Top executive gender diversity and financial reporting quality

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ABSTRACT

We examine whether gender diversity of chief executive and chief financial officers (CEOs and CFOs) is associated with financial reporting quality. The CEOs and CFOs of publicly traded companies are both required to certify the appropriateness of their financial statements and annual disclosures. We argue that gender diverse dyads (groups) of executives can bring different perspectives and professional skepticism to financial reporting. Using a sample of different CEO/CFO gender dyads during 2006–2019, we postulate and find evidence of higher accruals quality among firms led by gender-diverse dyads compared to accruals quality reported by firms led by all-male CEO/CFO pairs. Additional analyses reveal that the auditors of firms with gender-diverse executive dyads issue audit reports later, charge higher audit fees, and are more likely to be one of the Big 4 firms. These findings support the view that top executive gender diversity enhances financial reporting quality, which has important implications for corporate governance mechanisms.

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1. Introduction

On December 2, 2001, Enron Corporation declared bankruptcy and became the first in a domino-like chain of major US corporate failures. Three months later, WorldCom followed suit. In both instances, it was women who alerted key personnel to the fraudulent activities taking place: Sherron Watkins at Enron and Cynthia Cooper at WorldCom. While both women were part of the senior management team at their respective firms, neither were influential enough to affect on-going activities. In 2001, the 'C-suite' was almost completely male-dominated — sixteen of the seventeen members of Enron's Board of Directors were male, while fourteen of the fifteen members of WorldCom's Board were male, which likely contributed in part to the boards' decisions to ignore the warnings brought to them by female senior executives.

In the more than 20 years since Enron Corporation and WorldCom collapsed, business and political leaders and social groups have focused on breaking the so-called "glass ceiling" and increasing Board and senior executive gender diversity (e.g., Jeong and Harrison, 2017; Devillard et al., 2018). There were just two female Fortune 500 company CEOs in 2001; in 2020, more than 40 (90) women held a position of CEOs (CFOs) at S&P 500 and Fortune 500 companies (Green and

Roeder, 2020; Hinchliffe, 2022). This increase can be partly attributed to recent research on women in executive roles, which suggests that women are more conservative and risk averse (Hrazdil et al., 2020b; Hrazdil et al., 2023) and tend to be more ethical relative to their male counterparts (Ford and Richardson, 1994; Ye et al., 2010). Similarly, recent research on board gender diversity suggests that firms with gender diverse boards of directors are less likely to engage in financial fraud (Cumming et al., 2015; Wahid, 2019), have fewer internal control weaknesses (Chen et al., 2016), and have higher financial reporting quality (Dobija et al., 2021; Srinidhi et al., 2011; Zalata et al., 2022).[1] The evidence suggests that it is the diversity that improves performance, rather than the gender of a particular decision maker. While the impact of gender diversity on earnings quality has been examined in a board of directors setting, there is relatively little evidence as to whether the gender diversity of the key corporate decision makers affects financial reporting quality.

Accordingly, the objective of this study is to examine whether the gender diversity of CEOs and CFOs is associated with financial reporting quality. Note that CEOs and CFOs have, for a long time, provided assurances to auditors concerning the integrity of financial reporting in the management representation letter. As a response to highly publicized corporate financial scandals, the United States passed the Sarbanes-Oxley Act (SOX) in 2002. Section 302 (Corporate Responsibility for Financial Reports) of SOX requires that the CEO and the CFO of publicly traded companies certify the appropriateness of their financial statements and periodic reports filed with the Securities and Exchange Commission (SEC) and imposes criminal penalties for 'knowing' or 'willful' violations of the Act. These new strict rules and certifications impose more stringent recordkeeping requirements, where chief corporate officers can be held liable for their financial 'mis'-reporting. Accordingly, CEO and CFO perspectives and professional skepticism during the financial reporting process are crucial elements of financial reporting oversight.

A central tenet of the upper echelon theory of Hambrick and Mason (1984) is that the ways in which powerful actors' (i.e., of the 'upper echelons') in organizations interpret situations, challenges, or decisions they confront, are influenced by their experiences, values and personalities, which in turn, influence their strategic choices and organizational effectiveness (Hambrick, 2007). Since the introduction of upper echelons theory, financial research provides ample evidence that top managers, particularly CEOs and CFOs, exert significant influence on financial reporting decisions (Plöckinger et al., 2016), and that their experiences, values and traits affect financial reporting quality (Hrazdil et al., 2022a,2022b; Krishnan and Parsons, 2008; Ye et al., 2010). The general representation of the differences between men's and women's experiences is related to their individual contexts, where women are considered to maintain more relational, connected, and interdependent relationships (Gabriel and Gardner, 1999) and have empathetic behaviours and priorities as leaders (Post, 2015). This theory helps us assess whether gender-diversity of chief executives creates a unique cognitive framework that has a positive influence on financial reporting quality, relative to all male-dominated top management teams.

We measure financial reporting quality by the quality of accruals, based on two established proxies. First, Francis et al. (2005) define accrual quality as the measure of information risk associated with earnings, a key accounting number. Accruals quality informs investors about the mapping of accounting earnings into cash flows, where relatively poor accruals quality weakens this mapping and, therefore, increases information risk. Second, we estimate normal levels of accruals based on the modified Jones model (Dechow et al., 1995), adjusted for firm performance (Kothari et al., 2005) and isolate the discretionary component of earnings, which is more easily manipulated by management and whose magnitude therefore reflects earnings quality.

Using a sample of over 19,000 different CEO/CFO gender dyads during 2006–2019, we provide evidence consistent with the proposition that firms led by gender diverse dyads report higher quality earnings than firms led by all-male executives.[2] We then examine how, if at all, the expectation of higher financial reporting quality impacts the performance of the audit. An audit opinion states in essence that the audited financial statements are free from material misstatements. To reach that conclusion, the auditor assesses the *a priori* risk of material misstatement, and performs an audit to reduce the residual risk of material misstatement to a low level. Given an expectation of higher earnings quality from gender diverse dyads, it would be reasonable for an auditor to assess a lower *a priori* risk of material misstatement. This could result in a reduction in the amount of audit work performed, a reduction in the audit fee, and the ability to complete the audit more quickly. Surprisingly, our results suggest that auditors of firms with dyads of gender-diverse executives issue their audit reports *later*, charge *higher* audit fees, and are more likely to belong to one of the Big 4 firms, compared to firms led by all-male dyads. This result suggests that an auditor's *a priori* belief concerning the risk of material misstatement (an audit supply-side effect) is not the dominant force driving audit program design. Rather gender diverse executive dyads may expect the auditor to perform more audit tests (a demand-side effect), which facilitates higher financial reporting quality. This explanation is also consistent with our finding that gender diverse dyads are more likely to use the services of a Big 4 firm. Of course, other explanations are also possible. For example, when discussing financial reporting issues with a client's CEO and CFO during audit planning, an auditor may be more likely to encounter different views and beliefs about appropriate accounting treatments from a gender diverse CEO/CFO pair. This could lead to more audit work, higher audit fees, and higher accruals quality, which is consistent with our results. However,

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[1] At the same time, there is a strong opposition to promoting gender diversity among board members in proposed rule changes by the Nasdaq Stock Market (Plöckinger et al., 2021).

[2] Companies with female CEO and female CFO are very uncommon (i.e., they comprise 0.6% of the sample), which cannot facilitate a meaningful comparison between this subsample and other subsamples. Moreover, companies led by all-female CEOs/CFOs could be very different from other companies in other important characteristics. We therefore drop companies whose CEO and CFO are both female and focus on the comparison between companies with gender-diverse dyads of CEO and CFO and those with all-male dyads.

this supply-side perspective does not explain the higher likelihood that gender diverse CEO/CFO dyads utilize the services of Big 4 audit firms (a clear demand-side effect).

Our results contribute to the literature in the following ways. We are the first to document that firms with gender diverse dyads of CEOs and CFOs not only report higher quality accruals but also significantly differ in terms of the quality of their audits. Whereas prior research that investigates gender diversity in connection with financial reporting quality mainly focuses on diversity of corporate board members (Chen et al., 2016; Dobija et al., 2021; Wahid, 2019; Zalata et al., 2022), we analyze gender diverse dyads of executives in the U.S. after the implementation of SOX, which imposes criminal penalties on CEOs and CFOs for 'knowing' or 'willful' violations in the preparation of financial statements and periodic reports filed with the SEC. Furthermore, previous studies that examine gender diversity of executive officers in connection with earnings quality measure financial reporting quality indirectly; for example, Zalata et al. (2019) analyze classification shifting, which is a less litigious form of earnings management, or study women in all corporate officer roles (Krishnan and Parsons, 2008), and analyze gender diversity outside the U.S. setting, where Ye et al. (2010) show no significant differences in earnings quality for firms with female and male top executives among Chinese firms. Our analysis of accrual quality and the mechanisms through which such quality is achieved, provides strong evidence supporting the efficacy of gender diverse dyads of corporate executives on financial reporting quality in the U.S. setting.

Our results thus have important implications for executive selection as well as top management team monitoring from a governance and investor perspectives, in that they will help various stakeholders to better evaluate the dynamics of interactions in top management teams. The remainder of this paper proceeds as follows: Section 2 reviews the prior research and develops our hypotheses. Section 3 discusses the methodology we use and the research design. Section 4 presents the main empirical findings and additional test results. Section 5 concludes the paper.

2. Related literature and hypotheses development

2.1. Literature on gender diversity and performance

Research in psychology provides vast evidence that men and women think differently (Johnson and Whisman, 2013; Kling et al., 1999). Research in business-related topics builds on that perspective and explores the way gender diversity impacts decision making; for example, prior studies suggest that women are more risk averse (Hrazdil et al. 2020b, 2023; Zalata et al., 2019), more conservative (Zeng and Wang, 2015), exhibit greater ethical sensitivity to various situations (Ford and Richardson, 1994; Ye et al., 2010)[3], and foster more trust-building relationships (Jelinek and Adler, 1988; Klenke, 2003) than men. Men, on the other hand, exhibit a greater task orientation, a higher ambition to achieve demonstrable performance outcomes, and are more aggressive in the pursuit of such outcomes (Burke and Collins, 2001; Statham, 1987). Such differences can significantly affect various behaviors and outcomes.

For example, Krishnan and Parsons (2008) contribute to the debate on the association between ethics, gender diversity and attitudes towards money by studying all women in corporate officer roles and document a positive relationship between earnings sensitivity to bad news and senior management diversity. Others, such as Srinidhi et al. (2011), extend the notion of diversity to boards of directors and argue that if senior management gender diversity affects earnings sensitivity, it would be reasonable to expect earnings quality to be improved if the board of directors of a firm was also gender diverse. The authors document a positive relationship between having at least one female on the board of directors and earnings quality, attributing the outcome to a number of factors: (a) females tend to be more diligent regarding reporting and monitoring (Adams and Ferreira, 2009); (b) women are more social and open to alternate viewpoints (Rose, 2007); (c) women are less opportunistic (Krishnan and Parsons, 2008); and (d) women are more risk averse (Powell and Ansic, 1997). Srinidhi et al. (2019) further extend the notion of diversity to an audit setting and document that audit partner gender diversity enhances audit quality.

Finally, Ye et al. (2010) question whether the association between gender diversity and financial reporting quality would also apply to developing countries. Specifically, the authors investigate whether the gender effect cited by other studies would be the same, given the differences in language, culture, legal system and personal values. Ye et al. examine a large sample of Chinese firms from 2001 to 2006 and find no significant association between gender of top executives and earnings quality, attributing their finding to the institutional environment, and positing that the indoctrination of both males and females in China prevented what in Western cultures was "… different social role expectation[s] and values …" (p.53).

Despite the mixed outcomes, the common thread of all these studies is that none of them examined the gender diversity effect of the key executive (CEO/CFO) pairings. Typically, researchers examine the impact of gender diversity on earnings quality without considering the specific roles played by females. For example, Krishnan and Parsons (2008) do not study what role females played in senior management (only that there were females in senior management); Srinidhi et al. (2011) do not examine what role females played on a board (only that there were females on the board); and while Ye et al. (2010) examine the role played by females (CEO or CFO or board chair), they do not examine any interactions or gender diverse dyads of key executives.

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[3] It should be noted that the notion of what constitutes ethical behaviour is not fixed. Previous research points out that ethical business conduct is predicated on 'Western philosophical principles', where Ye et al. (1998) show that cultural and institutional differences would result in different outcomes as to whether something was ethical or not. Moreover, Krishnan and Parsons (2008), Srinidhi et al. (2011) and the other studies utilize data mainly from Western-oriented, economically developed, countries.

Our paper extends the research in gender diversity by specifically examining different CEO/CFO gender dyads — male (M) / M, M / Female (F), and F / M — using U.S. data from 2006 to 2019 and by examining how, if at all, the outcome of gender diversity of corporate executives on financial reporting quality impacts the characteristics of the audit.

2.2. Hypothesis development

There is general consensus that gender diversity within teams of key decision makers is beneficial to firms in various forms (Peni and Vähämaa 2010; Wahid, 2019; Chen et al., 2016; Srinidhi et al., 2011).[4] The upper echelon theory of Hambrick and Mason (1984) and Hambrick (2007) posits that the characteristics of senior leaders will determine organization decision-making. Srinidhi et al. (2019) discuss several gender diverse channels within the upper echelons theory framework, that help explain the dynamics in male–female teams which we draw on to formulate our predictions.

First, the perspective broadening channel, based on the resource dependency theory of Pfeffer and Salancik (1978), attributes the benefits of gender-diverse partners stemming from their different resources such as expertise, experience, and channels of information flow. Their inherent differences in characteristics and socialized experiences make men and women evaluate the same evidence using different viewpoints, experiences and inherent traits (Eagly and Wood, 1991). Men and women also communicate differently (Tannen, 2007). The effectiveness of gender diversity on corporate boards documented in prior literature (i.e., Wahid, 2019; Cumming et al., 2015; Chen et al., 2016) can be extended to the dyads of corporate executives. For example, the tendency for females to be more diligent regarding reporting and monitoring in their roles, more social and open to alternate viewpoints on corporate boards would apply equally to being either a CEO or CFO (Adams and Ferreira, 2009). Further, the view that women are more risk averse than males would probably be stronger if their roles were CEO or CFO (Shropshire et al., 2021). The difference in perspectives between the two chief executives results in the same corporate performance being interpreted and communicated differently by them. CEOs and CFOs assess the financial estimates differently and with different professional skepticism. We postulate that the differences in socialization experience and traits summarized in the previous section make it more likely that executive officers in a gender-diverse dyad bring more differentiated perspectives to financial reporting compared to either all-male or all-female dyads. This perspective broadening effect suggests a potential improvement in financial reporting quality when both male and female executives are present compared to when only male or only female executives are present.

Second, the communication channel argues that effective communication between two individuals could enhance the benefits of diversity by stimulating creativity, encouraging discussion, and enlarging the knowledge pool (Van Peteghem et al., 2018). Effective communication between the corporate leaders (CEOs and CFOs) and the audit team is necessary to ensure a high-quality audit. If the personal chemistry between the two chief executives is not harmonious, their communication could get strained. When both male and female executives communicate well, they raise more questions and resolve more financial reporting issues. In a mixed-gender dyad, we expect stronger communication links between the two key executives and greater accommodation with respect to each other's views than would be possible in a larger working group (Weber et al., 2009).[5]

Third, Srinidhi et al. (2019) point to the human capital channel that may explain the dynamics in male–female teams and resulting outcomes. Prior studies argue that gender-diverse boards could possess more expertise than all-male boards, as women face the 'glass ceiling' and need to cross a higher bar to enter corporate boards (Post and Byron, 2015). The human capital argument also applies to the executive setting. To reach the top of the corporate ladder, all executives need to have adequate education background and a broad knowledge related to their industry.[6] We assume that the underlying skill distribution for both male and female executives is similar; however, the human capital perspective acknowledges the possibility that the skill distribution for the female executives who cross the threshold is more truncated from below compared to that of the male executives, as the female executives may face a higher threshold to be promoted to their CEO/CFO positions. According to this perspective, the average skill level of a female executive is higher than that of a male executive, which may result in higher financial reporting quality in dyads of executives where a female CEO/CFO is involved.

All three perspectives imply that gender-diverse dyads deliver better-quality decisions than all-male groups. Irrespective of these views, there is also a possibility that gender diversity plays no significant role in financial reporting quality, which could be driven by other differences in expertise, experience, ethnicity, nationality, functional background, and organiza-

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[4] In addition to gender, diversity within teams can be reflected in other dimensions, such as ethnicity, nationality, functional background, and organizational membership; however, of these, gender diversity is the most widely studied dimension (Statham, 2019).

[5] We acknowledge that the faultline theory (i.e., how diversity structure may give rise to frictions and subgroup formation along so-called faultlines within a group of individuals) often applied to the board of directors may also apply to a dyad of CEO and CFO, provided that as there are other executive officers (i.e., chief information officers or chief operating officers) that may create sub-groups that overlap with diversity attributes. If subgroups are created within the corporate executive team, this may instigate negative group dynamics and hamper the effective communication between CEO/CFO and the auditors. However, this is unlikely, as it is the CEO/CFO pair that is ultimately responsible and accountable for the financial reports, and as any incompatible differences between the two executives would likely have been eliminated prior to the appointment of executives.

[6] Most CEOs hold bachelor's degrees in fields related to business, including business administration, management, or public administration. Most CEOs also have a master's degree in business administration, economics, management, or another related degree. CFOs generally require a graduate degree in business-related fields such as accounting, economics, and finance since they are in charge of the financial aspect of a business. Most CFOs also hold a professional accounting designation.

tional membership (a null hypothesis). Ultimately, the effect of gender diversity of chief corporate executives on financial reporting quality is an empirical question, which leads to our first hypothesis (in null form):

H1. *Dyads of gender-diverse executives are no more likely to issue reports with higher earnings quality than dyads of same-gender executives, ceteris paribus.*

The SEC in the US explains that the role of an auditor is to examine a firm's financial statements and provide a written report expressing an opinion as to whether the financial statements are fairly stated and comply in all material respects with generally accepted accounting principles [GAAP]. That is, the financial statements are free from material misstatements. Moreover, there is an extensive body of research that examines the relationship between the cost of providing an audit and the quality of that audit (Choi et al., 2010; Hoitash et al., 2007; Mitra et al., 2009; Simunic, 1980). To reach a conclusion that the audited financial statements are free from material misstatements, the auditor needs to assess the *a priori* risk of material misstatements and perform the audit to reduce the residual risk of misstatements (audit risk) to a low level.

If auditors expect higher financial reporting quality from gender diverse dyads, they will assess a lower *a priori* risk, and be motivated to reduce the amount of work performed, the concomitant fee, and be able to complete the audit in a timely manner. Note that these outcomes are audit supply-side effects, consistent with the performance of efficient audits. On the other hand, if H1 is true, gender diverse dyads of executives may expect the auditor to perform more tests. Note that auditors are themselves an element of a company's financial reporting system (similar to internal controls (Simunic, 1980), so a demand by executives for higher financial reporting quality may also impact on auditors in terms of their audit effort, audit fees, and auditor choice. Finally, a gender diverse CEO and CFO team may present an auditor with alternative and perhaps conflicting views of critical financial reporting issues, which may lead to more audit work, higher audit fees, and higher financial reporting quality. Ultimately, it is an empirical question whether supply-side effects or demand-side effects dominate in determining audit outcomes. This leads to our third hypothesis (in null form):

H2. *The choice of audit* firms *and the audits of companies are not affected by the gender diversity of the CEO/CFO dyads.*

As a supplementary analysis, we consider prior experience of working together in executive roles as a mediating effect of the aforementioned relationship. Huang and Hilary (2018) and Sun and Bhuiyan (2020) both examine the impact of tenure on firm performance in the context of 'independent' board directors and conclude that the benefits of new ideas, new thinking and outside monitoring decline over time. The results are consistent with the notion that 'familiarity breeds contempt', where long tenure increases familiarity between boards and executives and is detrimental to directors' independence. Similarly, Li and Wahid (2018) examine board diversity from the perspective of tenure and conclude that shorter tenure is desirable, as directors who have not been present long enough are less likely to exhibit a cohort mentality and to become a 'groupthink board'. On the other hand, effective communication can often be enhanced when mutual trust exists between two executives, which takes time and repeated collaboration to develop. This especially applies to gender diverse dyads; for example, Boone and Hendriks (2009) show that a top management's team collaborative behavior and information exchange are necessary conditions to unleash the performance benefits of functional background diversity. Given that managers remain in their executive roles (once appointed) for few years, we investigate whether the gender diversity effect on financial reporting quality and audit differs when the two executives have had an earlier collaboration.

3. Methodology

3.1. Sample and data definitions

Our initial sample includes all U.S. listed firms with available data from the Execucomp database during 2006 through 2019, for which we can identify gender of firms' CEOs and CFOs. We then merge Execucomp data with the Compustat fundamental annual files to obtain necessary financial data for our dependent, independent and control variables. We winsorize all non-categorical variables that fall in the top and bottom 1 percent of the distribution to mitigate potential problems of outliers. Our final sample consists of 3,840 U.S. publicly listed companies (representing 19,215 firm-year observations).

As our key variables of interest, we define *MIX* as the indicator variable that equals one for firms with either female CEO and male CFO or male CEO and female CFO (gender diverse dyads), and zero otherwise. We drop companies with female CEO and female CFO from our analysis (comprise 0.6% of the sample), which cannot facilitate a meaningful comparison between the gender-diverse dyads of CEO and CFO group (13% of the sample or 2,486 firm-year observations) and all-male dyads group (87% of the sample or 16,622 firm-year observations).

3.2. Regression models

To test our first hypothesis, we estimate the following model (Eq. (1)):

$$EQ_{it} = \alpha + \beta_1 MIX_{it} + \beta_2 SIZE_{it} + \beta_3 BIG4_{it} + \beta_4 LEVERAGE_{it} + \beta_5 LOSS_{it} + \beta_6 MTB_{it} + \beta_7 HIGHLIT_{it} + \beta_8 ALTMAN_{it}$$
$$+ IndustryFE + YearFE + \varepsilon_{it} \tag{1}$$

where *EQ* represents earnings quality. As the first proxy for earnings quality, we define *EQ_MDD* as the standard deviation of residuals based on the modified Dechow-Dichev model (Dechow and Dichev, 2002; Francis et al., 2005), where a higher standard deviation denotes lower earnings quality. For ease of interpretation, we multiply the standard deviation of residuals based on the modified Dechow-Dichev model by negative one, so that higher values correspond to higher earnings quality. As the second proxy for earnings quality (*EQ_MJR*), we estimate normal levels of accruals based on the modified Jones model (Dechow et al., 1995), which defines the accrual process as a function of growth in credit sales and investment in property, plant & equipment (PPE) and controls for firm performance (Kothari et al., 2005). We then decompose total accruals into non-discretionary and discretionary components, and multiply the values by negative one, where a lower magnitude of discretionary accruals indicates lower earnings quality.

The coefficient of interest is β_1 that test the effect of gender diverse dyads of executives on earnings quality relative to all-male dyads. Following the existing literature on determinants of earnings quality (e.g., Srinidhi et al., 2011), we control for several firm-specific characteristics in our models. We control for *SIZE* (firm's market value), *BIG4* (whether firm's auditor is a member of the Big 4 audit firms namely PwC, EY, KPMG and Deloitte), *LEVERAGE* (short-term and long-term debt, divided by total assets), and *ALTMAN* (Z-score, based on Altman, 1968), all of which we expect to be negatively related to the standard deviation of residuals (or positively related to earnings quality). We further control for *LOSS* (whether income before extraordinary items is negative in the current period), *MTB* (market value of equity divided by its book value of equity), and *HIGHLIT* (whether a firm belongs to a high litigation risk industry as defined in Francis et al., 1994). Lastly, we include industry and year fixed effects (*FE*) to control for all time-invariant factors that might affect earnings quality across the industry and for time variation in earnings quality common to all firms in the sample. Our standard errors are further clustered by firm (Bertrand et al., 2004).[7] The appendix provides definitions of all variables used in our research design.

To test our second hypothesis, we investigate whether any differences in earnings quality across gender diverse dyads of executives affect auditor choice, and trigger auditor responses through changes in audit effort. We introduce the following three variables to investigate the effect of gender diverse dyads of executives on audit report timing, audit fees, and choice of auditor, respectively. Specifically, we measure *AUD_LAG* as the natural logarithm of the number of days from the fiscal year-end to the audit report date; *AUD_FEE* as the natural logarithm of audit fees; and *BIG4* as the indicator variable that equals to one if the firm's auditor is a member of the Big 4 audit firms (PwC, EY, KPMG and Deloitte), and zero otherwise. Following existing literature, we estimate equation 2 (the audit report lag), equation 3 (the audit fee model), and equation 4 (the auditor choice model) with the inclusion of control variables based on prior audit fee studies (e.g., Hay, 2013; Hay et al., 2006; Simunic, 1980), audit report lag studies (e.g., Amin et al., 2018; Knechel and Payne, 2001), and auditor choice studies (e.g., Hrazdil et al., 2020a; Hinchliffe, 2022), respectively. The appendix summarizes all variable definitions.

$$AUD\_LAG_{it} = \alpha + \beta_1 MIX_{it} + \beta_2 SIZE_{it} + \beta_3 LRG\_ACCEL_{it} + \beta_4 BIG4_{it} + \beta_5 BUSY_{it} + \beta_6 INTL_{it} + \beta_7 LOSS_{it} + \beta_8 GC_{it} + \beta_9 SPI\_DM_{it}$$
$$+ \beta_{10} ALTMAN_{it} + IndustryFE + YearFE + \varepsilon_{it}$$

$$AUD\_FEE_{it} = \alpha + \beta_1 MIX_{it} + \beta_2 LNASSET_{it} + \beta_3 CURRENT_{it} + \beta_4 INVREC_{it} + \beta_5 LEVERAGE_{it} + \beta_6 ROA_{it} + \beta_7 MTB_{it}$$
$$+ \beta_8 ATENURE_{it} + \beta_9 LNBUSSEG_{it} + \beta_{10} LNGEOSEG_{it} + \beta_{11} SPI\_DM_{it} + \beta_{12} LOSS_{it} + \beta_{13} M\&A_{it} + \beta_{14} IPO_{it}$$
$$+ \beta_{15} BUSY_{it} + \beta_{16} HIGHLIT_{it} + \beta_{17} OPINION_{it} + \beta_{18} ICWEAK_{it} + \beta_{19} BIG4_{it} + IndustryFE + YearFE + \varepsilon_{it}$$

$$BIG4_{it} = \alpha + \beta_1 MIX_{it} + \beta_2 LnASSET_{it} + \beta_3 ATURN_{it} + \beta_4 CURRENT_{it} + \beta_5 LEVERAGE_{it} + \beta_6 ROA_{it} + IndustryFE + YearFE + \varepsilon_{it}$$

In the audit report lag, audit fee, and auditor choice models, we exclude all observations related to firms in the financial (between SIC 6000 and 6999) and utility (between SIC 4900 and 4949) industries because the audit fee model for these firms is different from other industries (Fields et al., 2004; Hay et al., 2006).

4. Results

4.1. Summary statistics

Table 1 presents the descriptive statistics of variables (defined in the Appendix) used to test our hypotheses. With the exception of categorical variables, all continuous variables are winsorized at the top and bottom percentiles. As evident

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[7] The inclusion of firm fixed effects along with clustering on firm may affect the estimation of the standard errors because of the additional degrees of freedom that occur (i.e., the matrix dimension increases whereas the does not). We therefore utilize industry and firm FE and cluster the standard errors by firm.

Table 1
Summary statistics and differences in means between two groups.

Variable	N	Mean	S.D.	Q1	Median	Q3
MIX	19,108	0.130	0.336	0.000	0.000	0.000
PRIOR	19,108	0.702	0.457	0.000	1.000	1.000

Panel A: Variables used in the earnings quality model

	MIX = 0		MIX = 1				
Variable	N	Mean	N	Mean	Diff	t-stat	
EQ_MDD	16,622	−0.042	2,486	−0.038	0.004	6.10	***
EQ_MJR	16,622	−0.043	2,486	−0.040	0.003	3.62	***
SIZE	16,622	7.691	2,486	7.728	0.037	0.98	
BIG4	16,622	0.894	2,486	0.906	0.012	1.93	*
LEVERAGE	16,622	0.249	2,486	0.231	−0.018	−4.16	***
LOSS	16,622	0.198	2,486	0.174	−0.024	−2.94	***
MTB	16,622	1.956	2,486	1.965	0.010	0.36	
HIGHLIT	16,622	0.305	2,486	0.346	0.041	4.02	***
ALTMAN	16,622	3.938	2,486	4.009	0.071	0.82	
ACCR_LAG	16,622	−0.011	2,486	−0.009	0.002	1.52	

Panel B: Variables used in the audit report lag model

	MIX = 0		MIX = 1				
Variable	N	Mean	N	Mean	Diff	t-stat	
AUD_LAG	12,068	4.050	1,839	4.054	0.003	0.64	
SIZE	12,068	7.531	1,839	7.620	0.089	1.90	*
LRG_ACCEL	12,068	0.665	1,839	0.687	0.022	1.85	*
BIG4	12,068	0.873	1,839	0.899	0.026	3.43	***
BUSY	12,068	0.732	1,839	0.709	−0.023	−2.07	**
GC	12,068	0.007	1,839	0.004	−0.002	−1.29	
INTL	12,068	0.190	1,839	0.244	0.053	5.02	***
LOSS	12,068	0.220	1,839	0.189	−0.032	−3.21	***
SPI_DM	12,068	0.787	1,839	0.793	0.006	0.61	
ALTMAN	12,068	4.238	1,839	4.424	0.186	1.64	

Panel C: Variables used in the audit fee and auditor choice models

	MIX = 0		MIX = 1				
Variable	N	Mean	N	Mean	Diff	t-stat	
AUD_FEE	12,621	14.476	1,996	14.555	0.079	2.90	***
ASSET	12,621	7.486	1,996	7.586	0.100	2.20	**
CURRENT	12,621	2.560	1,996	2.491	−0.069	−1.38	
INVREC	12,621	0.246	1,996	0.239	−0.007	−1.71	*
LEVERAGE	12,621	0.242	1,996	0.221	−0.022	−4.42	***
ROA	12,621	0.035	1,996	0.045	0.010	3.59	***
MTB	12,621	2.053	1,996	2.087	0.034	1.02	
ATENURE	12,621	18.370	1,996	19.001	0.631	1.29	
BUSSEG	12,621	1.074	1,996	0.986	−0.088	−5.99	***
GEOSEG	12,621	1.090	1,996	0.997	−0.093	−5.20	***
SPI_DM	12,621	0.787	1,996	0.789	0.002	0.20	
LOSS	12,621	0.220	1,996	0.193	−0.028	−2.88	***
MA	12,621	0.147	1,996	0.138	−0.010	−1.12	
IPO	12,621	0.011	1,996	0.012	0.001	0.32	
BUSY	12,621	0.702	1,996	0.658	−0.045	−3.92	***
HIGHLIT	12,621	0.344	1,996	0.403	0.059	5.03	***
OPINION	12,621	0.359	1,996	0.317	−0.042	−3.76	***
ICWEAK	12,621	0.028	1,996	0.028	−0.000	−0.10	
BIG4	12,621	0.872	1,996	0.901	0.029	3.91	***
ATURN	12,621	1.147	1,996	1.290	0.144	6.96	***

Notes: All variables are as defined in the Appendix.

from Table 1, about 13% of firm-years in our sample are led by gender diverse dyads of executives (either male CEOs and female CFOs, or female CEOs and male CFOs) and about 87% are led by male CEOs and CFOs. In our sample, CEOs and CFOs worked together for at least one year about 70% of the time. The bi-variate tests of differences among the key variables of interest (in panels A, B, and C) indicate that firms lead by gender diverse dyads of executives have significantly higher earnings quality (EQ_MDD and EQ_MJR), are charged significantly higher audit fees, and more likely be audited by one of the Big 4 firms.

Table 2
Correlations.

		(1)	(2)	(3)	(4)	(5)	(6)
MIX	(1)	1.000	**0.041**	**0.025**	**0.023**	**0.025**	0.005
EQ_MDD	(2)	**0.037**	1.000	**0.432**	**0.205**	**−0.253**	**0.214**
EQ_MJR	(3)	**0.025**	**0.351**	1.000	**0.117**	**−0.150**	**0.148**
BIG4	(4)	**0.022**	**0.165**	**0.094**	1.000	**0.407**	**−0.252**
AUD_FEE	(5)	**0.025**	**−0.253**	**−0.150**	**0.407**	1.000	**−0.376**
AUD_LAG	(6)	0.005	**0.219**	**0.126**	**−0.264**	**−0.408**	1.000

Notes: All continuous variables are winsorized at the 1% and 99% levels to mitigate the effect of outliers. All variables are as defined in the Appendix. Pearson (Spearman) correlation values are above (below) the diagonal; bold values denote significance at 5%.

Table 2 presents Pearson and Spearman correlations among the mix gender dyads of executives and variables related to earnings quality and audit effort, where the correlations further indicate significant associations between our key variables of interest and our key dependent variable.[8]

4.2. Earnings quality results

Table 3 presents the results of Eq. (1) for earnings quality (EQ_MDD in Panel A and EQ_MJR in Panel B, respectively) as the dependent variable and gender diverse dyads of executives (MIX) as the key independent variable in column (1). As a supplementary analysis, we partition the sample into groups of dyads to investigate whether the main association is affected by the chief executives' prior work experience in their executive roles. Column 2 is based on a sub-sample, where either executive has been newly appointed into his/her role (PRIOR = 0), whereas column 3 is based on a sub-sample where at the pair of executives work together in their roles for at least one-year.

The results in the first column indicate that after controlling for previously documented determinants of earnings quality, including industry and year fixed effects, firms led by gender diverse executives report significantly higher earnings quality relative to firms lead by all-male CEO-CFO pairs (the estimated coefficient of *MIX* is 0.003 and statistically significant with t-statistic of 2.35). The impact of gender diversity in executive dyads is also economically significant; the positive and significant *MIX* coefficient indicates that the average earnings quality increases by about 7 percent when firms are led by gender diverse dyads of executives. With regards to the control variables, the coefficients on *SIZE*, *BIG4*, *LEVERAGE*, and *ALTMAN* are all significantly positive, indicating that earnings quality is higher for firms that are larger, audited by one of the Big 4 audit firms, more leveraged, and firms that have lower bankruptcy risk. On the other hand, earnings quality is significantly lower for growth firms, firms that have experienced losses, and firms high lagged total accruals (negative *MTB*, *LOSS* and *ACCR_LAG* coefficients, respectively).

The results in the second column further reveal that the effect of gender diverse dyads of executives on earnings quality appears to be short-lived, as firms led by gender diverse CEOs/CFOs report higher quality earnings during the year when the executives work together for the first time. The MIX coefficient in column 3 is insignificant, indicating that prior or repeated collaboration between gender diverse executives has no significant impact on the quality of earnings. Panel B presents the results using our alternative measure of earnings quality, based on the modified Jones model, EQ_MJR), where the results remain statistically and economically significant at conventional levels. Overall, these findings are consistent with our first hypothesis that gender diverse dyads of executives improve financial reporting, at least in the short run.

As a sensitivity, we first investigate whether higher earnings for the gender diverse dyads of executives are driven by male CEO / female CFO (*MF_MIX*, representing 73% of the MIX) or female CEO / male CFO (*FM_MIX*, representing 27% of the MIX) pairs. In column 1, we replace MIX with MF_MIX and FM_MIX and document that only FM_MIX is statistically significant (results not tabulated).[9] Second, as firms with gender diverse boards have been shown to exhibit higher quality earnings (Srinidhi et al., 2011), we further control for gender diversity of firms' top management team, which has a significant input in production of financial information (Kim et al., 2022). We define *TMT_MIX* as an indicator variable that equals to one for firms with at least one female executive, and zero otherwise.[10] Inclusion of TMT_MIX in all models in Table 3 does not change our main result (results not tabulated).

4.3. Audit effort and auditor choice results

In this section, we present results related to our second hypothesis. Tables 4–6 present the results of equations 2, 3, and 4 for audit report lag (AUD_LAG), audit fee (AUD_FEE), and Big 4 audit firm (BIG4), as the dependent variables, respectively. The effect of gender diverse dyads of executives (MIX) on audit effort and auditor choice is presented in columns (1).

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[8] To ensure that there are no multicollinearity problems in our specifications, we compute the variance inflation factors (VIFs) for all variables used in our multivariate regressions. All VIFs are lower than commonly suggested cut-off (10.00), suggesting that there are not significant multicollinearity concerns.

[9] This result could be due to female CEOs being more ethical, conservative, or more capable. Female CEOs may have the ability and power to adopt more unbiased accounting policies, which results in higher accruals quality, and consequently demand higher-quality audits.

[10] ExecuComp collects up to 9 executives for a given year depending on how many executives they file in their proxy statement (though most companies only report 5).

Table 3
Earnings quality model.

Panel A	(1) Full Sample EQ_MDD			(2) PRIOR = 0 EQ_MDD			(3) PRIOR = 1 EQ_MDD		
Variables	Coef.		t-stat.	Coef.		t-stat.	Coef.		t-stat.
Intercept	−0.091	***	−14.16	−0.090	***	−12.70	−0.092	***	−12.94
MIX	0.003	**	2.35	0.005	***	4.10	0.002		1.31
SIZE	0.005	***	14.74	0.006		11.93	0.005	***	13.81
BIG4	0.009	***	3.82	0.010		3.78	0.009	***	3.32
LEVERAGE	0.012	***	3.87	0.016	***	3.95	0.011	***	3.05
LOSS	−0.007	***	−6.74	−0.008	***	−4.88	−0.007	***	−5.68
MTB	−0.006	***	−9.20	−0.008	***	−9.15	−0.006	***	−7.80
HIGHLIT	0.003		1.25	0.004		1.25	0.003		1.09
ALTMAN	0.001	***	5.72	0.001	***	5.63	0.001	***	4.60
ACCR_LAG	−0.015	**	−2.20	−0.026	**	−2.32	−0.009		−1.26
IND & YR FEs			Yes			Yes			Yes
N			19,108			5,688			13,420
Adjusted R^2			0.231			0.252			0.222
Panel B	(1) Full Sample EQ_MJR			(2) PRIOR = 0 EQ_MJR			(3) PRIOR = 1 EQ_MJR		
Variables	Coef.		t-stat.	Coef.		t-stat.	Coef.		t-stat.
Intercept	−0.079	***	−9.20	−0.087	***	−7.35	−0.077	***	−9.45
MIX	0.002	**	2.31	0.003	*	1.80	0.002		1.63
SIZE	0.004	***	11.62	0.004		8.90	0.004	***	9.84
BIG4	0.006	***	2.68	0.006		1.84	0.006	**	2.44
LEVERAGE	0.009	***	2.72	0.014	***	2.97	0.006	*	1.74
LOSS	−0.008	***	−6.99	−0.010	***	−5.10	−0.007	***	−5.01
MTB	−0.006	***	−9.44	−0.006	***	−6.02	−0.006	***	−8.58
HIGHLIT	0.003		1.28	0.000		0.12	0.004	*	1.73
ALTMAN	0.001	***	6.23	0.001	***	4.20	0.001	***	5.27
ACCR_LAG	0.015	*	1.94	0.005		0.39	0.020	**	2.17
IND & YR FEs			Yes			Yes			Yes
N			19,108			5,688			13,420
Adjusted R^2			0.109			0.114			0.106

Notes: This table presents regression results of the earnings quality model (Column 1) partitioned by the indicator variable PRIOR (Columns 2 and 3), where earnings quality is proxied by EQ_MDD (Panel A) and EQ_MJR (Panel B), respectively. Industry FE are based on Fama and French (1997) 48 industry groups. *, **, *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively, using two-tailed tests. T-statistic is determined by clustered standard errors at firm level.

Table 4
Audit report lag model.

Variables	(1) Full Sample AUD_LAG			(2) PRIOR = 0 AUD_LAG			(3) PRIOR = 1 AUD_LAG		
	Coef.		t-stat.	Coef.		t-stat.	Coef.		t-stat.
Intercept	4.395	***	112.93	4.467	***	93.28	4.354	***	100.84
MIX	0.014	**	2.10	0.017	**	2.00	0.013	*	1.68
SIZE	−0.033	***	−12.45	−0.034	***	−10.76	−0.033	***	−10.90
LRG_ACCEL	−0.119	***	−16.66	−0.132	***	−14.44	−0.113	***	−13.77
BIG4	−0.029	***	−2.86	−0.040	***	−3.47	−0.024	**	−2.06
BUSY	0.018	**	2.38	0.011		1.36	0.021	**	2.42
INTL	−0.008		−0.90	0.003		0.31	−0.013		−1.30
LOSS	0.023	***	4.35	0.030	***	3.56	0.018	***	2.92
GC	0.122	***	4.55	0.099	**	2.42	0.133	***	3.99
SPI_DM	0.004		0.70	0.003		0.35	0.003		0.58
ALTMAN	−0.001	**	−2.02	−0.003	***	−2.92	−0.001		−1.03
IND & YR FEs			Yes			Yes			Yes
N			13,907			4,334			9,573
Adjusted R^2			0.392			0.379			0.391

Notes: This table presents regression results of the audit report lag model (Column 1), and the audit report model, partitioned by the indicator variable: PRIOR (Columns 2 and 3). Industry FE are based on Fama and French (1997) 48 industry groups. *, **, *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively, using two-tailed tests. T-statistic is determined by clustered standard errors at firm level.

Table 5
Audit fee model.

Variables	(1) Full Sample AUD_FEE			(2) PRIOR = 0 AUD_FEE			(3) PRIOR = 1 AUD_FEE		
	Coef.		t-stat.	Coef.		t-stat.	Coef.		t-stat.
Intercept	10.223	***	100.66	10.344	***	92.84	10.176	***	86.83
MIX	0.054	**	2.20	0.021		0.92	0.066	**	2.32
ASSET	0.521	***	64.44	0.514	***	57.33	0.524	***	60.00
CURRENT	−0.034	***	−6.50	−0.030	***	−4.62	−0.035	***	−6.33
INVREC	0.834	***	9.99	0.771	***	8.36	0.860	***	9.38
LEVERAGE	−0.099	**	−2.03	−0.111	**	−2.12	−0.101	*	−1.82
ROA	−0.466	***	−5.85	−0.267	**	−2.52	−0.573	***	−6.34
MTB	0.023	***	3.03	0.025	***	2.81	0.024	***	2.81
ATENURE	0.001	**	2.10	0.001		0.79	0.002	**	2.52
BUSSEG	0.003		0.13	0.013		0.63	0.000		−0.01
GEOSEG	0.105	***	6.02	0.096	***	4.86	0.107	***	5.83
SPI_DM	0.154	***	8.78	0.137	***	6.01	0.159	***	7.95
LOSS	0.082	***	4.32	0.111	***	4.02	0.062	***	2.86
M&A	0.053	***	3.19	0.047	*	1.91	0.056	***	3.15
IPO	0.225	***	5.06	0.181	***	2.78	0.251	***	4.14
BUSY	0.031		1.24	0.046	*	1.79	0.023		0.86
HIGHLIT	−0.088	*	−1.88	−0.021		−0.39	−0.122	**	−2.53
OPINION	0.066	***	5.33	0.084	***	4.31	0.057	***	3.99
ICWEAK	0.414	***	11.04	0.502	***	9.37	0.335	***	7.76
BIG4	0.254	***	7.95	0.254	***	7.43	0.252	***	7.20
IND & YR FEs			Yes			Yes			Yes
N			14,617			4,542			10,075
Adjusted R^2			0.823			0.808			0.830

Notes: This table presents regression results of the audit fee model (Column 1), and the audit fee model, partitioned by the indicator variable: PRIOR (Columns 2 and 3). Industry FE are based on Fama and French (1997) 48 industry groups. *, **, *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively, using two-tailed tests. T-statistic is determined by clustered standard errors at firm level.

Table 6
Auditor choice model.

Variables	(1) Full Sample BIG4			(2) PRIOR = 0 BIG4			(3) PRIOR = 1 BIG4		
	Coef.		t-stat.	Coef.		t-stat.	Coef.		t-stat.
Intercept	−4.753		−0.14	−4.726		−0.15	−4.661		−0.11
MIX	0.348	***	3.66	0.340	**	1.99	0.336	***	2.91
ASSET	1.272	***	37.51	1.309	***	21.49	1.271	***	30.39
ATURN	0.333	***	6.30	0.311	***	3.48	0.356	***	5.30
CURRENT	−0.002		−0.12	0.051	*	1.86	−0.019		−1.16
LEVERAGE	0.277	*	1.66	−0.401		−1.49	0.718	***	3.26
ROA	−1.676	***	−7.33	−1.291	***	−3.34	−1.796	***	−6.20
IND & YR FEs			Yes			Yes			Yes
N			14,617			4,334			9,573
Adjusted R^2			0.414			0.379			0.391

Notes: This table presents regression results of the auditor choice model (Column 1), and the auditor choice model, partitioned by the indicator variable: PRIOR (Columns 2 and 3). Industry FE are based on Fama and French (1997) 48 industry groups. *, **, *** denote significance at the 0.10, 0.05, and 0.01 levels, respectively, using two-tailed tests.

Similarly, we present our supplementary analysis of the effect of executives' prior work collaboration in column 2 and 3, respectively.

First, results in Table 4 indicate that auditors of firms with gender-diverse dyads issue audit reports later (the estimated coefficient of MIX is 0.014 and statistically significant with t-statistic of 2.10 in column 1), regardless of whether executives have prior experience of working together (the estimated coefficient of MIX is 0.017 and statistically significant with t-statistic of 2.00 in column 2 and 0.013 and statistically significant with t-statistic of 1.68 in column 3, respectively). When we replace MIX with MF_MIX and FM_MIX in column 1, we find that only MF_MIX is statistically significant (results not tabulated).

Second, Table 5 portrays similar results with regards to audit fees. Specifically, the results indicate that after controlling for previously documented determinants of audit fees, including industry and year fixed effects, auditors of firms with gender-diverse dyads charge significantly higher audit fees (the estimated coefficient of MIX is 0.054 and statistically significant with t-statistic of 2.20 in column 1). Untabulated results further reveal that the result is driven by both MF_MIX and

FM_MIX when run separately in column 1 (results not tabulated). This relationship is further significantly moderated by the prior work collaboration of executives (the estimated coefficient of MIX is 0.021 and statistically insignificant in column 2 and 0.066 and statistically significant with t-statistic of 2.32 in column 3, respectively).

Finally, results in Table 6 reveal that gender diverse dyads of executives are more likely to utilize Big 4 audit firms relative to firms led by all-male executives (the estimated coefficient of MIX is 0.348 and statistically significant with t-statistic of 3.66 in column 1).[11] The result holds whether or not the CEOs and CFOs had prior work experience of working together in executive roles (both MIX coefficients in columns 2 and 3 are statistically significant) and are largely driven by the FM_MIX (results not tabulated).

Overall, our results support the premise that gender-diverse dyads of executives not only affect earnings quality but also influence the work and choice of auditors.

5. Conclusion

We examine the relationship between gender diversity of chief executive and chief financial officers and the firm's earnings quality. Using a sample of over 19,000 CEO/CFO gender dyads during 2006 to 2019, we find that firms led by gender-diverse dyads report higher earnings quality, compared to firms led by all-male pairs. We also find that the effects of executive gender diversity are associated with higher audit fees and longer audit report lags, thus indicating that gender-diverse dyads trigger auditor responses through additional audit effort.

Our findings clarify how gender diversity affects earnings quality, and the effects of gender diversity on auditor choice, and on the audit process. From a policy perspective, our findings are consistent with the notion that gender diversity among a company's top executives has a beneficial impact on the quality of financial reporting which should be of value to shareholders, investors, creditors, and other financial statement users.

Data availability

Data will be made available on request.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix

Variable definitions.

Variable name	Definition
MIX	Indicator variable that equals to one for firms with either female CEO and male CFO *or* male CEO and female CFO, and zero otherwise.
PRIOR	Indicator variable that equals to one when CEO and CFO worked together for at least one year, and zero otherwise.
EQ_MDD EQ_MJR	Earnings quality, measured by the standard deviation of residuals based on modified Dechow-Dichev model (Dechow and Dichev, 2002; Francis et al., 2005), multiplied by negative one.Earnings quality, based on the modified Jones model (Dechow et al., 1995), which defines the accrual process as a function of growth in credit sales and investment in property, plant & equipment (PPE) and controls for firm performance (Kothari et al., 2005). Total accruals are then decomposed into non-discretionary and discretionary components, and multiplied by negative one, where a lower magnitude of discretionary accruals indicates lower earnings quality.
SIZE	Natural logarithm of the firm's market value (price times the number of shares outstanding) at the end of fiscal year.

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[11] This result may be driven by audit committee demanding higher-quality audits (e.g., appointment of Big 4 auditors and more audit efforts) if the gender-diverse executives express different views on financial reporting issues (e.g., accounting policy choices), and higher audit quality manifests itself in higher quality of earnings.

(*continued*)

Variable name	Definition
BIG4	Indicator variable that equals to one if the firm's auditor is a member of the Big 4 audit firms (PwC, EY, KPMG and Deloitte), and zero otherwise.
LEVERAGE	Sum of short-term and long-term debt, divided by total assets.
LOSS	Indicator variable that equals to one if income before extraordinary items is negative in the current period, and zero otherwise.
MTB	Firm's market value of equity divided by its book value of equity.
HIGHLIT	Indicator variable that equals to one for high litigation risk industries as defined in Francis et al. (1994), and zero otherwise.
ALTMAN	Modified Altman (1968) Z-score = (1.2 × working capital + 1.4 × retained earnings + 3.3 × income before extraordinary items + 0.999 × sales) / total assets.
ACCR_LAG	Firm's lagged total accruals (net income less cash flow from operations), scaled by total assets.
AUD_LAG	Natural logarithm of the number of days from the fiscal year-end to the audit report date.
LRG_ACCEL	Indicator variable that equals to one if an audit's client is a large-accelerated filer, and zero otherwise.
BUSY	Indicator variable that equals to one if an audit's client has a year-end fall on December 31, and zero otherwise.
GC	Indicator variable that equals to one if a firm receives a going-concern report in a fiscal period, and zero otherwise.
INTL	Indicator variable that equals to one if an audit's client has international operations, and zero otherwise.
SPI_DM	Indicator variable that equals to one if an audit's client has a special item during the year, and zero otherwise.
AUD_FEE	Natural logarithm of audit fees.
ASSET	Natural logarithm of total assets (in millions).
CURRENT	Ratio of current assets to current liabilities.
INVREC	Ratio of total inventory and receivables to total assets.
ROA	Income before extraordinary items, scaled by total assets.
ATENURE	Number of years the company has been audited by the same audit firm,
BUSSEG	Natural logarithm of one plus the number of business segments.
GEOSEG	Natural logarithm of one plus the number of geographical segments.
M&A	Indicator variable that equals to one if an audit's client is engaged in a merger or acquisition during the year, and zero otherwise.
IPO	Indicator variable that equals to one if an audit's client is engaged in an initial public offering during the year.
OPINION	Indicator variable that equals to one if an audit's client receives a modified audit opinion and zero otherwise. A modified opinion is defined as anything except a standard unqualified audit opinion coded as one by COMPUSTAT.
ICWEAK	Indicator variable that equals to one if the auditor's opinion of the effectiveness of the company's internal control is either adverse or disclaimer, and zero otherwise.
ATURN	Ratio of sales to lagged total assets.

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