Female directors and accounting quality: A quasi-natural experiment research

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Abstract

This study capitalizes on the unique setting created by the enactment of a board gender quota in Norway, which led to an unprecedented increase in the number of female directors within a short timeframe. To examine the impact of female board presence on accounting quality, the study employs a difference-in-differences methodology, taking advantage of this quasi-natural experiment context. Given the inherently endogenous nature of the research topic, the interpretation of the relationship between the number of female directors on the board and accounting quality reported in some prior studies as casual relationships poses challenges. In that regard, this study aims to shed light on an unresolved issue with the implementation of a research design that is particularly robust to endogeneity concerns. The empirical analysis produces compelling results, firmly rejecting any significant impact of female directors on accounting quality. The findings hold strong across various checks.

Key-words: female directors; abnormal accruals; accounting conservatism; earnings response coefficients; difference-in-differences.

JEL: M41, M48.

1. Introduction

There is a well-established body of research exploring how the presence of women in top corporate ranks relates to accounting quality (Garcia-Blandon et al., 2019; García-Lara et al., 2017; Gull et al., 2018). The theoretical foundation for this inquiry draws from the psychology and behavioral economics literatures, which have revealed distinct behavioral differences between men and women (Costa et al., 2001; Feingold, 1994; Schmitt et al., 2008). Gender differences in risk aversion (Abou-El-Sood, 2021; Charness & Gneezy, 2012; Hardies et al., 2013), level of independence (Carter et al., 2003), and moral and ethical standards (Bernardi & Arnold,

1997; Ruegger & King, 1992) raise expectations for an association between women's presence in top corporate roles and accounting quality.

Focusing on the board of directors, while much of the research has centered around the impact of board composition in terms of independent and non-independent directors on accounting quality (e.g., García Osma, 2008; Jaggi et al., 2009; Klein, 2002), more recent studies have delved into the gender composition of boards (García-Lara et al., 2017; Gull et al., 2018; Sultana et al., 2020). Our study aligns with this recent research, investigating the effects of female board representation on accounting quality. To conduct the empirical analysis, we utilize a sample of firms from Norway and Denmark spanning the period 2001-2012. The Scandinavian region during the early 2000s offers a unique research setting to explore the impacts of women on boards on corporate outcomes. Notably, in Norway, board gender diversity experienced a substantial increase, multiplying by eight (from 5% to 41%) between 2001 and 2007 (Ahern & Dittmar, 2012). In contrast, neighboring Denmark witnessed little change in this percentage over the same period. This context presents a quasi-natural experiment setting, where the board gender quota would represent a natural shock. Consequently, this sort of laboratory environment provides an excellent opportunity to deeply analyze how the presence of female directors on boards may influence various corporate outcomes.

This study is motivated by the significant real-world interest surrounding the topic under investigation. The underrepresentation of women in leadership positions is widely recognized as a major challenge for corporations, and it has drawn attention from national governments and supranational institutions alike. To address this issue, an increasing number of countries have implemented board gender quotas, and national codes of good governance now emphasize the importance of achieving a balanced board gender composition. Additionally, global institutions like the United Nations and the European Union have explicitly acknowledged the need to promote gender equality in leadership, as evidenced in the Agenda for Sustainable Development and the Gender Equality Strategy 2020-2025, respectively (Garcia-Blandon et al., 2022). A second motivation stems from the lack of consensus among empirical studies regarding the relationship between female directors and accounting quality. Some studies suggest a positive relationship (e.g., Gul et al., 2011; Thiruvadi & Huang, 2011; Srinidhy et al., 2011), while others report insignificant results (Arioglu, 2020; Sun et al., 2011). Furthermore, certain studies indicate that the relationship is influenced by various factors, such as the type of firm, the role of female directors, or their demographic characteristics (e.g., Arun et al., 2015; García-Lara et al., 2017; Gull et al., 2018). Moreover, it is important to note that these studies have primarily focused on the US context. However, considering the significant influence of a firm's national environment on corporate governance and gender-related issues, caution should be exercised in generalizing the results from these studies. Therefore, evidence from other geographical areas is essential to provide a more comprehensive understanding of the subject. This study intends to contribute to fill this research gap.

The study intends to make a significant contribution to the accounting and corporate governance literatures by utilizing the unique research setting of the board gender quota introduced in Norway in 2006. The new regulation led to an unprecedented increase in the number of female directors on Norwegian boards within a short timeframe. More specifically, the setting of the study and its research design present two important advantages regarding prior related studies. Firstly, to address potential endogeneity issues inherent in studying the relationship between female directors and accounting quality, the study adopts a robust difference-in-differences (diff-in-diff) methodology, widely acknowledged for its effectiveness in

such contexts (Angrist & Pischke, 2010; Antonakis et al., 2014). More specifically, this framework provides advantages over standard regression in addressing causality, controlling for unobserved factors, and addressing temporal trends and spurious correlations. The choice of this research design aligns with previous studies exploring the impact of female directors on firm performance (Ahern & Dittmar, 2012; Dale-Olsen et al., 2013; Eckbo et al., 2022; Garcia-Blandon et al., 2023; Matsa & Miller, 2013; Yang et al., 2019). By employing a quasi-natural experiment approach and implementing the diff-in-diff methodology, the study establishes a strong foundation for drawing causal inferences regarding the relationship between female directors and financial reporting quality. Addressing the concerns raised by García-Lara et al. (2017) regarding female directors serving as a proxy for overall governance quality, the methodology used in this study allows for distinguishing the true impact of female directors on accounting quality. Unlike prior studies where the positive association between female directors and accounting quality may have been merely correlational, the approach taken here enables us to identify female directors as the driving force behind any observed changes in accounting quality following an increase in their representation on boards. Secondly the presence of female directors in our sample of firms is much larger than in prior studies.[1] Examining the effects of female directors on accounting quality using samples with minimal female representation can lead to contradictions and potentially misleading results regarding the impact of gender diversity. By including a more substantial proportion of female directors in our sample, this study is better equipped to thoroughly investigate and offer meaningful insights into the relationship between female directors and accounting quality.

The results of this study present compelling evidence that appointing female directors on the boardroom has no significant impact on accounting quality. This conclusion holds consistently across all proxies of accounting, such as abnormal accruals, accounting conservatism, and investors' perceptions of earnings quality. Given that the quality of accounting information did not change in Norway despite the remarkable increase in female director appointments within a short period, we can infer that similar effects are not likely to be observed in less favorable settings

The study continues as follows. The next Section describes the institutional setting, while Section 3 discusses the literature and develops the hypothesis. Then, Section 4 summarizes the design of the empirical analysis and explains the sample. Finally, Sections 5 and 6 present and discuss the results of the empirical analysis, while the last Section concludes the paper.

2. Institutional setting

Scandinavian countries form a homogeneous region from the point of view of company law legislation, which is the result of a long tradition of cooperation (Gregorič & Hansen, 2017). In terms of corporate governance indicators, Norway and Denmark falls under the Scandinavian civil law category, alongside Finland, and Sweden. The Scandinavian corporate governance system is considered strong and shares similarities with the corporate governance systems of the US and the UK, as noted in the classification scheme by La Porta et al. (1998). Investor protection is another important aspect of corporate governance in Norway. The board structure in Norway and Denmark is described as both one-tier and two-tier, and sometimes even semi

[1] For example, Gul et al. (2011) reported an average of only one female director on boards, and Thiruvadi & Huang (2011) found that 80% of firms had no female directors in the audit committee. In contrast to these studies, our sample shows that female directors hold approximately 40% of the board seats.

two-tier, according to Sinani et al. (2008). This flexibility allows for variations in governance models depending on the specific needs and preferences of companies. Furthermore, both countries have a well-developed system of corporate governance codes which serve as guidelines for companies, promoting best practices and enhancing transparency and accountability in corporate decision-making processes.

Regarding the board gender quota enacted in Norway in 2006, the regulation made a clear distinction between private limited liability companies (AS) and public limited companies (ASA). AS companies are privately owned, while ASA companies are larger and have the option to be listed on the stock market without requiring consent for share trading. The main differences between the two categories have been highlighted in previous research (Bøhren & Strøm, 2010). The board gender quota, targeted at ASA companies, serves the purpose of fostering gender diversity in corporate leadership. In 2003, the Companies Act underwent a reform, mandating a minimum representation of 40% for both genders on the boards of ASA companies. Initially, the compliance with this quota was intended to be voluntary. However, Norwegian regulators' expectation of firms willingly adhering to the gender quota was soon proven incorrect, leading to its enforcement as a mandatory requirement in 2006. Non-compliant firms faced the consequence of liquidation.

3. Background and hypothesis

The presence of female directors on the board is theoretically linked to the quality of accounting information released by the firm. However, before explaining the said association it is necessary to elucidate why and how the board of directors could impact accounting quality. The board plays a crucial role in overseeing managerial actions to ensure shareholder interests are protected (Fama & Jensen, 1983). As accounting information is essential for the board's monitoring function, corporate governance regulations like the Sarbanes-Oxley Act (SOX Act) emphasize the board's accountability over the company's accounting information. Studies have explored the impact of board characteristics on accounting quality, distinguishing between independent and non-independent directors. Boards with a higher proportion of independent directors are expected to better control earnings management by company managers (Dechow et al., 1996; García Osma, 2008; Peasnell et al., 2005). Other research has focused on the expertise of board members, particularly financial expertise, as required by the SOX Act for at least one member of the audit committee (Badolato et al., 2014; Park & Shin, 2004; Shepardson, 2019). Furthermore, there are also studies examining whether the gender composition of the board influences managers' likelihood to engage in earnings management activities (e.g., García-Lara et al., 2017; Gul et al., 2011; Sultana et al., 2020).

There is theoretical background to anticipate a positive impact of female directors on accounting quality. A first set of arguments revolves around the differences between men and women in terms of their behavioral traits. Studies in the fields of psychology and behavioral economics have consistently found that, on average, women tend to be more risk-averse (Charness & Gneezy, 2012; Jianakoplos & Bernasek, 1998; Sunden & Surette, 1998), independent (Adams & Ferreira, 2009), committed to ethical behavior and transparency (Bernardi & Arnold, 1997; Liao et al., 2015; Pierce & Sweeney, 2010; Ruegger & King, 1992), and less overconfident (Croson & Gneezy 2009) compared to men. This suggests that female directors may possess characteristics that make them more effective in the monitoring function over managers assigned to the board. Their higher risk aversion may lead them to be more cautious in approving risky financial

decisions, reducing the likelihood of aggressive earnings management practices. Additionally, their independence and commitment to ethical behavior may result in more objective decision-making and a greater emphasis on financial transparency, which could contribute to better accounting practices. A second set of arguments refers to gender discrimination. Historically, women have faced obstacles and bias in attaining leadership positions (Bilimoria & Piderit, 1994; Farrel & Hersch, 2005). As a result, the relatively few women who do manage to break through these barriers and become directors are often highly competent and talented individuals who have had to demonstrate exceptional capabilities. Thus, female directors appointed in such a context might be more likely to uphold high accounting standards and exhibit better accounting quality, given their rigorous selection process and the higher expectations placed upon them. Furthermore, gender discrimination practices that create a large pool of qualified and talented female candidates for directorships may lead firms that do not discriminate against women to have access to the best candidates available (García-Lara et al., 2017). This, in turn, could result in stronger accounting oversight and higher accounting quality in those firms. Overall, from a theoretical perspective, the positive impact of female directors on accounting quality can be explained by their distinct behavioral traits, such as risk aversion, independence, and commitment to ethical behavior, as well as the potential benefits derived from overcoming gender discrimination, which may lead to the appointment of more competent and capable female directors.

Several studies have empirically examined whether the presence of female directors on corporate boards is linked to differences in accounting quality, primarily focusing on the US context. Early research generally suggests that firms with more female directors exhibit superior accounting quality. For instance, Srinidhy et al.'s (2011) study on the US market from 2001 to 2007 reveals that firms with female directors demonstrate higher earnings quality, measured by discretionary accruals. In a similar vein, Thiruvadi & Huang (2011) explore the US case from 2003 to 2005, concentrating on the audit committee instead of the board's gender composition. They find that having a woman on the audit committee reduces earnings management through discretionary accruals, mirroring the findings of Srinidhy et al. (2011). From a different approach, Gul et al. (2011) examine the US market between 2001 and 2006. While they do not measure accounting quality through earnings management, they use a more indirect measure by examining the informativeness of stock prices. Their results suggest that firms with gender-diverse boards have stock prices that incorporate more firm-specific information, implying higher accounting quality. As an exception, Sun et al. (2011) also investigate the US market but from 2003 to 2005 find no significant association between the number of women on the audit committee and earnings management measured by discretionary accruals.

However, recent studies have presented varied and inconclusive evidence regarding the impact of female directors on accounting quality in different contexts. Fan et al. (2019) studied the US banking sector from 2000 to 2014 and found an inverted U-shaped relationship between the number of female directors and earnings management. The increase in accounting quality was observed when there were three or more female directors. Zalata et al. (2019) focused on US firms from 2007 to 2014 and concluded that the effects of female directors on accounting quality depended on their roles, with monitoring roles showing a positive association. In the European context, studies conducted by Arun et al. (2015) and García-Lara et al. (2017) in the UK revealed conflicting results. Arun et al. (2015) found a positive association between female directors and accounting quality only in firms with low levels of debt, while García-Lara et al. (2017) observed an impact on firms that discriminate against women but not on non-discriminating firms. In Australia, Sultana et al. (2020) discovered a positive impact of female directors on the audit

committee's real earnings management, which weakened over time. Studies in France by Gull et al. (2018), Lakhal et al. (2015), and Damak (2018) also produced mixed results, showing varying effects of female directors on accounting quality. Other studies in different settings also yielded inconclusive findings. For example, Arioglu (2020) found no significant impact in Turkey, while Dobija et al. (2022) and García-Sánchez et al. (2017) reported positive impacts in Poland and an international context, respectively. Finally, García-Lara et al. (2022) observed a decline in financial reporting quality among Norwegian firms most affected by the gender quota enactment. However, it's important to note that the primary focus of their paper was not to assess the impact of female directors on accounting quality. Instead, the study examines the effects of regulations that introduce significant changes to board composition. The authors explicitly state that the reported evidence should not be interpreted as evidence of a negative impact of female directors on accounting quality.

Overall, there is theoretical support for the belief that female directors tend to improve accounting quality more than male directors, and early studies generally supported this view. Therefore, even though more recent evidence is less conclusive about the impact of female directors on accounting quality, the hypothesis of this study is as follows:

Hypothesis: Female directors do increase accounting quality.

4. Research design and sample

4.1. Research design

The empirical analysis employs a diff-in-diff research design, which involves defining two groups as "treated" and "control", and two periods as "pre-treatment" and "post-treatment". The treated group comprises listed companies from Norway, while the control group consists of similar firms from Denmark. The pre-treatment period spans from 2001 to 2006, and the post-treatment period covers the years 2007 to 2012. Norwegian firms are chosen as the treated group because the introduction of a mandatory board gender quota in 2006 led to a significant increase in female directors on their boards within a short timeframe. On the other hand, Danish firms serve as the control group due to their relatively similar institutional corporate environment to Norway (Gregorič & Hansen, 2017) and the relatively stable presence of women on their boards during the study years. This setup creates a quasi-natural experiment setting, where the gender quota acts as an external shock. By comparing the treated and control groups, we can assess the impact of female directors on accounting quality. If female directors effectively restrain earnings management more than male directors, we should observe higher accounting quality in Norway during the post-treatment period, when the percentage of female directors surged, compared to the situation in Denmark, where this percentage remained relatively unchanged (see Figure 1). Accounting quality is measured using three different indicators: abnormal accruals, accounting conservatism, and earnings response coefficients.

Insert Figure 1 around here

4.1.1. Analysis of abnormal accruals

This analysis is based on the regression model represented by Eq. *(1)* below.

$$AWCA_{it} = \beta_0 + \beta_1 * TREAT_i + \beta_2 * POST_t + \beta_3 * TREAT * POST_{i,t} + \\ + \beta_{4\text{-}10} * CONTROLS_{i,t} + fixed\ effects_{i,t} + \varepsilon_{i,t} \qquad (1)$$

The dependent variable is abnormal working capital accruals (*AWCA*) defined as in DeFond & Park (2001) and later used by Carey & Simnet (2006), among other authors. Hence, *AWCA* is the difference between the actual firm's working capital and the expected working capital needed to support the current level of sales, calculated as follows.

$$AWCA_t = WC_t - [(WC_{t-1}/S_{t-1})xS_t] \quad (2)$$

where

WC_t: non-cash working capital in the current year computed as (current assets – cash and short-term investments) - (current liabilities - short-term debt);
WC_{t-1}: non-cash working capital in the previous year;
S_t: sales in the current year;
S_{t-1}: sales in the previous year.

AWCA is scaled by total assets.

There are two justifications for using abnormal working capital accruals instead of Jones-type definitions of accruals (Jones, 1991; Dechow et al., 1996; Kothari et al., 2005). Firstly, due to the relatively small number of observations per year, industry, and country in our sample, it becomes challenging to estimate discretionary accruals on a yearly and industry basis, as seen in some previous studies (Cameran et al., 2016; Francis & Wang, 2008). Secondly, the adoption of abnormal working capital accruals aligns with the findings of prior research that indicates management's discretion over this type of accruals (Ashbaugh et al., 2003; Becker et al., 1998), as also emphasized by Carey & Simnet (2006).

In Eq. *(1),* the variable of interest is the interaction term *TREAT*POST*. According to the hypothesis we anticipate a negative and statistically significant coefficient for this variable. Such a result would indicate lower earnings management and, thus higher accounting quality, in Norway during the post-treatment period. The equation also incorporates the standard control variables used in related literature (Cameran et al., 2016; Carey & Simnett, 2006; DeFond & Park, 2001). These controls include firm size (*SIZE*) to account for the tendency of larger firms to exhibit lower positive and higher negative accruals (Myers et al., 2003). Cash-flow from operations (*CFFO*) is included because of the well-established negative association between cash-flows and accruals (Dechow, 1994; Francis & Wang, 2008; Myers et al., 2003). Financial leverage (*LEVERAGE*) is introduced to control for the stronger incentives of highly leveraged firms to manipulate earnings to avoid debt covenant violations (Francis & Wang, 2008). Sales growth (*GROWTH*) is considered among the controls due to the general correlation between accruals and growth opportunities (Carey & Simnett, 2006). In line with the recommendation by Kothari et al. (2005), the return on assets (*ROA*) is used to capture the non-discretionary component of accruals, as accruals models may not fully capture this aspect. Additionally, we include the reporting of negative net income in the previous year (*LAGLOSS*) because firms at higher risk of financial distress are more prone to earnings manipulation (Francis & Wang, 2008). Lastly, the age of the firm (*AGE*) is included to control for the stability of long-established firms, which are less likely to engage in earnings manipulation (Cameran et al., 2016; Myers et al., 2003). Finally, Eq. *(1)* incorporates fixed effects for year, industry, and firm, which will be included in the estimations based on the specific estimation method used in each case.

4.1.2. Analysis of accounting conservatism

Watts (2003) defines accounting conservatism as the asymmetric verifiability requirement for the recognition of gains and losses. Similar to Cameran et al. (2016), this study measures accounting conservatism through Basu's (1997) model, based on the relationship between earnings and returns. Hence, positive (negative) market returns are considered proxies of good (bad) news. The main idea behind this model is that under accounting conservatism, earnings should be more sensitive to bad news (negative market returns) than to good news (positive market returns). Accordingly, the model represented by Eq. *(3)* below is proposed.

$$EARN_{it} = \beta_0 + \beta_1 RET_{i,t} + \beta_2 DRET_{i,t} + \beta_3 DRET*RET_{i,t} + \beta_4 TREAT_i + \beta_5 POST_t + \beta_6 POST*DRET*RET_{i,t} + \beta_7 TREAT*POST*DRET*RET_{i,t} + fixed\ effects_{i,t} + \varepsilon_{i,t} \quad (3)$$

The variables *EARN*, *RET* and *DRET* are defined as in Cameran et al. (2016). Hence, *EARN* (earnings) is earnings per share before extraordinary items in year *t* divided by the price of the share at the end of the former year; *RET* (market-adjusted returns) is the difference between stock returns and market returns; and *DRET* is a dummy variable which takes the value of 1 if *RET* has a negative value and 0 otherwise. *POST* and *TREAT* are the same variables previously used in Eq. *(1)*. Year, industry and firm fixed effects are used depending on the estimation method.

According to the hypothesis of this study, if female directors were associated with higher levels of accounting quality, we expect β_7 in Eq. *(3)* to be positive and statistically significant. This would indicate that accounting conservatism increased in Norway after the enactment of the board gender quota.

4.1.3. Analysis of investors' perceptions of earnings quality

Investors' perceptions towards the quality reported earnings is also a standard indicator of accounting quality in the accounting literature (Cameran et al., 2016; Ghosh & Moon, 2005; Hodge, 2003). Similar to these studies, we use earnings response coefficients (ERC) as the measure of investors' perceptions of earnings quality. The justification for using ERC is rather straightforward, as one should expect a stronger (weaker) investors' reaction to the release of accounting statements in firms with higher (lower) levels or earnings quality. Similar to Cameran et al. (2016), ERC are obtained from the estimation of Eq. *(4)* below, as $\beta_1 + \beta_2$.

$$RET_{it} = \beta_0 + \beta_1 EARN_{i,t} + \beta_2 \Delta EARN_{i,t} + \beta_3 SIZE_{i,t} + \beta_3 LEVERAGE_{i,t} + fixed\ effects_{i,t} + \varepsilon_{i,t} \quad (4)$$

All the variables in Eq. *(4)* have been used before in Eq. *(1)* or *(3)*, with the exception of *ΔEARN*, which measures the variation in earnings per share, and is computed as earnings per share in year *t* minus earnings per share in year *t-1*, scaled by the stock price in year *t-1*.

To test the hypothesis of this study, we adapt Eq. *(4)* to our specific diff-in-diff research design, leading to Eq. *(5)*. If, as we anticipate, accounting quality increased in Norway in the post-treatment period as a consequence of the unprecedented increase in the number of female directors, $\beta_6 + \beta_7$ should be statistically significant with positive sign.

$$RET_{it} = \beta_0 + \beta_1 EARN_{i,t} + \beta_2 \Delta EARN_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 LEVERAGE_{i,t} + \beta_5 TREAT_i + \beta_6 POST_t + \beta_7 POST*EARN_{i,t} + \beta_8 POST*\Delta EARN_{i,t} + \beta_9 TREAT*POST*EARN_{i,t} + \beta_{10} TREAT*POST*\Delta EARN_{i,t} + fixed\ effects_{i,t} + \varepsilon_{i,t} \quad (5)$$

Insert Table 1 here

4.2. Sample

The sample for the empirical study consists of non-financial firms listed on the stock markets of Norway and Denmark for the research period between 2001 and 2012. Banks and financial services firms, due to their specificities and accounting rules, are excluded from the sample, following the practice in accounting literature (e.g., Cameran et al., 2016; García-Lara et al., 2017). The sample has a panel data structure and consists of 137 firms, with 74 from Norway and 63 from Denmark, resulting in a maximum of 1044 firm-year observations over the twelve-year period. However, in the analysis using abnormal accruals, 87 observations are dropped due to missing data for at least one variable in Eq. *(1)*. Therefore, the final sample for this analysis consists of 957 firm-year observations, forming a panel data structure. Similarly, in the accounting conservatism analysis, 62 observations are excluded, resulting in a final sample of 982 firm-year observations. Regarding the examination of investors' perceptions of earnings quality, all observations for the first year of the research period are omitted because Eq. *(5)* involves the variable *ΔEARN*. The maximum number of observations for this analysis is 957 (87 firms over 11 years), but 73 observations are dropped due to missing data for at least one variable in Eq. *(5)*, leading to a final sample of 884 firm-year observations. All necessary data for constructing the variables used in Eq. *(1)* to *(5)* is obtained from Capital IQ, a database provided by Standard & Poor's. To mitigate the influence of outlier observations, the variables are winsorized at the top and bottom 1% level.

Insert Table 2 here

Table 1 provides the definition of all the variables used in the empirical study, and Table 2 presents some descriptive statistics for these variables. The average values of *POST* and *TREAT* indicate a balanced structure of the sample between observations in the pre and post treatment periods and between the treated and control groups. Moreover, the capital structure of the firms in the sample shows that, on average, debt represents 61% of assets, and 16% of the firms reported losses the previous year. These figures are relatively similar to those reported by Cameran et al. (2016) showing an average use of debt of 53% and about the same percentage of firms reporting losses. Table 3 shows pairwise Pearson correlation coefficients. Focusing on the correlation pattern of the control variables included in Eq. *(1)* to *(5)*, the fact that there is only one coefficient over 0.5 in absolute values (the correlation between *CFFO* and *ROA*) does not suggest serious multicollinearity problems in the estimations.

Insert Table 3 here

5. Results of the empirical analysis

The implementation of diff-in-diff models relies on the assumption that the outcome variables for the treated and control groups would have followed a parallel trend over time in the absence of the treatment (Abadie, 2005). This is known as the parallel trend assumption, which suggests that any divergent behavior of the treated group (Norwegian firms) after the treatment (enactment of the board gender quota) is attributed to the treatment itself. To assess this assumption, Table 4 presents the annual median changes in the dependent variables (*AWCA, ABSAWCA, EARN*, and *RET*) for both the treated and control groups during the pre-treatment period, along with the results of the Mann-Whitney test for median differences between the two groups. The use of changes in these variables leads to the exclusion of the first year of the research period. For *AWCA, ABSAWCA*, and *EARN*, insignificant differences are observed

between the treated and control groups across all years. However, for the variable *RET*, significant differences are noted for the years 2003 and 2006, while the remaining years show no significant differences. This indicates that the parallel trend assumption holds for the analyses based on abnormal accruals and accounting conservatism, but not for the analysis of investors' perceptions of earnings quality. To further address this issue, we conducted the *t*-test of differences of means for the entire pre-treatment period (untabulated). The results reveal insignificance at the usual statistical levels (*p*-value < 0.05). Therefore, we conclude that the parallel trend assumption is supported in the analyses based on abnormal accruals and accounting conservatism, while the evidence is weaker for the analysis involving investors' perceptions of earnings quality.

Insert Table 4 here

5.1. Analysis of abnormal accruals

According to the panel data structure of the dataset, Eq. *(1)* is estimated using fixed effects estimations after conducting the Hausman test, which recommends fixed effects over random effects *(p*-value < 0.01). This estimation involves dropping the time-invariant variable *TREAT* and industry fixed effects from the model, using only firm and year fixed effects. Additionally, to account for the heteroscedastic nature of some independent variables, significance tests are conducted with robust standard errors clustered at the firm level. Table 5 (Column 1) presents the results of the estimation, which is globally significant at the usual levels (*p*-value < 0.01). The main finding is the marginally significant coefficient of the variable of interest, *TREAT*POST* (*p*-value < 0.1). The positive sign of this coefficient suggests that Norwegian firms exhibited lower abnormal accruals after the accelerated incorporation of female directors compared to their Danish counterparts. This finding could indicate a positive impact of female directors on accounting quality, although it should be noted the low level of statistical significance. Furthermore, the results for the control variables show that *CFFO*, *GROWTH*, and *ROA* have significant coefficients with the expected signs (*p*-value < 0.01). Additionally, the coefficient of *LAGLOSS* is marginally significant (*p*-value < 0.1) with an unexpected negative sign. Although the correlation coefficients shown in Table 3 did not indicate serious multicollinearity issues in the dataset, we further assessed this matter by computing variance inflation factors after the estimation of Eq. *(1)*. The relatively low values of these factors[2] support our initial view.

Insert Table 5 here

In the accounting literature, raw abnormal accruals, absolute abnormal accruals, and segmented estimations with positive and negative abnormal accruals are commonly used (Cameran et al., 2016; Carey & Simnett, 2006). To further investigate the consistency of the marginally significant results reported for *TREAT*POST* in Column (1) of Table 5, additional estimations of Eq. *(1)* were conducted using absolute, positive, and negative abnormal accruals. The results of these estimations are presented in Columns (2), (3), and (4) of Table 5, respectively. All the new estimations are statistically significant (*p*-value > 0.01), but in each case, the interaction variable *TREAT*POST* presents an insignificant coefficient.

Insert Table 6 here

[2] See, in parentheses, the VIFs for the independent variables: *SIZE* (2.09); *CFFO* (2.31); *LEVERAGE* (1.52); *GROWTH* (1.37); *ROA* (1.23); *LAGLOSS* (1.02); *AGE* (1.15).

Even though the Hausman test provides support for fixed-effects estimation of Eq. *(1)*, we have conducted estimations with random effects as a robustness check. In these new estimations, the variable *TREAT* was included among the regressors, as it is compatible with the use of random effects. The new estimations included industry and year fixed effects, but not firm fixed effects. The results are presented in Table 6, following the same structure as Table 5. In all cases, the coefficient on the interaction variable *TREAT*POST* was found to be insignificant.

Therefore, we must conclude that the weak effect observed in Table 5 (Column (1)), suggesting higher accounting quality as a result of the increase in the number of female directors, does not hold across different definitions of abnormal accruals (raw, absolute, positive, or negative) or estimation methods (fixed effects or random effects).

5.2. Analysis of accounting conservatism

The second indicator of accounting quality used in this study is accounting conservatism, based on Basu's (1997) model of conditional conservatism. According to our hypothesis, if the appointment of a large number of female directors over a short period had a positive impact on accounting quality, we should observe an increase in accounting conservatism in Norway during the post-treatment period. Table 7 summarizes the results of the estimation of Eq. *(3)* with random effects (Column 1) and fixed effects (Column 2). Significance tests were conducted with robust standard errors clustered at the firm level. The Hausman test (untabulated) supports the use of random effects in the estimation (*p*-value = 0.3107) and, therefore, we base our conclusions on the estimation with random effects. However, the estimates with fixed effects are also reported as a robustness check. The analysis shows insignificant results for *POST*DRET*RET*, indicating that accounting conservatism did not change significantly in the overall sample of firms during the post-treatment period. The main result in Table 7 pertains to the variable *TREAT*POST*DRET*RET*, which should capture the differences in conditional conservatism between Norwegian and Danish firms during the post-treatment period. The insignificant coefficient for this variable indicates that the appointment of a large number of female directors had no significant effect on the level of accounting conservatism of Norwegian firms. This result remains consistent regardless of the estimation method used (with fixed or random effects).

Insert Table 7 here

5.3. Analysis of investors' perceptions of earnings quality

The final analysis of this study focuses on accounting quality as perceived by stock market participants, specifically examining whether ERC changed in Norway during the post-treatment period. Since the hypothesis suggests that female directors are associated with higher accounting quality, we would expect a stronger reaction from investors to the accounting information released by Norwegian firms in the post-treatment period. Table 8 presents the results of the estimation of Eq. *(5)*, using fixed effects (Column 1) and random effects (Column 2). The Hausman test (untabulated) supports estimations with fixed effects (*p*-value < 0.05), and accordingly, the conclusions are based on the results shown in Column 1. However, the estimates with random effects are also reported for robustness. In both estimations, significance tests are conducted with robust standard errors clustered at the firm level. ERC is calculated as the sum of the coefficients of *EARN* and *ΔEARN*. The results in Column 1 show a significant increase in ERC during the post-treatment period, as indicated by the positive and statistically

significant coefficient for *ERC*POST* (*p*-value < 0.01). This suggests that investors perceived higher accounting quality in the second half of the research period. However, the key variable of interest in this analysis is *ERC*TREAT*POST*, and its lack of significance indicates that there are no significant differences in ERC between the treated (Norwegian) and control (Danish) groups during the post-treatment period. Therefore, higher perceptions of earnings quality are observed in Norway and Denmark, but no significant differences are found between the two countries. Overall, the results reject any positive impact of female directors on accounting quality. The estimation with random effects in Column 2 supports the overall increase in ERC during the post-treatment period, as indicated by the positive and significant coefficient for *ERC*POST*. However, the negative and significant results for *ERC*TREAT*POST* in this estimation suggest that investors' perceptions of earnings quality actually increased more in Denmark than in Norway. This finding further confirms that the appointment of female directors did not have a significant positive impact on accounting quality.

Insert Table 8 here

6. Discussion

The results of the empirical analysis conducted in this study do not provide support for any significant impact of female directors' presence on corporate boards on accounting quality. The reported evidence remains consistent across different indicators of accounting quality used in the study and is independent of the estimation method employed. It is worth noting that one exception arises in the analysis based on abnormal accruals, where the interaction variable *TREAT*POST* exhibits a negative and marginally significant coefficient (*p*-value < 0.1) when raw abnormal accruals are used. This may suggest a potential positive impact of female directors on accounting quality. However, this particular result lacks robustness, as it does not hold consistently across alternative estimation methods. Moreover, more importantly, the estimations based on absolute, positive, and negative abnormal accruals all yield insignificant results, thus preventing any definitive conclusion regarding a decrease in abnormal accruals in Norway following the appointment of a large number of female directors.

To interpret the findings of this study on the light of the extant evidence, we must warn that the comparability of the evidence obtained in different settings is problematic. This is due to the intrinsically multi-disciplinary nature of the research topic, which integrates issues from the fields of accounting, corporate governance and gender studies, given the importance of the institutional context in these areas of knowledge. Having said that, even though earlier studies have found that the appointment of female directors has a positive impact on financial reporting quality (e.g., Gul et al., 2011; Srinidhy et al., 2011; Thiruvadi & Huang, 2011), recent studies tend to be less conclusive about this result and, for example, they find that the effects of female directors on accounting quality is conditioned by the level of debt of the firm (Arun et al., 2015), a minimum presence of female directors on the board (Damak, 2018), the gender discriminating character of the firm (García-Lara et al., 2017), the specific roles performed by these female directors (Zalata et al., 2019), or the statutory and demographic characteristics of female directors (Gull et al., 2018).

Therefore, the findings of our study oppose those reported by earlier studies. In the introductory section, we argued that the empirical setting of this study characterized by a quasi-natural research setting with an external shock which increased the presence of women on boards dramatically over a short period of time provided the ideal context for conducting this research.

The reasons are twofold: firstly, the implementation of diff-in-diff estimations in this context minimize the influence of endogeneity in our results and, secondly, because the presence of female directors in our sample of firms is much larger than in previous related studies. Regarding the first issue, García-Lara et al. (2017) highlight a potential channel through which female directors could influence accounting quality in earlier studies, suggesting that they may serve as a proxy for better governance quality. This implies the existence of an endogenous relationship between the presence of female directors on the board and accounting quality. In this context, the implementation of a quasi-natural experiment research design should lead to an insignificant effect of female directors on accounting quality, since this methodology is robust to endogeneity concerns. On the other hand, the comparison of our results with those of more recent studies also reveal some interesting issues. First, the lack of a significant impact of female directors on accounting quality is in line with the finding of recent studies which have failed to report sound and significant results on a general basis. For example, García-Lara et al. (2017) find a significant effect of female directors on accounting quality but limited to those firms which discriminate against female directors. Interestingly, in our research setting, the enactment of a mandatory board gender regulation obliged all the companies to achieve a minimum 40% of female presence on boards. This gender quota was designed to eliminate gender discrimination and promote women's access to boardroom positions. In that regard, our results are consistent with those of García-Lara et al. (2017) that the effect of female directors on accounting quality could be driven by gender discrimination against women. In the same vein, Gull et al. (2018) mention the importance of female directors' demographic characteristics to explain their impact on accounting quality. This argument is closely connected with the previous one. In a gender-discriminating context, there is a large pool of qualified and talented female candidates for directorships and firms which does not discriminate against women may have access to the best candidates available (García-Lara et al., 2017). Conversely, in a non-gender discriminating context, as the one investigated in this study, the demographic characteristics of male and female directors should converge, and therefore, the justification for the significant effect of female directors on accounting quality reported by Gull et al. (2018) disappears.

7. Conclusions, implications and limitations

This study takes advantage of the context created by the Norwegian board gender quota, which led to the appointment of a large number of female directors, to investigate how female directors affect accounting quality. The combination of this quasi-natural experiment research setting and difference-in-differences estimations provides robustness to the likely endogenous relationship between the presence of women on boards and accounting quality. However, our results firmly reject any significant impact of female directors on accounting quality.

The study has significant implications for academia and various stakeholders. Firstly, it would contribute to challenge the prevailing notion that female directors invariably improve accounting quality. Despite some recent studies pointing in this direction, the strong research design used in this study adds weight to the conclusion that there is no significant impact of female directors on accounting quality. The substantial increase in female directors from 5% to over 40% should have resulted in noticeable improvements if such an effect existed. Secondly, the findings may also question the widely held belief in corporate governance literature that female directors positively influence governance structures and practices. The lack of impact on earnings management suggests that the presence of female directors might not be directly responsible for the observed positive relationship in earlier studies. Instead, it is likely that well-governed firms tend to appoint more female directors. Moreover, the results challenge gender

studies literature, indicating that gender differences observed in the general population may not necessarily translate into leadership positions. This highlights the need to reevaluate assumptions about gender differences in leadership roles. From a practical standpoint, a higher representation of female directors on the board should not be automatically seen as an indicator of stronger accounting quality. This insight holds significant implications for various stakeholders. For instance, audit firms should refrain from incorporating the number of female directors into their audit fee calculations. Similarly, creditors and shareholders should avoid making assumptions about a firm's financial statement quality based solely on the presence of female directors on the board. Furthermore, policy-makers should not use the argument that enforcing board gender quotas will inherently lead to better-governed firms, particularly concerning accounting quality. The presence of female directors on its own does not guarantee improvements in these specific areas.

This study presents at least two limitations that should be considered when interpreting the findings. Firstly, using Danish firms as the control group in the research design might introduce some potential biases. While Scandinavian countries share significant institutional and corporate similarities, differences in legal and macroeconomic environments between Norway and Denmark could impact the robustness of the analysis. Although Danish firms are commonly used as controls in related studies on the impact of female directors on firm performance, we must acknowledge this potential limitation. Secondly, in the analysis based on accounting conservatism as the indicator of accounting quality, the parallel trend assumption cannot be guaranteed. Accordingly, the results from this particular analysis might not be as robust as the evidence based on abnormal accruals or investors' perceptions of earnings quality.

Lastly, given the importance of country-specific issues on both corporate governance and gender-related issues, the results reported here for Norway should not be broadly generalized. To gain deeper insights, future replications of this study in diverse settings—such as countries with varying levels of gender equality—could prove highly valuable. Particularly, examining board gender quotas that have been implemented in multiple countries following the Norwegian example, and employing difference-in-differences models, would offer a compelling extension of this research. By exploring different contexts, we can better understand the nuanced effects of female directors on accounting quality and other corporate outcomes.

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Table 1. Variable definitions

Variable	Definition
AWCA	Abnormal working capital accruals calculated as actual working capital minus expected working capital.
ABSAWCA	The absolute value of *AWCA*.
POST	1 for the observations of 2007 or later, and 0 otherwise.
TREAT	1 for the observations of Norwegian firms, and 0 otherwise.
EARN	Earnings per share before extraordinary items over the price of the share.
ΔEARN	Change in earnings per share scaled by the price of the share.
RET	The difference between stock returns and market returns.
DRET	1 if *RET* has a negative value, and 0 otherwise.
*TREAT*POST*	The interaction variable resulting of multiplying *TREAT* and *POST*.
SIZE	The logarithm of firm's sales.
CFFO	Cash flow from operations over total assets.
LEVERAGE	Total liabilities over total assets.
GROWTH	The growth of sales over the previous year.
ROA	Earnings before taxes over total assets.
LAGLOSS	1 if the firm reported negative income in the previous year, and 0 otherwise.
AGE	The number of years in logarithms since the foundation of the firm.

Table 2. Summary statistics

	Mean	St. Dev.	p25	Median	p75
AWCA	-0.005	0.061	-0.048	-0.002	0.039
ABSAWCA	0.062	0.054	0.019	0.044	0.093
POST	0.500	0.500	0	0.500	1
TREAT	0.505	0.500	0	1	1
EARN	0.067	0.145	0.011	0.059	0.116
ΔEARN	-0.002	0.146	-0.041	-0.003	0.035
RET	-0.043	0.435	-0.261	-0.026	0.212
DRET	-0.185	0.351	-0.257	-0.200	0
*TREAT*POST*	0.253	0.435	0	0	1
SIZE	7.692	2.012	6.373	7.490	9.043
CFFO	0.069	0.092	0.009	0.065	0.129
LEVERAGE	0.614	0.233	0.442	0.617	0.795
GROWTH	0.092	0.225	-0.035	0.072	0.185
ROA	0.043	0.083	0.006	0.030	0.085
LAGLOSS	0.158	0.365	0	0	0
AGE	4.579	1.338	3.638	4.644	5.106

Variables:

AWCA (abnormal working capital accruals); *ABSAWCA* (absolute value of *AWCA*); *POST* (1 for the observations of 2007 or later, and 0 otherwise); *TREAT* (1 for the observations of Norwegian firms, and 0 otherwise); *EARN* (earnings per share before extraordinary items over the price of the share); *ΔEARN* (change in earnings per share scaled by the price of the share); *RET* (the difference between stock returns and market returns); *DRET* (1 if *RET* has a negative value, and 0 otherwise); *SIZE* (the logarithm of firm's sales); *CFFO* (cash flow from operations over total assets); *LEVERAGE* (total liabilities over total assets); *GROWTH* (the growth of sales over the previous year); *ROA* (earnings before taxes over total assets); *LAGLOSS* (1 if the firm reported negative income in the previous year, and 0 otherwise); and *AGE* (the number of years in logarithms since the foundation of the firm).

Table 3. Pairwise correlations

Variables	*AWCA*	*ABSAWCA*	*POST*	*TREAT*	*EARN*	*ΔEARN*	*RET*	*DRET*	*TREAT*POST*
AWCA	1.000								
ABSAWCA	-0.118***	1.000							
POST	-0.071**	-0.022	1.000						
TREAT	0.041	0.058*	-0.000	1.000					
EARN	0.031	0.059*	-0.027	0.166***	1.000				
ΔEARN	0.005	0.035	-0.004	0.025	0.393***	1.000			
RET	-0.028	-0.112***	-0.093***	-0.027	0.166***	0.095***	1.000		
DRET	-0.020	-0.170***	0.005	-0.036	0.232***	0.077**	0.775***	1.000	
*TREAT*POST*	-0.026	0.032	0.566***	0.605***	0.112***	-0.000	-0.033	0.026	1.000
SIZE	-0.021	-0.194***	0.102***	-0.119***	0.111***	-0.002	0.025	0.087***	-0.004
CFFO	-0.118***	-0.293***	0.059*	-0.108***	0.051*	0.100***	0.166***	0.176***	-0.024
LEVERAGE	-0.078**	0.245***	-0.002	0.124***	0.234***	-0.010	-0.039	-0.042	0.057*
GROWTH	0.274***	0.080**	-0.078**	0.025	0.152***	0.163***	0.091***	0.063**	-0.019
ROA	0.060*	-0.215***	0.013	-0.035	0.357***	0.161***	0.208***	0.248***	0.003
LAGLOSS	-0.027	0.109***	-0.011	-0.017	-0.364***	0.202***	-0.061**	-0.164***	-0.050*
AGE	-0.024	-0.026	0.036	-0.048	0.153***	-0.003	0.043	0.083***	-0.014

Variables	*SIZE*	*CFFO*	*LEVERAGE*	*GROWTH*	*ROA*	*LAGLOSS*
SIZE	1.000					
CFFO	0.284***	1.000				
LEVERAGE	0.171***	-0.390***	1.000			
GROWTH	-0.028	0.109***	0.001	1.000		
ROA	0.216***	0.685***	-0.240***	0.155***	1.000	
LAGLOSS	-0.211***	-0.249***	-0.099***	-0.001	-0.440***	1.000
AGE	0.242***	0.032	0.266***	-0.071**	0.121***	-0.241***

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

Variables:

AWCA (abnormal working capital accruals); *ABSAWCA* (absolute value of *AWCA*); *POST* (1 for the observations of 2007 or later, and 0 otherwise); *TREAT* (1 for the observations of Norwegian firms, and 0 otherwise); *EARN* (earnings per share before extraordinary items over the price of the share); *ΔEARN* (change in earnings per share scaled by the price of the share); *RET* (the difference between stock returns and market returns); *DRET* (1 if *RET* has a negative value, and 0 otherwise); *SIZE* (the logarithm of firm's sales); *CFFO* (cash flow from operations over total assets); *LEVERAGE* (total liabilities over total assets); *GROWTH* (the growth of sales over the previous year); *ROA* (earnings before taxes over total assets); *LAGLOSS* (1 if the firm reported negative income in the previous year, and 0 otherwise); and *AGE* (the number of years in logarithms since the foundation of the firm).

Table 4. Annual median changes of the dependent variables for the treated (Norwegian) and control (Danish) groups during the pre-treatment period, with significance values

	AWCA			*ABSWCA*		
Year	**Treated group**	**Control group**	***P*-value**	**Treated group**	**Control group**	***P*-value**
2002	-1.416	-1.165	0.710	-0.119	-0.255	0.114
2003	-1.311	-0.967	0.484	-0.101	-0.227	0.472
2004	-1.278	-1.139	0.202	0.000	0.355	0.988
2005	-0.970	-1.161	0.879	-0.135	0.342	0.691
2006	-0.867	-1.085	0.988	-0.060	-0.185	0.942

	EARN			*RET*		
Year	**Treated group**	**Control group**	***P*-value**	**Treated group**	**Control group**	***P*-value**
2002	-0.345	-0.134	0.281	-0.694	-0.156	0.657
2003	0.050	0.339	0.529	-1.346	-0.353	0.001
2004	-0.093	-0.266	0.236	-0.479	-0.618	0.514
2005	0.000	-0.148	0.176	-2.052	-1.938	0.507
2006	-0.157	-0.093	0.619	-1.722	-2.347	0.003

The Mann-Whitney test is used for the assessment of statistical significance.

Variables:

AWCA (abnormal working capital accruals); *ABSAWCA* (absolute value of *AWCA*); *EARN* (earnings per share before extraordinary items divided by the price of the share); and *RET* (the difference between stock returns and market returns).

Table 5. Analysis of the impact of the appointment of female directors on abnormal accruals. Estimations performed with fixed effects

VARIABLES	(1) *AWCA*	(2) *ABSAWCA*	(3) Positive *AWCA*	(4) Negative *AWCA*
POST	0.0135	0.000691	0.00532	0.0152
	(0.00944)	(0.00797)	(0.00647)	(0.00941)
*TREAT*POST*	-0.0105*	0.00512	0.00861	-0.00960
	(0.00609)	(0.00797)	(0.00535)	(0.00839)
SIZE	-0.00273	-0.00793	-0.00291	0.00525
	(0.00529)	(0.00620)	(0.00373)	(0.00541)
CFFO	-0.395***	-0.00481	-0.122***	-0.106***
	(0.0445)	(0.0391)	(0.0325)	(0.0388)
LEVERAGE	-0.0289	0.0672**	0.0348*	-0.0446*
	(0.0275)	(0.0289)	(0.0208)	(0.0244)
GROWTH	0.0811***	0.0194**	0.0297***	0.00457
	(0.0155)	(0.00836)	(0.00798)	(0.0113)
ROA	0.170***	0.0177	0.0829**	0.0545
	(0.0584)	(0.0322)	(0.0314)	(0.0414)
LAGLOSS	-0.0111*	-0.000130	-0.000431	0.00278
	(0.00610)	(0.00660)	(0.00508)	(0.00684)
AGE	-0.000714	-0.0184	-0.00600	-0.00203
	(0.0201)	(0.0245)	(0.0142)	(0.0245)
Constant	0.0586	0.160	0.0704	-0.0508
	(0.0923)	(0.133)	(0.0697)	(0.127)
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Industry FE	NO	NO	NO	NO
R-squared	0.206	0.059	0.136	0.086
F-value	10.99***	3.20***	3.16***	2.56***
Observations	957	957	463	494

Robust standard errors in parentheses

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

Variables:

AWCA (abnormal working capital accruals); *ABSAWCA* (absolute value of *AWCA*); *POST* (1 for the observations of 2007 or later, and 0 otherwise); *TREAT* (1 for the observations of Norwegian firms, and 0 otherwise); *EARN* (earnings per share before extraordinary items over the price of the share); *ΔEARN* (change in earnings per share scaled by the price of the share); *RET* (the difference between stock returns and market returns); *DRET* (1 if *RET* has a negative value, and 0 otherwise); *SIZE* (the logarithm of firm's sales); *CFFO* (cash flow from operations over total assets); *LEVERAGE* (total liabilities over total assets); *GROWTH* (the growth of sales over the previous year); *ROA* (earnings before taxes over total assets); *LAGLOSS* (1 if the firm reported negative income in the previous year, and 0 otherwise); and *AGE* (the number of years in logarithms since the foundation of the firm).

Table 6. Analysis of the impact of the appointment of female directors on abnormal accruals. Estimations performed with random effects

VARIABLES	(1) *AWCA*	(2) *ABSAWCA*	(3) Positive *AWCA*	(4) Negative *AWCA*
TREAT	0.00267	-0.00227	-0.00775	0.00553
	(0.00806)	(0.00812)	(0.00995)	(0.0107)
POST	0.0194	0.0115	0.00975	-0.00253
	(0.0124)	(0.00840)	(0.00977)	(0.0149)
*TREAT*POST*	-0.0102	0.00393	0.00767	-0.00504
	(0.00840)	(0.00805)	(0.00873)	(0.0123)
SIZE	0.00134	-0.00421***	-0.00444**	0.00236
	(0.00194)	(0.00149)	(0.00203)	(0.00190)
CFFO	-0.468***	-0.00946	-0.171***	-0.106*
	(0.0653)	(0.0385)	(0.0525)	(0.0625)
LEVERAGE	-0.0170	0.0540**	0.0531**	-0.0541*
	(0.0325)	(0.0220)	(0.0264)	(0.0298)
GROWTH	0.120***	0.0200**	0.0570***	0.00954
	(0.0235)	(0.00789)	(0.0139)	(0.0182)
ROA	0.200**	-0.00219	0.117**	0.0722
	(0.0808)	(0.0332)	(0.0483)	(0.0646)
LAGLOSS	-0.0103	0.00205	0.00655	0.00269
	(0.00842)	(0.00663)	(0.00819)	(0.0103)
AGE	-0.00180	0.00409	-0.00388	-0.00916***
	(0.00223)	(0.00317)	(0.00507)	(0.00348)
Constant	0.0353*	0.0152	0.0618**	0.0164
	(0.0214)	(0.0211)	(0.0289)	(0.0255)
Firm FE	NO	NO	NO	NO
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
R-squared	0.236	0.313	0.475	0.335
Observations	957	957	463	494

Robust standard errors in parentheses

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

Variables:

AWCA (abnormal working capital accruals); *ABSAWCA* (the absolute value of *AWCA*); *POST* (1 if the observation corresponds to a year after 2006, and 0 otherwise); *TREAT* (1 if the observation corresponds to a Norwegian firm, and 0 otherwise); *SIZE* (the logarithm of firm's sales); *CFFO* (cash flow from operations over total assets); *LEVERAGE* (total liabilities over total assets); *GROWTH* (the growth of sales over the previous year); *ROA* (earnings before taxes over total assets); *LAGLOSS* (1 if the firm reported negative income in the previous year, and 0 otherwise); and *AGE* (the number of years in logarithms since the foundation of the firm).

Table 7. Analysis of the impact of the appointment of female directors on accounting conservatism. Dependent variable: *EARN.* Estimations performed with random (in Column (1)) and fixed (in Column (2)) effects

	(1)	(2)
	EARN	*EARN*
VARIABLES	Random Effects	Fixed Effects
RET	0.0274	0.0283
	(0.0294)	(0.0286)
DRET	-0.0177	-0.0185
	(0.0115)	(0.0111)
*DRET*RET*	0.0338	0.0311
	(0.0361)	(0.0353)
TREAT	0.0797**	
	(0.0394)	
POST	-0.0270*	-0.0190
	(0.0163)	(0.0136)
*POST*DRET*RET*	-0.00943	-0.0110
	(0.0360)	(0.0349)
*TREAT*POST*DRET*RET*	-0.0473	-0.0457
	(0.0385)	(0.0368)
Constant	-0.0252	0.0991***
	(0.0402)	(0.0129)
Firm FE	NO	YES
Year FE	YES	YES
Industry FE	YES	NO
R-squared	0.322	0.092
F-value		4.71***
Observations	982	982

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Variables:

EARN (earnings per share before extraordinary items over the price of the share; *RET* (the difference between stock returns and market returns); *DRET* (1 if *RET* has a negative value, and 0 otherwise); *TREAT* (1 for the observations of Norwegian firms, and 0 otherwise); and *POST* (1 for the observations of 2007 or later, and 0 otherwise).

Table 8. Analysis of the impact of the appointment of female directors on investors' perceptions of earnings quality. Dependent variable: *RET*

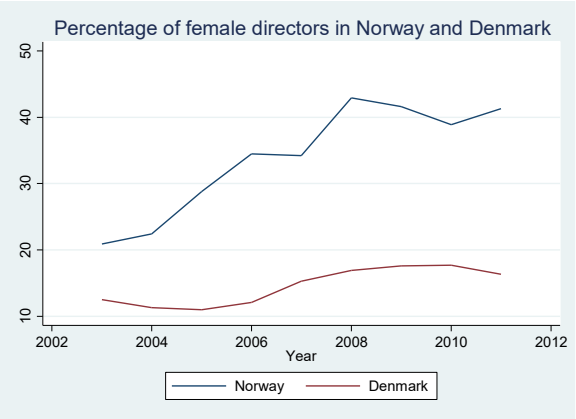
VARIABLES	(1) *RET* Fixed Effects	(2) *RET* Random Effects
EARN	0.737***	0.465***
	(0.160)	(0.166)
ΔEARN	-0.188*	-0.119
	(0.0968)	(0.102)
SIZE	-0.0165	-0.00165
	(0.0228)	(0.00901)
LEVERAGE	0.0126	-0.0643
	(0.192)	(0.137)
POST	-0.415***	-0.260***
	(0.0605)	(0.0397)
TREAT		-0.107***
		(0.0388)
*POST*EARN*	0.493*	0.740***
	(0.268)	(0.267)
*POST*ΔEARN*	0.503***	0.499***
	(0.0145)	(0.0146)
*TREAT*POST*EARN*	-0.231	-0.717***
	(0.280)	(0.265)
*TREAT*POST*ΔEARN*	-0.0988	-0.00467
	(0.166)	(0.148)
Constant	0.397**	0.672***
	(0.191)	(0.109)
Firm FE	YES	NO
Year FE	YES	YES
Industry FE	NO	YES
Observations	884	884
R-squared	0.541	0.551
F-value	51.10***	
ERC	0.549***	0.346**
*ERC*POST*	0.996***	1.239***
*ERC*TREAT*POST*	-0.338	-0.722***

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Variables:

RET (the difference between stock returns and market returns); *EARN* (earnings per share before extraordinary items divided by the price of the share); *ΔEARN* (change in earnings per share scaled by the price of the share); *SIZE* (the logarithm of firm's sales); *LEVERAGE* (total liabilities over total assets); *POST* (1 for the observations of 2007 or later, and 0 otherwise); *TREAT* (1 for the observations of Norwegian firms, and 0 otherwise); and *ERC* (Earnings response coefficient).

Figure 1. The evolution of the percentage of female directors on boards in Norway and Denmark over the research period



Source: OECD (2023).