A Female Style in Corporate Leadership? Evidence from Quotas*

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Abstract

This paper studies the impact of gender quotas for corporate board seats on corporate policy decisions. We examine the introduction of Norway's 2006 quota, comparing affected firms to other Scandinavian companies, public and private, that were unaffected by the rule. Based on differences-in-differences and triple-difference models, we find that firms affected by the quota undertook fewer workforce reductions than comparison firms, increasing relative labor costs and employment levels and reducing short-term profits. The effects are strongest among firms that had no female board members before the quota was introduced and present even for boards with older and more experienced members. The boards appear to be affecting corporate strategy in part by selecting likeminded executives.

JEL: G34, G38, M51, J78, J16

"It's just a terrible thought having to lay off people, because we like our employees and we need them. And they are well-trained, and they're loyal. And they have been working for us for decades, some of them, or many of them have. And it's just a terrible thought to have to send them away."
–Nicola Leibinger-Kammüller, CEO, TRUMPF Group
(PBS Newshour, Feb. 8, 2012)

When you make a decision, whatever that decision is whether it's about an acquisition, whether it's about anything, [being a woman] just makes you more sensitive to everyone that's involved, everyone that's involved; their health care, their retirement, all their benefits.
–Female corporate board member
(Broome, Conley, and Krawiec 2010, p.43; repetition in original)

Despite substantial female progress in recent years, business leadership remains largely male dominated. In the past fifteen years, women's share of corporate officer positions in Fortune 500 firms has grown from 8.7 to 15.7 percent; board seats from 9.6 to 15.2 percent; and CEO positions from 0.2 percent to 3.0 percent (Catalyst 2010). This trend is likely to continue as young women increasingly invest in business school training.[1] Whereas the pace of progress has been extensively documented and examined, little is known about how corporate strategy would be different if women were better represented at the top of the corporate ladder.

Policymakers in Europe have recently begun to hasten women's growth in business leadership by adopting gender quotas for corporate boards of directors. The European Union collectively and more than a dozen countries individually have considered these requirements; early adopters include France and Spain. The first such law, and the only mandatory quota already in effect, was adopted in Norway in 2006. The law required all publicly listed companies to increase female representation on their boards of directors to 40 percent within two years. The

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[1] In 1970, only 3.6 percent of master's degrees and 8.7 percent of bachelor's degrees in U.S. business schools were conferred on women. Today, women earn more than 44 percent of master's degrees in business and management, accounting for 37 percent of MBAs and 48 percent of specialized master's degrees. Among undergraduate business majors, women first outnumbered men in 2002 (AACSB 2010).

quota increased female representation by over 20 percentage points at the typical affected firm.

A large body of literature on gender points to fundamental differences in the preferences of men and women (Marini 1990; Croson and Gneezy 2009), and there is evidence that individual managers bring their own personal styles to managing their firms (Bertrand and Shoar 2003; Graham and Narsimhan 2004; Bloom and Van Reenen 2010; Malmendier, Tate, and Yan 2011). This does not necessarily imply, however, that gender quotas will affect corporate policy decisions. First, are there similar gender differences among the selected group of men and women at the top of the corporate world? Second, given that the policy focus has been on increasing *board* diversity, do corporate boards matter?

Despite the importance of this issue for the future of industry, if and how gender quotas will affect corporations remains unclear. Studies interested in the effects of female leaders and directors are based on cross-sectional comparisons and are difficult to interpret because selection in the matching of female managers and directors to firms can bias correlations of female leadership and firm outcomes. For example, Ryan and Haslam (2005) find that firms are more likely to promote women after negative performance shocks. The correlation between women's leadership and corporate outcomes thus may not imply a causal relation.

Furthermore, even if we knew the causal effect of women's business leadership, this knowledge would not necessarily extend to the effects of quotas or other mechanisms to enforce greater participation of women in corporate leadership. Ensuring women's board representation through quotas may change the nature of board member selection and thus have direct effects. For example, it may lower the average competence in the pool of eligible candidates, increase the number of members that are new to the board, or increase the total number of board seats.

This paper studies the effects of the Norwegian gender quota on corporate decision-making. Comparing financial data for publicly listed firms in Norway with a matched sample of

unlisted firms in Norway and listed and unlisted firms elsewhere in Scandinavia, we find that most corporate decisions were unaffected after women's board representation increased. Revenues, nonlabor costs, mergers and acquisitions, and initiations of joint ventures were similar between firms affected and unaffected by the policy. Sizeable differences emerged, however, in these firms' employment policies. Specifically, firms affected by the quota undertook fewer employee layoffs, causing an increase in relative labor costs (but not the average wage). Fewer layoffs reduced firms' short-run profits. After the quota, the ratio of operating profits to assets among affected firms decreased by about 4 percentage points, relative to firms that were unaffected by the law.

These results are robust to a variety of specifications and samples, and we find the strongest effects among firms that were required to add the most women in order to comply with the law. Falsification tests find no evidence of pre-trends or differential employment patterns among listed Norwegian firms during the previous global recession.

We also find no evidence that the impact of the Norwegian gender quota was driven by changes in board member characteristics other than gender, such as age or experience. Although the female directors were younger than average, they replaced younger men and did not decrease the average age of the boards. Indeed, we find that layoffs similarly decreased for boards with older and more experienced members after the quota. To the extent that the effects of the quota reflect gender differences in corporate leadership, the findings align with prior research documenting gender differences in attitudes towards layoffs, such as Rubinstein's (2006) survey of business newspaper readers. The differences may reflect female board members' consideration of labor hoarding as a more profitable long-run strategy or their having a greater concern for workers' vulnerability to unemployment risk. Indeed, experiments find that women are generally more long-term oriented (Silverman 2003) and altruistic (Andreoni and Vesterlund 2001) than are

men, and survey evidence documents corresponding sex differences in corporate directors' preferences and values (Adams and Funk 2009). It is also possible that men and woman have the same corporate goals but differ in their ability to achieve them. Whatever the motivation, our findings suggest that labor hoarding may be part of a distinctive female leadership style.

Separate from gender, our results indicate that corporate boards influence business decisions. They provide new evidence that boards of directors affect business strategy─an issue that is fundamental to developing effective corporate governance but inherently complicated by the endogeneity of the director-selection process. With respect to gender diversity on corporate boards, the closest paper is Adams and Ferreira (2009), who use fixed effects and instrumental variables to link female directors to increased monitoring but potentially lower firm value. We also examine the mechanisms through which corporate directors affect business strategy─an area in which a recent survey about the role of boards of directors by Adams, Hermalin, and Weisbach (2010, p.80) concludes that "much work remains to be done." We find that new female directors appear to affect strategy in part by selecting likeminded executives to run the business and in part by influencing existing managers, which is consistent with surveys, such as Demb and Neubauer (1992), who describe boards as playing an active role in developing corporate strategy and objectives.

This paper is part of a growing body of literature on the Norwegian gender quota. Event studies of the stock market reaction to these policies find opposite results, depending on which announcement date is examined (Ahern and Dittmar 2011; Nygaard 2011).[2] Our paper is the first to exploit a triple-difference identification strategy based on public/private and cross-country

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[2] A gender quota on Norwegian boards was first debated in the Norwegian legislature as early as October 1999 (Nygaard 2011). Ahern and Dittmar (2011) examine stock returns in February 2002 when the Minister of Trade and Industry first discussed the policy in an interview with Norway's largest newspaper. Nygaard (2011) examines stock returns in December 2005 when it was unexpectedly announced that the quota would actually be mandated and under the threat of forced liquidation. Both events are described as a surprise, but the first is associated with negative average stock returns and the second with positive.

differences, in addition to exploiting variation based on firms' distance from compliance prior to quota adoption. Among these papers, ours was also the first to find a significant effect of the quota on accounting variables, such as return on assets, and on employment. Most importantly, our paper is unique in its examination of how the gender quota changed the *style* of corporate leadership and shows that these changes in corporate strategy *cannot* be explained by board member age or experience. We find that the gender quota did not lead to less-profitable business decisions overall—only to changes in human resources management—an outcome that has been linked to gender differences in multiple surveys of business professionals and executives (e.g., Rubinstein 2006; Adams, Licht, and Sagiv 2010).

More broadly, the paper contributes to the economic literature on gender and organizations. Many studies have been concerned with existing barriers to women's professional advancement, including discrimination (e.g., Goldin and Rouse 2000), family obligations that reduce human capital investments and slow career progress (e.g., Bertrand, Goldin and Katz 2010; Miller 2011; Kunze 2011), and the lack of mentors (e.g., Athey, Avery, and Zemsky 2000).[3] In contrast, this paper is primarily concerned with understanding what happens when public policies help women overcome these barriers and occupy positions at the top of the corporate hierarchy. Rather than limiting our analysis to the effects of the quota on profits, we explore how management style changes when female leadership is exogenously increased.[4] Within the literature on gender quotas, our approach is closest in spirit to that of Chattopadhyay and Duflo (2004) and Pande (2003), who study how public good provision changes under the

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[3] See Blau and Kahn (2000) for more on the sources of the gender pay gap for all workers. For a discussion of gender imbalances among top positions, see Bertrand and Hallock (2001) and Glass Ceiling Commission (1995).

[4] Much of the affirmative action literature, in contrast, focuses on documenting the direct effects of programs or legislation on the employment or college admissions of the protected group (see, e.g., Holzer and Neumark 2000 and references therein). Studies that consider private sector business activity tend to focus on performance, assessing the potential efficiency costs from binding regulations, rather than asking if women bring a new leadership style to organizations.

leadership of female and minority politicians.

I. The Policy and Design of the Study

A. *The Norwegian Gender Quota*

The regulation we study requires that Norwegian public limited companies have at least 40 percent representation from each sex on their board, among directors appointed by shareholders. In Norway, public limited companies are required to have a capitalization of at least one million Norwegian kroner (about US$150,000) and an auditor, and their shares must be available to the general public, typically through a stock exchange. Similar gender quotas have been proposed or adopted elsewhere in Europe, and disclosure requirements have been introduced in the United States, United Kingdom, and Australia.[5] In Norway, a quota was initially proposed on a voluntary basis in 2003. After firms failed to increase their female representation, however, a mandatory quota was instituted in 2006, and firms were given two years to comply. According to official records from Statistics Norway, nearly all firms complied by February 2008 and all did by April 2008. Although efficiency arguments have been advanced in support of greater board diversity, they do not appear to be the reason why Norway adopted the quota scheme. Scholars summarize the events leading up to the quota as "the equity argument has become law" (Randøy, Thomsen, and Oxelheim 2006, p.2).[6] Policymakers appear to have been aiming to promote equality, rather than targeting any particular economic outcome.

To ensure that our estimates capture the effects of the quota for board members and not other policy changes, we investigated other legal changes implemented in Norway around the

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[5] Following the Norwegian gender quota, others have been passed in Spain (in 2007), the Netherlands (2009), France (2010), and Iceland (2010) and have been proposed in Belgium, Finland, and Sweden. The Swedish proposal was withdrawn following a change of government in 2006. Vice President of the European Commission Viviane Reding recently expressed an interest in quotas across all of Europe if private companies fail to voluntarily increase female representation on their boards.

[6] Ansgar Gabrielsen, the Minister of Trade and Industry, proposed the quota in 2002 to overcome the perceived problem of "boys' clubs" excluding women from corporate boards (Reiersen and Sjåfjell 2010).

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time of the quota. In corporate law, the Competition Act of 2004 replaced the Competition Act of 1993, which harmonized Norwegian law with European Union competition rules and introduced a pre-merger notification scheme. In commercial law, an act relating to cosmetic products was passed in 2005 and effective in 2006. Potentially more relevant for our analysis is the 2005 Working Environment Act, which updated the 1977 law (as amended in 1995). Appendix A describes all aspects of the law that affect employee termination; as we document, there were minimal changes in these provisions. Both versions of the law also equally applied to listed and unlisted firms *within* Norway, which means that its impact should be accounted for in our within-Norway and triple-difference identification strategies.[7] The European Union also required firms to adjust their accounting from domestic Generally Accepted Accounting Principles (GAAP) to International Financial Reporting Standards (IFRS) by 2005. Although this change should not differentially affect financial reporting within Norway, we also re-estimate our main models with controls for accounting standards (results in Appendix, Table A1). This does not alter the results.

B. *Data and Empirical Approach*

We analyze a panel of Scandinavian companies in the years 1999 to 2009 using data from Bureau Van Dyjk's Orbis database. We start with the full set of public limited companies in Norway, excluding banks and financial institutions, which are subject to different ownership rules.[8] We limit the sample to firms with shares listed on an exchange and with nonmissing information on directors, industry, assets, employees, labor costs, and operating profits in 2006, leaving us with 104 listed Norwegian companies. Restricting the treatment group to listed

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[7] The only exception is one change (to requirements about what economic information firms must share with employees) that applied only to larger firms with 50 or more workers, which could potentially differentially impact public companies (both laws required advance notification of terminations; see Appendix A for further details). Our results, reported below, are robust to restricting the sample to these larger firms (see Table 5).

[8] Norway also changed the registration requirements for financial firms during this period, leading many financial firms to change their organization's form away from being a public limited company. See Pinto Ribeiro et al. (2010) for comparisons between Orbis data and national register-based sources.

companies ensures comparability across countries for the listed versus unlisted classification used

for identification. This choice also focuses our analysis on the subset of companies, subject to the

quota, that were least able to avoid it. To avoid the regulation, a *listed* firm would have to delist

and concentrate its ownership before it could convert to private status. Indeed, a substantial

number of *unlisted* Norwegian public limited companies converted to private status in the wake

of the quota, whereas few public *listed* companies changed to private status (Nygaard 2011). Our

results are robust to alternate sample selection rules.[9]

Our estimation approach relies on difference-in-difference comparisons with matched

samples of private firms in Norway and public and private firms elsewhere in Scandinavia.[10] For

each public company in Norway, we identify the five closest firms in each of the three

comparison groups based on industry, assets, employees, and operating profits in 2006. We create

a single index for firms' proximity using Abadie et al.'s (2004) matching algorithm, weighting

differences in each firm characteristic using the inverse of its sample standard error. Although

matching helps ensure similarity between the various samples, we obtain similar results when we

forgo matching and use the full samples.[11] Financial variables are winsorized at the 1 percent

tails, as is common when working with accounting data.

Summary statistics for the various samples are reported in Table 1 for 2006. Affected

firms are similar to matched firms, although they have somewhat higher assets and lower profits

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[9] For example, Panel A of Table A2 in the Appendix reports results that include unlisted public limited Norwegian companies in the treated group and draws additional matched controls for them. As expected, the effects are diluted by including these firms; the estimates are smaller in magnitude than our main results, yet still statistically significant.

[10] If firms differ along both observable and unobservable dimensions, estimation that combines matching on observables and fixed effects (to account for time-invariant unobservables) can yield more reliable estimates than matching alone (Smith and Todd 2005).

[11] Table A2 in the Appendix reports these results. Estimates in Panel B forgo the matching procedure and find similar results using a control group comprised of all unlisted companies in Norway and all companies elsewhere in Scandinavia for which data are available. As an additional robustness check, estimates in Panel C show that the main results are also robust to limiting the control sample to companies relatively more similar to the affected companies (within a distance of five units) and excluding the two affected companies with no close matches.

and labor costs as a percent of assets (these differences are not statistically significant at conventional levels). Industry mix is similar across the groups as well, with many firms in manufacturing; transport, storage, and communication; or real estate, renting, and business (i.e., service) activities. Because each affected firm is matched with its nearest neighbors, the matching procedure can draw the same comparison firm multiple times. In all, the 1,560 observations for comparison firms correspond to 1,103 distinct firms. We account for the repeated observations in the estimation by adjusting the standard errors for clustering at the firm level.

C. *Effects of the Quota on Board Composition*

To assess the direct impact of the quota on female board representation, we analyze data on board members from Orbis for the years 2006 and 2009.[12] Over the three-year period, the average female share on boards of directors more than doubled among affected firms, whereas that share increased by only 35 percent for private firms in Norway. Elsewhere in Scandinavia, the increase was 58 percent for public firms and 45 percent for private firms. On average, affected firms increased female representation by about one board member (from 1.1 to 2.3 women) and reduced their male membership by a similar amount (from 5.0 to 4.1 men). Board size increased slightly over the period from 6.1 to 6.3 members. As board size and turnover may directly affect board performance (Adams, Hermalin, and Weisbach 2010), we control for these changes in our analysis of the impact of the quota, where the data are available. In all, 122 new women assumed positions on boards of public companies after the law was implemented.[13]

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[12] We impute the gender of each named director by matching first and middle names to official lists of names used in Scandinavia. For cases in which the record includes a gendered title, such as Mr. or Mrs., we use the title. We are unable to determine gender for 0.57 percent of the directors and instead assign a weight of one-half for both male and female in these cases. The unassigned gender cases are due to directors with gender-neutral names and without gendered titles. The results are identical if we exclude these individuals from the director sample or assume that they are all men.

[13] Based on administrative data from the Norwegian government, the number of distinct women serving on the corporate boards of public companies in our sample increased from 159 at the end of 2005 to 281 in 2009. Although the additional women substantially changed board composition, they represent a trivial share of the more than 80,000 Norwegian women with more than an undergraduate education. In addition

To further document the direct impact of the quota, we estimate the following regression model for gender representation on the board of firm j:

$$Y_j = \beta*Norway_j*Listed_j + \delta*Norway_j + \lambda*Listed_j + \varepsilon_j,$$

where $Norway_j$ and $Listed_j$ are indicator variables. We report the difference-in-differences estimate for β in the first row of Table 2. Relative to other listed firms outside of Norway and to unlisted firms in Norway, affected firms have female board shares in 2009 that are 20 percentage points higher (column 1), following an average increase in female board share from 2006 that is 17 percentage points larger (column 2). These dramatic differences indicate that the law had a substantial impact on board composition. The estimates for δ show no differences in female representation between private companies in Norway and elsewhere in either 2006 or 2009. Outside of Norway, listed companies have about 6 percent lower female representation in both years (there is a difference in the first column for 2009, but not for the change between 2006 and 2009 in the second column).

II. Effects of the Quota on Corporate Activity

A. *Corporate Profits*

This section describes our main empirical strategy and describes the quota's overall effects on profitability—an indicator of short-term firm performance. To isolate the impact of the quota, we compare changes in outcomes among the affected listed firms in Norway in the years immediately preceding and following the imposition of the quota with changes during the same time period among a sample of similar comparison firms that were not directly affected by the quota. Because no single comparison group is ideal, we implement the strategy in three stages

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to the domestic supply of talent, Norwegian companies can also draw both male and female directors from outside of the country (as long as one-half of the directors are residents of Norway or citizens and residents of a different country in the European Union or European Economic Area), which greatly increases the pool of potential directors. In 2009, foreigners comprised only about 17 percent of directors at public companies in Norway.

and report results in the three columns of Table 3.

In the first column, we use the full sample of listed Norwegian firms, combined with the matched control sample of the five closest unlisted Norwegian companies. The within-Norway estimates compare listed and unlisted firms:

$$Y_{ijt} = \beta_1 * Listed_j * Post2006_t + \gamma_i * Year_t + \alpha_j + \tau_t + \varepsilon_{ijt,} \qquad (1)$$

where Y_{ijt} measures profits at firm j in industry i in period t, and the terms α_j and τ_t are firm and year fixed effects, respectively. The term γ_i allows for differential linear time trends by industry group.[14] The sample period is from 2003 to 2009, and standard errors are adjusted to allow for arbitrary within-firm correlations in the error term.

The impact of the quota reported in column 1 is negative, indicating that annual profits decreased: within-Norway, profits declined by 2.7 percent of assets among listed firms after 2006 relative to the change in profits in unlisted firms during the same time period. However, this empirical approach will not isolate the impact of the quota if listed and unlisted companies in Norway do not follow a common time trend (Dale-Olsen, Schøne, and Verner 2011). An important concern is that being publicly traded may afford affected firms greater access to capital for growth or may expose their managers to different pressures under similar market conditions.

To address this concern, we employ a second identification strategy that exploits variation within the set of listed companies in Scandinavia. In this approach, listed companies in Denmark, Finland, and Sweden provide the comparison group used to estimate the counterfactual year effects:

$$Y_{ijt} = \beta_2 * Norway_j * Post2006_t + \gamma_i * Year_t + \alpha_j + \tau_t + \varepsilon_{ijt}. \qquad (2)$$

In equation (2), the impact of the law is represented by β_2, the coefficient for the interaction term between Norway and the post-reform period. The estimate for β_2 (in the third column of Table 3)

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[14] We classify firms into the industry groups listed in Table 1, using NACE revision 1.1 classification codes.

is remarkably similar to that in the first column. The quota is associated with a decline in profits by 3.4 percent of assets (again statistically significant at the 5 percent level), this time relative to the change in profits of listed companies outside of Norway.

Our third identification strategy combines these two approaches to estimate a triple-difference for the impact of the law. This approach simultaneously allows public and private firms to follow different trends, while also accounting for any differential changes in business conditions or regulatory environments that may have affected Norwegian firms relative to firms elsewhere in Scandinavia. In this specification, we compare the change in outcomes between listed and unlisted companies in Norway and elsewhere in the region:

$$Y_{ijt} = \beta_3 * Norway_j * Listed_j * Post2006_t + \lambda * Norway_j * Post2006_t$$

$$+ \delta * Listed_j * Post2006_t + \gamma_i * Year_t + \alpha_j + \tau_t + \varepsilon_{ijt.} \qquad (3)$$

The impact of the law is captured by β_3, the triple-interaction between indicators for Norway, listed, and post-2006. This term can be interpreted as the difference in how the profit differential between listed and unlisted companies in Norway changed after 2006, compared to how the corresponding differential changed in other countries at the same time. Equivalently, it is the difference in how the profit differential between Norway and other countries changed differentially for listed and unlisted companies after the quota.

The effect of the quota on profitability is negative, as in the previous columns, and the magnitude is 4.1 percent of assets (column 5). The difference in trends between Norway and the other countries that affect *all* companies is measured by the term λ, which can be interpreted as the difference-in-difference between Norway and other countries among unlisted companies. Similarly, the term δ captures the differential change in listed versus unlisted companies outside of Norway. In specification (3), these simple difference-in-difference estimates are unrelated to the effect of the quota. These estimates can be thought of as specification checks for equations (1)

and (2) in that there is no reason to expect the quota to induce any variation along these dimensions after controlling for the triple-difference. Indeed, the estimates are small, positive, and statistically indistinguishable from zero. The results in columns 2, 4, and 6 of Table 3 show that the results are robust to the inclusion of additional controls for the total board size and the average number of other board seats occupied by its members in 2006 and 2009.

The relative change in profits is also not due to affected firms increasing their assets, while leaving sales revenue unchanged. The estimated effect of the quota on total assets, measured in either levels or logs, is not statistically significant. Indeed, Table A3 in the Appendix shows that the results are robust to measuring profits relative to sales.

B. *Labor Outcomes*

While the profitability results in the previous section provide an important summary measure of the immediate impact of the quota, the main goal of this paper is to uncover *how* corporate decision-making changes after the quota. Our next analysis, reported in Table 4, decomposes the change in profits into the effects on revenues and costs and identifies increased relative employment as a root cause. Each column reports the triple-difference estimate of the effect of the quota using specification (3) for a different dependent variable.

The first column of Table 4 repeats the estimate for overall profitability: operating profits decrease by 4.1 percent of assets. Because of the accounting identity, this decrease in profits must reflect some combination of a decrease in revenues and/or an increase in costs. To explore the corporate changes that lead to the decrease in profits, we separately examine the impact of the quota on these items. Because the triple-difference specification is common across these regressions, the sum of the effects on each of these components must sum to the aggregate effect on overall profitability. The second column reports the results for revenues. The estimate, which is noisy and not statistically significant, suggests that revenues may decrease by a modest 0.9

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percent of assets, on average, after the quota is imposed.

The most substantial effect of the law, both statistically and economically, is its effect on labor costs. As reported in the third column of Table 4, labor costs increase by 4.1 percent of assets, on average, relative to unaffected firms after the quota. In contrast to the results for labor costs, we find that other costs decrease by about 1.0 percent of assets, on average, after the quota, and the decrease is not statistically significant (column 4). The fact that other costs *decrease* suggests that the increase in labor costs are not simply attributable to the firms negotiating poorly with all of their suppliers after the quota takes effect. This evidence is more consistent with changes in board members' style and preferences, rather than skill or experience, causing the drop in short-run profitability. These patterns are repeated in the second panel of Table 4, where estimates are reported that include controls for board size and number of other boards.

To investigate the impact on labor outcomes in further detail, we separately estimate the quota's effects on employment (number of workers) and labor costs (the sum of compensation costs for all workers). We unfortunately do not observe the full distribution of wages paid at these firms. The main results are reported in columns 1 and 3 of Table 5. Each of the three panels reports estimates from a different identification strategy described in the previous section: specification (1), the within-Norway comparison, is in Panel A; specification (2), within-listed companies, is in Panel B; and specification (3), the triple-difference is in Panel C. The 2005 update to employment regulation in Norway (described in Section 3 and Appendix A) makes the within-Norway and triple-difference approaches especially valuable for exploring labor effects of the quota. Columns 2 and 5 show that the effects are similar in a sample limited to firms with more than 50 workers, providing further evidence that they are not driven by the changes in employment regulation.

These estimated effects of the quota are again quite similar across the three empirical

approaches. For total employment, the triple-difference estimate is an increase of 0.31 log points, or 36 percent ($p < 0.01$). For the median listed Norwegian firm, this corresponds to about 110 additional jobs that were either created or not destroyed, relative to the comparison firms. The estimates for total labor costs are also positive and statistically significant across the three models. The magnitudes are slightly smaller than the employment estimates: about 0.15 log points, or 16 percent, in the triple-difference specification. The difference between these estimates implies that the quota led to greater relative employment, but did not also increase average wages per worker. For all specifications, the results are robust to the inclusion of controls for board size and the average number of other boards (columns 3 and 6).

The sign and significance of the employment results are not driven by a few outlier observations with large employment changes, but the precise magnitude may be inflated. To investigate this possibility, we first re-estimated the main DDD employment model on a sample limited to observations with standardized regression residuals of less than three (positive or negative). The estimated effect of the quota dropped to a more moderate 0.24 log points (standard error of 0.03). We also experimented with dropping each of the treated companies (and their associated controls) in turn: the point estimates ranged from 0.27 to 0.33. Finally, we estimated robust regression[15] and least absolute deviation versions of our main DDD model, which yielded point estimates of 0.11 (standard error of 0.02) and 0.20 (standard error of 0.02), respectively. These results support the robustness of the positive employment estimate but also reveal some sensitivity in the exact magnitude of the estimate to individual observations. Adjusting for outliers reduces the size of estimate by as much as two-thirds.

This pattern of changes in employment and labor costs is consistent with affected firms'

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[15] The robust regression procedure first estimates the model using all observations with no weights. Then the main estimates are computed, excluding all influential observations (with Cook's D values greater than one) and lower weight on observations with large absolute residuals from the original regression.

corporate boards leading management to hire or retain additional workers whose salaries are below average for the firm. These lower-compensated workers are more vulnerable to risks of negative employment shocks than their highly compensated counterparts. To examine the role of layoffs in these effects, we measure the effect of the quota on year-to-year net reductions in employment. Table 6 reports estimates for the triple-difference model (equation 3). The first column presents estimates from a linear probability model of an indicator for a greater than 1 percent decline in total firm employment. The probability of such a reduction in total firm employment in a given year decreases by 25 percentage points among affected firms, relative to other firms, after the quota is adopted. This constitutes a sizeable drop, especially when compared with the sample mean of 32 percent and standard deviation of 47 percent. In the next two columns, we separately examine the incidence of larger layoff events, affecting more than 3 or 5 percent of the workforce. Layoffs fitting these definitions occur in 25 percent and 20 percent, respectively, of firm-year observations in the full sample. After female board representation increases with the quota, the incidence of these larger layoffs among affected firms decreases by 20 percentage points (for the 3 percent cutoff; column 2) and by 13 percentage points (for the 5 percent cutoff; column 3) relative to unaffected firms. These estimates reflect 65 to 80 percent reductions in the annual incidence of layoffs, relative to the sample means, and 32 to 54 percent of the sample standard deviations.

The quota's impact on employment changes is not symmetric. We also examine the incidence of year-to-year *increases* in employment of more than 1, 3, and 5 percent (columns 3–5). Workforce expansions are more common than layoffs in our sample, and these occur in 55, 48, and 42 percent of firm-year observations. We find little evidence of a relation between the quota and employment expansions; the estimates are much smaller relative to the sample means and standard deviations and are not statistically significant.

Together, these estimates suggest that the growth in relative employment after the quota primarily results from fewer workforce reductions, rather than more workforce expansions. One interpretation is that the gender quota induced transfers from shareholders to workers, at least in the short-run, possibly because the preferences or ability of directors changed. Another possibility is that the quota-induced, gender-diverse boards shifted focus to maximizing long-run shareholder value by avoiding layoffs. Layoffs directly reduce payroll costs and improve short-run operating performance, but they may also increase costs later by decreasing employee morale and requiring the recruiting and training of new hires when demand rebounds (Parson 1972; Katz 1986).[16] Either way, the new board structures appear to reduce mass layoffs in periods of low demand. We conclude that gender quotas for directors can translate into meaningful differences in corporate strategy.

In theory, stock market event studies of the policy's announcement could be used to indicate whether the market expected the quota to create value for shareholders, but such studies of the Norway quota find opposite results, depending on which announcement date is examined (Ahern and Dittmar 2011; Nygaard 2011).[17] Even if the market correctly anticipated that women would reduce layoffs, Edmans (2011) finds that the stock market undervalues the intangible benefits from such strategies. Ultimately, time will tell whether the gender quota created value for these firms in the long run.

C. *Robustness Checks*

Pre-Existing Trends.—We examine various robustness checks in order to verify the

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[16] Indeed, some management scholars argue that employment downsizing often fails to generate the benefits sought by management (e.g., Cascio 2002). A number of studies find that layoffs are associated with low stock prices or accounting performance (Worrell and Sharma 1991; Lin and Rozeff 1993; Cascio, Young, and Morris 1997; Palmon, Sun, and Tang 1997; Hallock 1998), but it is difficult to separate the effects of a layoff from the effects of the adverse economic conditions that caused it.

[17] See footnote 2 for details. As a measure of investors' perceptions, stock price movements may underestimate women's ability to lead companies (Wolfers 2006). Nevertheless, Adams, Gray, and Nowland (2011) find that shareholders react more positively to new appointments of female directors than to male directors at Australian firms (outside of a quota setting).

connections between the gender quota for board composition, decreased profits, and reduced layoffs. We start by testing for pre-existing trends. We compare relative changes among affected firms during the period preceding the mandatory quota for two reasons. First, the quota itself was not a surprise when the mandate was adopted in 2006, and there may have been anticipatory changes. Starting in 2003, public firms in Norway were encouraged to increase female representation on their boards of directors and warned of mandatory quotas starting in 2006. In practice, few firms added women in earnest until the mandatory period. Thus, the timing of the effects may suggest whether the results are in fact due to the addition of women to the boards or are instead attributable to an omitted variable that led Norway to adopt the rule. Second, we test for differences between affected and unaffected firms before 2007 as a falsification check for pre-existing trends that could obscure proper inference of the quota's effects.

To investigate the presence of pre-existing trends between 2003 and 2006, we extend our dataset to 1999 in order to include a baseline period before 2003. We estimate an expanded version of specification (3) with two sets of triple-difference effects. The first set, reported in the first row of Table 7, shows triple-difference effects for the 2003 to 2006 period, relative to the earlier 1999 to 2002 period. These estimates show no indication of differential effects in the preceding period. The estimates are statistically insignificant. They are also substantially smaller than, and inconsistent in sign relative to, the post-quota estimates reported in the second row of Table 7. As in the previous tables, these effects are computed relative to the 2003 to 2006 period and reveal significant declines in profits and layoffs.[18]

Distance from Compliance.—We also test the prediction that firms furthest from compliance in 2006 should display the greatest effects of the law. About half the firms in the

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[18] Adding the pre-period data has little effect on the main triple-difference estimates for the post-2006 period. We also estimated separate quota effects year-by-year; the individual post-quota coefficients were not statistically distinguishable from one another.

affected group had no women on their boards in 2006, when the quota became law. In analysis reported in Table 8, we estimate whether these firms, which were effectively required to add a greater number of women to their boards before the 2008 deadline, exhibited greater effects.

In Panel A of Table 8, we limit the sample to the affected firms and estimate differential effects of the quota based on firms' distance to compliance. Because all of the firms in this specification are affected by the law, we are not able to control for baseline time trends. Instead, we simply compare changes in the main outcomes after 2006 for firms, depending on their boards' status in 2006. We find that profits were relatively stable for firms with some women but declined significantly after the quota was adopted for those that had no women on their boards in 2006. Both employment numbers and costs increased for both sets of firms, but the increases are significantly larger among firms that had no women on their boards in 2006 ($p < 0.06$). The incidence of layoffs declined for all treated firms, but the effect is larger and more precisely estimated for the firms with no women on their boards in 2006.

While this variation within the treatment group provides additional support for the main results for profits and employment, there are important limitations to the analysis. In particular, without a control group, we are not able to identify the actual impact of the quota on either set of firms.[19] To address this issue, we estimate an expanded version of our main triple-difference model (equation 3), which allows for heterogeneous effects based on whether the board included

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[19] The identification approach in panel A is closest to the approach used in Ahern and Dittmar (2011), though that paper uses variation in female director share in 2002, instead of 2006. The major limitation of this approach is that firms with female directors before the quota were unusual and may have had different time trends in outcomes for reasons unrelated to the quota. For example, Appendix Table A.I in Ahern and Dittmar (2011) shows that firms with any female directors in 2002 were larger, had more leverage, and located in different industries. Estimation that uses this variation and does not allow for differential time trends by industry, size, and other factors risks uncovering spurious relationships. For example, Ahern and Dittmar (2011) conclude that assets increased after the quota. When we estimate the regression model in panel A of Table 8 for log assets, we also find positive and significant estimates for *Post-2006* for both groups of firms and a larger estimate (0.635 compared with 0.540) for those with no women in 2006. However, this relation reverses in the triple-difference model, where the *Post-2006*Norway*Listed* estimate is negative for firms with no women and positive for those with some women in 2006 and not statistically different.

any women before the law was adopted. The results are reported in Table 8, Panel B. These estimates are based on the full sample of affected and matched comparison firms. To identify the impact of the quota, we also include additional controls for the interactions between the "No Women in 2006" indicator variable and the variables for *Post-2006*, *Norway*Post-2006*, and *Listed*Post-2006*.

The results find larger estimates of the quota's effect on all outcomes for firms with no women on the board in 2006 before the mandate was adopted. Although the estimates for firms with some female board members in 2006 are similar in magnitude to the overall estimates reported in the previous sections, the estimates are less precisely estimated (on the reduced set of firms) and not always statistically significant. The effects for firms with no women in 2006 are larger and statistically significant for each of the main outcomes: profits decline by 4.5 percent of assets; employment increases by 0.46 log points, or 58 percent; employee costs increase by 0.25 log points, or 28 percent; and the rate of layoffs declines by 24 percentage points.

This analysis suggests that our main findings are indeed attributable to the gender quota, rather than another, unobserved shock affecting listed firms in Norway after 2006. Nevertheless, it is also important to recognize the limitations of this last approach. Even if the quota is exogenous, the *timing* of compliance is not. It is likely that the firms that complied during the voluntary period found it less costly to do so and differ from noncomplier firms in other dimensions as well. Even during the mandatory period, the exact timing of compliance may be related to unobservable firm characteristics that may also affect profitability and employment. For example, firms may have differed in their abilities to identify and attract capable women to serve on their boards, especially in a period of suddenly increasing demand for female board members. For these reasons, our main analysis relies on identification based on the imposition of the quota, rather than on the observed timing of compliance.

Unrelated Effects of Recession.—Our results indicate that listed companies in Norway responded differently to the recent global recession than did other listed and unlisted companies inside and outside Norway. We link these patterns to the quota but another possibility is that there is something else about listed Norwegian companies that make them less likely to lay off workers in recessions. In this section, we investigate and rule out two possible reasons for why Norwegian companies might respond differently and then examine relative changes in Norway during the previous global recession as a falsification test.

1. **Government Ownership:** We verify that the results are not limited to government-owned firms. This exercise is useful in eliminating political explanations for the apparent shift in corporate priorities to favor employment, especially of lower-wage workers (e.g., La Porta and López-de-Silanes 1999; Megginson and Netter 2001). We obtain information on stock ownership from Orbis. Our main analytic sample, examined above, already excludes all companies in which the Norwegian government's direct ownership stake exceeds one percent (because of missing information). In further tests, we exclude the possibility that the government is directly influencing the appointment of directors and corporate strategy, even when its ownership role is indirect, such as through pension or sovereign wealth funds. From the sample, we identify and exclude 32 Norwegian listed firms in which the sum of the government's direct and indirect ownership share is at least one percent (and also exclude their matched comparison firms). Estimates on this smaller sample, reported in Table A4 in the Appendix, closely resemble the findings for the full sample.

2. **Petroleum Industry:** Norway is a large producer of petroleum, and so high oil prices may have buffered some companies from the effects of the recession. The results are unchanged if we exclude companies in the petroleum industry from the analysis. If there are spillover effects to Norwegian firms in other industries, there is no reason to expect these to be limited

to public listed companies.

3. **Other Effects of Global Recession:** To further examine whether other possible (but unidentified) differences might affect how Norwegian companies' labor policies respond to recession, we collected additional data from the pre-quota period and estimated our triple-difference model using data from the previous global recession.[20] This exercise provides a general falsification check to test whether the differential changes in profits and employment were linked to the quota. We study the global recession that started around 2001 using financial data on Scandinavian public and private firms from Orbis for the period of 1997 to 2003. Our sample of firms includes all listed Norwegian companies with data available in 2000, the last year in the pre-period, and a set of matched comparison firms from each of the three other groups (private Norway, public elsewhere, and private elsewhere) using the same matching algorithm as before. In contrast with our findings for the period surrounding the implementation of the quota, there is no relative change in profits, employment, employee costs, or layoffs in listed firms in Norway for the period following the 2001 recession. The DDD estimates, reported in Table A5 in the Appendix, are small and statistically insignificant. The lack of an effect in this earlier period supports our interpretation that the relative changes in profits and employment amid the recent global downturn indeed reflect the impact of the quota.

III. Are the Results about Gender or Other Effects of the Quota?

The Norwegian gender quota for corporate directors brought meaningful differences in corporate strategy, specifically in corporations' labor and layoff policies. Although the quota concerned gender, the results we have discussed so far could potentially be attributed to changes

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[20] One possibility we considered is differences in unionization. However, unionized labor is in fact *less* common in Norway (57%) than in the other Nordic countries (82% in Sweden, 76% in Denmark, and 76% in Finland).

in other characteristics of the newly appointed women or other consequences of compliance with the quota.

A. *Director Ability?*

Compliance with the gender quota forced firms to appoint directors they would not otherwise select and may have altered other observable characteristics of companies' board members, such as their age and executive experience. If scarce female talent was the reason for low female representation before the quota, then the binding constraint imposed by the quota could have induced firms to hire less qualified women. In particular, the new female directors may be younger and less experienced than the men they replaced. The fact that the quota increased labor costs but did not affect revenue or nonlabor costs suggests that the effects of the quota are not simply due to an overall decrease in director quality. Nonetheless, it is possible that changes in director age and experience could explain the reluctance of the new boards to undertake layoffs.

We track changes in average director age for public listed companies from 2002 to 2009 using official data from the Norway business register. Figure A1 in the Appendix plots the average age of all directors, male directors, and female directors of public listed companies over time. The averages of these firm-year-level values are presented with 95 percent confidence intervals. Women on boards are younger on average than men. A naïve analysis might conclude that the quota lowered board age, but that is not correct. The average age of female directors does not change over the period and neither does the average age of *all* directors; the increasing share of female directors is offset by the rising average age of male directors. Director age is also stable throughout its distribution, not just its mean. Between 2003 and 2009, the tenth percentile of the age distribution is level at 37, the median is level at 49, and the 90th percentile decreases only slightly from 62 to 61.

The fact that the average director age is stable indicates that declining director age is not a likely candidate to explain the impact of the quota. We confirm this intuition using the Norway business register data to estimate an expanded version of the first specification (that relies on within-Norway variation by listed status) that includes controls for average board member age, board size, the average number of other board seats, and the share of new directors (i.e., those who were not directors at the same firm in the previous year). Adding these controls leaves the coefficients on *Listed*Post-2006* virtually unchanged (see Table A6 in the Appendix). This is similar to results reported by Ahern and Dittmar (2011; Online Appendix Table XII) for Tobin's Q: controlling for age and experience decreased the magnitude of the coefficient on director gender by less than 10 percent (from –0.593 to –0.541).

For additional information on director characteristics, we collected data from Thomson ONE Banker, which is available for 94 of the 104 public Norwegian firms in our main analytic sample. Table A7 in the Appendix summarizes the average values for key background and demographic characteristics of male and female board members of these firms in 2009. Female board members are about five years younger than males, on average, and are significantly less likely to have worked as a CEO.[21] Although women average less previous board experience, the difference is not statistically significant, and they tend to be currently serving on more boards, possibly as a result of the quota. Although they have similar educational backgrounds, women are more likely to have experience in education, law, or the public sector and less likely to have worked in engineering.

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[21] Unfortunately, our director *panel* does not contain information on CEO experience. Figure A2 in the Appendix uses data reported in Ahern and Dittmar (2011; Table 2) to plot the shares of directors at affected firms whose outside occupation was CEO and who had any prior CEO experience, for the years 2001 to 2009. There is a steady decline in the share of directors with any CEO experience in the early part of the decade, but this trend ends the quota was mandated in 2006. Indeed, the share remains relatively stable after the quota (59 percent in 2006 and 58 percent in 2009). There is even more stability in the share of directors who are currently CEOs. In fact, that share is slightly higher in 2008 than in 2001 (26 percent vs. 25 percent) and slightly lower in 2009 (24 percent).

To shed some light on whether women appointed to board seats after the quota were similar to previously appointed women, Appendix Table A7 also compares female board members, serving in 2009, who were first appointed to their boards before and after the quota. The women are broadly similar. Differences in CEO experience, education, and other board positions are small and not statistically significant. The only statistically significant differences (other than the mechanical difference in age that would be expected if all women were initially appointed to boards at the same age) are increases in directors with work experience in education (from 0 to 5 percent) and information technology (from 4 to 12 percent). The increasing representation of people with backgrounds in information technology is also present for male of board members. In all, women appointed to board positions after the quota have similar education, professional experience, and other characteristics to woman appointed before the quota took effect.

The lack of any *decline* in average director age or experience following the quota makes these characteristics unlikely candidates to explain the impact of the quota. Furthermore, as an additional test, we examine whether the effects of the quota on profitability and employment were concentrated among corporate boards that were younger and less experienced. Table 9, Panel A reports tests that repeat the main triple-difference estimates but allow for differential effects for firms with older and younger boards in 2009 (based on whether average board member age is above or below the median value of 51). Panel B does the same by CEO experience (in which the median is 25 percent). The pattern of the quota's effects is similar across all board types, and the point estimates for layoffs are even larger for older and more experience boards. Although these cuts by age and experience are potentially endogenous, the relative stability of the estimates does not support age or experience as the primary channels for the quota's effect.

B. *Declining Corporate Activity?*

Another alternate explanation for the observed changes in profits and employment is that boards affected by the quota were somewhat dysfunctional during the transition period. One might imagine that the quota could lead boards to be relatively inactive either because of contentiousness between senior male board members and their new female colleagues or because the new directors were more tentative than those they replaced. For example, it is possible that new directors, particularly new directors selected because of an external mandate, would feel hesitant about major corporate activities, including downsizing.

In order to test if the employment results are due to a general reduction in corporate activity following the quota, rather than an intentional reduction in layoffs, we compare rates of mergers and acquisitions, joint ventures, and minority stake purchases in the three-year windows before and after the quota was implemented. We separately calculate these rates for listed Scandinavian companies (drawn from our group of affected firms and the matched control sample) inside and outside of Norway.

The results, reported in Table 10, do not support the inactivity hypothesis. Within Norway, activity levels actually increased modestly after the quota for each of the three measures. Furthermore, the changes in activity levels are all statistically indistinguishable between the listed companies affected and unaffected by the quota. We similarly find no indication of inactivity when we include private companies in the sample and estimate a DDD model in which we compare changes in activity between listed and unlisted companies in Norway and elsewhere in the three-year periods before and after the quota. The quota does not appear to have reduced corporate activity. This indicates that the relative reduction in layoffs for affected firms was not

the result of their boards being incapable of taking such actions.[22]

C. *Director Entrenchment?*

Another possibility is that the quota scheme entrenches female directors. Because female directors are required by law and replacements might be scarce, existing female directors may feel secure in their positions, leading them to feel less pressure to represent shareholders than do their male counterparts. Bertrand and Mullainathan (2003) find that the average manager is reluctant downsize—one feature of what they call "the quiet life." One possibility is that male and female directors have the same preferences—both would reduce layoffs if there were no personal consequences to them—but only female directors act on these preferences because they are harder to replace.

Data on actual turnover rates provide little support for this theory. The share of departing board members in public Norwegian companies was similar in the years before (19 to 22 percent between 2002 and 2005) and after (18 and 24 percent in 2007 and 2008) the quota. Annual turnover rates for female board members fluctuated between 9 and 30 percent between 2002 and 2006 and were 16 and 23 percent in 2007 and 2008, showing no evidence of entrenchment.

D. *Gender Difference in Corporate Leadership?*

If not director inexperience, inactivity, or entrenchment, then what led the quota and the new female directors to change firms' labor policies? Without any evidence that the quota's impact is driven by other factors, it is natural to consider a possible connection to board member gender itself, which was the intended target of the quota and its largest direct outcome. A growing literature in economics, management, and social psychology points to fundamental differences in

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[22] The employment growth is also not due to increased merger activity. As described in Section II.A, there is no change in assets associated with the quota. Ahern and Dittmar's (2011) analysis finds some indication of firms size increasing after the quota. As discussed above, that relation disappears when we control for baseline trends (see footnote 19).

the leadership styles of male and female executives.[23] Traditional stereotypes associate corporate

leadership with masculinity (Koenig et al. 2011) and with masculine traits, such as power,

confidence, aggression, and objectivity (Offermann and Beil 1992). Rather than adopting

characteristically male behavior, there is evidence in the management literature of successful

female leaders adopting a distinctive, "transformational" style (Rosener 1990; Bass and Avolio

2006; Dezső and Ross 2008).[24] For example, whereas men are more likely to assert themselves

in a controlling manner, women tend to take greater account for the rights of others (Eagly and

Carli 2007).

To better understand gender differences among corporate leaders, Adams and Funk

(2009) surveyed the universe of resident directors and CEOs of publicly traded companies in

Sweden in 2005.[25] Gender equality and board structure in Sweden are similar to Norway. The

results are summarized in Figure A3 in the Appendix. Relative to male directors at the same firm,

female directors report significantly different values than do their male colleagues. Female

directors care less about self-enhancement values (achievement and power) and more about self-

transcendent values (universalism and benevolence). Women board members are also more

independent-minded, valuing self-direction and stimulation more than men and tradition and

conformity less. All of these differences (except achievement) are sizeable in magnitude,

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[23] Most economic studies of gender differences in preferences focus on students, workers, or the general population, so it is unclear whether the conclusions extend to the selected group of men and women at the top of the corporate world. There are many reasons to be skeptical. For example, women who choose to enroll in business school have unusually high levels of testosterone (Sapienza, Zingales, and Maestripieri 2009), which may affect how managers lead their organizations (Levi, Li, and Zhang 2010). Women who act too "feminine" may be denied promotion (Branson 2006), and women who do make it to the top in a predominantly male environment may adapt their behavior such that gender differences disappear (Adams and Funk 2009).
[24] In their meta-analysis of 44 studies of leadership style, Eagly, Johannesen-Schmidt, and van Engen (2003) find women score 0.10 standard deviations higher in the "transformational" dimension than men.
[25] Their survey instrument consisted of Schwartz's (1992) 40-question Portrait Value Questionnaire plus a question designed to measure risk aversion. The Schwartz value survey is among the most advanced used by psychologists, has been replicated in many countries, and produces consistent and reliable results. Researchers have also shown that these values predict economic behavior in experimental settings, such as voting decisions and altruistic behavior (e.g., Andreoni and Vesterlund 2001).

measuring about one-third of a standard deviation, and statistically significant.

These differences in male and female directors' values and preferences may explain the quota's effect on firms' outcomes. For example, female directors, motivated by their more self-transcendence values, may lead their firms to decisions that are more stakeholder-oriented, such as maintaining their payrolls in periods of low demand, even at the expense of short-run profits. Indeed, Adams, Licht, and Sagiv (2010) show that directors who value benevolence and universalism are more likely to side with stakeholders when presented with vignettes based on actual legal cases in which there was a tension between the interests of shareholders and those of other stakeholders. The large gender gaps in conformity and tradition, possibly related to women's exclusion from male social networks (e.g., Ibarra 1992), may shed some light on Adams and Ferreira's (2009) finding that female directors are tougher monitors of CEOs; women may be more willing to challenge established practices. Dollar, Fisman and Gatti (2001) find a similar pattern in government, where greater female representation in parliament is associated with less corruption.

Another possibility is that female directors are maximizing long-run shareholder value by avoiding layoffs. Although retaining workers lowered short-run operating performance, it could improve long-run profits by increasing morale and avoiding recruiting and training costs when demand rebounds. Under this interpretation, the new women on these boards are encouraging their firms to adopt strategies that view employees as assets with specific human capital to be developed, rather than as costs to be cut. This interpretation is consistent with women being more patient than men (Silverman 2003; Frederick 2005) and being more likely to use implicit contracts to provide workers with job security.[26]

To further explore gender differences in corporate leadership, we also examine the

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[26] This interpretation would be analogous to family firms that have been shown to protect workers' jobs in periods of reduced demand (Sraer and Thesmar 2007; Bassanini et al. 2010).

quota's effect on corporate leverage as an indicator of corporate risk-taking. Although among the general population women are typically more risk-averse than men (Byrnes, Miller, and Schaffer 1999; Eckel and Grossman 2008), women in the boardroom are not and may even be more risk loving. In fact, women assign less value than men to security, suggesting that having female directors is less likely to affect a firm's financial leverage or the risk profile of investment. We examine women's effect on leverage using the various difference-in-difference and triple difference approaches previously described, and the results are in Table 11.

In the triple-difference model, we find a negative association between the gender quota and firms' debt-to-assets ratios, consistent with female board members preferring safer financial strategies. This result is not, however, statistically significant or consistent across estimation approaches. Furthermore, the magnitude of the response—equivalent to about a tenth of a standard deviation—is modest when considering the large shifts in board composition. The strong association with employment outcomes and weaker association with leverage suggest that self-transcendent values are more important than is risk aversion in forming women's distinctive style.

IV. How Do Directors Affect Corporate Strategy?

Our analysis above indicates that exogenous changes in board composition caused by quotas led to shifts in corporate strategy. But what are board members actually doing to affect corporate outcomes? In this section, we explore potential underlying mechanisms.

The primary function of a company's board of directors is to hire executives to run the firm's day-to-day operations, to advise management, and to approve changes in corporate control. In existing studies, the role of the board in actively setting corporate strategy is unclear. In a classic descriptive analysis of boards, Mace (1971) concludes that boards of large- and medium-sized U.S. corporations serve largely as a sounding board for the CEO and top management but do not establish corporate objectives, strategies, or policies. Yet later studies, such as Demb and

Neubauer (1992) and MacAvoy and Millstein (1999), describe boards as playing a more active role. Even when boards do not set strategy directly, they can guide it indirectly when hiring the top executives who will make these decisions. Examining how the new board members in Norway are able to reduce layoffs may shed greater light on boards' role in setting strategy more broadly.

One way for board members to influence the company's direction may be to appoint likeminded individuals to top executive positions, that is, men or women with similar, more stakeholder-oriented preferences or more patience.[27] Indeed, using data for S&P 1,500 companies in the United States, Matsa and Miller (2011a) show that greater female representation on corporate boards increases the likelihood that the CEO will be a woman and increases women's representation among the company's other top-five executives. To investigate the role of CEO turnover in Norway, we supplement our data on CEOs with administrative data from the Norwegian government. Between 2003 and 2009, we find 144 cases of CEO turnover from one year to the next, representing 70 out of the 104 listed firms. Turnover rates in listed firms actually declined slightly (by about 1 percentage point, not statistically significant) in the years immediately following the quota, whereas those in unlisted firms were stable. This is consistent with the lack of an overall association between board diversity and CEO turnover reported by Adams and Ferreira (2009).

Even without increasing the rate of turnover, gender-diverse boards may be selecting new chief executives with different characteristics. For example, in the period before the quota, all replacement CEOs were male. After the quota, 2 (5 percent) were female. This increased hiring of female CEOs is suggestive; it is quantitatively small, but the supply of Norwegian female

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[27] More female board members may also indirectly increase demand for female managers. Even when it results from a quota, exposure to female leaders has been shown to improve perceptions of female leaders among decision makers (Beaman et al. 2009).

executives was also likely reduced by the spike in demand for female directors after the quota. Even among potential male CEO candidates, the gender-diverse boards may be selecting executives who share their values, which unfortunately are not observable in any of our datasets.

To test if CEO changes are a means through which female directors influence policy, we separate listed Norwegian firms into those with a CEO change (34 firms) between December 2005 and December 2007 from those without (69 firms). We select this time period to capture CEO turnover events occurring after the quota but early enough that they are not likely to be caused by changes in corporate outcomes caused by the quota. We estimate heterogeneous effects of the quota for our main outcomes, allowing for differences based on whether the board selected a new CEO after the quota took effect. We do this by interacting the main effects of interest in our main regression models (equations 1–3) with indicators for having a CEO change and for not having one. In order to ensure that counterfactual time trends for each set of Norwegian listed firms is based on the appropriate set of control firms, we also add a separate regressor to each model that interacts the post-quota period indictor with an indicator for being a listed Norwegian firm with a CEO change or one of its matched control firms. In all cases, the estimates for these control variables are quantitatively small and statistically insignificant.

The estimated effects of the quota, separated by CEO turnover, are reported in Table 12. Across all outcomes, the estimated effects are larger for firms with CEO changes. In the triple-difference model (Panel A), the decline in profits is 6.0 percentage points for firms with CEO changes compared with 3.0 for those without. There are also differential changes in employment, employee costs, and layoffs between firms with CEO turnover and those without. The estimates are essentially unchanged if we add an additional post-2006 control for CEO turnover in any companies (including the comparison firms). These results, reported in Panel B, imply that the estimates in Panel A are not being caused by characteristics of CEO turnover that are unrelated to

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the quota.

The pattern of differential effects suggests that selecting a firm's executives is one way in which female board members influence their firms' corporate decisions. Consistent with this interpretation, only two of the 39 new CEOs hired at these firms had ever served as a CEO of a publicly traded firm before the quota period. Rather than the boards using CEO turnover to influence strategy, a possible alternative interpretation is that poor accounting performance led these firms to replace their CEOs. To evaluate this possible interpretation, we researched the circumstances surrounding the exiting CEOs' separations from these firms. Although it is inherently difficult to classify if a separation was forced or voluntary (Eisfeldt and Kuhnen 2010), we were able to use firms' disclosures and press accounts to verify 15 cases in which the CEO left the firm for reasons unrelated to firm performance, such as a bona fide illness, retirement, or better opportunities elsewhere. In these cases, we also find large effects, though with some loss of precision (which is not surprising, given the smaller sample size). The results for the triple-difference model are reported in Panel B. Profits decline by 6.2 percentage points, employment increases by 0.53 log points, employee costs increase by 0.46 log points, and layoffs decline by 22 percentage points.

We conclude that selecting a firm's executives is one way in which female board members influence their firms' corporate decisions. Nevertheless, we find that increased female board representation enabled by the quota also affects policies, even when firms' CEOs did not change (see Panel A). This suggests a viable, albeit potentially more modest, role in which boards influence corporate strategy by advising and directing current managers, at least in Norway. Although the managers were retained at these firms, it may also be that the board's authority to select new management is what ultimately induced these executives to change corporate policy.

V. Conclusions

Governments across Europe have adopted or considered using quotas to increase gender diversity on corporate boards. This paper studies the first national quota for female board representation introduced in Norway in 2006. Within three years, the female share of corporate directorships doubled from 18 to 40 percent. Using financial data for publicly listed firms in Norway, and a matched control sample of unlisted firms in Norway and all firms elsewhere in Scandinavia, we find that short-run corporate profitability declined after the quota was adopted. Profits decreased because of increased labor costs from fewer layoffs and higher relative employment. These results show that gender quotas can affect corporate strategy. Although the impact of any particular quota may depend on the economic, social, and cultural context, the fact that we document important effects in Norway is itself meaningful. Scandinavian countries are highly ranked in international comparisons of gender equality (e.g., Guiso et al. 2008); the effects of gender quotas may be larger in countries with more traditional gender roles or less public commitment to gender equality.

It is natural to ask if the effects of the quota in this paper can shed light on female corporate leadership styles. As women take leadership positions in more corporations around the world, an important question is how, if at all, this demographic shift will affect industry. This paper shows that profitability fell and employment rose after women were brought onto corporate boards *because* of a quota. Although the Norwegian experience may not predict what will happen when women rise to boards without a quota, there are indications that female corporate leaders exhibit similar values and preferences outside of Norway as well—in environments without quota restrictions. In the United States, for example, businesses owned by women were less likely to lay off workers during the recent recession than were similar male-owned businesses (Matsa and Miller 2011b). Differences may not be limited to labor strategy; U.S. companies with more

female board representation also spend more on environmental and corporate social responsibility (Post et al. 2011; Marquis and Lee 2011). Indeed, International Survey Research (2004) finds that U.S. female senior executives attach the greatest importance to what they describe as the "communal" aspects of the workplace, such as working relationships, customer quality focus, and communication. By contrast, male senior executives are driven more by personal-reward factors, such as career development and compensation.

Although we find what appear to be large differences in managerial style between male and female corporate leaders today, these differences may diminish over time. As more women ascend the ranks of corporate hierarchies, and as the supply of available female talent increases, gender differences in leadership style may diminish if shareholders are better able to select women who match their preferences from the larger pool of candidates. Over time, the presence of additional women on boards may also influence the equilibrium behavior of women and the men serving with them. For example, Adams and Ferrerira (2009) find that male board members have better attendance records when serving on diverse boards, and Boyd, Epstein, and Martin (2010) find that male judges vote differently when they serve on judicial panels with women.[28] The long-term effects of greater gender diversity in corporate leadership present an important area for future research.

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[28] Furthermore, if women's leadership styles are influenced by internal or external costs for violating expectations about appropriate feminine behavior (Blau and Ferber 1986; Jamieson 1995; Akerlof and Kranton 2000), then these norms could change as women's representation increases.

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Table 1. Summary statistics for publicly listed companies in Norway and matched comparison companies, 2006

	Norway		Other Scandinavian Countries	
	Listed	Unlisted	Listed	Unlisted
Assets (€ millions)				
Mean	836	470	780	485
Median	104	95	74	92
St dev	2,213	1,097	2,215	1,137
Employment				
Mean	2,024	796	2,634	1,620
Median	302	96	310	319
St dev	5,433	2,469	6,017	4,198
Operating profit / Assets				
Mean	0.034	0.071	0.043	0.053
Median	0.061	0.063	0.068	0.058
St dev	0.175	0.097	0.160	0.104
Labor cost / Assets				
Mean	0.220	0.252	0.283	0.250
Median	0.187	0.194	0.236	0.202
St dev	0.189	0.245	0.225	0.229
Debt / Assets				
Mean	0.190	0.146	0.139	0.153
Median	0.157	0.011	0.080	0.042
St dev	0.176	0.201	0.150	0.207
Industry Share				
Agriculture, hunting, and fishing	4.8	4.0	0.0	4.8
Mining	1.0	1.0	0.8	1.0
Manufacturing	37.5	36.7	42.3	36.5
Electricity, gas, and water supply	2.9	3.7	2.9	3.7
Construction	2.9	2.3	2.9	2.3
Wholesale and retail trade	9.6	11.0	9.8	10.4
Transport, storage, and communication	18.3	18.5	18.3	17.3
Real estate, renting, and business activities	22.1	21.9	22.1	22.7
Other community, social, and personal services	1.0	1.0	1.0	1.4
Observations	104	520	520	520
Number of distinct firms	104	396	293	414

Notes: This table reports summary statistics in 2006 for publicly listed companies in Norway and three sets of matched comparison companies. Each set of comparison firms consists of the five most similar firms, based on assets, operating profits, labor costs, and industry in 2006 (matched with replacement using Abadie et al.'s (2004) matching algorithm and inverse variance weighting). Variables are winsorized at the 1 percent tails.

Table 2. Change in gender representation on corporate boards

	Share female, 2009	Change in share female, 2006−2009
Norway*Listed	0.199***	0.166***
	[0.019]	[0.021]
Norway	-0.005	-0.004
	[0.010]	[0.010]
Listed	-0.057***	-0.006
	[0.010]	[0.010]
Observations	1,660	1,660
R^2	0.081	0.052

Notes: This table reports coefficient estimates and standard errors (in brackets) from regressions of different dependent variables on indicators for whether the firm is in Norway, whether the firm is listed, and whether the firm is both in Norway and listed. Norwegian listed firms were affected by the gender representation law. Each observation is a firm, and the sample includes all listed companies in Norway and the matched set of control firms, described in Table 1, with nonmissing data.
*** p<0.01

Table 3. Changes in operating profits / assets

	DD: Within Norway by Listed		DD: Within Listed by Norway		DDD: By Norway and Listed	
	(1)	(2)	(3)	(4)	(5)	(6)
Norway*Listed*Post-2006					-0.041**	-0.040**
					[0.016]	[0.017]
Norway*Post-2006			-0.034**	-0.034**	0.010	0.010
			[0.015]	[0.014]	[0.007]	[0.007]
Listed*Post-2006	-0.027**	-0.027**			0.015	0.014
	[0.011]	[0.011]			[0.012]	[0.012]
Controls for board size & average number of other board seats		X		X		X
Observations	3,116	3,116	3,460	3,460	8,901	8,901
Number of firms	610	610	596	596	1,620	1,620
R^2	0.05	0.05	0.10	0.10	0.05	0.05

Notes: This table summarizes the results from firm-panel regressions of firms' profitability (operating profits divided by assets) on variables indicating whether a firm is affected by the gender representation law and a set of controls. Results are reported using three different samples of comparison firms to provide different counterfactuals for what would have happened to listed, Norwegian firms (the affected group) absent the reform: columns 1 and 2 use unlisted, Norwegian firms; columns 3 and 4 use listed, non-Norwegian firms; and columns 5 and 6 use both sets of comparison firms in a triple-difference specification. Controls in all regressions include firm and year fixed effects and industry-specific time trends. Where indicated, controls also include board size and the average number of other board seats. Standard errors, adjusted for clustering at the firm level, are reported in brackets. The panel covers firms from 2003 through 2009 but is not balanced because of missing data.
** $p < 0.05$

Table 4. Breaking down the change in operating profit / assets, DDD specification

	Operating profit / Assets	Revenue / Assets	Labor costs / Assets	Other costs / Assets
Panel A. Main results				
Norway*Listed*Post-2006	-0.041**	-0.009	0.041**	-0.010
	[0.016]	[0.057]	[0.017]	[0.049]
Observations	8,901	8,901	8,901	8,901
Number of firms	1,620	1,620	1,620	1,620
R^2	0.05	0.01	0.02	0.01
Panel B. With controls for other board characteristics				
Norway*Listed*Post-2006	-0.040**	-0.007	0.042**	-0.009
	[0.017]	[0.057]	[0.017]	[0.050]
Controls for board size & average number of other board seats	X	X	X	X
Observations	8,901	8,901	8,901	8,901
Number of firms	1,620	1,620	1,620	1,620
R^2	0.01	0.05	0.01	0.03

Notes: This table summarizes the results from firm-panel regressions of firms' profits, revenues, labor costs, and other costs (each divided by assets) on an indicator for whether the firm is affected by the gender representation law using the triple-difference framework reported in Table 3, columns 5 and 6. All regressions include controls for firm and year fixed effects, industry-specific time trends, and the appropriate pairwise interactions. Standard errors, adjusted for clustering at the firm level, are reported in brackets.

** $p<0.05$

Table 5. Changes in employment and labor costs

	Log employment			Log labor costs		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. DD: Within Norway by Listed						
Listed*Post-2006	0.468***	0.374***	0.464***	0.165***	0.194***	0.169***
	[0.077]	[0.075]	[0.076]	[0.047]	[0.064]	[0.047]
Observations	2,369	1,612	2,369	2,369	5,984	2,369
Number of firms	520	351	520	520	351	520
R^2	0.20	0.25	0.20	0.32	0.17	0.33
Panel B. DD: Within Listed by Norway						
Norway*Post-2006	0.276***	0.297***	0.292***	0.260***	0.253***	0.284***
	[0.083]	[0.072]	[0.082]	[0.071]	[0.061]	[0.070]
Observations	3,324	2,639	3,324	3,324	2,639	3,324
Number of firms	583	482	583	583	482	583
R^2	0.22	0.24	0.23	0.22	0.17	0.23
Panel C. DDD: By Norway and Listed						
Norway*Listed*Post-2006	0.310***	0.295***	0.307***	0.153*	0.128*	0.144*
	[0.091]	[0.081]	[0.091]	[0.082]	[0.076]	[0.084]
Observations	7,811	5,984	7,811	7,811	5,984	7,811
Number of firms	1,517	1,181	1,517	1,517	1,181	1,517
R^2	0.15	0.17	0.15	0.24	0.21	0.24
Controls for board size & average number of other board seats			X			X
Limit to firms with at least 50 employees		X			X	

Notes: This table summarizes the results from firm-panel regressions of firms' log employment and log labor costs on variables indicating whether a firm is affected by the gender representation law and a set of controls. Results are reported using the three different samples of comparison firms reported in Table 3. Controls in all regressions include firm and year fixed effects, industry-specific time trends, and the appropriate pairwise interactions. Standard errors, adjusted for clustering at the firm level, are reported in brackets.
*** $p < 0.01$, * $p < 0.1$

Table 6. Year-to-year changes in employment, DDD specification

	Downsizing: Annual decrease in employment			Expansion: Annual increase in employment		
	> 1%	> 3%	> 5%	> 1%	> 3%	> 5%
Mean of dependent variable	0.32	0.25	0.20	0.55	0.48	0.42
Panel A. Main results						
Norway*Listed*Post-2006	-0.252***	-0.204***	-0.130**	0.080	0.098	0.110
	[0.065]	[0.063]	[0.060]	[0.071]	[0.072]	[0.072]
Observations	6,872	6,872	6,872	6,872	6,872	6,872
Number of firms	1,347	1,347	1,347	1,347	1,347	1,347
R^2	0.04	0.04	0.03	0.03	0.03	0.03
Panel B. With controls for other board characteristics						
Norway*Listed*Post-2006	-0.250***	-0.193***	-0.121**	0.074	0.089	0.117
	[0.066]	[0.062]	[0.060]	[0.072]	[0.073]	[0.073]
Controls for board size & average number of other board seats	X	X	X	X	X	X
Observations	6,872	6,872	6,872	6,872	6,872	6,872
Number of firms	1,347	1,347	1,347	1,347	1,347	1,347
R^2	0.04	0.04	0.03	0.03	0.03	0.03

Notes: This table summarizes the results from firm-panel regressions of various measures of net changes in firms' employment on an indicator for whether the firm is affected by the gender representation law using the triple-difference framework reported in Table 3, columns 5 and 6. All regressions include controls for firm and year fixed effects, industry-specific time trends, and the appropriate pairwise interactions. Standard errors, adjusted for clustering at the firm level, are reported in brackets.

*** $p < 0.01$, ** $p < 0.05$

Table 7. Analysis of pre-existing trends, DDD specification

	Operating profit / Assets	Log employment	Log labor costs	Decrease in employment > 3%
Norway*Listed*Post 2003	-0.010	-0.165	0.107	0.124
	[0.021]	[0.126]	[0.120]	[0.076]
Norway*Listed*Post-2006	-0.040**	0.307***	0.190**	-0.166**
	[0.017]	[0.093]	[0.092]	[0.070]
Observations	11,403	10,063	10,063	8,266
Number of firms	1,463	1,347	1,347	1,116
R^2	0.06	0.11	0.24	0.03

Notes: This table tests for pre-existing trends. Results are reported from firm-panel regressions of firms' profitability (operating profits divided by assets), log employment, log labor costs, and layoffs (net decreases in employment of more than 3 percent) using the triple-difference framework reported in Table 3, column 5. The sample is extended back to 1999, and the specification includes a placebo indicator for listed, Norwegian firms after 2003. All regressions include controls for firm and year fixed effects, industry-specific time trends, and the appropriate pairwise interactions. Standard errors, adjusted for clustering at the firm level, are reported in brackets.
*** $p < 0.01$, ** $p < 0.05$

Table 8. Heterogenous effects based on distance from compliance

	Operating profit / Assets	Log employment	Log labor costs	Decrease in employment > 3%
Panel A. Sample of Listed Firms in Norway				
Post-2006*No Women in 2006	-0.042**	0.729***	0.718***	-0.037
	[0.019]	[0.134]	[0.097]	[0.064]
Post-2006*Some Women in 2006	0.003	0.487***	0.515***	-0.102**
	[0.010]	[0.082]	[0.077]	[0.046]
Observations	554	519	519	469
Number of firms	100	95	95	90
R^2	0.02	0.26	0.29	0.01
Panel B. DDD: Full Sample				
Post-2006*Norway*Listed	-0.045*	0.456***	0.247**	-0.239**
*No Women in 2006	[0.026]	[0.150]	[0.124]	[0.094]
Post-2006*Norway*Listed	-0.027	0.301**	0.225*	-0.196**
*Some Women in 2006	[0.019]	[0.117]	[0.116]	[0.087]
Observations	8,901	7,811	7,811	6,872
Number of firms	1,620	1,517	1,517	1,347
R^2	0.004	0.12	0.14	0.02

Notes: This table tests for heterogeneous effects based on distance to compliance when the law was adopted in 2006. Results are reported from firm-panel regressions of firms' profitability (operating profits divided by assets), log employment, log labor costs, and layoffs (net decreases in employment of more than 3 percent) on an indicator for whether the firm is affected by the gender representation law interacted with whether the firm's board contained any women in 2006, as well as a set of controls. Results are reported using two different specifications. Panel A limits the sample to affected firms and estimates raw, differential effects of the law based on whether the firm's board contained any women in 2006, with firm fixed effects but without any controls for baseline time trends. Panel B uses the full sample and the triple-difference framework reported in Table 3, columns 5 and 6, augmented with a fourth difference based on whether the firm's board contained any women in 2006. These regressions include controls for firm and year fixed effects, industry-specific time trends, and the appropriate pairwise interactions. Standard errors, adjusted for clustering at the firm level, are reported in brackets.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 9. Differential effects of the quota by director age and exeperience in 2009, DDD specification

	Operating profit / Assets	Log employment	Log labor costs	Decrease in employment > 3%
Panel A. Differential Effects by Average Director Age				
Norway*Listed*Post-2006	-0.030*	0.342***	0.174	-0.210***
*High Director Age	[0.017]	[0.124]	[0.108]	[0.069]
Norway*Listed*Post-2006	-0.052**	0.272***	0.127	-0.197**
*Low Director Age	[0.022]	[0.105]	[0.093]	[0.078]
Observations	8,898	7,808	7,808	6,869
Number of firms	1,617	1,514	1,514	1,344
R^2	0.05	0.15	0.24	0.04
Panel B. Differential Effects by Average Director Experience				
Norway*Listed*Post-2006	-0.036*	0.279**	0.084	-0.220***
*High Director Experience	[0.018]	[0.129]	[0.110]	[0.077]
Norway*Listed*Post-2006	-0.045**	0.336***	0.212**	-0.190***
*Low Director Experience	[0.020]	[0.107]	[0.096]	[0.069]
Observations	8,898	7,808	7,808	6,869
Number of firms	1,617	1,514	1,514	1,344
R^2	0.05	0.15	0.24	0.04

Notes: This table tests for heterogeneous effects based on average director age and experience at affected firms in 2009. Results are reported from firm-panel regressions of firms' profitability (operating profits divided by assets), log employment, log labor costs, and layoffs (net decreases in employment of more than 3 percent) on an indicator for whether the firm is affected by the gender representation law interacted with the board age (in Panel A) or experience (in Panel B) indicator, as well as a set of controls for firm and year fixed effects, industry-specific time trends, and the appropriate pairwise interactions. High director age means that average age is equal to or above the median of 51. High experience means that at least one-quarter of directors have CEO experience (the median share). Standard errors, adjusted for clustering at the firm level, are reported in brackets.
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 10. M&A activity among listed firms before and after the quota

	Merger or Acquisition	Joint Venture	Minority Stake
Norway			
Before quota	0.442	0.058	0.154
After quota	0.452	0.096	0.183
Change in Norway	0.010	0.038	0.029
Other countries			
Before quota	0.468	0.031	0.116
After quota	0.478	0.051	0.089
Change in other countries	0.010	0.020	-0.027
Difference-in-difference	-0.001	0.018	0.056
	[0.081]	[0.035]	[0.052]

Notes: This table reports the shares of listed companies that undertook a merger or acquisition, entered a joint venture, or invested a minority stake in another company at least once during the three-year periods before (2003–2005) and after (2007–2009) the quota was adopted. Statisics are listed separately for companies in Norway and companies in other Scandinavian countries.

Table 11. Changes in debt / assets

	DD: Within Norway by Listed		DD: Within Listed by Norway		DDD: By Norway and Listed	
	(1)	(2)	(3)	(4)	(5)	(6)
Norway*Listed*Post-2006					-0.010	-0.008
					[0.020]	[0.020]
Norway*Post-2006			-0.003	-0.003	0.002	0.000
			[0.017]	[0.017]	[0.008]	[0.009]
Listed*Post-2006	0.002	0.001			0.005	0.003
	[0.015]	[0.015]			[0.009]	[0.010]
Controls for board size & average number of other board seats		X		X		X
Observations	2,814	2,814	3,414	3,414	8,521	8,521
Number of firms	606	606	592	592	1,612	1,612
R^2	0.07	0.07	0.08	0.08	0.03	0.03

Notes: This table summarizes the results from firm-panel regressions of firms' financial leverage (total debt divided by assets) on variables indicating whether a firm is affected by the gender representation law and a set of controls. Results are reported using the three different samples of comparison firms reported in Table 3. Controls in all regressions include firm and year fixed effects and industry-specific time trends. Standard errors, adjusted for clustering at the firm level, are reported in brackets.

Table 12. Heterogeneous effects based on CEO change, DDD specification

	Operating profit / Assets	Log employment	Log labor costs	Decrease in employment > 3%
Panel A. Full Sample				
Norway*Listed*Post-2006*CEO Change	-0.060**	0.385***	0.241*	-0.251***
	[0.027]	[0.138]	[0.131]	[0.083]
Norway*Listed*Post-2006*No Change	-0.030*	0.269**	0.105	-0.179***
	[0.016]	[0.106]	[0.088]	[0.068]
Observations	8,901	7,811	7,811	6,872
Number of firms	1,620	1,517	1,517	1,347
R^2	0.05	0.16	0.24	0.04
Panel B. Full Sample Controlling for all CEO Changes				
Norway*Listed*Post-2006*CEO Change	-0.058**	0.384***	0.250*	-0.271***
	[0.028]	[0.140]	[0.133]	[0.085]
Norway*Listed*Post-2006*No Change	-0.031*	0.270**	0.101	-0.170**
	[0.016]	[0.106]	[0.089]	[0.068]
Observations	8,901	7,811	7,811	6,872
Number of firms	1,620	1,517	1,517	1,347
R^2	0.05	0.16	0.24	0.04
Panel C. Sample of CEO Changes Unrelated to Performance and Matched Controls				
Norway*Listed*Post-2006	-0.062	0.533**	0.457**	-0.218*
	[0.040]	[0.230]	[0.224]	[0.121]
Observations	1,307	1,152	1,152	1,019
Number of firms	238	224	224	202
R^2	0.04	0.16	0.24	0.05

Notes: Panel A reports separate estimates of the impact of quotas for Norwegian listed firms whose CEO changed between December 2005 and December 2007 and those whose CEO did not change. Results are reported from firm-panel regressions using the triple-difference framework reported in Table 3, column 5. Controls in all regressions include firm and year fixed effects, industry-specific time trends, and the appropriate pairwise interactions. To ensure that the proper counterfactual is estimated, the CEO change and No change variables are defined for the matched controls based on the status of their matched listed firm, not their own realized value. Panel B adds a control for CEO changes at unaffected, as well as affected, firms. In Panel C, the sample is restricted to affected firms with a CEO change that was classified as unrelated to firm performance based on firms' disclosures and press accounts, and these firms' matched controls. Standard errors, adjusted for clustering at the firm level, are reported in brackets.

*** p<0.01, ** p<0.05, * p<0.1

Appendix A. Overview of Changes to Labor Law from the 2005
Working Environment Act

This appendix details changes in Norwegian labor law brought on by the 2005 Working Environment Act. Our goal in developing this inventory of the Act was to ascertain whether the Act implemented any changes that (1) would have affected large and small companies differentially or (2) regulated layoffs or the termination of employment. It is important to note that both laws equally apply to public and private companies operating in Norway and apply whether or not a company has shares listed on an exchange.

Section I lists all provisions of the Working Environment Act that are contingent on the number of a firm's employees. Section II lists all provisions of the Working Environment Act that regulate the termination of employment. Both sections organize provisions based on whether they experienced major changes, minor changes, or no changes when the law was updated in 2005. Although there were some changes to specific provisions, none of the changes would predict a decrease in layoffs among firms affected by the board member gender quota.

The 2005 Working Environment Act (No. 62) updated the 1977 law (Act No. 4) as amended in 1995. Specific references to sections of the laws are provided in this document.

I. PROVISIONS CONTINGENT ON THE NUMBER OF EMPLOYEES

Summary

The Working Environment Act contains a few provisions that are contingent on the number of employees. None of these provisions changed in 2005, except for the new requirement for employer consultations. The requirement for employer consultations was completely new in the 2005 law but applied equally to public and private companies and whether or not the company has shares listed on an exchange. The new requirement could raise the costs of negative economic shocks if consulting workers leads the most productive workers to seek alternative employment, but keeping workers informed could also increase productivity if the consultations lead to higher employee morale. Either way, the effect is likely modest and pertains equally to firms that are affected and unaffected by the gender quota. Indeed, the results presented in the paper are virtually unchanged if we restrict the sample to firms employing more than 50 employees (ensuring that all Norwegian firms are subjected to the consultation requirement).

Major Changes

Employer consultations:
This provision is a novel element in the updated law. Firms that regularly employ at least 50 employees are obligated to provide information to workers about the firm's economic prospects, how these prospects would affect its workforce, and the like. In an effort to maintain confidentiality, the provision allows the employers to retain some information in consultations with their employees.
Section references for prior version of law: N/A
Section references for updated version of law: 8-1; 8-2; 8-3.

No Changes

Collective Redundancies:
Collective redundancies are defined as the termination of ten or more employees within a 30-day period, excluding terminations for cause. Firms' responsibilities to provide consultation and expert advice to employees in connection with collective redundancies did not change with the law, neither did the conditions employers must follow, such as calling consultations as early as possible and giving a very detailed notice, including the grounds for redundancies. Notice must also be forwarded to the Public Employment Service and employees' elected representatives may comment on the notification directly to the Public Employment Service. Collective redundancies may not come into effect earlier than 30 days after the Public Employment Service has been notified, and the Public Employment Service may extend this waiting period.
Section references for prior version of law: 56A.
Section references for updated version of law: 15-2.

More than one employer/Duties of employer to workers other than own employees:
This provision pertains to work environment standards for contract workers or self-employed persons who perform tasks in connection with an employer's activities. If there are more than ten employees simultaneously employed at a workplace and there is no principal employer, then it is to be agreed in writing which employer is in charge of coordinating work environment standards or else the Labor Inspection Authority will decide.
Section references for prior version of law: 15.
Section references for updated version of law: 2-2.

*Electing safety officials***:**
Workforces of ten or more employees are required to elect a safety representative. At firms with fewer than ten employees, parties may agree in writing to another arrangement or to not have a safety representative (although this agreement may be vacated by the Labor Inspection Authority). Workforces of more than ten employees may have more than one representative. The number of safety representatives should proportional to the number of workers and the type of work performed.
Section references for prior version of law: 25-1; 25-2.
Section references for updated version of law: 6-1.

Working Environment Committees:
Working environment committees are concerned with planning and maintaining safe and healthy work environment standards. Firms that employ at least 50 workers must have a working environment committee representing the employers, employees, and safety and health staff. Firms that employ between 20 and 50 employees may form a working environment committee when agreed by the parties. The Labor Inspection Authority may also require a working environment committee for firms with fewer than 50 employees, based on the conditions of work.
Section references for prior version of law: 23; 24.
Section references for updated version of law: 7-1.

Staff rules:
Industrial enterprises, commercial enterprises, and offices employing more than ten people require work rules for those who are not in a managerial or a supervisory position. These rules dictate various guidelines for workers, such as rules of behavior in a workplace and conditions for dismissal. The Ministry may make exceptions to this requirement.
Section references for prior version of law: 69.
Section references for updated version of law: 14-16.

II. PROVISIONS CONCERNING EMPLOYMENT TERMINATION

Summary

The Working Environment Act regulates employment termination, but these regulations changed little when the law was updated in 2005. The few adjustments mostly affected the time allotted for certain types of leave. Other details of law were also clarified. The biggest change was a new provision that allows for employee suspension while serious breaches of contract are being investigated. This change is discussed below in the context of summary dismissal (i.e., termination for cause). None of these changes can explain the reduction in layoffs found in the paper.

Major Changes

Summary dismissal:
An employer may summarily dismiss an employee if he or she commits a gross breach of duty or other serious breach of his or her employment contract. The new law does *not* change the employee's rights when he or she receives a dismissal notice (see "Notices of Termination" below). The new law also does *not* change the consequences, should the notice be found to be invalid. The new law does, however, add an additional provision allowing the employer to suspend an employee suspected of misdoings that may lead to summary dismissal, while the matter is investigated. During the suspension period, the employee receives the salary he or she earned on the date of suspension and retains the rights as one dismissed by notice. Before the law change, immediate summary dismissal was explicitly allowed.
Section references for prior version of law: 61; 66.
Section references for updated version of law: 15-13; 15-14; 15-11; 17-3; 17-4.

Protection against dismissal during sickness:
According to the new law, those absent (wholly and partly) because of illness or an accident are protected from dismissal following the first 12 months of the sickness, assuming that there are no other apparent reasons for dismissal. The previous law was more complicated; most employees were only protected for the first 6 months after illness or accident, but those who had been employed for at least five consecutive years or had an illness/accident that was due to the work were protected for 12 months. There was no change to the requirement for medical certification when the employer calls for it.
Section references for prior version of law: 61; 64.
Section references for updated version of law: 15-8; 17-5.

Minor Changes

Concerning lay judges:
Courts dealing with dismissal disputes have a panel of lay judges with "a broad knowledge of industrial life." The previous law required that two-fifths of the judges be employers and two-fifths be employees. The new law calls for a similar split but requires that the judges be appointed by recommendation of the employers' organization and by recommendation of the employees' organization, instead of necessarily being employers and employees themselves. The new law also excludes the requirement that the panel consist of ten judges or "a higher number divisible by five."
Section references for prior version of law: 61B.
Section references for updated version of law: 17-6.

Temporary employment:
Under both laws, temporary employment is only allowed when it is required by the nature of the work, when the employee is a trainee or a temporary replacement, when the employee is the chief executive, or

when the person is employed in a labor market scheme coordinated by the Public Employment Service. The new law also allows temporary contracts (1) for employees in organized sports and (2) when agreed to by national unions for work related to art, research, or sport. There was *no* change to the time limits for giving notice. The new law, however, subjects those temporarily employed for more than four consecutive years to provisions regulating the termination of employment relationships; this does not apply to trainees, those employed in labor market schemes coordinated by the Public Employment Service, and those employees in organized sports.
Section references for prior version of law: 58A; 61.
Section references for updated version of law: 14-9; 14-10; 14-11.

Protection against dismissal during military service:
Those in compulsory or voluntary military service or similar public services are protected from dismissal for a certain time period. The new law increased the time period from 14 to 24 months. Employees are required to notify their employers if they wish to return to work after completing military service. The new law increases the notice that returning employees must give employers from 14 days to one month.
Section references for prior version of law: 61; 65A.
Section references for updated version of law: 12-12; 15-10; 17-3; 17-4; 17-5.

Protection against dismissal during partial leave of absence:
Leaves of absence for maternity or adoption may be taken as partial leaves of absence, whereby the employee reduces working hours per week and receives a corresponding partial claim for maternity benefits if agreed to by the employee and employer. The newer law allows greater flexibility in possible arrangements for partial leaves, including fewer restrictions on the amount of the reduction in working hours and the removal of a requirement that the minimum period for partial leave be 12 weeks.
Section references for prior version of law: 31A; 61; 65.
Section references for updated version of law: 12-6; 12-7; 15-9; 17-3; 17-4; 17-5.

Protection against dismissal for care of young children:
The new law modestly increased the right to leave to care for dependent children. Under both regimes, an employee is allowed ten days per year to care for a sick child or 15 days if the employee has more than one child, ending with the calendar year of the child's 12th birthday. This allowance is increased to 20 days per year if the child is chronically ill or disabled, and the new law extended this allowance through the calendar year of the child's 18th birthday (instead of the calendar year of the child's 16th birthday under the previous law). The new law also allows employees leave for medical exams and for when a child needs constant attention at home. Whereas employees were previously allowed leave to care for seriously ill children up to age 16 if hospitalization was required, the new law allows leave to care for seriously ill children up to age 18, even if hospitalization is not required, and in the case of required hospitalizations up to age 12, even if the child is not suffering from serious illness. The new law also maintains the right to a leave of absence to attend health care training in the case of chronic illness or disability. Both laws also allow an employee who has sole or nearly sole responsibility for a child double the leave, and the new also allows half of those days to be transferred from a mother or father to a person with whom the employee lives and does not have responsibility for his or her own children.
Section references for prior version of law: 61; 65; 33A.
Section references for updated version of law: 12-9; 17-3; 17-4; 17-5.

Chief Executive:
The chief executive may contract with a firm to settle termination disputes through arbitration. The new law also allows the chief executive to agree in advance to waive his or her rights in the event of termination in exchange for compensation upon termination.
Section references for prior version of law: 61D.
Section references for updated version of law: 15-16.

Preferential claim to reinstatement:
After termination due to lack of work, an employee has a preferential claim to new employment at the same firm, unless the employee is unqualified for the work. This applies to those who have been employed for at least 12 months of the previous two years, including most temporary employees. The new law maintains the same time limits for preferential claims and the same conditions with respect to an employers' bankruptcy. The new law extends to part-time employees a preferential claim to new full-time positions, if they are qualified.
Section references for prior version of law: 67.
Section references for updated version of law: 14-2; 14-3; 14-4.

Periods of Notice:
The employer and the employee must give at least one month's notice, unless otherwise stated in writing or in a collective bargaining agreement. If employed for at least five consecutive years, either party must give two months' notice; similarly, if employed for at least ten consecutive years, either party must give three months' notice. Different notice periods apply when a worker is employed for at least ten consecutive years and over a certain age: notice must be at least four months in advance if the employee is at least 50, five months if at least 55, and six months if at least 60. In these cases, the employee may terminate employment with three months' notice. Collective bargaining agreements or other wage agreements may not reduce the notice requirements for any workers employed for at least five consecutive years. The only change under the new law is that the Ministry is allowed to issue regulations that would shorter periods of notice for employees in labor market schemes, such as those coordinated by the Public Employment Service.
Section references for prior version of law: 58.
Section references for updated version of law: 15-3.

No Changes

Notices of Termination:
Before making a decision to dismiss an employee with notice, an employer must discuss the matter with the employee and his or her representative, unless the employee does not want to or it is not practically possible. Notices must be written and contain information about the employee's rights, time limits for legal proceedings, the name of employer, preferential rights to reinstatement (if applicable), and the grounds for dismissal (if requested by the employee). If these requirements are not fulfilled and the employee brings legal action within four months of receiving notice, the notice, unless under special circumstances, will be invalid. If the notice is invalid, the employee may be entitled to compensation.
Section references for prior version of law: 57.
Section references for updated version of law: 15-1; 15-4; 15-5.

Disputes concerning unwarranted notice of termination:
The new law made *no* changes to these provisions, which specify various time limits for negotiations, initiating legal proceedings, etc.
Section references for prior version of law: 61; 61A; 61C.
Section references for updated version of law: 17-1; 17-3; 17-4; 17-7.

Termination due to unforeseeable occurrences:
If employees must be laid off due to accidents, natural disasters, or other unforeseeable events, the time limit for giving notice may be reduced to 14 days.
Section references for prior version of law: 59.
Section references for updated version of law: 15-3-10.

Protection against unwarranted notice of termination:
Employees are expressly protected from dismissal in three specific circumstances: (1) if an employee is laid off on grounds of "curtailed operations or rationalization measures" but is able to contribute in other ways; (2) if an employee is laid off because of outsourcing ordinary operations to a third party, unless it is essential to the health of the business; or (3) if an employee is dismissed because of his or her age before age 70.
Section references for prior version of law: 60.
Section references for updated version of law: 15-7.

Protection against dismissal during and after pregnancy or adoption:
Pregnant women are protected from termination if no other reason for dismissal is apparent. Pregnant women and new mothers are allowed certain leaves, including leave for prenatal examinations, twelve weeks of leave during pregnancy, and six weeks of required maternity leave after birth. The father (or another person assisting the mother if the parents do not live together) is allowed two weeks of leave to help the mother in childbirth-related activities. The mother and father/assistant are jointly allowed 12 months in total for maternity and pregnancy leaves. Both are each entitled to up to 12 additional months for each child if taken immediately after the first 12 month leave, unless they initially took a partial leave of absence (see "Protection against dismissal during partial leave of absence" above). An employee who is the sole caretaker of a child may take up to two years of additional leave (instead of the additional 12 months). Adoptive and foster parents are also entitled to parental leaves of absence when taking over responsibility for care of the child, as long as the child is younger than 15 years and not a stepchild. For more protections, see also the section "Protection against dismissal for care of young children" in this report. Times allowed for leaves of absences during and after pregnancy were *not* changed by the new law.
Section references for prior version of law: 31; 65.
Section references for updated version of law: 12-1; 12-2; 12-3; 12-4; 12-5; 12-7; 15-9.

Right to remain in post:
An employee may remain in his or her post during legal disputes concerning termination, unless a court rules otherwise. This right does not apply to disputes regarding summary dismissal, dismissal during a trial period, or contract or temporary workers, unless a court rules otherwise. This right also does not apply to those employed in labor market schemes coordinated by the Public Employment Service who are dismissed under certain conditions.
Section references for prior version of law: 58A; 61-4; 63; 66.
Section references for updated version of law: 15-11.

Consequences of unfair dismissal:
If a court deems a dismissal illegal, the employee should retain employment and may be awarded compensation by the court. However, after weighing the interests of both parties, a court may decide that the employment shall be terminated if finding it to be "clearly unreasonable" that employment should continue.
Section references for prior version of law: 62.
Section references for updated version of law: 15-12.

Concerning trial periods:
If a notice is given to those working for a trial period, the grounds for notice must be regarding a lack of proficiency, suitability, or reliability. The provision only applies if notice is given before the trial period expires. Except in certain cases, the trial period must be shorter than six months. An employer may extend the trial period if an employee has been absent with prior notice.
Section references for prior version of law: 63.
Section references for updated version of law: 15-6.

References:
A dismissed employee has a right to a reference from the employer, which states the employee's name, date of birth, nature of work, and duration. Those summarily dismissed are also entitled to references, but their employers may state that the employee was summarily dismissed without giving the reasons for the dismissal.
Section references for prior version of law: 68.
Section references for updated version of law: 15-15.

Provisions concerning labor disputes:
These regulations concerning dismissal do not apply to labor disputes under certain acts (Labor Disputes Act and Civil Service Disputes Act). The Ministry may decide to what extent the regulations concerning termination apply to public servants.
Section references for prior version of law: 56.
Section references for updated version of law: 1-2; 15-17.

Staff rules:
Industrial enterprises, commercial enterprises, and offices employing more than ten people require work rules for those who are not in a managerial or a supervisory position. These rules dictate various guidelines for workers, such as rules of behavior in a workplace and conditions for dismissal. The Ministry may make exceptions to this requirement.
Section references for prior version of law: 69.
Section references for updated version of law: 14-16.

Protection against dismissal concerning transfer of ownership:
In the case of a transfer of ownership from one employer to another, employees may not be dismissed solely because of the transfer.
 Section references for prior version of law: 73C.
Section references for updated version of law: 16-4.

Collective Redundancies:
Collective redundancies are defined as the termination of ten or more employees within a 30-day period, excluding terminations for cause. Firms' responsibilities to provide consultation and expert advice to employees in connection with collective redundancies did not change with the law, neither did the conditions employers must follow, such as calling consultations as early as possible and giving a very detailed notice, including the grounds for redundancies. Notice must also be forwarded to the Public Employment Service and employees' elected representatives may comment on the notification directly to the Public Employment Service. Collective redundancies may not come into effect earlier than 30 days after the Public Employment Service has been notified, and the Public Employment Service may extend this waiting period.
Section references for prior version of law: 56A.
Section references for updated version of law: 15-2.

Appendix Figure A1. Average director age among publicly listed companies in Norway, 2002–2009. This figure plots summary statistics for the average age of male directors, female directors, and all directors among publicly listed companies in Norway. Averages of these values across firms are presented with 95 percent confidence intervals (across companies for each year).
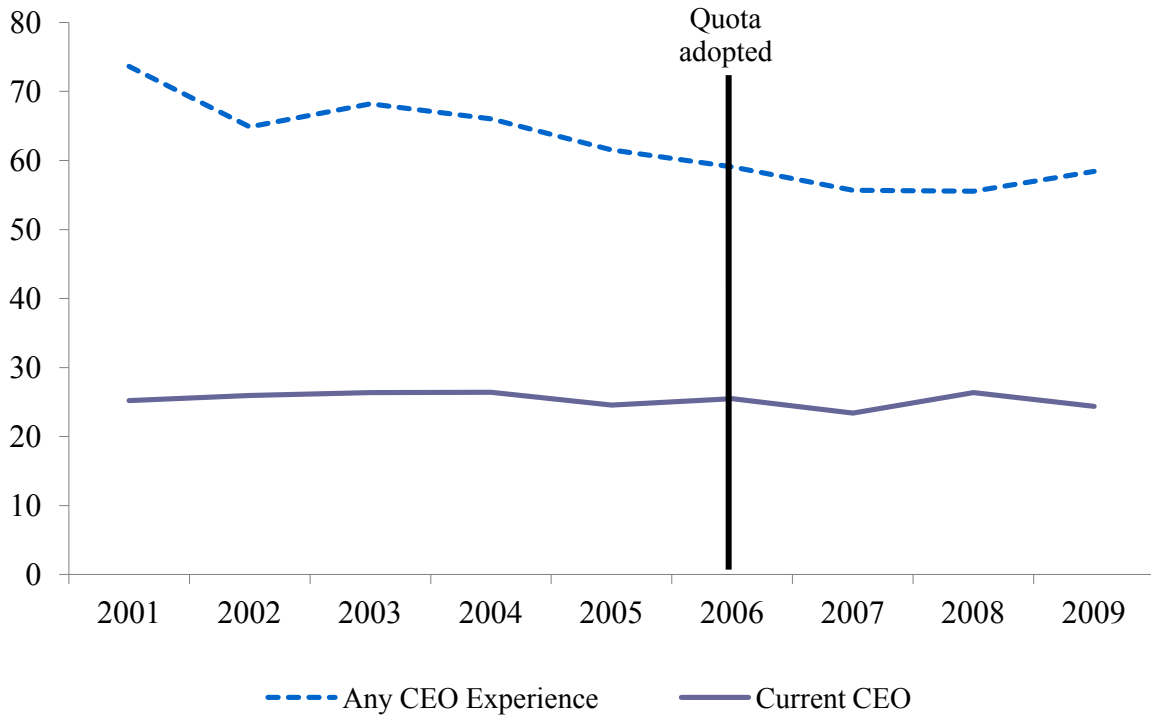
Appendix Figure A2. Average director CEO experience among public listed companies in Norway, 2001–2009. This figure plots summary statistics for the average percent of directors who are currently a CEO or have any current or previous CEO experience among publicly listed companies in Norway. Source: Ahern and Dittmar (2011), Table 2.
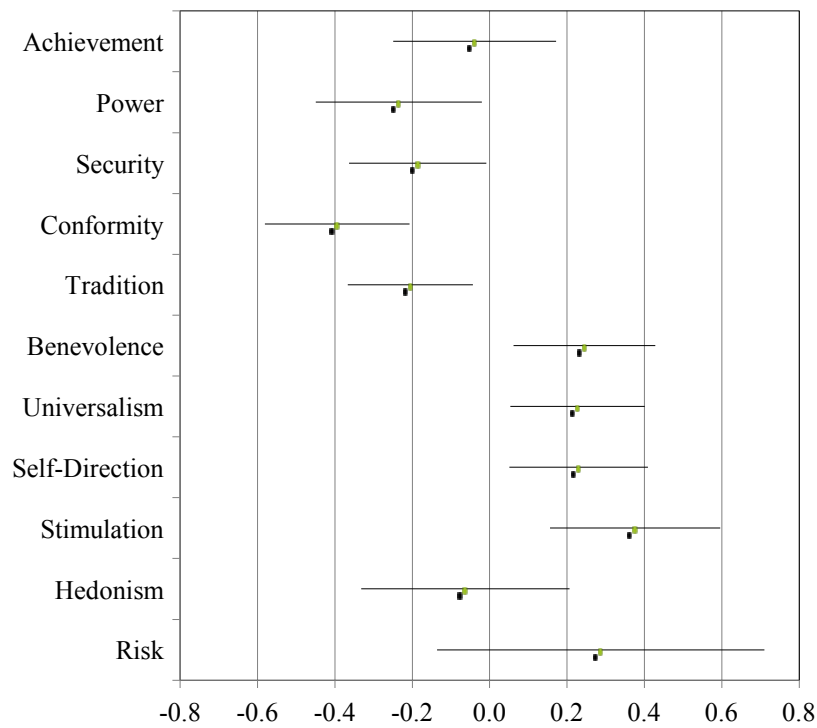
Appendix Figure A3. Differential values and risk attitudes of female directors, relative to male directors at the same firm, Sweden 2005. Average differences and 95 percent confidence intervals are reported. Estimates are from Adams and Funk (2009, Table 4). Raw value scores range between one and six, with higher numbers reflecting a higher importance of the value dimension. The dependent variables are first demeaned with respect to the individual's average response in order to reflect the respondent's relative value priorities. Specifications control for age and firm fixed effects.

Table A1. Robustness check: Controlling for accounting standard, DDD specification

	Operating profit / Assets	Log employment	Log labor costs	Decrease in employment > 3%
Norway*Listed*Post-2006	-0.038**	0.310***	0.151*	-0.208***
	[0.016]	[0.090]	[0.082]	[0.063]
Observations	8,901	7,811	7,811	6,872
Number of firms	1,620	1,517	1,517	1,347
R^2	0.05	0.16	0.24	0.04

Notes: This table tests whether the results presented above are robust to including indicator variables for accounting standard (local GAAP or IFARS, compared with missing). Results are reported from firm-panel regressions of firms' profitability (operating profits divided by assets), log employment, log labor costs, and layoffs (net decreases in employment of more than 3 percent) on variables indicating whether a firm is affected by the gender representation law and a set of controls. Results are reported using the triple-difference framework reported in Table 3, column 5. Controls in all regressions include firm and year fixed effects, industry-specific time trends, and the appropriate pairwise interactions. Standard errors, adjusted for clustering at the firm level, are reported in brackets.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A2. Robustness to alternative samples, DDD specification

	Operating profit / Assets	Log employment	Log labor costs	Decrease in employment > 3%
Panel A. Include unlisted companies in treated group				
Norway*Listed*Post-2006	-0.026*	0.231***	0.137*	-0.123**
	[0.015]	[0.077]	[0.074]	[0.056]
Observations	15,928	13,837	13,837	11,768
Number of firms	2,967	2,751	2,751	2,327
R^2	0.03	0.12	0.21	0.03
Panel B. Full sample of control firms				
Norway*Listed*Post-2006	-0.023**	0.398***	0.270***	-0.174***
	[0.012]	[0.077]	[0.070]	[0.043]
Observations	88,779	74,422	74,422	65,340
Number of firms	17,053	15,379	15,379	13,979
R^2	0.02	0.10	0.26	0.02
Panel C. Limit sample to close matches				
Norway*Listed*Post-2006	-0.041***	0.308***	0.175*	-0.218***
	[0.016]	[0.090]	[0.092]	[0.063]
Observations	7,822	6,928	6,928	6,080
Number of firms	1,418	1,339	1,339	1,185
R^2	0.05	0.15	0.20	0.04

Notes: This table tests whether the results presented above are robust to alternate sample selections and controls. Panel A uses all potential comparison firms (private Norwegian and other public and private Scandinavian firms). Panel B includes unlisted, public limited Norwegian firms in the affected group. Panel C limits the matched sample to those within five units of distance and drops the two affected companies with no close matches. Results are reported from firm-panel regressions of firms' profitability (operating profits divided by assets), log employment, log labor costs, and layoffs (net decreases in employment of more than 3 percent) on variables indicating whether a firm is affected by the gender representation law and a set of controls. Results are reported using the triple-difference framework reported in Table 3, column 5. Controls in all regressions include firm and year fixed effects, industry-specific time trends, and the appropriate pairwise interactions. Standard errors, adjusted for clustering at the firm level, are reported in brackets.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A3. Alternative measure of performance

| | Operating Profits / Sales | | |
	(1)	(2)	(3)
	DD: Within Norway by Listed	DD: Within Listed by Norway	DDD: By Norway and Listed
Norway*Listed*Post-2006			-0.151**
			[0.074]
Norway*Post-2006		-0.149**	0.029
		[0.073]	[0.018]
Listed*Post-2006	-0.116*		0.043
	[0.064]		[0.035]
Controls for board size & average number of other board seats	X	X	X
Observations	2,680	3,411	8,430
Number of firms	579	587	1,582
R^2	0.02	0.03	0.02

Notes: This table summarizes the results from firm-panel regressions of firms' profitability (operating profits divided by sales) on variables indicating whether a firm is affected by the gender representation law and a set of controls. Results are reported using three different samples of comparison firms to provide different counterfactuals for what would have happened to listed, Norwegian firms (the affected group) absent the reform: column 1 uses unlisted, Norwegian firms; column 2 uses listed, non-Norweigan firms; and column 3 uses both sets of comparison firms in a triple-difference specification. Controls in all regressions include firm and year fixed effects, industry-specific time trends, board size, and the average number of other board seats. Standard errors, adjusted for clustering at the firm level, are reported in brackets. The panel covers firms from 2003 through 2009 but is not balanced because of missing data.
** $p < 0.05$, * $p < 0.1$

Table A4. Robustness check: Excluding firms with any government ownership, DDD specification

	Operating profit / Assets	Log employment	Log labor costs	Decrease in employment > 3%
Norway*Listed*Post-2006	-0.044**	0.287***	0.206*	-0.167**
	[0.022]	[0.111]	[0.110]	[0.075]
Observations	6,079	5,346	5,346	4,657
Number of firms	1,113	1,042	1,042	915
R^2	0.05	0.17	0.22	0.05

Notes: This table tests whether the results presented above are robust to the exclusion of 32 listed, Norwegian firms that had any direct or indirect government ownership and their matched control firms. Results are reported from firm-panel regressions of firms' profitability (operating profits divided by assets), log employment, log labor costs, and layoffs (net decreases in employment of more than 3 percent) on variables indicating whether a firm is affected by the gender representation law and a set of controls. Results are reported using the triple-difference framework reported in Table 3, column 5. Controls in all regressions include firm and year fixed effects, industry-specific time trends, and the appropriate pairwise interactions. Standard errors, adjusted for clustering at the firm level, are reported in brackets.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A5. Falsification check in the pre-quota period, DDD specification

	Operating profit / Assets	Log employment	Log labor costs	Decrease in employment > 3%
Norway*Listed*Post-2000	0.022	0.098	0.058	-0.003
	[0.022]	[0.083]	[0.085]	[0.069]
Observations	7,463	6,821	6,821	5,455
Number of firms	878	825	825	619
R^2	0.04	0.04	0.12	0.04

Notes: As a falsification test, this table analyzes whether public Norwegian firms displayed a similar differential response to the previous global recession. Results are reported from firm-panel regressions of firms' profitability (operating profits divided by assets), log employment, log labor costs, and layoffs (net decreases in employment of more than 3 percent) on variables indicating whether a firm is Norwegian, listed, and in the recession period, as well as a set of controls. Results are reported using a triple-difference framework similar to the regression reported in Table 3, column 5, except for the different time period. Controls in all regressions include firm and year fixed effects, industry-specific time trends, and the appropriate pairwise interactions. Standard errors, adjusted for clustering at the firm level, are reported in brackets.

Table A6. Controlling for board member age and turnover, within-Norway specification

	Operating profit / Assets	Log employment	Log labor costs	Decrease in employment > 3%
Listed*Post-2006	-0.025**	0.465***	0.301***	-0.273***
	[0.011]	[0.076]	[0.067]	[0.050]
Observations	3,111	2,365	2,365	1,864
Number of firms	610	520	520	413
R^2	0.06	0.21	0.33	0.08

Notes: This table tests whether the results presented above are robust to controlling for average board member age and turnover using data from the Norway business register. Results are reported from firm-panel regressions of firms' profitability (operating profits divided by assets), log employment, log labor costs, and layoffs (net decreases in employment of more than 3 percent) on variables indicating whether a firm is affected by the gender representation law and a set of controls. Results are reported using the within-Norway difference-in-difference framework reported in Table 3, column 1. Controls in all regressions include average board member age, board size, the average number of other board seats, and the share of new directors (i.e., those who were not directors at the same firm in the previous year) in addition to firm and year fixed effects and industry-specific time trends. Standard errors, adjusted for clustering at the firm level, are reported in brackets.

*** $p<0.01$, ** $p<0.05$

Table A7. Board member characteristics by gender and tenure, 2009

	Male	Female	P-value of difference	Female board members			Male board members		
				Appointed before 2006	Appointed since 2006	P-value of difference	Appointed before 2006	Appointed since 2006	P-value of difference
Professional experience									
Age	54.135	48.902	<0.001	51.211	48.139	0.035	56.717	52.166	<0.001
	[0.594]	[0.636]		[1.227]	[0.731]		[0.796]	[0.816]	
CEO	0.314	0.170	<0.001	0.220	0.154	0.319	0.268	0.347	0.123
	[0.026]	[0.026]		[0.059]	[0.029]		[0.038]	[0.035]	
CFO	0.064	0.044	0.302	0.060	0.039	0.565	0.058	0.068	0.700
	[0.014]	[0.014]		[0.034]	[0.015]		[0.020]	[0.018]	
Other current board positions	0.638	0.858	0.064	1.060	0.795	0.329	0.558	0.696	0.272
	[0.064]	[0.099]		[0.248]	[0.105]		[0.086]	[0.092]	
Other previous board positions	0.900	0.714	0.170	1.020	0.621	0.123	0.949	0.864	0.645
	[0.093]	[0.098]		[0.232]	[0.106]		[0.135]	[0.126]	
Education									
MBA	0.158	0.130	0.360	0.100	0.139	0.444	0.151	0.163	0.767
	[0.020]	[0.023]		[0.043]	[0.028]		[0.031]	[0.027]	
Other masters' degree	0.176	0.188	0.744	0.200	0.184	0.801	0.166	0.184	0.659
	[0.021]	[0.027]		[0.057]	[0.031]		[0.032]	[0.028]	
PhD	0.030	0.048	0.317	0.020	0.057	0.177	0.022	0.037	0.409
	[0.010]	[0.015]		[0.020]	[0.019]		[0.012]	[0.014]	
Role on board									
Audit committee	0.319	0.633	0.004	0.556	0.667	0.596	0.324	0.314	0.936
	[0.057]	[0.090]		[0.176]	[0.105]		[0.081]	[0.080]	
Compensation committee	0.377	0.467	0.416	0.444	0.476	0.881	0.324	0.429	0.375
	[0.059]	[0.093]		[0.176]	[0.112]		[0.081]	[0.085]	
Nominating committee	0.145	0.033	0.042	0.000	0.048	0.329	0.206	0.086	0.164
	[0.043]	[0.033]		[0.000]	[0.048]		[0.070]	[0.048]	
Committee chair	0.290	0.167	0.168	0.333	0.095	0.212	0.353	0.229	0.263
	[0.055]	[0.069]		[0.167]	[0.066]		[0.083]	[0.072]	
Employee representative	0.209	0.133	0.019	0.100	0.143	0.403	0.158	0.246	0.047
	[0.022]	[0.023]		[0.028]	[0.043]		[0.031]	[0.031]	

Table A7. Board member characteristics by gender and tenure, 2009 (cont.)

	Male	Female	P-value of difference	Female board members			Male board members		
				Appointed before 2006	Appointed since 2006	P-value of difference	Appointed before 2006	Appointed since 2006	P-value of difference
Industry experience									
Consulting	0.104	0.141	0.210	0.140	0.141	0.986	0.101	0.105	0.911
	[0.017]	[0.024]		[0.050]	[0.028]		[0.026]	[0.022]	
Education	0.012	0.039	0.073	0.000	0.051	0.004	0.007	0.016	0.462
	[0.006]	[0.014]		[0.000]	[0.018]		[0.007]	[0.009]	
Energy	0.134	0.160	0.413	0.180	0.154	0.675	0.094	0.163	0.061
	[0.019]	[0.026]		[0.055]	[0.029]		[0.025]	[0.027]	
Engineering	0.195	0.107	0.004	0.140	0.096	0.427	0.159	0.221	0.157
	[0.022]	[0.022]		[0.050]	[0.024]		[0.031]	[0.030]	
Finance	0.159	0.160	0.960	0.140	0.167	0.646	0.196	0.132	0.127
	[0.020]	[0.026]		[0.050]	[0.030]		[0.034]	[0.025]	
High tech	0.024	0.015	0.411	0.020	0.013	0.745	0.022	0.026	0.789
	[0.009]	[0.008]		[0.020]	[0.009]		[0.013]	[0.012]	
IT	0.064	0.097	0.182	0.040	0.115	0.049	0.029	0.090	0.017
	[0.014]	[0.021]		[0.028]	[0.026]		[0.014]	[0.021]	
Law	0.058	0.112	0.036	0.100	0.115	0.759	0.073	0.047	0.354
	[0.013]	[0.022]		[0.043]	[0.026]		[0.022]	[0.016]	
Medicine	0.012	0.024	0.329	0.040	0.019	0.493	0.022	0.005	0.225
	[0.006]	[0.011]		[0.028]	[0.011]		[0.013]	[0.005]	
Pharmacueticals	0.021	0.039	0.265	0.040	0.039	0.962	0.029	0.016	0.437
	[0.008]	[0.014]		[0.028]	[0.015]		[0.014]	[0.009]	
Public sector	0.021	0.058	0.044	0.040	0.064	0.483	0.015	0.026	0.446
	[0.008]	[0.016]		[0.028]	[0.020]		[0.010]	[0.012]	
Tourism	0.003	0.005	0.753	0.000	0.006	0.319	0.000	0.005	0.319
	[0.003]	[0.005]		[0.000]	[0.006]		[0.000]	[0.005]	
Observations	330	211		50	161		139	191	

Notes: This table reports means and standard errors (in brackets) for various characteristics of board members of listed firms in Norway in 2009. These firms are affected by the gender representation law. Average characteristics are reported separately for men and women, along with the *p*-value associated with the difference in means. Fewer observations are available for age and committee memberships.