

DISCUSSION PAPER SERIES

IZA DP No. 15691

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## ABSTRACT

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# Gender Diversity, Labour in the Boardroom and Gender Quotas\*

This study investigates boards of (non-executive) directors and whether employee representation has a positive effect on gender diversity on boards. We exploit rich, newly assembled board–director matched panel data for Norway and Germany, which contain unique information on whether a director represents shareholders or employees during the period around 2008, when a Norwegian board gender quota came into effect. We present two novel results that challenge previous thinking about the effects of board gender quotas on women directors. First, we find a positive impact of employee representation before the gender quota reform on gender diversity. Second, although the Norwegian gender quota has increased the probability of a director being female, the effect through employee representation has relatively decreased after the implementation of the reform. We discuss potential mechanisms and implications for the design of co-determination laws and gender quotas.

**JEL Classification:** G3, J16, K3, L21, L25, M54

**Keywords:** affirmative action, employee representation, shared governance, co-determination, women, boards of directors, firm size

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## INTRODUCTION

International statistics show that women are highly underrepresented in the upper echelons of large public liability corporations (European Commission, 2016; Miller, 2018). For illustration, women account for only 5.2% among Chief Executive Officers (CEO) in Fortune 500 companies (Catalyst, 2019) and on boards of directors less than 10% of the directors were women (OECD, 2020) until 2003. Little change can be observed in the top management, except in boards of (non-executive) directors. During the past 13 years, several countries have introduced board gender quota laws starting with Norway in 2008.<sup>1</sup> These regulate the minimum representation of women on boards of non-executive directors. By 2016, on average 16% are women on boards of directors in the OECD countries, in Norway it is 40 % (OECD, 2020).

The main function of corporate boards is to protect shareholder assets, appoint and monitor the CEO, and strategic involvement (Adams, Hermalin, & Weisbach, 2010; Adams, 2017; Post & Byron, 2015). All corporate boards contain representatives of the shareholder side and the chair who are elected by the general assembly of the corporation. Some countries practice a system of shared governance which implies that boards consist of representatives of the shareholders and gives in addition rights to representatives of the employees to sit on the boards. The aim is to balance workers and shareholder interests in order to democratize corporate governance.<sup>2</sup> Employee representatives are either elected by and among the employees of the corporation or the unions. A group of 13 European countries have long had shared governance in place, among these are Norway and Germany countries with relatively

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<sup>1</sup> Belgium, Germany, France, Italy, Austria, Portugal, and the Netherlands have introduced binding board gender quota laws, and Denmark, Ireland, Greece, Spain, Luxembourg, Poland, Slovenia, Sweden, Finland, and the UK have introduced soft measures (European Institute for Gender Equality, 2019).

<sup>2</sup> Under shared governance workers can influence board decisions but own no shares.

strong employee representation.<sup>3</sup>In this study, we focus on these board of (non-executive) directors which we also refer in short to as “boards” and all members on the board are referred to as directors or representatives of the shareholders or employees.

Empirical evidence so far has pointed to strong resilience to replace male directors by female ones and it seems that only board gender quotas have so far overcome the male dominance among directors representing shareholders (e.g. Adams & Ferreira, 2009; Ahern & Dittmar, 2012; Eckbo, Nygaard, & Thorburn, 2022; Kirsch, 2019; Maida & Weber, 2019; Matsa & Miller, 2013).<sup>4</sup> Some studies have shown a strong decline in the number of targeted corporations during the announcement period of a board gender quota law (Bøhren & Staubo, 2014), and the tendency to increase board seats instead of substituting male directors (Eckbo et al., 2022). A so far neglected aspect of board of directors is the potential role of employee representation or shared governance that might challenge previous thinking about the effects of gender quotas on the board gender composition. Employee representation might break the homophily of boards and increase gender diversity including possible interaction effects with the board gender quota.

This study investigates whether shared governance significantly increases gender diversity among board directors. We test this hypothesis empirically by a difference-in-differences estimation approach that compares boards with employee representation status and

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<sup>3</sup> The 13 countries are Austria, Croatia, Denmark, Finland, France, Germany, Hungary, Luxembourg, the Netherlands, Norway, Slovakia, Slovenia, and Sweden (Conchon, Kluge, & Stollt, 2015).

<sup>4</sup> The research literature has pointed to several explanations of the underrepresentation of women in top leadership positions. A main reason why women earn less and are less likely promoted the lower human capital compared to men due to lower investment into education and less work experience (Mincer & Polachek, 1974; Bertrand & Hallock, 2001). Traditionally, women take longer work interruptions due to bearing and rearing children and are more likely to work part-time which has negative effects on human capital acquisition and career progression. Some studies show these costs are particularly high for the high-skilled (Ejrnæs & Kunze, 2013, England *et al.*, 2016, Bütikofer *et al.*, 2017). As a result, relatively few women are found in the pipeline for promotion, which is referred to as the frozen pipeline.

boards without in the Norwegian setting around the period of the introduction of the board gender quota reform. To test robustness to general trends, we use Germany as a control group.

We predict that co-determination leads to more gender diversity on boards or the likelihood that a director is female from the perspectives of upper echelons theory (Hambrick & Mason, 1984; Hambrick, 2007) and contact theory (Pettigrew & Tropp, 2006). One view is that the inclusion of employee representatives on boards introduces more heterogeneous experiences and values of directors which can lead to an increased likelihood that directors are female. Another view is that more gender mixed work environments that expose men more likely to work in gender mixed teams and alongside female colleagues change attitudes towards less gender biased views. We discuss these arguments in more detail in addition to the view that unions, that act on behalf of employees, can be important drivers of equality, and gender equality, particularly.

This study tests the theoretical predictions using newly assembled board-director-panel data for public limited corporations and the corresponding legal regulations in Norway and Germany during the period 2000 to 2009. Particularly, we estimate the causal effects of shared governance and the gender quota law on female representation on boards. Our empirical approach has several advantages for our analysis. First, our data on gender diversity, defined as the share of females on a board of (non-executive) directors, contain considerable identifying variation across boards/corporations and time.<sup>5</sup> Second, in our data we observe for each director whether the director represents the shareholders or employees. Since we can trace all directors on a board, we can also measure employee representation status of a board. To estimate the effect of shared governance on gender diversity we exploit the quasi-experimental cross-

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<sup>5</sup> Internationally and historically the level of female representation on boards has been low and variation has been small until the late 1990s.

sectional variation in employee representation status of a corporation accruing to the co-determination law that has been in place throughout the entire period in Norway and Germany. As we find, 30% of public limited corporations in Norway have employee representatives, and hence are our treatment group; the remaining form a suitable control group.<sup>6</sup> The hard board gender quota in Norway applies only to shareholder directors. To estimate the effect of the gender quota, we exploit the time variation coming from the introduction of the gender quota in 2008, and carefully distinguish the pre-reform period, the announcement period and the post-reform period. The main novelty of our empirical model compared to the literature<sup>7</sup> is that we allow for effects of shared governance and interacted effects with the time effects of the board gender quota in a difference-in-differences regression model. We then estimate the effect of employee representation (pre-reform), the board gender quota as well as the interacted effects of employee representation and the board gender quota. Our main results are estimated holding firm fixed effects constant to control for any fixed unobserved differences between firms such as industry, organisation, as well as board director characteristics, such as experience and holding multiple directorships. In supplementary results, we also control for general trends, such as the increase of supply of highly skilled women over time, by estimating a triple difference model and use of listed public limited corporations in Germany that also follow strong co-determination laws as a control group. The fact that we can exploit exogenous variation related to a legal framework and a reform makes our analysis less vulnerable to endogeneity issues as they are manifold in the leadership literature (see for reviews in Antonakis, Bendahan, Jacquart, & Lalive, 2010, 2014).

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<sup>6</sup> We discuss in the Estimation Strategy section in more detail the underlying assumptions.

<sup>7</sup> Matsa and Miller (2013) estimate the effect of the gender quota among shareholder elected directors on firm performance in a difference-in-difference framework where the first difference is before and after the reform, and the second is between private and public limited corporations within Norway. Co-determination laws also apply to private limited corporations and hence do not offer additional variation to identify our key parameters of interest.

A caveat of our data is that we cannot observe anything about the appointment process, that is the list of candidates and voting results in the general assembly or among employees. Instead, we rely on detailed observational panel data regarding the observed board composition and employee representation status. We acknowledge that due to the observation window stopping in 2009, we interpret our findings regarding the interacted effect of employee representation and board gender quota as short-term effects after the introduction of the board gender quota, and we cannot draw conclusions regarding the long-term.

Our first key finding is that the presence of employee representatives on the board of directors increases the probability of a director being female during the pre-gender quota period, that is in the absence of a board gender quota. We show this in descriptive graphs as well as in more direct estimates. We find the positive descriptive relationship both for Norway and for Germany during the period before the gender quota. Second, we replicate previous results that the gender quota increases the probability that a director is female during announcement and post period, and present the novel finding that the representation of women among employee-elected directors relatively decreases after the gender quota reform. These are novel findings and have not been explored in the previous literature on gender quotas. We interpret this as an unintended consequence of the Norwegian gender quota to increase female representation on boards. Thus, providing a new way of thinking about employee power on leadership gender composition in corporate governance.

By studying the role of employee representation on boards and its effects on gender diversity we contribute to several strands in the literature. We contribute to the literature in corporate governance on the composition of boards and its increasing interest in the individual director characteristics, and the increase in female representation (Adams, 2017). This literature has shown conflicting evidence on the question whether individual characteristics of directors, particularly female, lead to better financial performance of firms. Part of the reason may be that

skills of directors are not one-dimensional as shown in Adams and Kirchmaier (2016) who look at the industry-gender interactive skills. We add to this strand by considering gender and the functional representation of employees or shareholders.

Our study also ties in with previous management studies analysing the determinants of the presence of women in top management more broadly (Dezső, Ross, & Uribe., 2016) and on boards (e.g., Guldiken, Mallon, Fainshmidt, & Judge, 2019; Kogut, Colomer, & Belinky, 2014), such as organizational reactions to external demands for greater board diversity (Oliver, 1991). Knippen, Shen, and Zhu (2019) analyse the addition of board seats as an organizational reaction to the external social demand for more women on boards.

Our paper also contributes to the literature whether employees benefit from employee representation on corporate boards (e.g. Gorton and Schmidt, 2004). Previous empirical studies have focused on worker and firm outcomes, including productivity and wages, and recent summaries suggest very small effects (for recent studies see Jäger, et al. 2021, Jäger et al. 2022). We add a dimension of firm performance, in terms of diversity and inclusive work-life, that has increasingly importance in the corporate world and find significant positive effects.

## **THEORY FRAMEWORK AND HYPOTHESES**

The previous literature does not provide a clear theoretical discussion of the question whether more employee representation on boards can increase gender diversity on boards. The empirical, mostly descriptive literature has documented the underrepresentation of women on boards (European Commission, 2016; Post & Byron, 2015). An explanation put forward is the reluctance of firms to substitute male directors by female ones. This seems partly related to the stereotypical associations between masculinity and leadership (Koenig, Eagly, Mitchell, & Ristikari, 2011), hindering women to progress to the top echelons. We derive three arguments

from theoretical strands in the management and psychological literature predicting that co-determination may increase gender diversity on boards.

An argument can be based on upper echelons theory (UET) (Hambrick & Mason, 1984; Hambrick, 2007) predicting that breaking the homogeneity of experiences and values of directors through co-determination leads to more gender diversity on boards. UET proposes that leaders form their fields of visions and their evaluations of the firm's strategic situation, based on their values, experiences, and preferences, in addition to certain economic principles such as the marginal and incremental principle. UET uses proxy variables related to demographics or other individual characteristics to capture differences in (unobserved) values and visions. Shareholder representatives typically have recently collected experience as top managers, are in their mid-50s and male and thus are integrated in the corporate elite and the so called 'old boys network' (Ahern & Dittmar, 2012). When director seats are filled with new candidates, position requirements are (mostly informally) formulated based on the characteristics of previous directors. In terms of the similarity attraction paradigm (Byrne, 1971), boards of directors consisting only of shareholder elected directors are more likely to suggest new candidates that have profiles more similar to previous directors respectively role holders. Employee representatives can potentially be white or blue-collar workers of any rank, and connected to the unions rather than to the corporate elite. Employees, the pool of potential employee representatives, work more likely alongside women than upper echelons do due to the underrepresentation of women in leadership positions. Following UET, if shareholder representatives represent more conservative, masculine values and experiences and employee representatives more inclusive and egalitarian values including gender equality, co-determination rules can lead to less male biased appointments or elections of new directors, and more gender diversity (Adams & Funk, 2012). Ultimately, more (gender) diversity on boards may also affect other firm performance outcomes according to UET.

Contact theory can also predict positive effects of employee representation on gender diversity. Contact theory predicts how biases and beliefs of a dominant group, men and male leaders, are affected by exposure or contacts with the minority group, women and women leaders (Pettigrew & Tropp, 2006). Gender-mixed work environments, where men are working alongside women colleagues break down stereotypes and encourage understanding regarding diversity and inclusive work-life. This may be particularly the case if men and women work as peers (Apestequia, Azmat, & Iriberry, 2012), as it is the case regarding the pool of potential employee representatives on boards and those who elect. Previous studies have shown such positive effects through contacts with female business leaders (Beaman, Chattopadhyay, Duflo, Pande, & Topalova, 2009). Finseraas, Johnson, Kotsadam, and Torsvik (2016) have found in a vignette study that the integration of women in a male dominated group leads to changes in the attitudes of men in favour of women and reduces biases against women. Dahl, Kotsadam, and Rooth, (2021) find that living and working with women for eight weeks causes men to have more egalitarian attitudes. This also includes that they prefer mixed-gender group work to single sex groups.

Some studies also suggest that unions seek more equality, and to some extent improve the relative position of women in the labour market. For instance, Farber, Herbst, Kuziemko, and Naidu (2018) show that unions led to significantly more equality in the income distribution in the US during the period from 1936 to 2018. With respect to the link between unions and their impact on women, Blau and Kahn (2003) find that the highly centralized wage setting of unions significantly increases women's pay. Western and Rosenfeld (2011) observe an increase of inequality in hourly wages when membership of private sector unions in the US fell. To our knowledge, no evidence exists on the question whether employee representatives or unions increase female representation in top management positions, including boards. The literature is scarce on whether co-determination causally affects any outcomes, such as firm performance

(Balsmeier, Bermig, and Dilger, 2013), wages or employment. An exception is Jäger, Schoefer, and Heining (2021) who find no significant effects of a reform in the 1970s in Germany that reduced co-determination rights. Using upper echelons theory and contact theory as well as empirical predictions regarding unions we predict that co-determination leads to more gender diversity on boards or the likelihood that directors are female, which is summarised in our first hypothesis:

**Hypothesis (H1).** *Employee representation status of a board leads to an increase in the likelihood that a director is female.*

In this study, we describe with novel board-director level data for Norway and Germany the representation of women on boards and among employee representatives particularly during the period before, during and after the introduction of a gender board quota. Breaking the male dominance through hard board gender quotas could even increase the positive predicted effects through employee representatives on boards. This prediction is in line with Balafoutas, Davis, and Sutter (2016), who have shown that the effectiveness of affirmative action policies, such as gender quotas, depends to a great extent on their acceptance within the affected groups. Previous evidence on the direct effect of gender diversity on firm performance that has used board gender quotas as quasi-experiments is mixed (see, e.g., Ahern & Dittmar, 2012, Matsa & Miller, 2013, Eckbo et al., 2022; Yang, Riepe, Moser, Pull, & Terjesen, 2019 for Norway; Ferreira, Ginglinger, Laguna, & Skalli, 2021, for France and Maida & Weber, 2019, and Ferrari, Ferraro, Profeta, & Pronzato, 2021, and Carbonero, Devicienti, Manello, and Vannoni (2021) for Italy). Board gender quotas can be viewed as a constraint on the appointment of directors regarding gender. This literature however has paid no attention to other constraints through shared governance that regulates board composition in terms of representatives of the

shareholders and employees. We test whether the gender diversity on boards is causally related to laws of co-determination and board gender quotas. We exploit these two institutions as quasi-experiments in a difference-in-differences estimation strategy. Hence, our second hypothesis is:

**Hypothesis (H2).** *The effect of employee representation status on the likelihood that a director is female is increased during the announcement and introduction of a board gender quota.*

### **INSTITUTIONAL BACKGROUND**

For Norway, the Public Company Act in 1997 (“Allmenaksjeloven”) regulates public limited corporations, which can be listed on the Oslo stock exchange. All public limited corporations must have a board of directors consisting typically of independent directors. It must have at least three members (independent of firm size) and at least five members if the corporation has a corporate assembly (“bedriftsforsamling”). Public limited corporations larger than 200 employees must have a corporate assembly. Eventually, how many board directors sit on the board is decided by the general assembly or corporate assembly if it exists. Board directors are elected for a four-year period.

The practice of employee elected board members is a part of the Norwegian industrial relations system dating back to the basic agreement in 1935 between the employee and employer federations, and the law regulating board representation from 1972 (Rasmussen & Huse, 2011). Employees in public limited corporations with at least 30 employees and less than 200 employees can demand to elect employee representatives as board members. If the company size is between 30 and 50 employees, then two-thirds of employees can demand at least one representative. The majority of employees in corporations between 50 and 200 employees can require that one third of the board members, or a minimum of two

representatives are elected by and among employees. Corporations larger than 200 employees must have at least one-third employee representatives. Employee directors and other directors have the same power and rights (Adams, 2017). It should be noted that employee representation is not automatic in Norwegian corporations with less than 200 employees. Employees must explicitly request it by a formal and signed request. We acknowledge that we do not observe the election process in our dataset.

In the empirical analysis, we exploit that we can observe in the board-director-year data how many members a board of directors has and for each director which side he or she represents. As we show with the data, at the mean public limited corporations have 150 employees and 30% of public limited corporations have employee representatives on boards. Listed public limited corporations tend to be larger and 43% have employee representatives (Table 1, Panel B). In the empirical analysis we exploit the comparison of corporations with employee representatives and those without to estimate the effect of employee representation on recruitment of women into boards. The Norwegian case offers advantages in the literature evaluating effects of worker power, since in most countries with co-determination all corporations have employee representatives and therefore researchers lack a control group.

We start the empirical analysis by assuming that whether a corporation practices shared governance or not, and how many employee representatives are on the board of directors is quasi-exogenous and driven by the constraint induced by the law. A question may arise why employees of a corporation and boards diverge from the minimum number of employee-elected board directors. Since the board represents shareholder interests and they form the majority on board, it is in line with the literature to assume that boards are not going to allow more employee elected directors than obligatory by law due to the power dynamics in the boardroom (Bøhren, 2011). A question may however be why in some corporations, employees do not have or want employee elected directors, even though they could have. In robustness tests, we empirically

explore the potential bias to our results if some firms choose no employee representation, or less than the minimum by law. Arguably there is no clear expected bias in either direction.<sup>8</sup>

In addition to shared governance, the board composition in Norway is regulated regarding gender diversity by the gender quota law. Discussions regarding the introduction of a national gender quota in Norway started in 2002 in the Norwegian Parliament and the press. The minister of trade voiced concerns regarding the underrepresentation of women on boards. One year later, the Parliament enacted a voluntary gender quota for public limited corporations both listed and unlisted. In December 2005, as only a few firms had increased the percentage of women on board of directors by then, the Parliament enacted a mandatory “hard” gender quota. Large boards, 9 directors or more, must at least 40% women and 40 % men among shareholder-elected board directors. For smaller boards, the quota is at least 33%.<sup>9</sup> The gender quota specified that the requirement for shareholder representatives on board of directors must be fulfilled by existing public limited corporations by 1 January 2008. Hence, firms had two years to fulfil the binding gender board quota. The ultimate sanction for non-compliance is that the firm is liquidated. Before 2003, there have been no gender diversity goals in place in Norway. For example, Norway did not incorporate gender equality into the Code of Governance.

Depending on the board size and number of employee representatives, the proportion of women and men on the board may diverge from the minimum requirements by the board gender quota law, as we are going to show in the empirical section of the paper. It is crucial to note

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<sup>8</sup> On the one hand, one may argue, that employees prefer to make use of their say in decision-making and power on the board. On the other hand, employees may face high costs of participation in very small firms since board work is additional work to their regular employment. Hence, they may not vote in favor of using the right.

<sup>9</sup> Public act § 6-11a: “Requirement regarding the representation of both sexes on the board of directors” states that on the board of directors of public limited liability companies, both sexes shall be represented in the following manner: (1) If the board of directors has two or three members, both sexes shall be represented, (2) If the board of directors has four or five members, each sex shall be represented by at least two members, (3) If the board of directors has six to eight members, each sex shall be represented by at least three members, (4) If the board of directors has nine members, each sex shall be represented by at least four members, and if the board of directors has more members, each sex shall represent at least 40% of the members of the board, and (5) The rules in Nos. 1 to 4 apply correspondingly for elections of deputy members of the board of directors.

that the law applies only to public limited corporations<sup>10</sup> and the board gender quota is defined as the proportion of women and men among the shareholder-elected directors. The requirement for employee-elected directors in the gender quota law is only that if there are two or more employee representatives on the board of director then both gender must be represented with at least one (§ 6-11 paragraph 2 in the “*Allmennaksjeloven*”). Co-determination laws apply both to private and public limited corporations so that (large) private limited corporations form no control group regarding shared governance.

In the empirical analysis, we use public limited corporations in Germany that are co-determined and larger than 2000 employees as a control group during the period 2002 to 2009. There are three reasons why we argue that Germany is a suitable control group. First, Germany and Norway are among the countries giving most power to labor in the boards of private sector firms and the laws have been long in place. Second, we can assemble comparable board-director-panel data for a relatively long period before the full enforcement of the Norwegian board gender quota for Germany. As for Norway, we can accurately observe whether a board member represents the shareholder side or the employee side. Third, Germany has also introduced a hard board gender quota, although only since 2016. Hence, the period before 2010, long before the introduction, is arguably a suitable pre-gender quota field lab. For more details regarding the German institution see the Appendix A.

## **DATA DESIGN AND DESCRIPTIVE STATISTICS**

For the empirical analyses, we have assembled novel board director–corporation matched panel data for Norway on the population of public limited corporations and for Germany on co-

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<sup>10</sup> Public limited corporations that have few women among their employees (less than 20%) do not have to comply with the gender quota law. As we focus on large firms, this is not often the case and it is restricted to very male-dominated sectors. We cannot measure the composition of employees in our data.

determined public limited corporations larger than 2000 employees. The information in both datasets has been standardized as much as necessary and we use the longest panels suitable for the analyses.

For Norway, we extracted the population of public limited corporations (i.e., ASAs) over the period 1999–2009 from the database of the Brønnøysund Register Centre (“Brønnøysundsregistre”) through the database constructed by Berner, Mjøs, and Olving – BMO (2016).<sup>11</sup> According to Norwegian law, every registered ASA must file a yearly profit and loss account within one month of the general assembly’s acknowledgement of the yearly balance sheet. In addition, every ASA must register the names and gender of the board directors as well as their roles (chair, vice chair, deputy director). All information from these reports are organised in the BMO database. A shortcoming is that it does not contain information on employee-elected board directors and their gender. Therefore, we supplemented the firm-level data by merging individual director-level information from the Brønnøysund Register on directors’ names, genders, and roles, distinguished into shareholder- and employee-elected directors, as well as deputies for the period 1999–2009.

We present results using data on all active public limited corporations in Norway during the observation period along side the subgroup of corporations listed on the stock market. As we show in Appendix Table 1A, the number of all corporations tends to decline over time due to reorganizations and, possibly, closures which may create a concern regarding non-random selection out of the sample (Bøhren & Staubo, 2014). The sample of listed, and larger, corporations is quite balanced and we use these for our main results. Information regarding

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<sup>11</sup> We use the same data source and sample of public limited corporations for Norway as in Eckbo et al. (2022), except that we have additionally merged the director-level information on each corporation with information on the gender of the director and whether the board director represents shareholders or employees.

industry composition for the two samples is also reported in Appendix Table 1A revealing similarities.

The dataset contains detailed information on each board's number of directors, the directors' gender and their status as representatives of shareholders or employees. Through a unique individual identifier, we follow board directors within our sample of public limited corporations, and calculate the number of board seats that a director holds during the same year and the accumulated years of experience as board director. We use these as control variables in our analysis.

For Germany, we assembled a comparable board-director-panel data set containing information on all boards and board directors in all corporations that have parity employee representation on board and have at least 2,000 employees. Parity employee representation means that both employees and shareholders are represented by 50 percent of the directors on the board. The chair of the board is from the shareholders elected. We base the analysis database on the Hans Boeckler Foundation database supplemented by long time series information and additional characteristics. It is a balanced panel of hand-collected director-based information from the corporations' annual reports for the period 2005–2016.<sup>12</sup>The database contains an anonymized identification number for each corporation together with the individual-level director identifiers, the year, the main information on whether directors are employee or shareholder representatives, and the calendar dates of entry to or exit from the board of directors. We define 31 December in every year as the date at which we count a director as part

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<sup>12</sup> The variables that this database contains are the firm name, a unique firm I.D., the financial year, the number of employee representatives, and the firm's legal organizational form. Each director is identified by an anonymous person I.D. In addition, the dataset reports the director's gender, date of appointment, date of resignation (if he/she is no longer in office), representation function (shareholder or employee-elected), and additional functions, such as chairmanship or deputy chairmanship.

of the board.<sup>13</sup> We have extended the time series of individual director characteristics for the period 2002–2004 by referring to the firms’ annual reports and the German database ‘Aktienführer Data Archive’.<sup>14</sup> We added firm-level variables, including the Nomenclature of Economic Activities (NACE) industry code, of each corporation, the number of employees and the company’s founding year; all from the Orbis database and from the annual reports. We have calculated the company age based on the company’s founding year.

### **Summary statistics**

Appendix Table 1A shows with the individual director level data significant differences in board director experiences between employee- and shareholder-elected directors. We find that shareholder elected directors hold at the mean 1 to 1.5 directorships in the same year. For employee-elected directors, the means are considerably lower consistent with that they can only hold a seat in the firm they are employed with (in Norway). Employee-elected directors have an average of four to 18 months’ experience on a board, compared to 3-4 years which is close to one legislative period for shareholder directors.

From the firm level averages reported in the Appendix Table 1A, we find that 30% of all Norwegian firms and 43% of listed Norwegian firms have boards of directors with employee representatives. This is the main control group in our analysis. 45 % of all Norwegian firms are listed on Oslo stock exchange. Nearly all of the German boards are characterized by shared governance, except for few observations (2%) for firm-years in which the boards did not (yet) have shared governance. The proportion of employee representatives is 50 % in accordance

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<sup>13</sup> If a director was on the board earlier during the year but left the board before 31 December, we dropped the member from the corresponding year’s record and only count the director who is a member as of 31 December of the same year.

<sup>14</sup> Because the German data sample from the Boeckler Foundation (2005–2016) only include anonymous person IDs, we cannot perfectly match this sample of directors with the additional board-director-year level information that we collected for 2002–2004.

with parity-representation required by the law. German boards are larger than Norwegian boards: 15 seats compared with five seats for all Norwegian firms and six seats for listed firms. Norwegian firms are smaller than the respective German firms, with an average of 277 employees (for listed firms) compared with an average of 50,922 employees for German firms. Likewise, German firms have substantially larger assets (in Euro) and are older.

## **DESCRIPTIVE ANALYSIS**

### **Graphical analyses of gender diversity on boards**

We start by descriptively analysing whether the degree of gender diversity on the boards differs between the group of employee representatives and shareholder elected directors during the period before and around the introduction of the board gender quota in Norway. Figure 1 plots the percentage of all female directors on the board for Norway as a general measure of gender diversity on boards, and the percentages of female shareholder-directors and employee-representatives. Recall, that the Norwegian gender quota law applies only to the shareholder-elected directors. In the period prior to the reform (2000-2002), the proportion of female directors among all shareholder representatives was quite low, between 4% and 10%. From 2002 to 2003, the proportion began to increase. It is notable that the curve only slowly increased after the law was proposed in 2003 and the voluntary quota was introduced. However, it becomes visibly steeper around 2005 when the quota was enforced and existing public liability corporations had two years to fulfil the quota.<sup>15</sup> In the following, we refer to the period from 2004 to 2007 as the announcement of the quota period or the in-phase period, and 2008 and 2009 as the (immediate) post-reform period. In the post-reform period, we observe that the

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<sup>15</sup> Recall that the penalty for non-compliance is the dissolution of the firm. Note that the Norwegian panel of listed and unlisted public limited corporations is unbalanced. However, the descriptive graph looks very similar if we only use a balanced panel of firms that retains ASAs until 2009, or if we restrict the sample to listed ASAs.

mean proportion of shareholder-elected female directors is 40%. The overall trend in terms of the number of women among shareholder representatives on boards has been examined previously using hand-collected data<sup>16</sup> (Ahern & Dittmar, 2012; Matsa & Miller, 2013) and the same data source that we use (Eckbo et al., 2022).

The novel aspect of Figure 1 is that we add the proportion of women among the employee-elected directors. Strikingly, we find that in the pre-reform period, the proportion of women among employee-elected directors was much larger than that among shareholder-elected directors. Almost 20% of employee-elected directors were female in 1999, and this proportion has slightly increased since then, reaching almost 30% by 2009. In 2006, one year after the voluntary quota was announced, the proportion of women among the shareholder-elected directors overtook the proportion among the employee-elected members. Since then, the growth appears larger in the former group than in the latter. The question arises whether the relatively high percentage of women among employee representatives long before the board gender quota is specific to Norway. Some evidence regarding external validity we can provide by looking at the data for Germany, a country which also has co-determination laws, but that has had no board gender quota before 2016.

-----Insert Figure 1 about here-----

Figure 2 plots with the German data the corresponding percentages. Comparing the proportion of women among employee representatives and shareholder directors, we observe that the former is much higher than the latter—18% compared with 3 to 7%—during the pre-reform period of 2002–2010.<sup>17</sup> In line with the finding for Norway, we also find for Germany

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<sup>16</sup> Eckbo et al. (2022) use data of the Brønnøysund Register Centre (“Brønnøysundsregistre”), which are cleaned and assembled by Berner et al. (2016).

<sup>17</sup> The German law allows for calculation of the gender quota as an overall average. However, mostly likely because there was already greater female representation among employee-elected directors pre-reform, virtually all firms chose to have separate gender quotas after 2015. Hence, both the shareholder- and employee-elected directors had to comply separately with the quota.

that women accounted for about 20% of employee representatives on boards long before the gender quota. Representation among the shareholder directors was relatively low between 3 to 7%. Since 2010, the proportion of women on both sides gradually increased, but the increase remains relatively larger on the shareholder side. While the proportion of shareholder-elected women directors continues to fall short of the female share of employee-elected directors, there is significant convergence.

-----Insert Figure 2 about here-----

### **Corporate instruments to fulfil the quota and shared governance**

Questions arise how the corporations have adjusted to incorporate the law of the board gender quota and co-determination. To explore this question descriptively we run some correlations with the Norwegian data. Corporations can adjust their boards in several ways to reach the quota goal: They can retain the current directors and enlarge their boards by newly recruiting female board directors who either come from outside the pool of previous and experienced directors, or from the existing pool of directors which would lead to an increase in multiple directorships to experienced women directors. We test both hypotheses with our data. The results are reported for public limited corporations in Table 1. The results are quite similar whether we run the regressions on all firms in our sample, or only those listed as reported in Appendix Table 2A. On average listed Norwegian boards have six directors during the pre-reform period. Since the phase-in period of the gender quota law, the board size of Norwegian firms has significantly increased, but by less than one seat. When we distinguish directorships representing employees and shareholders in column 2, we find that the increase is due to an additional seat for employee representatives during the phase-in period.

Firms may also increase the number of women on boards by recruiting experienced female shareholder-elected directors from other boards who are not employees and can sit on

several boards. The results in column 3 reveal a significant increase in the number of seats that a female director holds on different boards in the same year during the period from 2003 to 2009. Compared with the pre-reform period when women held on average 1.2 seats in listed firms, the number of seats increased by 0.36 during the announcement period and an additional 0.28 seats during the post-reform periods, respectively. For men, the average number of board seats declines over the same period. Specifically, we find that male directors hold 0.1 to 0.3 less seats since the reform.

We also investigate to what extent firm size is correlated with our main variable number of employee elected directors around the reform, and whether there is a systematic pattern of firms switching into or out of a board of directors with employee representatives. We find that the number of employee representatives is significantly positively correlated with the number of employees in the firm as the law suggests. Yet, we find no significant differential effects during the announcement or during the post-reform period (that is compared to the pre-reform period). When we use as the outcome whether a board has employee representative or not, then we find a tendency of boards to enter this status during the announcement period. Hence, these correlations suggest that firms have not adjusted firm size in order to meet thresholds in the co-determination law in relation to the introduction of the board gender quota. However, a correlation exists between the variables firm size and employee elected which however seems unrelated to the gender board quota. We account for that in our main empirical analysis of gender diversity through controls for firm fixed effects and for number of employees. In addition, we observe some switching behaviour of boards with respect to employee representation status, a point we return to in the discussion of mechanism.

-----Insert Table 1 about here-----

## REGRESSION RESULTS

### Estimation strategy

Our estimation approach builds on the difference-in-differences regression specification in Matsa and Miller (2013) where they have estimated the effect of the board gender quota law on firm performance by comparing the changes over the period 2003-2009 of public limited corporations (the treatment group) in Norway, to a control group (see for a discussion of the method in the reviews by Antonakis et al., 2010, 2014).<sup>18</sup> We extend and modify the regression specification to our research question. Our main outcomes are two measures of gender diversity on a board. We model the Norwegian gender quota reform and distinguish an announcement period (2003-2007), from the pre-reform period (2000-2002), and post-reform period (2008-2009) in line with the institutional description. Finally, our substantial extension is that we allow for an effect through the presence of employee representatives on the board and the interaction of this effect with the gender quota dummy variables for the announcement and post-reform period on gender diversity among directors.

We specify the main regression model as a linear probability model:

$$Y_{ijt} = \beta_0 + \beta_1 ER_{jt} + \beta_2 Phasein_t + \beta_3 Post_t + \beta_4 Phasein_t * ER_{jt} + \beta_5 Post_t * ER_{jt} + \beta_6 X_{it} + \lambda_j + u_{ijt} \quad (1)$$

where the outcome variable,  $Y_{ijt}$  is a dummy variable, which takes a value of one if the director  $i$  in firm  $j$  and year  $t$  is female, and zero otherwise. For the outcome newly appointed female director, we exploit the director panel structure of our data, and the dummy variable is

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<sup>18</sup> The authors use two alternative control groups that are not exposed to a gender board quota: the other Scandinavian countries and matched private limited corporations in Norway. Note that they do not take into account a potential role of employee elected directors since the gender board quota only applies to shareholder representatives. In their regression, they control for a long array of firm characteristics including firm size and board size in order to exclude the contamination of the key parameters which represent the effect on firm performance in their study.

equal to one if there is a corresponding change observed between two consecutive years within a board, and zero otherwise. When we use newly appointed female directors in equation (1), we control for firm heterogeneity in a more flexible way.

Our key explanatory variables of interest are the variable for employee-representation ( $ER_{jt}$ ) on board  $j$  in year  $t$  and the interactions of  $ER_{jt}$  and the dummy variables for the phase-in period and the post-reform period. The variable  $Phasein_t$  is defined as a dummy variable equal to 1 for the phase-in period (2003-2007) and thereafter, and the variable  $Post_t$  is defined as a dummy variable equal to 1 during the post-reform period (2008-2009). The omitted period is the pre-reform period 2000 to 2002. We have defined the splines such that one can read the marginal effects from our tables. The marginal effects of the gender quota reform on female representation on boards are captured by the coefficients  $\beta_2$  and  $\beta_3$  for the announcement period and the (full enforcement) post-reform periods, respectively. Based on our theoretically derived hypothesis, we predict that the signs of the coefficients are positive.

To account for more heterogeneity and increase precision, we add firm fixed effects,  $\lambda_j$  and controls for individual director and time-varying characteristics, in  $X_{it}$ , namely the number of board seats a director  $i$  holds in year  $t$  and the board director experience that a director  $i$  has in year  $t$  within our sample. For these variables, we also include interaction terms with the characteristic of whether the director is elected by the employees. The error term  $u_{ijt}$  captures additional unobserved idiosyncratic noise.

Our key parameters are  $\beta_1$ ,  $\beta_4$ , and  $\beta_5$  which can be interpreted as the marginal effects of employee-representation on our outcomes in the respective periods. Note that we measure the pure effect of employee representation, and not of the gender of the employee director. The gender of the director is the outcome. This means in the base period (pre-reform), the coefficient  $\beta_1$  measures the direct effect of employee representation on the probability that a director is

female. We hypothesize that the effect is positive, which is consistent with a push factor. The coefficients  $\beta_4$  and  $\beta_5$  estimate the marginal change of the effect of employee representation, respectively. Theoretically, we expect that the effect through shared governance persisted or even was amplified in interaction with the gender quota. Hence, the coefficients are expected to be positive. If employee representation has a positive effect on gender diversity on boards, then we expect at least one of the key coefficients to be significantly positive and all others not significant. The interpretation of the key parameter is then that given the number of shareholder directors, one additional employee representative increases the likelihood of a director being female by 100 times the coefficient estimate.

We start the regression analysis by comparing boards with employee representatives, the treated, to the comparison group of those without employee elected directors, the untreated. We then test whether employee elected directors, holding other factors constant, increase the probability that a director is female (or a newly appointed director) and whether the effect of the board gender quota over time differs between these. Identification of the key parameter depends on that boards with zero employee representatives exist in our sample, and that the observed group allocation is uncorrelated with the error term, or other firm characteristics. In our sample on Norwegian corporations, 70% of boards have no employee-elected directors and thus these firms form the control group. In other estimates, we replace the binary variable for employee representatives by the number of employee representatives to estimate the linear effect. The corresponding variable takes the values between zero and four in the Norwegian sample.

A crucial underlying assumption of our estimation approach is that in the absence of the gender quota reform firms with and without employee representatives would have parallel trends in the outcome of gender diversity. Appendix Figure 1A provides a graphical test of this assumption where we find that during 1999 to 2000, that is prior to 2003, in both groups the

representation of women was low, 3 % among the shareholder directors and 8 % among the rest, and moderately increasing between 2001 and 2002 among employee representatives.

In the estimation exercises of equation (1) we also attempt to address other concerns regarding specification problems. First, we explore how we model the co-determination law and test whether we can distinguish the number of employee representatives from firm size. Recall that the law includes the rule that the number of employee representatives on board is a function of the number of employees<sup>19</sup>, yet we already have controlled for firm fixed effects that may capture some of that correlation as well as director characteristics. Particularly, we run alternative regressions where (1) we add as a control the number of employees in the corporation for firm size and (2) we lag our key variable number of employee representatives and add the lagged number of employees. All these specifications lead to the same results as our main specification. For detailed results see the Appendix Tables 3A to 5A. Second, we test whether general trends in gender diversity on boards explain our findings by using Germany as a control group and estimating a difference-in-difference-in-differences regression. This allows us to test whether the effect is due to a general increase in the inflow of women into board positions, or the board gender quota.

## **Results from Difference-in-Differences**

### **Results for the probability of a director being female**

We present the estimation results for the sample of all Norwegian corporations alongside our main results based on the balanced sample of listed corporations. For each sample, we present three sets of results: the unconditional estimates, estimates conditional on firm fixed effects, and estimates adding individual characteristics of the directors. The unconditional

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<sup>19</sup> Due to the unobserved election process, we cannot exploit this variation for identification.

estimates correspond to a simple difference-in-differences estimator which however may give biased estimates due to firm and director heterogeneity. Therefore, our preferred specification is the within-firm estimate controlling for director characteristics. When we interpret the results, we focus on the Norwegian sample of listed firms, which we later pool with the German data. The results in terms of the direction of the main effects and overall findings tend to be robust to the sample selection.

-----Insert Table 2 about here-----

Table 2 presents the estimation results where we use the employee representation status of a board as the key explanatory variable. Regarding the general effect of the board gender quota, we observe for Norwegian listed firms that the representation of women significantly increased in the phase-in period by 24 percentage points and in post-reform by 29 percentage points.

The estimated coefficient of the employee representation status is interpreted as the percentage point change in the likelihood that a director is female if we compare boards consisting of both shareholder and employee elected directors with boards consisting of only shareholder elected directors. The results for listed Norwegian firms reveal that the probability of a female director is significantly higher, 3.6 to 6.8 percentage points, before the reform if employee representatives are present on the board. The differential effect of the employee representation status is not significant during the announcement period (2003-2007) compared to the pre-reform period (2000-2002). But we observe that the differential effect of employee representation is significantly negative after the introduction of the board gender quota law. The effect is 10 to 15 percentage points lower for listed firms after the board gender quota reform compared to the pre-reform period and the announcement period. For all firms the estimates tend to be slightly smaller when we hold firm fixed effects and board director characteristics constant.

Hence, we find that the gender quota law that targets shareholder representatives has led to an increase in overall diversity on boards. Employee representation before the introduction of the board gender quota has also a marginal positive effect on overall gender diversity on boards, but this effect has turned negative after the quota reform. The results are very similar across all and listed corporations, but the magnitude of the effects tends to be larger among listed firms.

In Table 3, we replace the binary variable for employee representation status by the number of employee elected directors on board which more closely captures the rules in the law and therefore facilitate interpretation. The results confirm that the gender quota has increased the representation of women compared with the pre-reform period. The estimated effect of the number of employee-elected directors can now be interpreted as the marginal percentage point change in the likelihood that the director is female if the number of employee-elected directors increases by one member, holding all other characteristics constant. The estimates on the sample of all listed firms reveal that the probability of a director being female increases before the reform by 1.9 to 2.9 percentage points per additional employee-elected director in listed firms. During the announcement period, the differential effect of the number of employee-elected directors is not significant. After the reform, the effect of shared governance on the probability of a director being female significantly decreases; the differential effect is 4.4 to 5.4 percentage points lower compared with the period before the introduction of the gender quota reform and the announcement period. Controlling for individual director characteristics confirms the main results and slightly increases the precision of the estimates.

-----Insert Table 3 about here-----

To test whether employee representation on board is directly affecting the probability of a female director or it is mediated through firm size as suggested by the law, we also ran regressions controlling for the number of employees in the firm in the same year. The results

are presented in Appendix Table 3A. A comparison with table 3 reveals that the size and significance of the coefficients are unaffected. A concern may be that firm size in the same period is not exogenous.

As an alternative specification we measure both the number of employee representatives and firm size in the year before the outcome which makes these variables pre-determined. Appendix Table 4A reports the results. Note that the number of observations go down since one year is lost because of the inclusion of lagged variables in the regressions. Overall, the results remain unchanged.

The effect of employee representation on board might be correlated with the number of shareholder representatives on the same board and the board size. To test for the power of employee elected directors relative to board size, we replace the number of employee representatives by the share of employee elected directors in  $t$  that is calculated as the number of employee elected directors divided by the number of all directors on board. The corresponding results are reported in Appendix Table 5A and show that the results remain unaffected.<sup>20</sup>

An additional concern might be the question why employees who have the right to a representative on the board of directors do not use their right, and whether this creates an upward bias. If a firm has less than 200 employees, it must first vote to have employee-elected directors on the board. A priori it is unclear in which direction any potential bias of our results would operate. It could be that using the right of employee representation on boards has strong benefits for employees because they can provide information and affect decision-making processes, although it also involves costs if board work is time intensive at low compensation.

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<sup>20</sup> We also tested the same model by additionally controlling for board size as a further robustness check. The results remain and the results are reported in Appendix Table 6A.

If these factors are strongly related to gender attitudes this could bias our results – though not in obvious ways upward. To provide some test, we re-estimate the models on a restricted sample of firms that have at least one employee-elected board director.

In this exercise we can also exploit in more detail the law that rules a soft gender quota among employee representatives, such that only boards with more than one employee representative must have both genders among employee representatives after the introduction of the board gender quota in 2008. In this specification, we replace the main explanatory variable number of employee representatives by a binary variable that is set equal to 1 if the board contains two or more employee representatives, and zero otherwise. The results are presented in Table 4.

-----Insert Table 4 about here-----

Table 4 shows that the effect of having more than one employee representative compared to exactly one is positive and significant prior to the announcement of the board gender quota on the likelihood that the director is female. The other two interacted effects of having more than one employee representative and the period dummies are not significant. These results are robust to the set of conditioning control variables. One may only note that including not listed firms increases the precision of the negative marginal effect post-reform, but the point estimates are similar to those in the regressions for only listed corporations. These additional regression results on the restricted sample lead to the same conclusions as we have drawn before regarding the positive effect of employee representation on gender diversity. The finding regarding the marginal decreasing effect of employee representation post reform seems less strong for the restricted sample. This may suggest the importance of exit and entries of boards into employee representation status. Furthermore, these results reveal that the flexible law regarding gender diversity among employee elected directors has

not increased gender diversity on boards in contrast to the hard quota among shareholder elected directors.

### **Empirical results for newly appointed female directors**

To account for even more heterogeneity, we now estimate equation (1) for the outcome variable whether a newly appointed director is female which is the year-to-year change in female directors. When we examine the estimated coefficients in Table 5 capturing the effects of the number of employee-elected directors on the binary outcome, we now find a significant increase in the probability of a director being female in the case of newly appointed directors for all firms, as well as for listed Norwegian corporations. The point estimate of the differential effect of an additional employee representative, holding director characteristics and firm fixed effects constant, is 1.9 percentage points. The reported results also reveal that the positive effect of employee representation for newly appointed female directors has significantly decreased since the announcement and post period of the Norwegian gender quota law, but with no further change during the post gender quota period. The differential effect during the announcement period of employee elected directors is significant and negative only for listed firms with a point estimate of 1.4 to 1.5 percentage points.

These findings are consistent with the requirement of the gender quota law that the gender quota only applies to shareholder-elected directors. Therefore, it is interesting to see that the effect of the number of employee elected representatives is not significantly decreased more in the post-reform period compared with the announcement period. Thus, the results clearly reveal that during the announcement period, firms focused on hiring new shareholder-elected female directors to fulfil the quota law requirements. A side effect is that significantly fewer employee-elected directors were appointed during the announcement period compared to prior to the

reform. Hence, firms gained flexibility regarding gender diversity through shared governance and the gender quota law.

-----Insert Table 5 about here-----

### **Robustness check: Estimation results using listed German corporations during 2002–2009 as a control group (Triple-Differences Estimation)**

We cannot completely rule out that gender diversity in Norway would have increased even in the absence of a gender quota reform. To address this concern, we use our sample of German listed corporations as a control group during the period 2002 to 2009.

Germany, like Norway, had strong employee representation during the period before 2010, but the composition is completely unaffected by the German gender quota, which was not in place or even seriously discussed until later. Hence, we argue that we observe a relatively pure effect of employee representation on the probability of a director being female after conditioning on the set of variables in our model. By this approach, we can test whether the pure effect of the gender quota reform and the coefficients of interest (the effect of the number of employee-elected directors pre-reform, during the phase-in and post-reform) change or become zero. (See the Appendix for more details on Germany.)<sup>21</sup>

We extend the model for the outcome whether the director is female or not for Norway and estimate a fully interacted model. We define the variable *Treat* as equal to one if the country is Norway, the treated group, and zero if it is Germany, the control group. The triple difference accounts for changes across time that may favour the promotion of women on boards. This may

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<sup>21</sup> We acknowledge that Norwegian and German firms are quite different in our data sets in terms of assets and size, for example. Yet these are the most attractive boards in both of these countries in economic terms. To account for differences in the best way with our data, we present estimates conditional on firm fixed effects and board size.

capture increased investment of women in education and labour force participation. The other variable definitions correspond to the previous ones. We estimate the following linear probability model:

$$I_{Female\ director_{ijt}} = \beta_0 + \beta_1 ER_{jt} + \beta_2 Phasein_t + \beta_3 Post_t + \beta_4 Phasein_t * ER_{jt} + \beta_5 Post_t * ER_{jt} + \beta_6 Treat_j + \beta_7 Treat_j * Post_t + \beta_8 Treat_j * Phasein_t + \beta_9 Treat_j * ER_{jt} + \beta_{10} ER_{jt} * Phasein_t * Treat_j + \beta_{11} ER_{jt} * Post_t * Treat_j + \beta_{12} X_{it} + \lambda_j + u_{ijt}.$$

The coefficients of main interest are now  $\beta_9$ ,  $\beta_{10}$  and  $\beta_{11}$ . These coefficients can be interpreted as the difference-in-differences-in-differences estimates. If employee representation is a factor leading to more women on boards, then we expect at least one of these coefficients to be significant and positive.

-----Insert Table 6 about here-----

From the estimation results of the triple differences model, we see that the positive effects of the gender quota reform in Norway remain. Conditional on firm and individual characteristics, the differential increase in the likelihood that a director is female is 17 percentage points since the phase-in period and an additional 21 percentage points during the post-reform period.

When we turn to the coefficient estimates of the three key variables, i.e., the number of employee-elected board directors interacted with Norway (treated) and the phases, we confirm the sign of our previous findings. The size of the point estimates changes slightly. We find a positive differential effect of the number of employee-elected female directors during the pre-reform period for Norway. However, the differential effect decreases significantly again during the phase-in and post-reform periods. In comparison to our main results on Norway the effects tend to be weaker but support our main results.

## **Summary of results and discussion of mechanisms**

In summary, we find that employee representation significantly increases the likelihood that a director is female on boards of directors. Even though the marginal effects, holding constant other differences, are small since employee representatives account for a small number of seats on boards, the marginal effects are strongly positive and significant. We therefore find support of our hypothesis H1. We present some novel evidence that after the introduction of the board gender quota in Norway, the effect through employee representation has relatively declined. This result is in contrast to our hypothesis H2.

We extend previous findings in the literature on the effected outcomes and mechanisms related to fulfilling a board gender quota as our study shows that corporations have increased gender diversity on the shareholder side, but also have used the flexibility on the employee side. Although boards are not completely free whether they want women among employee elected representatives after the enforcement of the Norwegian board gender quota, they only need both genders represented if there are two or more employee representatives. This is a novel and so far overlooked finding in the literature on the Norwegian board gender quota, and internationally. It seems an unintended effect of the board gender quota on employee- versus shareholder-elected female directors that has not been investigated by previous studies (e.g., Ahern & Dittmar, 2012; Matsa & Miller, 2013).

Our results supporting hypothesis H1 are consistent with theoretical predictions as we have developed them in the theory framework that co-determination leads to more gender diversity on boards from the perspectives of upper echelons theory, contact theory, or mechanisms through more equality oriented-behaviour of unions, or a combination of these.

Questions arise what can explain the relative decrease in appointment of women as employee representatives on boards post reform. The decrease might be because of the reduced demand by firms for female employee-elected directors or the reduced supply in terms of

women seeking appointments as employee-elected directors. From the demand perspective and following our regression results for newly appointed women directors on boards, one explanation could be that the predominant focus was on fulfilling the target of 40% females among shareholder-elected directors after the announcement of the gender quota and less focus was on the presence of women among employee representatives.

From the supply side, our findings raise the question of why fewer women have entered careers as employee-elected directors after the introduction of the board gender quota. One reason for this finding could be that the demand for shareholder-elected directors increased due to the Norwegian gender quota and that women who are qualified to serve as either shareholder or employee directors might have migrated to the shareholder-elected director market. In the Appendix Table 7A we present correlations using the Norwegian director level data to test for such switching among women. We find that after 2003 and before the board gender quota became binding in Norway the likelihood of switching significantly increased by 17 percentage points; that is previous female employee representatives were increasingly switching to shareholder director status. This empirical correlation suggests the question whether previous corporate governance studies analyzing the appointment of newly recruited women directors versus so called golden umbrellas of established women directors considered previous experiences as employee directors or only those as shareholder directors. Another mechanism could work through the election process if employees have a strong preference for female candidates among employees only in the absence of a gender quota or female directors on boards in general. To investigate such processes, more detailed data on voting behaviour in unions and firms are needed combined with data as we use in this study.

## CONCLUDING REMARKS

This study presents novel empirical evidence on the question of whether employee representation increases gender diversity on boards, and whether interaction effects of the board gender quota and employee representation exist. For the empirical analysis, we exploit newly assembled director–board matched panel data for Norway and Germany during the 2000s. Both of the countries have strong labour power in the board room and since 2008 the Norwegian board gender quota law was fully enacted.

The main result is that there is a positive impact of employee representation on the probability of a director being female. We show that the hard Norwegian gender quota has increased the probability of a director being female, which is consistent with previous studies, (e.g., Ahern & Dittmar, 2012; Matsa & Miller, 2013) but had also an interacted effect with employee representation. We demonstrate an unintended and so far, overlooked effect of the board gender quota, which is that the marginal effect of employee representation on the probability that a director is female has become negative following the introduction of the quota, and implies a relative decrease in this probability. This effect is robust to a number of model assumptions, such as unobserved firm heterogeneity and general trends. Our results also reveal that most adjustments in terms of appointing new women directors to Norwegian boards were already significantly offset during the announcement period of the quota law by a decline in number of female employee-elected directors.

Our study provides new insights into an unintended consequence of gender quotas on boards, but also bears potential for future research. First, we present direct evidence on the short-term effects of shared governance and its interaction effects with the first board gender quota law in the world by employing a difference-in-differences estimation approach and a triple differences approach. The advantage of these empirical approaches is that they address concerns regarding endogeneity. A caveat is that we only estimate short-term effects of the

interacted effect for one country. In future research, it would be valuable to evaluate the German case beyond a descriptive analysis and with a longer time series including post 2016, the year of the introduction of the German board gender quota. It would then be possible to evaluate more long-term effects by the pooled sample and our model allowing for unobserved firm heterogeneity and general trends. Second, more research is needed to analyse the mechanisms behind the unintended reduction in female employee directors after the introduction of the board gender quota in Norway. A crucial question is whether this effect is driven by the demand side in the market or the supply side, that is the pipeline of available women suitable for director positions. Third, and with respect to upper echelons theory (Hambrick and Mason, 1984; Hambrick, 2007), our empirical findings suggest a need to develop a more differentiated and comprehensive social processes theory that incorporates both shareholder-elected directors as well as additional groups of directors with different values and experiences, such as employee-elected directors. This can lead to a better understanding of the mechanisms behind the finding that an affirmative action policy favouring the presence of women on boards leads to a significantly lower appointment of female employee-elected directors on boards.

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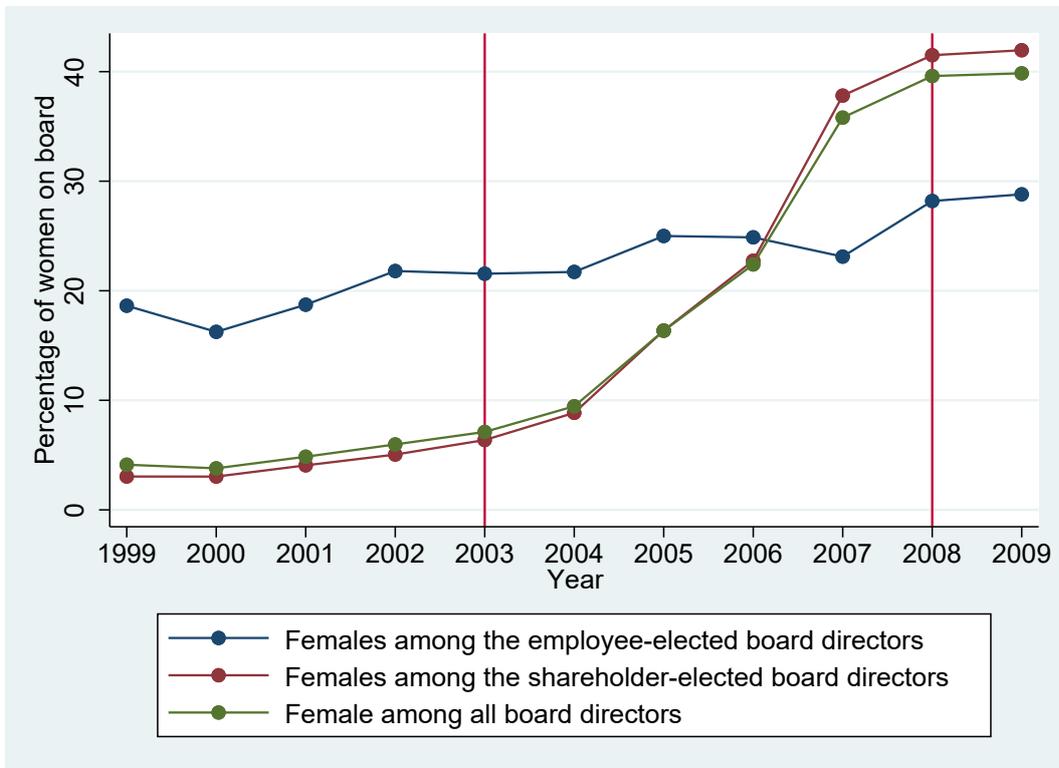
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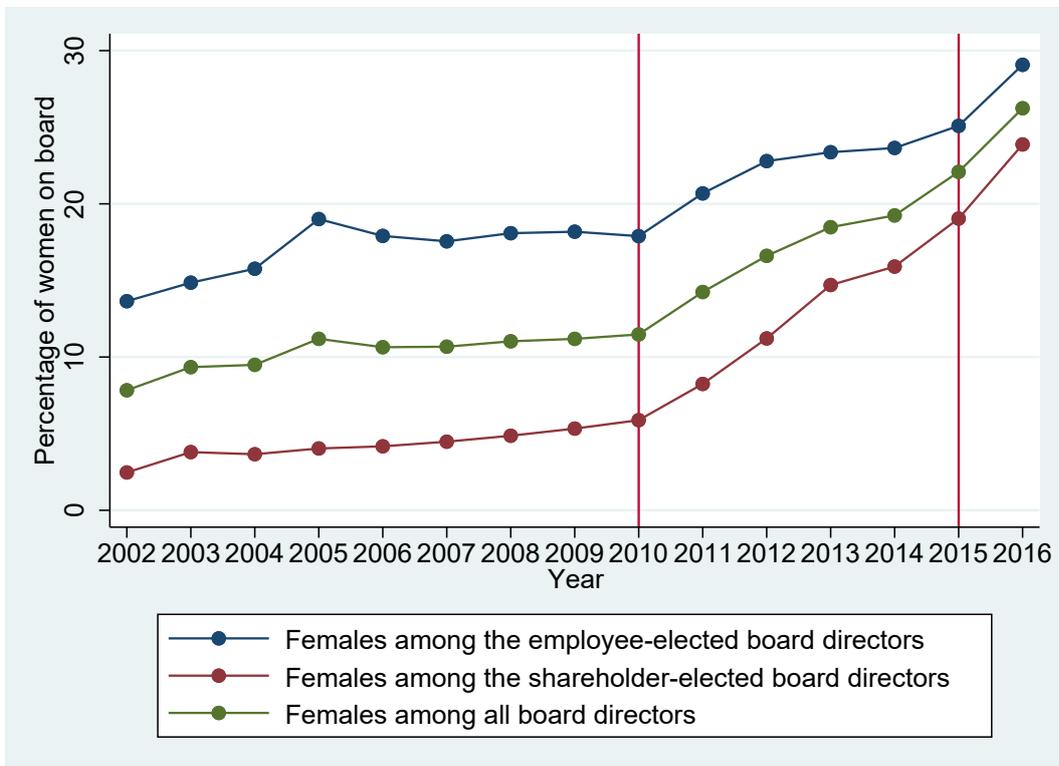
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**Figures**

**FIGURE 1** Percentage of women on Norwegian boards of directors, 1999-2009



**FIGURE 2** Percentage of women on German boards of directors, 2002-2016



## Tables

**Table 1: Corporate instruments to fulfill the quota and shared governance**

	Board size	Board size	# seats	# seats	# employees	ERstatus
<i>Listed</i>						
# employee elected		0.96***	-0.099*	-0.057*	145.6**	
		[0.066]	[0.052]	[0.032]	[69.0]	
=1 if 2003-2009 (phase in)	0.26**	0.13	0.18	-0.17***	-49.6	0.032***
	[0.11]	[0.12]	[0.15]	[0.059]	[47.6]	[0.012]
=1 if 2008-2009 (post)	0.36***	-0.12	0.28**	-0.20***	-130.3	-0.026*
	[0.12]	[0.15]	[0.13]	[0.077]	[81.0]	[0.016]
# employee elected & Phase in		0.0019	0.078	-0.0049	16.1	
		[0.068]	[0.058]	[0.033]	[77.8]	
# employee elected & Post		0.12	-0.065	-0.023	84.5	
		[0.080]	[0.064]	[0.034]	[59.0]	
Constant	5.99***	5.12***	1.46***	1.87***	149.7**	0.023***
	[0.13]	[0.11]	[0.15]	[0.063]	[67.8]	[0.0069]
Number of Observations	1186	1186	1493	6019	1186	1186
R2	0.013	0.50	0.021	0.018	0.029	0.0063
Unit of observation	Firms	Firms	Individuals	Individuals	Firms	Firms
Sample			Female	Male		

Sample 2000-2009 for Norway. Standard errors are presented in parentheses and clustered at the firm level. ERstatus is a binary variable equal to 1 if there are employee representatives on the board.

**Table 2: Regression results for the outcome being a female director, Norway**

Specification with binary variable for board with (=1) or without (=0) employee representatives

	All Norwegian Firms			Listed Norwegian Firms		
Employee representation status	0.076***	0.030**	0.031**	0.068***	0.036*	0.051**
	[0.012]	[0.015]	[0.016]	[0.017]	[0.021]	[0.021]
=1 if 2003-2009 (phase in)	0.11***	0.095***	0.18***	0.15***	0.14***	0.24***
	[0.0075]	[0.0073]	[0.011]	[0.011]	[0.011]	[0.017]
=1 if 2008-2009 (post)	0.27***	0.24***	0.30***	0.22***	0.22***	0.29***
	[0.0085]	[0.010]	[0.011]	[0.011]	[0.014]	[0.015]
Employee representation status & Phase in	0.018	0.014	0.0048	0.0010	-0.011	-0.022
	[0.013]	[0.013]	[0.015]	[0.018]	[0.019]	[0.022]
Employee representation status & Post	-0.12***	-0.11***	-0.13***	-0.10***	-0.11***	-0.15***
	[0.015]	[0.017]	[0.017]	[0.017]	[0.020]	[0.020]
Number of years of experience			-0.051***			-0.054***
			[0.0028]			[0.0041]
# years of experience & employee elected			-0.00087			0.0022
			[0.0065]			[0.0076]
# seats			0.016***			0.021***
			[0.0045]			[0.0071]
# seats & employee elected			-0.026			-0.061**
			[0.024]			[0.029]
Firm Fixed Effect	No	Yes	Yes	No	Yes	Yes
Number of Observations	14881	14881	14881	7512	7512	7512
R2	0.093	0.16	0.22	0.082	0.13	0.20

Sample 2000-2009. Standard errors are presented in parentheses and clustered at the firm level.

The variable employee representation status is equal to zero if a board has no employee representatives and is equal to one otherwise.

**Table 3: Regression results for the outcome being a female director, Norway**  
Specification with number of employee elected board directors

	All Norwegian Firms			Listed Norwegian Firms		
# employee elected	0.032***	0.015***	0.015**	0.029***	0.019***	0.024***
	[0.0048]	[0.0058]	[0.0064]	[0.0068]	[0.0069]	[0.0074]
=1 if 2003-2009 (phase in)	0.11***	0.096***	0.19***	0.15***	0.14***	0.24***
	[0.0073]	[0.0072]	[0.011]	[0.011]	[0.011]	[0.016]
=1 if 2008-2009 (post)	0.27***	0.24***	0.30***	0.23***	0.22***	0.28***
	[0.0086]	[0.010]	[0.011]	[0.011]	[0.013]	[0.014]
# employee elected & Phase in	0.0092*	0.0049	0.0013	0.0012	-0.0067	-0.0100
	[0.0048]	[0.0049]	[0.0057]	[0.0066]	[0.0065]	[0.0075]
# employee elected & Post	-0.053***	-0.046***	-0.052***	-0.044***	-0.044***	-0.054***
	[0.0062]	[0.0072]	[0.0069]	[0.0070]	[0.0079]	[0.0077]
Number of years of experience			-0.051***			-0.054***
			[0.0028]			[0.0041]
# years of experience & employee elected			-0.00031			0.0028
			[0.0064]			[0.0075]
# seats			0.016***			0.021***
			[0.0045]			[0.0071]
# seats & employee elected			-0.029			-0.064**
			[0.024]			[0.029]
Firm Fixed Effect	No	Yes	Yes	No	Yes	Yes
Number of Observations	14881	14881	14881	7512	7512	7512
R2	0.095	0.16	0.22	0.084	0.13	0.20

Sample 2000-2009. Standard errors are presented in parentheses and clustered at the firm level.

**Table 4: Regression results for the outcome being a female director**  
Specification as in Table 5 on a reduced sample of only boards with at least one employee elected board director. Binary explanatory variable that is equal to 0 if one employee elected board director, and equal to 1 if more than one.

	All Norwegian Firms			Listed Norwegian Firms		
# employee elected >1	0.028**	0.040***	0.040**	0.028*	0.032*	0.033*
	[0.013]	[0.015]	[0.016]	[0.016]	[0.017]	[0.020]
=1 if 2003-2009 (phase in)	0.079**	0.090***	0.15***	0.12**	0.096***	0.16***
	[0.031]	[0.029]	[0.030]	[0.051]	[0.033]	[0.037]
=1 if 2008-2009 (post)	0.23***	0.21***	0.26***	0.18***	0.20***	0.24***
	[0.029]	[0.046]	[0.046]	[0.043]	[0.069]	[0.087]
# employee elected >1 & Phase in	0.053*	0.016	0.026	0.036	0.032	0.040
	[0.032]	[0.030]	[0.032]	[0.052]	[0.033]	[0.037]
# employee elected >1 & Post	-0.087***	-0.097**	-0.12**	-0.066	-0.10	-0.12
	[0.032]	[0.049]	[0.047]	[0.045]	[0.071]	[0.088]
Number of years of experience			-0.041***			-0.041***
			[0.0047]			[0.0058]
# years of experience & employee elected			-0.0076			-0.0084
			[0.0072]			[0.0084]
# seats			0.017**			0.016
			[0.0086]			[0.011]
# seats & employee elected			0.0012			-0.021
			[0.027]			[0.033]
Firm Fixed Effect	No	Yes	Yes	No	Yes	Yes
Number of observations	5781	5781	5781	3896	3896	3896
R2	0.056	0.12	0.16	0.056	0.10	0.15

Sample 2000-2009. Standard errors are presented in parentheses and clustered at the firm level.

**Table 5: Regression results for the outcome newly appointed female director, Norway**  
Specification as in Table 5.

	All Norwegian Firms			Listed Norwegian Firms		
# employee elected	0.012***	0.012**	0.0093*	0.013***	0.019***	0.019***
	[0.0026]	[0.0049]	[0.0050]	[0.0033]	[0.0056]	[0.0059]
=1 if 2003-2009 (phase in)	0.050***	0.047***	0.11***	0.074***	0.072***	0.14***
	[0.0040]	[0.0044]	[0.0057]	[0.0064]	[0.0067]	[0.0089]
=1 if 2008-2009 (post)	0.017	0.0053	0.041***	-0.022*	-0.033**	0.0097
	[0.012]	[0.012]	[0.011]	[0.013]	[0.013]	[0.013]
# employee elected & Phase in	-0.0022	-0.0054	-0.0059	-0.0075	-0.014***	-0.015***
	[0.0034]	[0.0040]	[0.0041]	[0.0046]	[0.0052]	[0.0055]
# employee elected & Post	-0.0046	-0.0013	-0.0047	0.0051	0.0076	0.0013
	[0.0059]	[0.0066]	[0.0058]	[0.0064]	[0.0069]	[0.0065]
Firm Fixed Effect	No	Yes	Yes	No	Yes	Yes
Director Characteristics	No	No	Yes	No	No	Yes
Number of Observations	14881	14881	14881	7512	7512	7512
R2	0.017	0.048	0.14	0.017	0.038	0.13

Sample 2000-2009. Standard errors are presented in parentheses and clustered at the firm level.

**Table 6: Regression results for the outcome being a female director, pooled for Norway and Germany**

	All listed Firms					
# employee elected	0.0032	0.010**	0.0071*	-0.0076	0.0045	-0.00044
	[0.0040]	[0.0043]	[0.0041]	[0.0066]	[0.0055]	[0.0054]
=1 if 2003-2009 (phase in)	0.023	0.011	-0.039	0.040	0.021	-0.026
	[0.031]	[0.028]	[0.031]	[0.035]	[0.030]	[0.033]
=1 if 2008-2009 (post)	0.012	0.0095	0.020	0.022	0.014	0.025
	[0.028]	[0.025]	[0.025]	[0.029]	[0.026]	[0.026]
=1 if Norway, =0 if Germany	-0.0032	-0.12***	-0.055	-0.012	-0.096**	-0.020
	[0.037]	[0.039]	[0.041]	[0.039]	[0.043]	[0.046]
=1 if phase in and Norway	0.12***	0.12***	0.19***	0.10***	0.11***	0.17***
	[0.034]	[0.031]	[0.035]	[0.037]	[0.032]	[0.036]
=1 if post and Norway	0.21***	0.20***	0.21***	0.20***	0.20***	0.21***
	[0.031]	[0.029]	[0.028]	[0.031]	[0.029]	[0.029]
# employee elected & Phase in	0.00034	0.0011	0.0044	-0.0016	0.000069	0.0031
	[0.0036]	[0.0033]	[0.0035]	[0.0040]	[0.0035]	[0.0038]
# employee elected & Post	0.0000093	-0.00019	-0.00046	-0.0012	-0.00055	-0.00092
	[0.0035]	[0.0031]	[0.0031]	[0.0036]	[0.0032]	[0.0031]
# employee elected & Norway	0.033***	0.016	0.012	0.038***	0.019*	0.016
	[0.0092]	[0.010]	[0.0100]	[0.0096]	[0.010]	[0.010]
No. employee elected & Phase in & Norway	-0.0084	-0.014*	-0.018**	-0.0067	-0.013	-0.017**
	[0.0087]	[0.0080]	[0.0082]	[0.0087]	[0.0082]	[0.0084]
# employee elected & Post & Norway	-0.043***	-0.043***	-0.047***	-0.043***	-0.043***	-0.047***
	[0.0078]	[0.0083]	[0.0078]	[0.0078]	[0.0083]	[0.0078]
Firm Fixed Effect	No	Yes	Yes	No	Yes	Yes
Director Characteristics	No	No	Yes	No	No	Yes
Board size	No	No	No	Yes	Yes	Yes
Number of Observations	17460	17460	17460	17460	17460	17460
R2	0.057	0.11	0.14	0.057	0.11	0.14

The sample contains all listed corporations for Norway and Germany for the period 2002 to 2009.

Standard errors are presented in parentheses and clustered at the firm level.

## Appendix: Institutional background for Germany

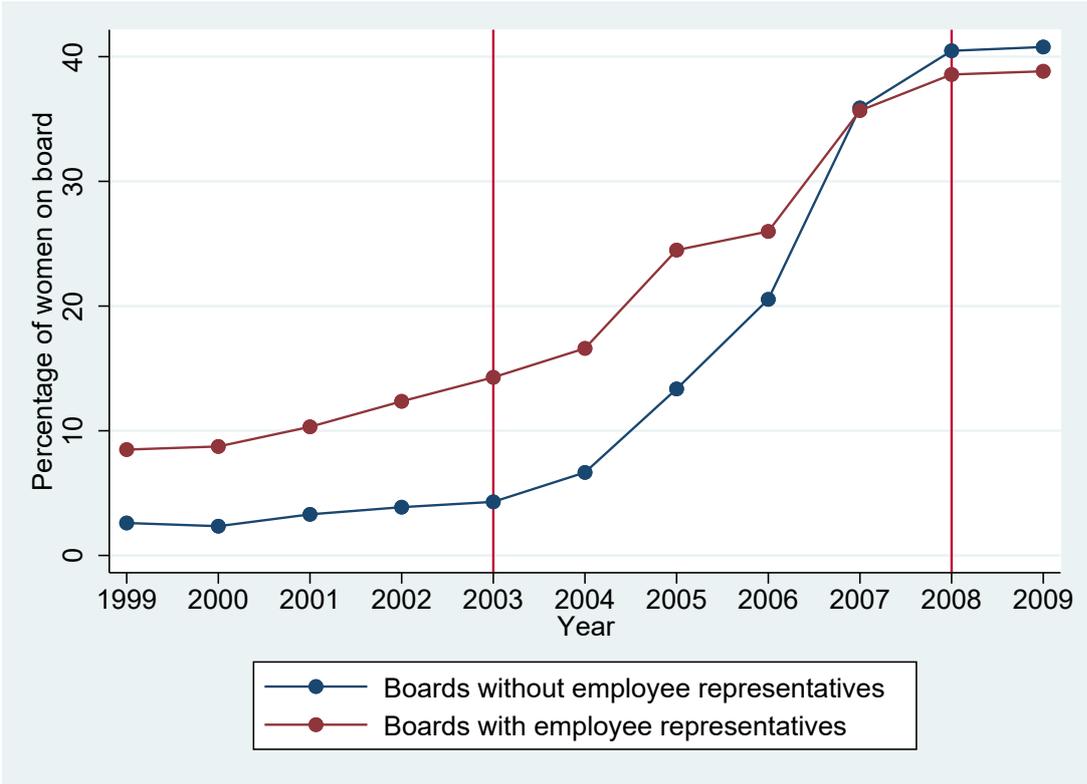
### **Employee representation and the gender quota in Germany**

According to the German Stock Corporation Act (*Aktiengesetz*), the board of directors contains only non-executive directors representing the shareholders or the employees and they are appointed for four years. The size of the board of directors (at least three members) depends on the firm's stock capital, and the number of board members must be divisible by three.

The degree of employee representation on board of directors is regulated in the co-determination law (*Mitbestimmungsgesetz*) and depends on the form of organization, the number of employees and the firm's industry. Under the co-determination law, such corporations have parity employee representation. Half of all the board members represent the shareholders and the other half represent the employees. The chairperson represents the shareholders and has a double vote in board decisions. Shareholder representatives are appointed by the Annual General Meeting. Employee representatives can be employees of the firm or suggested candidates by the unions. All employee representatives are elected by the employees of the company. In our data sample, all German corporations have employee representatives, but the number is varying across firms.

The German Corporate Governance Code (DCGK) first mentioned gender diversity as a goal for firms in a revised version published in 2010 (DCGK, 2010), thus after the observation period (2000-2009) of our study. The German Parliament approved a binding quota in March 2015, which became effective on 1 May 2015, with corporations required to comply from 1 January 2016. The quota requires that a board of directors must fill vacancies with a woman if the board does not have at least 30% of each gender among its directors (Draft of Law of the German Federal Government, 2015). The gender quota applies to approximately 100 listed corporations with employee representation (German Parliament, 2015). In our empirical analyses, we focus on firms affected by the gender quota in 2016, which are those with at least 2,000 employees and parity employee representation on their boards.

**FIGURE 3** Share females on boards of directors by employee representation status, Norway



## Appendix: Tables

**Table 1A: Summary statistics**

	All Norwegian firms sample		Listed Norwegian firms sample		Listed German firms sample	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Panel A: Individual board director characteristics						
Female	0.15	0.36	0.20	0.40	0.11	0.31
New female director appointment	0.06	0.23	0.07	0.26	0.04	0.19
Number of years of board experience	3.40	2.24	3.70	2.44	3.30	3.26
Number of years of board experience of employee elected	0.32	1.07	0.44	1.28	1.56	2.70
Number of years of board experience of shareholder elected	3.08	2.42	3.26	2.68	1.73	2.96
Number of seats	1.58	1.16	1.66	1.22	1.48	1.08
Number of seats & employee elected	0.12	0.33	0.16	0.37	0.54	0.63
Number of seats & shareholder elected	1.46	1.26	1.49	1.35	0.93	1.34
Number of indiv.-year observations	14881		7687		11672	
Panel B: Firm/ board characteristics						
Listed	0.45	0.50	1.00	0.00	1.00	0.00
Number of employee elected	0.67	1.11	1.03	1.27	7.47	2.16
Employee representation status	0.30	0.46	0.43	0.50	0.98	0.14
Board size	5.46	1.88	6.21	1.78	15.41	3.79
Number of employees	151.13	875.67	277.44	1288.88	50922.93	93048.93
Assets in 100T Euro	42.03	269.47	84.33	390.23	241.90	755.92
Age of firm	23.19	29.20	33.20	34.49	83.68	61.28
<i>Industries</i>						
Agriculture	0.03	0.17	0.03	0.16	0.02	0.15
Offshore/Shipping	0.14	0.35	0.24	0.42	0	0
Transport	0.01	0.12	0.02	0.12	0.07	0.25
Manufacturing	0.14	0.35	0.17	0.38	0.51	0.50
Telecom/IT/Technology	0.23	0.42	0.23	0.42	0.03	0.18
Electricity	0.01	0.12	0.02	0.13	0.05	0.21
Building/Construction	0.07	0.25	0.06	0.24	0.02	0.15
Trade	0.10	0.30	0.07	0.25	0.07	0.25
Finance	0.05	0.22	0.01	0.11	0.08	0.27
Other	0.22	0.41	0.16	0.37	0.15	0.36
<i>Years</i>						
2000	0.15	0.36	0.13	0.34	0.00	0.00
2001	0.15	0.35	0.12	0.32	0.00	0.00
2002	0.13	0.34	0.11	0.32	0.09	0.29
2003	0.12	0.33	0.10	0.30	0.10	0.29
2004	0.11	0.32	0.11	0.31	0.10	0.30
2005	0.12	0.32	0.10	0.30	0.13	0.34
2006	0.07	0.25	0.09	0.28	0.14	0.34
2007	0.05	0.23	0.09	0.28	0.15	0.35
2008	0.05	0.22	0.08	0.26	0.15	0.36
2009	0.05	0.21	0.07	0.26	0.15	0.35
Number of Observations	2661		1211		757	

*Note:* The table reports means and standard deviations for the period 2000-2009.

**Table 2A: Corporate instruments to fulfill the quota and shared governance**

	Board size	Board size	# seats	# seats	# employees	1 if ERstatus
<i>All</i>						
# employee elected		1.07***	-0.017	0.022	139.0***	
		[0.049]	[0.025]	[0.028]	[43.8]	
=1 if 2003-2009 (phase in)	0.14*	-0.038	-0.15***	0.29***	-23.2	0.015**
	[0.072]	[0.077]	[0.034]	[0.054]	[19.4]	[0.0069]
=1 if 2008-2009 (post)	0.62***	0.12	-0.18***	0.24**	-68.4*	-0.0060
	[0.12]	[0.13]	[0.059]	[0.098]	[40.0]	[0.012]
# employee elected & Phase in		0.060	-0.018		8.52	
		[0.052]	[0.025]		[54.5]	
# employee elected & Post		0.048	-0.016	-0.031	81.6	
		[0.071]	[0.028]	[0.053]	[69.7]	
Constant	5.32***	4.71***	1.71***	1.16***	64.9***	0.022***
	[0.083]	[0.069]	[0.037]	[0.067]	[22.2]	[0.0043]
Number of Observations	2673	2673	12671	2210	2673	2673
R2	0.013	0.44	0.010	0.020	0.040	0.0018
<i>Listed</i>						
# employee elected		0.96***	-0.038	-0.060**	145.6**	
		[0.066]	[0.038]	[0.025]	[69.0]	
=1 if 2003-2009 (phase in)	0.26**	0.13	0.32***	-0.17***	-49.6	0.032***
	[0.11]	[0.12]	[0.081]	[0.044]	[47.6]	[0.012]
=1 if 2008-2009 (post)	0.36***	-0.12	0.25*	-0.20**	-130.3	-0.026*
	[0.12]	[0.15]	[0.14]	[0.078]	[81.0]	[0.016]
# employee elected & Phase in		0.0019			16.1	
		[0.068]			[77.8]	
# employee elected & Post		0.12	-0.049	-0.025	84.5	
		[0.080]	[0.065]	[0.036]	[59.0]	
Constant	5.99***	5.12***	1.35***	1.87***	149.7**	0.023***
	[0.13]	[0.11]	[0.11]	[0.061]	[67.8]	[0.0069]
Number of Observations	1186	1186	1493	6019	1186	1186
R2	0.013	0.50	0.020	0.018	0.029	0.0063
Unit of observation	Firms	Firms	Individuals	Individuals	Firms	Firms
Sample			Female	Male		

Sample 2000-2009 for Norway. Standard errors are presented in parentheses and clustered at the firm level.

**Table 3A: Regression results for the outcome being a female director, Norway**  
As in Table 3 with additional control for number of employees in the firm in period t

	All Norwegian Firms			Listed Norwegian Firms		
# employee elected	0.030***	0.015***	0.015**	0.027***	0.019***	0.024***
	[0.0049]	[0.0058]	[0.0063]	[0.0068]	[0.0066]	[0.0072]
=1 if 2003-2009 (phase in)	0.11***	0.096***	0.19***	0.15***	0.14***	0.24***
	[0.0073]	[0.0071]	[0.011]	[0.011]	[0.011]	[0.016]
=1 if 2008-2009 (post)	0.28***	0.24***	0.30***	0.23***	0.22***	0.28***
	[0.0086]	[0.010]	[0.011]	[0.011]	[0.013]	[0.014]
# employee elected & Phase in	0.0089*	0.0048	0.0012	0.00083	-0.0068	-0.0099
	[0.0048]	[0.0050]	[0.0057]	[0.0067]	[0.0066]	[0.0077]
# employee elected & Post	-0.055***	-0.046***	-0.052***	-0.046***	-0.044***	-0.054***
	[0.0066]	[0.0072]	[0.0069]	[0.0074]	[0.0079]	[0.0078]
Number of years of experience			-0.051***			-0.054***
			[0.0028]			[0.0041]
# years of experience & employee elected			-0.00028			0.0028
			[0.0065]			[0.0075]
# seats			0.016***			0.021***
			[0.0045]			[0.0071]
# seats & employee elected			-0.029			-0.064**
			[0.024]			[0.029]
Firm Fixed Effect	No	Yes	Yes	No	Yes	Yes
# of Employees	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	14881	14881	14881	7512	7512	7512
R2	0.098	0.16	0.22	0.087	0.13	0.20

Sample 2000-2009. Standard errors are presented in parentheses and clustered at the firm level.

**Table 4A: Regression results for the outcome being a female director, Norway**  
As in Table 3 but with number of employee elected lagged by one period and control for number of employees in the firm in period (t-1)

	All Norwegian Firms			Listed Norwegian Firms		
# employee elected (t-1)	0.029*** [0.0058]	0.0075 [0.0052]	0.0093 [0.0058]	0.030*** [0.0078]	0.022*** [0.0070]	0.025*** [0.0076]
=1 if 2003-2009 (phase in)	0.10*** [0.0080]	0.094*** [0.0075]	0.17*** [0.010]	0.15*** [0.011]	0.13*** [0.011]	0.23*** [0.015]
=1 if 2008-2009 (post)	0.27*** [0.0088]	0.23*** [0.010]	0.29*** [0.011]	0.23*** [0.011]	0.22*** [0.013]	0.28*** [0.015]
# employee elected(t-1) & Phase in	0.0058 [0.0052]	0.0024 [0.0047]	-0.00097 [0.0052]	-0.0059 [0.0067]	-0.0095 [0.0062]	-0.014** [0.0070]
# employee elected(t-1) & Post	-0.053*** [0.0069]	-0.043*** [0.0075]	-0.049*** [0.0073]	-0.045*** [0.0078]	-0.046*** [0.0079]	-0.053*** [0.0080]
Number of years of experience			-0.055*** [0.0030]			-0.059*** [0.0042]
# years of experience & employee elected			0.0061 [0.0069]			0.011 [0.0081]
# seats			0.027*** [0.0059]			0.032*** [0.0084]
# seats & employee elected			-0.060** [0.027]			-0.11*** [0.033]
Firm Fixed Effect	No	Yes	Yes	No	Yes	Yes
# of Employees(t-1)	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	11858	11858	11858	6419	6419	6419
R2	0.086	0.15	0.22	0.071	0.11	0.20

Sample 2000-2009. Standard errors are presented in parentheses and clustered at the firm level.

**Table 5A: Regression results for the outcome being a female director, Norway**  
As in Table 3 but with share of employee elected board directors

	All Norwegian Firms			Listed Norwegian Firms		
Share employee elected	0.23***	0.11**	0.11**	0.19***	0.13**	0.17***
	[0.038]	[0.045]	[0.048]	[0.051]	[0.057]	[0.060]
=1 if 2003-2009 (phase in)	0.11***	0.098***	0.19***	0.15***	0.14***	0.24***
	[0.0074]	[0.0072]	[0.011]	[0.011]	[0.011]	[0.016]
=1 if 2008-2009 (post)	0.27***	0.24***	0.29***	0.22***	0.21***	0.28***
	[0.0086]	[0.010]	[0.011]	[0.011]	[0.014]	[0.015]
Share employee elected & Phase in	0.059	0.020	-0.012	0.0068	-0.058	-0.090
	[0.039]	[0.040]	[0.045]	[0.055]	[0.054]	[0.060]
Share employee elected & Post	-0.37***	-0.32***	-0.38***	-0.31***	-0.32***	-0.41***
	[0.050]	[0.056]	[0.054]	[0.059]	[0.064]	[0.062]
Number of years of experience			-0.051***			-0.054***
			[0.0028]			[0.0041]
# years of experience			-0.00032			0.0026
& employee elected			[0.0065]			[0.0075]
# seats			0.016***			0.021***
			[0.0045]			[0.0071]
# seats & employee elected			-0.028			-0.062**
			[0.024]			[0.029]
Firm Fixed Effect	No	Yes	Yes	No	Yes	Yes
Number of Observations	14881	14881	14881	7512	7512	7512
R2	0.093	0.16	0.22	0.081	0.13	0.20

Sample 2000-2009. Standard errors are presented in parentheses and clustered at the firm level.

The share of employee elected board directors is calculated as the ratio of number of employee elected board directors divided by the total number of directors on board (board size).

**Table 6A: Regression results for the outcome being a female director, Norway**  
 Specification as in Table 3 plus board size as control variable.

	All Norwegian Firms			Listed Norwegian Firms		
# employee elected	0.015***	0.0076	0.0096	0.0095	0.010	0.015**
	[0.0054]	[0.0056]	[0.0062]	[0.0068]	[0.0066]	[0.0076]
=1 if 2003-2009 (phase in)	0.11***	0.097***	0.19***	0.15***	0.14***	0.24***
	[0.0071]	[0.0071]	[0.011]	[0.011]	[0.011]	[0.016]
=1 if 2008-2009 (post)	0.28***	0.24***	0.30***	0.24***	0.22***	0.28***
	[0.0087]	[0.0100]	[0.011]	[0.011]	[0.013]	[0.014]
# employee elected & Phase in	0.0087*	0.0048	0.0012	0.0012	-0.0065	-0.0096
	[0.0047]	[0.0049]	[0.0057]	[0.0064]	[0.0066]	[0.0076]
# employee elected & Post	-0.056***	-0.047***	-0.053***	-0.050***	-0.044***	-0.054***
	[0.0066]	[0.0071]	[0.0068]	[0.0073]	[0.0078]	[0.0077]
Number of years of experience			-0.050***			-0.054***
			[0.0028]			[0.0040]
# years of experience & employee elected			-0.00027			0.0026
			[0.0064]			[0.0074]
# seats			0.016***			0.021***
			[0.0045]			[0.0072]
# seats & employee elected			-0.028			-0.061**
			[0.024]			[0.029]
Firm Fixed Effect	No	Yes	Yes	No	Yes	Yes
# of employees	Yes	Yes	Yes	Yes	Yes	Yes
Board size	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	14881	14881	14881	7512	7512	7512
R2	0.10	0.16	0.22	0.090	0.13	0.20

Sample 2000-2009. Standard errors are presented in parentheses and clustered at the firm level.

**Table 7A: Are women more likely to switch role on boards?**

	Move into employee representative role	Move into shareholder representative role
female* Phase in	0.0082	-0.0079
	[0.013]	[0.052]
female* Phase in	-0.0036	0.17***
	[0.015]	[0.057]
female* Post	-0.0029	-0.14***
	[0.012]	[0.044]
=1 if 2003-2009 (phase in)	-0.0067*	-0.055***
	[0.0041]	[0.016]
=1 if 2008-2009 (post)	0.0058	-0.017
	[0.0064]	[0.025]
Number of Observations	7764	7764
R2	0.00054	0.0064

Director-year panel dataset for Norway, 2001-2009.

Standard errors are presented in parentheses and clustered at the firm level.