%)	44.59	50.21	42.44	−5.62***	7.77***	2.15
				(0.006)	(0.000)	(0.493)
MBA (%)	26.74	28.02	26.54	−1.29	1.49	0.20
				(0.539)	(0.947)	(0.894)
Higher Educ. (%)	29.12	29.10	24.11	0.02	4.99***	5.01*
				(0.910)	(0.003)	(0.077)
Age	48.15	52.25	52.20	−4.10***	0.05	−4.06***
				(0.000)	(0.721)	(0.000)
Tenure	0.00	4.15	3.39	−4.15***	0.76	−3.39***
				(0.000)	(0.155)	(0.000)
Shares owned (%)	1.14	3.12	1.62	−1.98***	1.50***	−0.48
				(0.000)	(0.001)	(0.184)
Insider (%)	5.08	6.18	7.74	−1.10	−1.55	−2.65
				(0.622)	(0.897)	(0.658)
Norwegian	86.11	92.56	93.14	−6.45***	−0.57*	0.00
				(0.003)	(0.088)	(0.134)
Same Last Name	4.48	5.60	4.65	−1.12	0.95	0.00
				(0.671)	(0.898)	(0.348)
Panel B: Primary Outside Occupation (%)						
VP	14.59	9.00	7.65	5.59***	1.35	6.94*
				(0.010)	(0.704)	(0.081)
Consultant	8.94	7.34	7.27	1.60	0.06	1.67
				(0.632)	(0.802)	(0.805)
Board member	47.49	56.58	36.81	−9.09***	19.77***	10.68
				(0.005)	(0.000)	(0.114)
Professor	2.46	2.21	1.54	0.26	0.67	0.92
				(0.489)	(0.668)	(0.858)
CEO	30.87	26.28	23.66	4.59	2.63	7.22
				(0.133)	(0.317)	(0.162)
Attorney	2.96	2.51	2.84	0.44	−0.33	0.11
				(0.461)	(0.979)	(0.309)
Manager	10.08	6.63	7.38	3.45**	−0.76	2.69**
				(0.037)	(0.850)	(0.022)
CFO	6.34	3.51	3.65	2.83*	−0.14	2.69*
				(0.052)	(0.846)	(0.060)
Partner/Principal	12.95	18.59	11.10	−5.63***	7.48***	1.85
				(0.004)	(0.002)	(0.756)
Accountant	1.14	0.92	0.94	0.21	−0.02	0.19
				(0.983)	(0.985)	(0.480)
Other	29.53	25.23	50.75	4.31	−25.52***	−21.21***
				(0.272)	(0.000)	(0.000)
Observations	1,100	3,639	1,048			

TABLE 8

Fixed Effects Regressions of Board Characteristics on Tobin's Q

This table presents coefficients from fixed-effects OLS regressions of firm and board characteristics on Tobin's Q. Sample period is 2001 to 2008 where firms are all firms listed on the Oslo Stock Exchange in 2007 with available data. All variables are defined in the appendix. The occupation variables are dummy variables equal to one if a board has at least one shareholder-elected board member whose primary occupation is the listed occupation. Heteroskedasticity-robust $p-$values clustered at the firm-level are reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *.

	Dependent variable: Tobin's Q		
	(1)	(2)	(3)
Percent women	−0.305**	−0.220	−0.180
	(0.023)	(0.206)	(0.411)
Board size		−0.031*	−0.050*
		(0.069)	(0.052)
Tenure		0.013	0.008
		(0.253)	(0.644)
Age		0.010	0.028**
		(0.223)	(0.030)
Average shareholdings		0.993	2.064
		(0.335)	(0.124)
Higher education		0.210	
		(0.272)	
CEO Experience		0.738**	
		(0.049)	
CEO Experience^2		−0.710*	
		(0.062)	
Insider			0.205**
			(0.017)
Vice President			0.019
			(0.765)
Consultant			0.070
			(0.314)
Board Member			0.369***
			(0.009)
Professor			−0.075
			(0.580)
CEO			0.114
			(0.362)
Attorney			−0.026
			(0.795)

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Table 8 - *Continued*

	Dependent variable: Tobin's Q		
	(1)	(2)	(3)
Non-Executive Manager			−0.049
			(0.502)
CFO			0.018
			(0.806)
Partner/Principal			−0.117
			(0.111)
Accountants			0.098
			(0.458)
Log(Employees)	−0.110***	−0.121**	−0.140**
	(0.001)	(0.020)	(0.037)
Capex	0.434***	0.495	0.702
	(0.006)	(0.123)	(0.184)
R&D	−0.039	−0.643	−0.519
	(0.742)	(0.480)	(0.519)
Durable assets	−0.162	−0.313	−0.626**
	(0.295)	(0.170)	(0.034)
Leverage	0.192	0.036	0.141
	(0.205)	(0.863)	(0.597)
Firm Fixed Effects?	Yes	Yes	Yes
Year Fixed Effects?	Yes	Yes	Yes
Adjusted R^2	0.173	0.224	0.223
Observations	740	417	268
Firms	154	73	59