# Audit partners' gender and time variances of key audit matters

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## Abstract

**Purpose** – This study aims to examine whether audit partners' gender affects the year-to-year changes (year-to-year additions and drops) of key audit matters (KAMs) identified in the audit report. This study also examines whether female audit partners' audit experiences, accounting education and narcissism reduce the difference in time variances of KAMs reporting between female and male audit partners. This study defines the year-to-year additions and drops of KAMs as the time variance of KAMs.

**Design/methodology/approach** – Data of this study includes the audit reports of Australian Securities Exchange 300 companies for the period from 2017 to 2021. This study also applies the theory of female auditors' preference for anchoring and availability heuristics. This study uses multivariate regression with robust standard errors clustered by the firms. This study also uses several robustness tests.

**Findings** – The findings suggest that female audit partners disclose fewer time variant KAMs in that they have a lower tendency both to add new KAMs and to drop old KAMs. Further analysis suggests that the differences between female and male audit partners decrease as the female audit partners' experience increases or if the female audit partner possesses a bachelor's degree in accounting. Female audit partners' narcissism also reduces the gender gap in the time variances of KAMs.

**Practical implications** – The fact that female audit partners report more stable KAMs implies that there are differences between female and male audit partners in the way audit risk assessments are conducted, audits are planned and professional judgement is applied by female and male audit partners.

**Social implications** – The findings imply that female audit partners' experience, accounting education and narcissistic personality can play a significant role in explaining the differences in audit outcomes produced by male and female audit partners.

**Originality/value** – This study is novel in showing that female audit partners report more stable and less time-variant KAMs. The findings of this study may inform audit firms and regulators that female audit partners' experience, tertiary qualifications in accounting and narcissistic personality traits may be effective means of reducing the gender gap in auditing. The findings also imply that auditors' observable and unobservable personality traits affect audit outcomes.

**Keywords** Key audit matter, Auditors' gender, Time variances of key audit matters

**Paper type** Research paper

## 1. Introduction

In an effort to increase the information content and usefulness of audit reports, global standard setters have introduced a series of reforms to audit reporting via auditing

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standards, such as International Standards on Auditing (ISA) 700 and ISA 701. The most notable reforms are changes in the format of audit reports and the requirement to report key audit matters (KAMs). ISA 701 requires the audit partner to identify key risk areas in the audit process and disclose them as KAMs. Auditors must apply significant personal judgment in identifying the KAMs and then decide what to disclose about identified KAMs. The principle-based approach, as per ISA 701, followed by auditors in identifying and reporting KAMs, implies that an audit partner's experiences, value systems, risk attitude and reporting motivations may affect the disclosure of KAMs. After identifying a KAM, the auditor needs to decide what information to disclose about it. The standard setters expected that the reported KAMs will enhance the information content of audit reports. Furthermore, reported KAMs will be audit- and client-specific (Minutti-Mezza, 2021). To the extent that the identification and disclosure of KAMs are functions of auditors' personal risk attitudes, audit partners' gender may play a significant role in the identification and disclosure of KAMs.

Recent studies have examined the determinants of KAMs reporting (Sierra-García *et al.*, 2019; Bepari *et al.*, 2022). These studies have examined the determinants of total number and types of KAMs. An underresearched area is the year-to-year addition of new or drop of old KAMs. Although most of the previous studies have focused on the intercompany differences, little evidence exists on the year-to-year intracompany variations of KAMs reporting. We define the year-to-year addition and drop of KAMs as the time variances of KAMs. Studies that focused on the effect of audit partners' gender on KAMs reporting have examined the gross number and content characteristics of KAMs (Abdelfattah *et al.*, 2021; Bepari *et al.*, 2022). However, focusing just on the gross number of KAMs oversimplifies the essence of the KAMs reporting requirements because the dynamics of addition and drop of KAMs are ignored. Focusing on the year-to-year change in KAMs reporting, by adding new and/or dropping old KAMs, provides an indication of the time variances of audit risks and fresh perspectives on the auditing. Reporting the same KAMs every year may be characterized as routine application of professional standards and repletion of the same audit procedures. On the contrary, adding new KAMs and/or dropping of old KAMs reflect fresh perspectives and a more proactive approach to the identification and response to audit risks (Duboisee De Ricquebourg and Maroun, 2022). The addition of new KAMs and the replacement of old KAMs bring instability in KAMs reporting requiring afresh negotiation with audit committees (AC) every year.

The Financial Reporting Council (2013) expects the KAMs disclosure to be client-specific and audit year-specific. However, regulators have shown concerns over the lack of year-to-year variances in KAMs (Financial Reporting Council, 2015, 2016a). Similar concerns have been expressed by accounting practitioners as to the stickiness of KAMs over years [PricewaterhouseCoopers (PwC), 2015]. The year-to-year variance in KAMs reporting is important to reflect the dynamics of the risk environment of the client. Otherwise, the KAMs reporting will become "boilerplate" disclosures. As lack of year-to-year variance in the KAMs runs counter to the essence of ISA 701, the Financial Reporting Council (2015) calls for empirical research in this regard. Following the Financial Reporting Council (2015) call, Duboisee De Ricquebourg and Maroun (2022) have examined if switches of audit firm and audit partner affect the time variances of KAMs, whereas Zhang and Shailer (2021) examined if year-to-year changes in KAMs affect the audit fees. We extend the literature by examining if audit partners' gender affects the time variances of KAMs. We examine whether audit partners' gender affects the year-to-year changes (year-to-year additions and drops) of KAMs identified in the audit report.

The effect of female audit partners' insufficient exposure to important and complicated tasks, as well as the effect of gender favouritism in audit firms, on the audit quality have generated enhanced controversy and interests in recent years (Garcia-Blandon *et al.*, 2019). Regulators and audit firms are also concerned about how to reduce the gender gaps in auditing (Garcia-Blandon *et al.*, 2019). Our study is motivated by the recent trend in auditing research that examines the effect of audit partners' gender on the audit quality. To explain the effect of audit partners' gender on the time variances of KAMs, we rely on female audit partners' cognitive and psychological differences with male audit partners in terms of availability heuristic (Kudryavtsev and Cohen, 2011; Tversky and Kahneman, 1974), preference for anchoring (Kudryavtsev and Cohen, 2011), less overconfidence (Douglas and Miller, 2015), lower preference for aggressive negotiations (Douglas and Miller, 2015) and more risk averse attitude (Bajtelsmit and VanDerhei, 1997). Due to these cognitive and psychological differences between male and female audit partners, we expect female audit partners to report more stable KAMs compared to their male counterparts.

Audit partner's accounting degree (Chu *et al.*, 2022), experience (Sonu *et al.*, 2019; Wang *et al.*, 2015) and narcissism (Chou *et al.*, 2021) have been found to be associated with enhanced audit quality and larger audit fees. No evidence exists on whether these attributes reduce the effect of audit partners' gender difference in auditing. We extend the literature by examining if female audit partners' experience, accounting degree and narcissism reduce the difference in time variances of KAMs reporting between female and male audit partners.

Our sample consists of 3,765 KAMs reported for the Australian Securities Exchange (ASX) 300 listed companies spanning over 1,430 firm-year observations from 2017 to 2021 periods. We use univariate tests as well as multivariate regressions to examine our research questions.

We make several contributions to the audit, gender and KAMs literature. Unlike early studies on KAMs, we examine the time variances of KAMs and document that audit partners' gender affects the time variances of KAMs. We find that female audit partners are less likely to add new KAMs, drop old KAMs and make overall change in the previously reported KAMs. ISA 701 requires the auditor to review the audit planning, risks assessment and audit process for every audit. Introducing new KAMs and dropping old KAMs provide evidence of the adoption of a fresh perspective on the yearly audit. The fact that female audit partners report more stable KAMs implies that there are fundamental differences between female and male audit partners in the way audit risks assessments are conducted, audits are planned and professional judgement is applied by female and male audit partners. We find that the female audit partners' years of experience, a degree in accounting and narcissist traits reduce differences with their male counterparts in the KAMs disclosures. Hence, our findings may inform audit firms and regulators of effective means of reducing gender gaps in auditing. Our findings also imply that auditors' observable and unobservable personality traits affect audit outcomes.

The paper progresses as follows. Hypotheses are developed in Section 2. In Section 3, methodologies are discussed. Results are presented in Section 4. The paper is concluded in Section 5.

## 2. Hypothesis development

### *2.1 Audit partners' gender and time variances of key audit matters*

The effect of female audit partners' insufficient exposure to important and complicated tasks and the effect of gender favouritism in big audit firms on the audit quality have generated enhanced controversy and interests in recent years (Garcia-Blandon *et al.*, 2019). Empirical evidence suggests that female representations are very low and of low profile,

whereas the male domination exists in audit firms (Anderson-Gough *et al.*, 2005). Moreover, audit firms have long been criticized for gender discriminations in the assignment of audit tasks (Lennox and Wu, 2018; Nasution and Jonnergård, 2017). Due to the cognitive and psychological differences between male and female audit partners, and due to the lower exposures to important and complicated tasks, female audit partners perceive more risks in auditing (Hardies *et al.*, 2016) and are more risk averse (Nekhili *et al.*, 2020).

Recognizing the effect of audit partners' gender differences on the KAMs reporting, Bepari *et al.* (2022) provided evidence in the Australian context that female audit partners report higher number of KAMs, higher number of accounts level KAMs and fewer number of entity level KAMs than their male counterparts, despite the fact that entity level KAMs have greater implications than that of accounts level KAMs. Abdelfattah *et al.* (2021), in the UK context, show that female audit partners report more, longer and less readable KAMs in more negative tones than their male counterparts.

Judgmental or availability heuristics imply that most people rely on mental shortcuts (Belsky and Golivich, 2020). Reliance on heuristics causes anchoring biases. Tversky and Kahneman, 1974) suggest that "heuristics" reduce the complex decision-making problem to a simple judgmental anchoring operation. They argue that the anchoring effect is the disproportionate reliance of the decision-maker on the initially presented values, conditions or parameters. As a result, decision-makers' estimates are biased toward the anchor values. The anchoring bias results in insufficient adjustments by the decision-maker because the final decision is assimilated toward the starting point of the decision-maker's deliberations. Anchoring may result in bases and fallacies in decision-making (Tversky and Kahneman, 1974).

Early psychological research has documented that due to their risk averse attitudes (Bajtelsmit and VanDerhei, 1997), in risky environments, female professionals take decisions based on the "availability heuristic." Females are more prone to anchoring on what is available (Kudryavtsev and Cohen, 2011), and they underperform in negotiations and negotiate less aggressively (Douglas and Miller, 2015). These cognitive and psychological differences between male and female audit partners also imply that female audit partners will disclose more stable KAMs than their male counterparts, because adding new KAMs and dropping old KAMs require renewed negotiations with the AC. Addition of new KAMs also enhances auditors' risk perceptions.

There are many reasons why risk adverse auditors might prefer to not change KAMs reported in the previous year. KAMs reporting affects the audit partner's risk perceptions and legal liability. Auditors need to disclose the audit procedures of the identified KAMs. Ex post KAMs reporting, if any misstatement is found relating to areas reported as KAMs, auditors may be held liable for negligence. On the contrary, if an auditor did not report that particular item as a KAM, the auditor may resort to the argument of reasonable assurance and the excuse of conducting audit on a sample basis. Hence, risk averse auditors will have a preference for a standardized list of KAMs that can be reported year-after-year without embracing new risks areas every year. Changing the KAMs would need auditors to negotiate anew with the AC and disclose new audit procedures in the audit report. New KAMs also reduce the comparability with previous years and with industry peers. Hence, introduction of new KAMs and drop of old KAMs have implications for audit efforts, peer comparisons and for the relationship of the auditor with the clients. Brasel *et al.* (2016) argue that auditors will have a preference to disclose more "innocuous boilerplate [key] audit matter" as a form of legal protection. Against this backdrop, Wilson (2021) suggests that to report KAMs independently, auditors will have to withstand pressures from the AC and from the management of the client firm, and auditors will have to have the grit to confront

them. Apart from the risk of confrontation with the client, Vinson *et al.* (2019) found that auditors litigation risks increase when they introduce new KAMs or drop old KAMs. Moreover, jurors consider auditors to have more legal liability after the inclusion of new KAMs. Gimber *et al.* (2016) and Backof *et al.* (2022) conclude that introducing new KAMs causes an increase in auditors' legal liability perception, while Pelzer (2021) documents that risk averse auditors do not want to be an outlier, rather they prefer to report a standardized list of industry generic KAMs.

The addition and drop of KAMs introduce instability in KAMs reporting and require afresh negotiation with the AC every year. The AC members may oppose the reporting of new KAMs by auditors. The aggressive negotiation skills of male audit partners might play a significant role in convincing the AC members to approve the change in the already reported KAMs. Also, adding new KAMs by dropping old KAMs requires auditors to identify new risk areas. Due to their preferences for anchoring and availability heuristics, due to their risk averse attitudes and preferences for less aggressive negotiations, female audit partners may be less likely to add new KAMs and drop old KAMs and more likely to retain existing KAMs than their male counterparts. We propose the following hypothesis:

*H1*. Female audit partners report more stable KAMs than their male counterparts (KAMs reported by female audit partners are less time variant than those of their male counterparts).

### *2.2 Does exposure to experience reduce the gender gap in key audit matters reporting?*

Early research has shown that, as the experience of female audit partners increases, gender differences in terms of audit outcomes and audit efforts decrease. Gender differences between male and female audit partners' attitudes may decrease as the female partners become more experienced and knowledgeable. The risk aversion attitude of women is mitigated by an increase in their financial knowledge (Hibbert *et al.*, 2013; Dwyer *et al.*, 2002). Anderson-Gough *et al.* (2005) argued that the risks of jeopardizing the job opportunities and leadership roles due to gender inequality may encourage a change in the mindset of women when they enter the audit profession leading them to the process of masculinization. Haynes (2017) argued that the masculine orientation helps female partners grow and progress within the audit firms. Bustos-Contell *et al.* (2022) interpreted audit partners' experience as a process of masculinization. They find that as the audit team leaders' experience increases, their masculinization process helps reduce the gender gap in auditing. Hence, female audit partners' exposure to more experience may reduce the gender differences in KAMs reporting. The implication is that the differences in attributes of KAMs reported by female audit partners and those reported by male audit partners may decrease as the female audit partners become more experienced. Accordingly, we propose the following hypothesis:

*H2a*. The effect of audit partners' gender difference on the time variances of KAMs disclosure decreases as the female audit partners' experience increases.

### *2.3 Does female audit partners' accounting education reduce the gender gap in key audit matters reporting?*

Early literature has documented that auditors' education in accounting (a tertiary degree in accounting) is associated with improved audit quality, higher audit fees and types of KAMs reported by auditors. Chu *et al.* (2022) documented that if the auditor possesses a tertiary

degree in a quantitative discipline/accounting, it causes an increase in the audit fees earned by the auditor and improves the accrual quality of the client. Murat Ocak (2018) found that an auditor's education level reduces the negative effect of the auditor's business pressures on the audit quality. Bepari *et al.* (2022) also documented that an audit partner's accounting degree reduces the number of KAMs reported and increases the number of entity level KAMs. Because education enhances confidence level and provides with deeper insights, an accounting degree of a female audit partner should reduce the difference in time variances of KAMs reporting in terms of additions and drops of KAMs:

*H2b*. The effect of audit partners' gender on the time variance of KAMs disclosure decreases if the female audit partner has a bachelor degree in accounting.

*2.4 Does female audit partners' narcissism reduce the gender gap in key audit matters reporting?*

Narcissism entails one's beliefs of superiority, an elevated self-image and their recognition by others (Campbell *et al.*, 2004). It involves an extreme sense of self-entitlement, dominance in the decision process and the desire for constant recognitions (Ham *et al.*, 2017). Although excessive narcissism is considered as clinical disorder, narcissism which is not excessive is considered as a personality trait (Emmons, 1987). The level of narcissism in a person is relatively stable and enduring (Campbell *et al.*, 2004). The sense of superiority may lead a narcissist to be a productive person and a transformative leader (Maccoby, 2004). Narcissists are excessively motivated individuals who do not succumb to a herd mentality (Maccoby, 2003). Narcissistic persons envision to change the order of the business (Maccoby, 2003) and take risks in pursuing their objectives disregarding fear of failing.

Narcissism may affect audit partners' independence in alternative ways. Due to the excessive self-esteem and the need for recognitions, narcissists tend to develop excessive recognition and dominance in their professional domain (Maccoby, 2003). Because audit failure can tarnish audit partners' reputations (He *et al.*, 2021), narcissistic audit partners will have strong motivation to conduct high-quality audits (Nevicka *et al.*, 2016) and will withstand against the possible compromise of independence. Alternatively, narcissistic audit partners may have less regards for public backlash arising from audit failure. To the extent that retaining and managing more clients represent success and pride, narcissistic audit partners may attempt to retain the clients rather than lose their independence. The other possibility is that narcissist auditors will avoid capitulating to herd mentality and succumbing to the social pressure if retaining the client is deemed more important (Maccoby, 2003). Nevertheless, the risks of losing clients will be of less concern to narcissistic auditors, who are proficient in accepting and managing risks and pursuing their objectives regardless (Chou *et al.*, 2021). Hence, narcissistic audit partners may not succumb to client pressures, may stick to their own opinions and challenge clients' accounting policies and estimates, demonstrate greater competence and have more grits required to introduce new KAMs and to change old KAMs. The narcissistic personality of a female audit partner may reduce her risk averse attitudes, her anchoring mentality and her reliance on availability heuristics. Hence, we propose the following hypothesis:

*H2c*. The effect of audit partners' gender on the time variances of KAMs disclosure decreases if the female audit partner is a narcissist.

## 3. Research method

### 3.1 Sample and data

Our sample consists of companies listed on the ASX 300 index from 2017 to 2021. The index is rebalanced quarterly to allow for the exit and entry of firms into the index list. To examine a stable sample, we considered the index as of March 31, 2019, and then traced those firms from 2017 to 2021 periods. The index covers approximately 85% of the market capitalization of all firms listed on the ASX. We collected financial data from multiple sources such as Osiris and Board Room databases, annual reports and Yahoo Finance to limit the need to remove companies from our sample because some data was missing.

Data on KAMs was hand-collected from annual reports. Table 1, Panel A, shows the sample selection procedures. Table 1, Panel B, shows the industry distributions of the companies in our sample.

Table 1, Panel C, shows the industry distribution of KAMs in terms of the addition of KAMs, drop of KAMs and unchanged KAMs. The average number of KAMs per firms during the study period was 2.633, the average number of KAMs additions was 0.541, the average number of KAMs drops was 0.656 and the average number of unchanged KAMs per firm-year-observation was 2.039. For 476 of the 1,430 firm-year-observations, the reported KAMs remained unchanged from the previous year.

Table 2 shows the industry distribution of the female audit partners. The financial sector has the highest percentage of female audit partners (16.74%) followed by consumer discretionary (16.30%), industrials (15.86%), real estate (11.45%), consumer staples (11.01%), materials (10.57%), information technology (7.93%), health care (6.61%) and energy (2.64%).

Table 3 shows the yearly distribution of all KAMs-related variables: such as average number of KAMs, KAMs added, KAMs dropped, constant KAMs and firm-year-observations with KAMs unchanged. During the entire period, new KAMs have been added in 39.8% observations; old KAMs have been dropped in 44.6% observations; and in 41.8% observations, KAMs remained unchanged from the previous period.

### 3.2 Empirical models

To examine whether the audit partners' gender affects the time variances of KAMs in terms of the addition of new KAMs and drop of old KAMs, we run the following models:

$$\text{DVs} = \alpha + \beta_1 Gender + \sum Control + \sum Industry\,Dummy + \sum YearDummy + \sum Audit\,Firm + \mu$$

Models 1a–1e.

Where, DVs = dependent variables. The DVs used are as follows: KAM_ADD = number of new KAMs added during current year; KAM_DROP = number of old KAMs dropped during current year; KAM_CON = number of KAMs unchanged from previous period; KAM_CHANGE = a dummy variable taking the value of 1 if the reported KAMs have changed during current period either by addition or drop, 0 otherwise; and NKAM_CHANGE = net change in KAMs estimated as the sum of KAM_ADD and KAM_DROP divided by the number of KAMs in the prior year.

To examine if female audit partners have a lower tendency to change reported KAMs from previous period, we use a logistic model with the dichotomous dependent variable KAM_CHANGE in Model 1d. A logit model is appropriate as the dependent variable is

*Panel A: Sample selection procedure*

| | |
|---|---|
| Total firm-year observations: (300*5 years) | 1,500 |
| Delisted or merged | −10 |
| Annual report unavailable | −5 |
| Less: Contain multiple financial statement of different trusts | −10 |
| Less: Data not extractable from encrypted annual reports | −20 |
| Less: Foreign companies with different reporting currencies and audit jurisdictions | −25 |
| Total sample used in the study | 1,430 |

*Panel B: Industry distribution of samples*

| Industry sector | 2021 | 2020 | 2019 | 2018 | 2017 | Total | % |
|---|---|---|---|---|---|---|---|
| Consumer staples | 17 | 14 | 17 | 16 | 18 | 82 | 5.73 |
| Materials | 51 | 57 | 54 | 56 | 57 | 275 | 19.23 |
| Real estate | 32 | 33 | 29 | 33 | 33 | 160 | 11.19 |
| Consumer discretionary | 44 | 44 | 43 | 43 | 43 | 217 | 15.17 |
| Energy | 18 | 18 | 19 | 20 | 19 | 94 | 6.57 |
| Financials | 35 | 36 | 35 | 33 | 34 | 173 | 12.10 |
| Health care | 21 | 22 | 22 | 22 | 21 | 108 | 7.55 |
| Industrials | 28 | 30 | 28 | 29 | 28 | 143 | 10.00 |
| Information technology | 22 | 23 | 22 | 22 | 24 | 113 | 7.90 |
| Telecommunications services | 6 | 8 | 7 | 8 | 9 | 38 | 2.66 |
| Utilities | 3 | 6 | 6 | 6 | 6 | 27 | 1.89 |
| Total | 277 | 291 | 282 | 288 | 292 | 1,430 | 100 |

*Panel C: Industry distributions of KAMs (total KAMs, addition, drop, constant)*

| Industry sector | Total no. of KAMs | KAM_ADD | KAM_DROP | KAM_Constant | Unchanged # of firms | *N* |
|---|---|---|---|---|---|---|
| Consumer staples | 223 (2.719)[a] | 35 (0.427) | 53 (0.646) | 126 (1.537) | 24 | 82 |
| Materials | 665 (2.409) | 142 (0.516) | 169 (0.615) | 375 (1.363) | 79 | 275 |
| Real estate | 355 (2.204) | 30 (0.188) | 46 (0.288) | 246 (1.537) | 86 | 160 |
| Consumer discretionary | 554 (2.541) | 113 (0.521) | 136 (0.627) | 326 (1.502) | 58 | 217 |
| Energy | 269 (2.831) | 57 (0.606) | 65 (0.691) | 159 (1.691) | 22 | 94 |
| Financials | 584 (3.337) | 70 (0.405) | 76 (0.439) | 399 (2.306) | 61 | 173 |
| Health care | 247 (2.266) | 32 (0.296) | 32 (0.296) | 161 (1.491) | 42 | 108 |
| Industrials | 377 (2.618) | 49 (0.342) | 58 (0.405) | 249 (1.741) | 55 | 143 |
| Information technology | 300 (2.631) | 66 (0.584) | 67 (0.592) | 171 (1.513) | 31 | 113 |
| Telecommunications services | 113 (2.897) | 15 (0.395) | 23 (0.605) | 67 (1.763) | 10 | 38 |
| Utilities | 80 (2.857) | 17 (0.629) | 19 (0.704) | 44 (1.629) | 6 | 27 |
| Total KAMs | 3,765 | 616 | 746 | 2,321 | – | – |
| Average KAMs | 2.633 | 0.541 | 0.656 | 2.039 | – | – |
| Firm year | 1,430 | 1,138 | 1,138 | 1,138 | 476 | 1,430/ 1,138 |

**Notes:** [a]Total number of KAMs (average number of KAMs). To calculate average number of KAM_ADD, KAM_DROP and KAM_Constant, we exclude observations for 2017 as it was the first year of reporting KAMs, and hence, no addition or dropping of KAMs can be calculated. Total 1,138 observations from 2021 to 2018 were available

**Source:** Authors' own work

**Table 1.**
Sample distributions

| Industry sector | No. of observations with female audit partners | % |
|---|---|---|
| Consumer staples | 25 | 11.01 |
| Materials | 24 | 10.57 |
| Real estate | 26 | 11.45 |
| Consumer discretionary | 37 | 16.30 |
| Energy | 6 | 2.64 |
| Financials | 38 | 16.74 |
| Health care | 15 | 6.61 |
| Industrials | 36 | 15.86 |
| Information technology | 18 | 7.93 |
| Telecommunications services | 1 | 0.44 |
| Utilities | 1 | 0.44 |
| Total | 227 | 100 |

**Source:** Authors' own calculation

**Table 2.** Industry distribution of female audit partners

| | 2021 | 2020 | 2019 | 2018 | 2017 | Pooled Total |
|---|---|---|---|---|---|---|
| KAM_N (AVERAGE) | 672 (2.426)[a] | 770 (2.646) | 735 (2.606) | 775 (2.691) | 816 (2.794) | 3,765 (2.633) |
| KAM_ADD | 126 (0.455) | 188 (0.646) | 154 (0.546) | 150 (0.521) | NA | 616 (0.541) |
| KAM_DROP | 215 (0.776) | 174 (0.597) | 181 (0.642) | 175 (0.608) | NA | 745 (0.655) |
| KAM_CON | 546 (1.971) | 581 (1.997) | 568 (2.014) | 626 (2.174) | NA | 2,321 (2.039) |
| KAM_CHANGE | 159 (0.574) | 181 (0.622) | 160 (0.567) | 162 (0.563) | NA | 662 (0.582) |
| NKAM_CHANGE | 0.474 | 0.487 | 0.471 | 0.412 | NA | 0.461 |
| KAM_UNCHANGED | 118 | 110 | 122 | 126 | NA | 476 |
| No. of firm-year-observations | 277 | 291 | 282 | 288 | 292 | 1,430/1,138[b] |
| % of firms KAMs added | 0.331 | 0.459 | 0.481 | 0.399 | NA | 0.398 |
| % of firms KAMs dropped | 0.480 | 0.425 | 0.506 | 0.447 | NA | 0.446 |
| % of firms KAMs unchanged | 0.419 | 0.377 | 0.519 | 0.433 | NA | 0.418 |

**Notes:** [a]Total number of KAMs (average number of KAMs); [b]292 firm-year-observations of 2017 are excluded to calculate the average of KAM_ADD and KAM
**Source:** Authors' own calculation

**Table 3.** Yearly distributions of KAMs additions, drops and constant KAMs

binary, and our key independent variable (Gender) is also binary. All models are estimated using multivariate regression.

To examine the effect of experience, accounting education and narcissism of female audit partners on the time variances of KAMs, we use the following models:

$$\text{DVs} = \alpha + \beta_1 Gender + \beta_2 Exp * Gender + \sum Control + \sum Industry\,Dummy + \sum Year\,Dummy + \sum Audit\,Firm + \mu$$

Models 2a–2e:

$$\text{DVs} = \alpha + \beta_1 Gender + \beta_2 Acc\,Edu * Gender + \sum Control + \sum Industry\,Dummy + \sum Year\,Dummy + \sum Audit\,Firm + \mu$$

Models 3a–3e:

$$\text{DVs} = \alpha + \beta_1 Gender + \beta_2 Narcissism * Gender + \sum Control + \sum Industry\,Dummy + \sum Year\,Dummy + \sum Audit\,Firm + \mu$$

Models 4a–4e.

*Independent variables*.

*Gender*: A binary variable taking the value of 1 if the signing audit partner for firm *i* in year *j* was a female, 0 otherwise. For firms having dual signing audit partners, we consider the gender of the lead audit partner.

*Exp* refers to years of audit experience. For each auditor, we traced LinkedIn Account and/or audit firm's website to find out the auditor's experience. We use this variable in the natural log form. We use the interaction variable Exp**Gender* to examine if female audit partners' years of experience reduces their differences in KAMs reporting with their male counterparts. We expect a significant relationship between *Exp* and disclosure of KAMs, because experienced auditors are expected to be more precise in identifying KAMs.

*AccEdu* is a binary variable taking the value of 1 if the audit partner has a bachelor's degree in accounting, 0 otherwise. Our variable of interest is *AccEdu*Gender* which will capture the effect of accounting education on KAMs reporting practices by female auditors.

*Narcissism* is measured using the size of the signature of the audit partner in square centimetres. We follow Chou *et al.* (2021), Ham *et al.* (2018) and Ham *et al.* (2017) to draw a rectangle tightly surrounding the signature, each side of the rectangle touches the most extreme endpoint of the signature. We measure the size of the signature by multiplying the length and width of the rectangle. For each partner, we calculate the average signature size over the sample period. The signature-based measure of narcissism has been validated in an experimental setting (Chou *et al.*, 2021) and has been widely used in research on CEOs and audit partners' narcissism studies. The greater the area of the signature, the more narcissistic is the auditor. Our variable of interest is *Narcissism*Gender* which will capture the effect of Narcissism variable on KAMs reporting practices by female auditors. Examples of measuring the size of the signature are shown in Appendix 1.

*Control variables*. Consistent with Davis and Hay (2012), we use the number of reportable segments of the client as a proxy, *Complex*, representing the complexity of the client's business and hence the audit. We measure *Size* of clients by the natural logarithm of the of total assets of the client (consistent with Sierra-García *et al.*, 2019). We use *Lev*, for leverage, measured as the total liabilities divided by total assets (following Wu *et al.*, 2016). A highly leveraged firm is likely to have more KAMs (Sierra-García *et al.*, 2019). We use *Int* to proxy for the client's intangible assets intensity and define as the intangible assets including goodwill divided by total assets (following Barth *et al.*, 2001). Client's revenue; inventory; and property, plant and equipment (PPE) have direct implications for the number of KAMs reported as these items are widely identified as KAMs (Kend and Nguyen, 2020). We include *Rev, Inv and PPE*, as these line items are reported in the financial statements of the client, divided by reported total assets. We include *ROA* to proxy for profitability, measured as client firms' net profit divided by total assets. We include an indicator variable *Loss*, taking the value of 1 for reporting a loss during

the period, otherwise 0 (Zero) (following DeFond and Zhang, 2014). The reporting of a loss by a client may trigger additional audit efforts and, hence, may have implications for KAMs reporting. Consistent with Sierra-García *et al.* (2019), we use a variable *Quick* to represent the Quick ratio. Following Abdelfattah *et al.* (2021), we use a variable *Risk* to represent risk measured by annual dispersion in the share price. To control for the industry specific effect on auditors' disclosure of KAMs, we include industry dummy variables in the model. The energy sector is excluded from the model as we use this sector as the reference sector. Consistent with Abdelfattah *et al.* (2021), we also control for year effects and audit firm effects.

The variable *Fee* represents the natural log of client's total audit fee paid for audit purposes. If auditors spend more time and resources in identifying and auditing KAMs, then the audit fee must be positively associated with KAMs reporting. We include the variable *NAF* to represent any nonaudit fees paid by the client to the audit firm. NAF is measured as the nonaudit fee divided by the total fee (audit + non-audit) paid by the client. We define the variable *Switch* as a binary variable taking the value of 1 if there was a change (switch) of the auditor during the period, 0 otherwise. Consistent with Bepari *et al.* (2022), to control for differences in KAMs reporting by industry specialist auditors and nonspecialist auditors, we include a variable *SpAu*, taking value 1 if the company's auditor has listed the client's industry as one of the first three of his/her specialization area in his/her LinkedIn or in audit firm profile, 0 otherwise. All variables are summarized in Appendix 2.

## 4. Results and discussions

### *4.1 Descriptive statistics and univariate tests*

Descriptive statistics of different variables and mean difference test results between male and female audit partners are shown in Table 4. About 22.3% of the audit partners are female. About 48.5% of the auditors have a bachelor's degree in accounting. The average score for narcissism is 4.828, and the average years of experience of the sample audit partners is 23.91 years. The average number of KAMs reported are 2.633 (Table 3). On average, 0.541 KAMs are added, 0.655 KAMs are dropped and 2.039 KAMs are constant from the previous year. KAMs have changed from previous year for about 58.2% of observations, the relative change in KAMs from previous year's KAMs is 46.1%. Sampled firms have an average total asset of $17,969m, the average audit fee of $1.451m, while the average nonaudit fee of $0.826m. Our sample firms have an average of $813m intangible assets, $351m inventory, $7,658.82m debt, $354 million profit, $1,370.421m PPE and $4,127.381m revenue. About 93.5% of firms are audited by Big4 auditors. About 18.5% of the sample firms have incurred losses during the study period. Firms have an average 3.30 business segments, quick ratio of 1.12 and dispersion of share price (risks) $0.70. About 6.84% of sample firms have experienced audit partner switch. This low percentage of auditor-switch is consistent with the findings of Kend and Nguyen (2022), who find a small percentage of auditor switch in Australia. However, it is inconsistent with Abdelfattah *et al.* (2021) who find a 26% auditor switch in the UK context.

The mean difference tests suggest significant differences between male and female audit partners in terms of all key metrics of KAMs disclosures. Female audit partners add (drop) fewer number of new (old) KAMs and report higher number of constant (unchanged) KAMs than male audit partners. The descriptive statistics and mean difference tests of control variables clustered based on partners' gender further suggest that although female audit partners, on an average, audit larger firms, they earn, on average, lower fees and lower nonaudit fees. On an average, 85.36% of the female audit partners in our sample belong to Big4 audit firms, and the corresponding percentage for male audit partners is 94.32%.

| Variables | *N* | Sample mean | Mean female | Mean male | Difference in mean | *t*-tests |
|---|---|---|---|---|---|---|
| KAM_ADD | 1,138 | 0.541 | 0.482 | 0.567 | −0.085*** | −22.952 |
| KAM_DROP | 1,138 | 0.655 | 0.567 | 0.693 | −0.126*** | −27.085 |
| KAM_CON | 1,138 | 2.039 | 2.176 | 1.991 | 0.185*** | 23.094 |
| KAM_CHANGE | 1,138 | 0.582 | 0.484 | 0.629 | −0.155*** | −31.837 |
| NKAM_CHANGE | 1,138 | 0.461 | 0.415 | 0.473 | −0.058*** | −19.429 |
| Exp | 1,138 | 23.91 | 22.24 | 24.41 | −2.170** | *−2.318* |
| Gender | 1,138 | 0.225 | NA | NA | NA | *NA* |
| AccEdu | 1,138 | 0.485 | 0.579 | 0.418 | 0.161*** | *7.037* |
| Narcissism | 1,138 | 4.828 | 4.372 | 4.959 | −0.587*** | *−21.346* |
| Size (million$) | 1,138 | 17,969.39 | 22,656.16 | 16,624.12 | 6,032.041 | *8.638* |
| Fee (million$) | 1,138 | 1.451 | 1.319 | 1.554 | −0.235*** | *−4.975* |
| NAF (million$) | 1,138 | 0.826 | 0.567 | 0.985 | −0.418*** | *−5.346* |
| Int (million$) | 1,138 | 813 | 752.878 | 1,224.458 | −471.580*** | *−11.083* |
| Inv (million$) | 1,138 | 351 | 311.787 | 420.186 | −108.398*** | *−9.495* |
| Lev (million$) | 1,138 | 7,958.82 | 9,937.77 | 7,384.43 | 2,553.34*** | *9.947* |
| Profit [3] (million$) | 1,138 | 354.461 | 406.319 | 343.087 | 163.233*** | *4.371* |
| Big4 | 1,138 | 0.935 | 0.8536 | 0.9432 | −0.0896*** | *−5.463* |
| Loss | 1,138 | 0.185 | 0.173 | 0.199 | −0.026 | *−1.268* |
| PPE (million$) | 1,138 | 1,370.421 | 1,271.981 | 1,383.439 | −111.458*** | *−6.865* |
| Rev (million$) | 1,138 | 4,127.381 | 4,372.438 | 4,046.693 | 325.745*** | *8.672* |
| Complex | 1,138 | 3.30 | 3.48 | 3.26 | 0.22** | *2.374* |
| Quick | 1,138 | 1.12 | 1.118 | 1.132 | −0.014 | *−1.267* |
| Risk | 1,138 | 0.70 | 0.72 | 0.69 | 0.03 | *1.493* |
| Switch | 1,138 | 0.068 | 0.052 | 0.073 | −0.021*** | *−13.863* |
| SpAu | 1,138 | 0.378 | 0.403 | 0.372 | 0.031*** | *6.487* |

**Table 4.**
Univariate tests of variables for clients audited by male auditors and female auditors

**Notes:** ***Significant at 1% level; **significant at 5% level. Variables are defined in Section 3.2. For Size, Fee and Exp, we use natural log values in the regressions. We deflate Lev, Profit, PPE, Int, Inv and Rev by total assets to remove the scale differences
**Source:** Authors' own work

*4.2 Correlation coefficients and other diagnostics*

We examine the Pearson correlations coefficients among all variables (not reported for the brevity purpose). The independent and control variables are correlated with dependent variables in the expected directions. Among the independent variables, the highest correlation coefficient (0.464) is found between Size and Lev. Among the dependent variables, the highest correlation coefficient (0.429) is found between KAM_ADD and KAM_DROP (0.429). The correlation coefficient of less than 0.80 does not create multicollinearity problem (Gujarati and Porter, 2009). Moreover, the lower correlations between dependent variables imply that our dependent variables are capturing different phenomena of KAMs reporting. In ordinary least square regression models, we use robust standard errors clustered by firms to control for serial correlations and heteroscedasticity. We also control for year effects and industry effects. Furthermore, variance inflation factor (VIF) values are examined for potential multicollinearity in the independent variables. A VIF value of less than 10 does not indicate a multicollinearity problem (Gujarati and Porter, 2009). The highest VIF value in our estimations was 4.256, thereby suggesting no multicollinearity problem. To remove outlier observations, we winsorize continuous variables for the highest and lowest 1% of the observations.

*4.3 Results*

*4.3.1 Audit partners' gender and time variances of KAMs.* Table 5 shows the results of Models 1a–1d. Model 1d is a logistic regression. The *F*-statistics are significant for all models, implying that the models capture different aspects of the time variances of KAMs. The coefficient of the "Gender" variable is significant in all five models. It is negative in Models 1a [−0.085 (*t*-values = −2.991)], 1b [−0.091 (*t*-values = −4.028)] 1d [−0.473 (odd ratio = 0.623)] and Model 1e [−0.228 (*t*-values = −3.479)], while it is positive in Model 1c [0.310 (*t*-values = 3.573)]. These results imply that female audit partners add (drop) smaller number of new (old) KAMs and have a lower tendency to change existing KAMs than their male counterparts. In other words, female audit partners report more stable and less time-variant KAMs than those of their male counterparts.

Among control variables, we find significant coefficient for Fee, NAF, Size, Complex, Loss, Rev, Risk, SpAu and Switch. These findings suggest that bigger and more complex companies with higher audit fees and higher risks have more time-variant KAMs in terms of number of KAMs added, dropped and changed compared to their KAMs reported in the

| Variables | Model 1a KAM_ADD | Model 1b KAM_DROP | Model 1c KAM_CON | Model 1d KAM_CHANGE | Model 1e NKAM_CHAGNE |
|---|---|---|---|---|---|
| Constant | 0.254 (0.938) | 0.218 (1.173) | 1.317*** (4.308) | 0.532*** (1.702) | 0.413 (1.127) |
| Gender | −0.085*** (−2.991) | −0.091*** (−4.028) | 0.310*** (3.573) | −0.473*** (0.623) | −0.228*** (−3.479) |
| Fee | 0.083** (2.394) | 0.045* (1.836) | −0.043** (−2.417) | 0.375** (1.455) | 0.061*** (3.624) |
| NAF | −0.018 (−1.294) | −0.023 (−0.827) | −0.051*** (−4.217) | −0.158* (0.854) | −0.045** (−2.445) |
| Size | 0.016 (1.248) | 0.179 (1.351) | 0.043*** (3.942) | 0.182* (1.199) | 0.056* (1.871) |
| Lev | 0.023 (1.169) | −0.027 (−1.094) | 0.035 (1.282) | 0.217 (1.242) | 0.011 (1.192) |
| Complex | 0.136*** (4.372) | 0.139*** (3.287) | 0.124*** (3.247) | 0.271*** (1.311) | 0.209*** (3.816) |
| Int | −0.018 (−0.851) | −0.035 (−1.185) | 0.055* (1.869) | 0.082 (1.085) | 0.009 (1.249) |
| Rev | −0.083* (−1.858) | −0.036* (−1.843) | 0.047*** (3.510) | 0.232* (1.261) | 0.027 (1.238) |
| Inv | −0.008 (−0.917) | 0.016 (0.728) | 0.110 (0.843) | 0.089 (1.093) | 0.091 (1.138) |
| PPE | −0.068 (−0.856) | 0.011 (0.857) | 0.021 (0.064) | 0.076 (1.079) | 0.117 (1.209) |
| Loss | 0.126** (2.449) | 0.081** (2.439) | 0.031** (2.472) | 0.148* (1.159) | 0.138** (2.397) |
| ROA | −0.314 (−0.852) | −0.213 (−1.037) | −0.049* (−1.839) | 0.045 (1.046) | −0.066*** (−3.278) |
| Quick | 0.033 (1.164) | 0.022 (1.265) | 0.025 (1.246) | 0.009 (1.009) | 0.007 (0.714) |
| Risk | 0.189* (1.821) | 0.042*** (3.168) | 0.158*** (3.327) | 0.269*** (1.308) | 0.208*** (3.264) |
| SPAU | 0.079** (2.373) | 0.049*** (3.428) | −0.039** (−2.442) | 0.294** (1.342) | 0.092** (2.371) |
| Switch | 0.135* (1.875) | 0.158** (2.495) | −0.209*** (−3.971) | 0.391*** (1.478) | 0.158*** (4.278) |
| Year effect | Yes | Yes | Yes | Yes | Yes |
| Industry effect | Yes | Yes | Yes | Yes | Yes |
| Audit firm fixed effect | Yes | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 28.42% | 26.18% | 35.74% | NA | 31.23% |
| Pseudo $R^2$ | NA | NA | NA | 34.71% | NA |
| *F*-statistics | 65.680*** | 53.675*** | 68.481*** | NA*** | 61.23*** |
| *N* | 1,138 | 1,138 | 1,138 | 1,138 | 1,138 |

**Notes:** *Significant at 10% level; **significant at 5% level; ***significant at 1% level.

$$\text{DVs} = \alpha + \beta_1 Gender + \sum Control + \sum Industry\,Dummy + \sum Year\,Dummy + \sum \text{Audit Firm} + \mu \quad \text{Models 1a–e.}$$

where DVs = dependent variables. The DVs used are as follows: KAM_ADD = number of new KAMs added during current year; KAM_DROP = number of old KAMs dropped during current year; KAM_CON = number of KAMs unchanged from previous period; KAM_CHANGE = a dummy variable taking the value of 1 if the reported KAMs has changed during current period either by addition or drop, 0 otherwise; NKAM_CHANGE = net change in KAMs estimated as the sum of KAM_ADD and KAM_DROP standardized by the number of KAMs in the prior year. Odd ratios are disclosed within parentheses in Model 4d. Models 1a, 1b, 1c and 1e are run using multivariate regression. Robust *t*-statistics are shown in the parentheses. Standard errors are clustered at the firm level. Control variables are Fee, NAF, Size, Lev, Complex, Int, Rev, Inv, PPE, Loss, ROA, Quick, Switch and SpAu

**Source:** Authors' own work

**Table 5.** Effect of audit partners' gender on the time variance of KAMs-addition and drop of KAMs

prior year. Furthermore, the time variance of KAMs is greater for specialist auditors and auditor switches. The significant coefficients for all these factors in the logistic regression (Model 1d) imply that these factors also enhance the likelihood of changes of KAMs in terms of additions or drops of KAMs.

### *4.4 The effects of audit partners' experience, education and narcissism in reducing the gender gap in key audit matters reporting*

Results of the effect of experience, education and narcissism on the time variance of KAMs are reported in Table 6, Panels A–C. The coefficient of the "Gender" variable is negative and significant in Models 2a [−0.077 (*t*-values = −3.728)], 2b [−0.085 (*t*-values = −3.276)], 2d [−0.297 (odd ratio = 0.743)] and 2e [−0.257 (*t*-values = −3.418)]. It is positive and significant in Model 2c [0.279 (*t*-values = 2.969)]. The coefficient of Gender*Exp interaction is positive and significant in Models 2a [0.071 (*t*-values = 2.471)], 2b [0.049 (*t*-values = 2.395)], 2d [0.164 (odd ratio = 1.178)] and 2e [0.067 (*t*-values = 3.209)], while it is negative and significant in Model 2c [−0.052 (*t*-values = −2.438)].

We also find consistent results (positive and significant) for the Gender*AccEdu interaction variable in Models 3a [0.059 (*t*-values = 2.416)], 3b [0.062 (*t*-values = 2.461)], 3d [0.209 (odd ratio = 1.232)] and 3e [0.128 (*t*-values = 4.276)]. In Model 3c, the coefficient of the Gender*AccEdu variable is negative and significant [−0.048 (*t*-values = −1.878)].

The coefficient of Gender*Narcissism variable is positive and significant in Models 4a −0.072 (*t*-values = 2.461)], 4b (0.084 [*t*-values = 2.483)], 4d [0.193 (odd ratio = 1.213)] and 4e [0.054 (*t*-values = 3.528)]. The coefficient of Model 4c is negative and significant [−0.138 (*t*-values = −1.872)]. For brevity, we do not discuss the coefficients of the control variables.

The results support the conjecture that audit partners' experience, accounting degree and narcissism reduce the gender gap in the time variance of KAMs reporting. Specifically, these three attributes enhance female audit partners' propensity to add new KAMs, drop old KAMs and reduce the number of constant KAMs. We interpret these findings to imply that as female audit partners become more experienced and educated in the context of accounting and auditing, their confidence in changing KAMs increases. Female audit partners with higher NARCISSISM are also more likely to make changes to reported KAMs.

### *4.5 Robustness analysis*

The years 2020 and 2021 of our sample coincided with the COVID-19 pandemic. As we have controlled for year effects in our regressions, our results should not be affected by the effects of COVID-19. However, given that Kend and Nguyen (2022) have documented significant differences in KAMs reporting between COVID-19 and pre-COVID-19 periods, we also run all regressions separately for the COVID-19 period (2020 and 2021) and the pre-COVID-19 period (2017, 2018 and 2019). Our findings do not change between the COVID-19 and pre-COVID-19 periods.

As additional robustness tests, we define "EXP" to represent the number of years the auditor has worked as an audit partner. We define education to take the value of 1 if the audit partner has a quantitative degree (such as in accounting, statistics, mathematics or finance). We also generate a relative measure of narcissism by dividing the area of audit partner's signature by the total number of characters in the audit partner's name. We then run Models 2a–2e, 3a–3e and 4a–4e with these alternative definitions of variables. The results are consistent with our original estimations.

| Variables | KAM_ADD | KAM_DROP | KAM_CON | KAM_CHANGE | NKAM_CHAGNE |
|---|---|---|---|---|---|
| *Panel A: The effects of audit partners' experience in reducing the gender gap in KAMs reporting* | | | | | |
| | Model 2a | Model 2b | Model 2c | Model 2d | Model 2e |
| CONSTANT | 0.247 (1.271) | 0.228 (1.125) | 1.283*** (3.528) | 0.425*** (1.529) | 0.386 (1.275) |
| Gender | −0.077*** (−3.728) | −0.085*** (−3.276) | 0.279*** (2.969) | −0.297*** (0.743) | −0.257*** (−3.418) |
| Exp | 0.081*** (3.184) | 0.067** (2.439) | −0.147*** (3.761) | 0.246*** (1.279) | 0.082*** (4.268) |
| Exp*Gender | 0.071** (2.471) | 0.049** (2.395) | −0.052** (−2.438) | 0.164** (1.178) | 0.067*** (3.209) |
| Control | Yes | Yes | Yes | Yes | Yes |
| Year effect | Yes | Yes | Yes | Yes | Yes |
| Industry effect | Yes | Yes | Yes | Yes | Yes |
| Audit firm fixed effect | Yes | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 29.64% | 26.41% | 28.37% | NA | 32.28% |
| Pseudo $R^2$ | NA | NA | NA | 38.21% | NA |
| *F*-statistics | 66.42 | 68.11 | 63.09 | NA | 57.94 |
| *N* | 1,138 | 1,138 | 1,138 | 1,138 | 1,138 |
| *Panel B: The effects of audit partners' education in reducing the gender gap in KAMs reporting* | | | | | |
| | Model 3a | Model 3b | Model 3c | Model 3d | Model 3e |
| CONSTANT | 0.315 (0.984) | 0.209 (1.128) | 1.239*** (4.307) | 0.308*** (1.361) | 0.373 (1.102) |
| Gender | −0.074*** (−2.973) | −0.110*** (−3.914) | 0.392*** (3.673) | −0.275*** (0.759) | −0.287*** (−3.492) |
| AccEdu | 0.079** (2.346) | 0.068*** 3.065 | −0.083* (1.873) | 0.194** (1.214) | 0.082** (2.470) |
| Gender*AccEdu | 0.059** (2.416) | 0.062** (2.461) | −0.048* (−1.878) | 0.209** (1.232) | 0.128*** (4.276) |
| Control | Yes | Yes | Yes | Yes | Yes |
| Year effect | Yes | Yes | Yes | Yes | Yes |
| Industry effect | Yes | Yes | Yes | Yes | Yes |
| Audit firm fixed effect | Yes | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 29.73% | 29.094% | 31.67% | NA | 32.29% |
| Pseudo $R^2$ | NA | NA | NA | 35.38% | NA |
| *F*-statistics | 63.71 | 67.61 | 54.98 | NA | 68.03 |
| *N* | 1,138 | 1,138 | 1,138 | 1,138 | 1,138 |
| *Panel C: The effects of audit partners' narcissism in reducing the gender gap in KAMs reporting* | | | | | |
| | Model 4a | Model 4 b | Model 4c | Model 4d | Model 4e |
| CONSTANT | 0.209 (1.217) | 0.218 (1.261) | 1.113*** (3.371) | 0.329*** (1.389) | 0.381 (1.178) |
| Gender | −0.082*** (−3.428) | −0.087*** (−3.149) | 0.584*** (4.564) | −0.298*** (0.742) | −0.247*** (−3.443) |
| Narcissism | 0.091*** (4.671) | 0.083** (2.451) | −0.091*** (−3.538) | 0.186*** (1.204) | 0.120** (2.472) |
| Gender*Narcissism | 0.072** (2.461) | 0.084** (2.483) | −0.138* (−1.872) | 0.193** (1.213) | 0.054*** (3.528) |
| Control | Yes | Yes | Yes | Yes | Yes |
| Year effect | Yes | Yes | Yes | Yes | Yes |
| Industry effect | Yes | Yes | Yes | Yes | Yes |
| Audit firm fixed effect | Yes | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 36.74% | 36.011% | 35.61% | NA | 37.18% |
| Pseudo $R^2$ | NA | NA | NA | 35.91% | NA |
| *F*-statistics | 65.07 | 65.73 | 59.74 | NA | 68.24 |
| *N* | 1,138 | 1,138 | 1,138 | 1,138 | 1,138 |

**Notes:** *Significant at 10% level; **significant at 5% level; ***significant at 1% level.
DVs = $\alpha + \beta_1 Gender + \beta_2 Exp * Gender + \sum Control + \sum Industry\ Dummy + \sum Year\ Dummy + \sum$ Audit Firm + $\mu$. Models 2a–2e.
DVs = $\alpha + \beta_1 Gender + \beta_2 Acc\ Edu * Gender + \sum Control + \sum Industry\ Dummy + \sum YearDummy + \sum$ Audit Firm + $\mu$. Models 3a–3e.
DVs = $\alpha + \beta_1 Gender + \beta_2 Gender * Narcissism + \sum Control + \sum Industry\ Dummy + \sum Year\ Dummy + \sum$ Audit Firm + $\mu$. Models 4a–4e. where DVs = dependent variables. The DVs used are as follows: KAM_ADD = number of new KAMs added during current year; KAM_DROP = number of KAMs dropped during current year; KAM_CON = number of KAMs unchanged from previous period; KAM_CHANGE = a dummy variable taking the value of 1 if the reported KAMs has changed during current period either by addition or drop, 0 otherwise; NKAM_CHANGE = net change in KAMs estimated as the sum of KAM_ADD and KAM_DROP standardized by the number of KAMs in the previous year. To examine if female audit partners have a lower tendency to change reported KAMs from previous period, we use a logistic model with the dichotomous dependent variable KAM_CHANGE in a multivariate setting (Models 2d, 3d and 4d). All models are run using multivariate regressions using robust standard errors. Robust *t*-statistics are shown in the parentheses. Standard errors are clustered at the firm level. Control variables are Fee, NAF, Size, Lev, Complex, Int, Rev, Inv, PPE, Loss, ROA, Quick, Switch, Risk and SpAu
**Source:** Authors' own work

**Table 6.**
The effect of audit partners' personal traits in reducing the gender effects on time variance of KAMs

Although we control for client-specific characteristics in all models, the results may have been affected by the confounding factors. To get rid of the differences of client characteristics, we conduct a partner-level analysis. For each variable, we calculate the average of all clients audited by an individual audit partner to generate partner-level variables. We run all models using these partner-level variables. The results are consistent

with our baseline results. (Robustness tests results are not reported here for brevity. They are available from the corresponding author upon request).

*4.6 Addressing the problem of endogeneity*

We conduct additional analyses to address the concern of endogeneity. Our results may have been influenced by endogeneity biases, such as omitted variables and self-selection biases. Lennox and Wu (2018) suggest that the selection of a female audit partner may not be random, rather certain firm characteristics may be associated with the selection of a female audit partner. Moreover, riskier clients have been found to be assigned to female audit partners (Garcia-Blandon *et al.*, 2019; Hardies *et al.*, 2016). To address the potential endogeneity problems, we perform propensity score matching (PSM), apply the instrumental variable approach using the two-stage least-square regressions (2SLS) and difference in difference (DiD) approach.

*4.6.1 Propensity score matching.* Companies audited by female audit partners may be different in certain characteristics from companies audited by male audit partners. We estimate models using a PSM sample.

To identify the PSM sample, we estimate the following Probit model to estimate the probability of appointing a female audit partner. The variable "Gender" is the dependent variable. We also include all of the firm-related variables from Model 1. We include the variable "FemaleBoard" defined as the percentage of female members in the board because the proportion of female members in the board has been found to be associated with the probability of selecting a female audit partner (Lee *et al.*, 2019):

$$\begin{aligned}\Pr[\text{Gender} = 1] = {} & \alpha + \beta_1 \text{FemaleBoard} + \beta_3 \text{Size} + \beta_4 \text{Complex} + \beta_5 \text{Int} + \beta_6 \text{Rev} \\ & + \beta_7 \text{Switch} + \beta_8 \text{Inv} + \beta_9 \text{Risks} + \beta_{10} \text{ROA} + \beta_{11} \text{Loss} \\ & + \text{Year} + \text{Industry} + \mu\end{aligned}$$

Consistent with Abdelfattah *et al.* (2021), we match with replacement for each female audited client with one male audited client that has the nearest propensity score. Dehejia and Wahba (2002) suggested that PSM with replacement brings better results than PSM without replacement. Following Abdelfattah *et al.* (2021), we identify matched pair with the lowest propensity score difference of 1%. We obtained a PSM sample of 206 observations. We test the reliability of our matching, by performing *t*-tests to examine whether the firms' characteristics are different for the selected sample audited by female partners and the sample audited by male partners. Our *t*-test results suggest insignificant differences in all client-related variables between the two subsamples. The univariate tests results for the PSM sample are presented in Appendix 3 [1]. The univariate test results of the propensity matched samples suggest significant differences in the dependent variables but no significant differences in independent variables. These results imply that our matching was appropriate. We use this sample to examine the effect of audit partners' gender on the time variances of KAMs (Models 1a–1e). The results are reported in Table 7, Panel A. We find the results are similar to the ones reported in Table 5. Specifically, the coefficient of the "Gender" variable is negative and significant in Models 1a [−0.126 (*t*-values = −3.498)], 1b [−0.138 (*t*-values = −3.183)], 1d [−0.239 (odd ratio = 0.787)] and 1e [−0.180 (*t*-values = −3.619)]. The coefficient of "Gender" variable is positive and significant in Model 1c [0.206 (*t*-values = 3.108)].

| | KAM_ADD | KAM_DROP | KAM_CON | KAM_CHANGE | NKAM_CHAGNE |
|---|---|---|---|---|---|
| *Panel A: Propensity score matching sample* | | | | | |
| Constant | 0.209** (2.471) | 0.237 (1.172) | 1.097** (2.438) | 0.241*** (1.173) | 0.304* (1.878) |
| Gender | −0.126*** (−3.498) | −0.138*** (−3.183) | 0.206*** (3.108) | −0.239*** (0.787) | −0.180*** (−3.619) |
| Control | Yes | Yes | Yes | Yes | Yes |
| Year effect | Yes | Yes | Yes | Yes | Yes |
| Industry effect | Yes | Yes | Yes | Yes | Yes |
| Audit firm fixed effect | Yes | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 39.53% | 38.64% | 41.45% | | 39.81% |
| Pseudo $R^2$ | | | | 35.26% | |
| *F*-statistics | 73.568*** | 70.495*** | 77.329*** | | 69.517*** |
| *N* | 206 | 206 | 206 | 206 | 206 |
| *Panel B: Two-stage least square regression* | | | | | |
| Constant | 0.197** (2.428) | 0.213 (1.268) | 1.089*** (3.394) | 0.238*** (1.268) | 0.381* (1.872) |
| Gender | −0.184*** (−3.648) | −0.175*** (−3.475) | 0.194** (2.438) | −0.174** (0.840) | −0.1942*** (−4.154) |
| Control | Yes | Yes | Yes | Yes | Yes |
| Year effect | Yes | Yes | Yes | Yes | Yes |
| Industry effect | Yes | Yes | Yes | Yes | Yes |
| Audit firm fixed effect | Yes | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 41.62% | 42.56% | 44.53% | | 47.6% |
| Pseudo $R^2$ | | | | 34.19% | |
| *F*-statistics | 79.618*** | 77.646*** | 68.387*** | | 71.073*** |
| *N* | 1,138 | 1,138 | 1,138 | 1,138 | 1,138 |
| *Panel C: Difference in difference (DiD) analysis* | | | | | |
| Constant | 0.372*** (4.665) | 0.347*** (4.318) | 1.094*** (3.127) | 0.293*** (1.340) | 0.388*** (3.817) |
| MF | −0.064** (−2.479) | −0.119*** (−4.362) | 0.125** (2.432) | −0.097** (0.908) | −0.053** (−2.441) |
| Control | Yes | Yes | Yes | Yes | Yes |
| Year effect | Included | Included | Included | Included | Included |
| Industry effect | Included | Included | Included | Included | Included |
| Audit firm fixed effect | Yes | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 45.28% | 49.03% | 41.97% | | 47.29% |
| Pseudo $R^2$ | | | | 43.28% | |
| *F*-statistics | 82.19*** | 78.43*** | 86.92*** | 80.76*** | 79.19*** |
| *N* | 98 | 98 | 98 | 98 | 98 |

**Notes:** ***Significant at 1% level; **significant at 5% level; *significant at 10% level. *T*-values in brackets. Results of control variables are not reported for brevity.

$$\text{DVs} = \alpha + \beta_1 Gender + \sum Control + \sum Industry\,Dummy + \sum Year\,Dummy + \sum \text{Audit Firm} + \mu \quad \text{Models 1a–1e.}$$

where DVs = dependent variables. The dependent variables used are as follows: KAM_ADD = number of new KAMs added during current year; KAM_DROP = number of KAMs dropped during current year; KAM_CON = number of KAMs unchanged from previous period; KAM_CHANGE = a dummy variable taking the value of 1 if the reported KAMs has changed during current period either by addition or drop, 0 otherwise; NKAM_CHANGE = net change in KAMs estimated as the sum of KAM_ADD and KAM_DROP standardized by the number of KAMs in the prior year. Robust *t*-statistics are shown in the parentheses. Standard errors are clustered at the firm level. Control variables are Fee, NAF, Size, Lev, Complex, Int, Rev, Inv, PPE, Loss, ROA, Quick, Switch and SpAu

**Source:** Authors' own work

**Table 7.** The effect of auditors' gender on content characteristics of KAMs

It Is worth noting that even for the PSM samples, female audit partners have lower narcissism than male audit partners, and narcissism affects time variances of KAMs. Hence, we cannot rule out that the possibility that the results of the PSM samples are affected by the differences in narcissism between the male and female audit partners.

*4.6.2 Two-stage least-square regressions.* The PSM method fails to control for the effect of unobservable factors that affect both the dependent variable and independent variables. Some unobservable factors may affect both the selection of female auditors and the disclosure of KAMs made by the auditors. We use a 2SLS instrument variable approach to

deal with this problem. In the first stage, we construct a Probit regression model with the variable "Gender" as the dependent variable. We use all of the control variables used in our main regression as the independent variables. We consider proportion of female member on the board (FemaleBoard) as the instrumental variable. Lee *et al.* (2019) suggested that the existence of female members in the board increases the likelihood of selecting a female audit partner. Moreover, it is unlikely that the percentage of female members on the board will affect the disclosure of KAMs by auditors, because auditors usually interact with the client's AC.

To test the validity of our instrumental variable, we run the regression of FemaleBoard on the gender variable and generate the residuals. We then use the residuals in the main models. The coefficient of the residual (of FemaleBoard) is insignificant in all models, suggesting that our instrument choice is valid [2].

In the second stage regression, we use the fitted values of "Gender" from the first stage regression as our main independent variable to test different research questions. The results are presented in Table 7, Panel B. The results from the 2SLS models are similar to the results from our main models.

*4.6.3 Difference in difference analysis.* The quasi-experimental DiD analysis is another popular method of dealing with endogeneity and omitted variable biases. We adopt the quasi-experimental DiD analysis methodology following Abdelfattah *et al.* (2021). The same method has also been used by Ittonen *et al.* (2013), Hardies *et al.* (2016) and Garcia-Blandon *et al.* (2019). We examine whether the time variance of KAMs changes after a switch from a male audit partner to a female audit partner, with a control sample of male-to-male audit partner switches. We create a dummy variable, MF, which takes the value of 1 if the audit partner switches from male to female, 0 otherwise. We find 98 observations of changes: 76 male-to-male and 22 male-to-female audit partner switches. Consistent with Hardies *et al.* (2016) and Abdelfattah *et al.* (2021), we estimate Models 1a–1e, where dependent variables are KAM_ADD, KAM_DROP, KAM_CON, KAM_CHANGE and NKAM_CHNAGE, respectively; in Models 1a–1e, MF is the main independent variable of interest in all five models, and all of the control variables are in change form from year $t-1$ to year $t$, considering each audit client as its own control. The results are presented in Table 7, Panel C. The coefficient of MF is negative and significant when the dependent variables are KAM_ADD and KAM-DROP, and the coefficient of MF is positive and significant when the dependent variable is KAM_CON. These findings suggest that when the audit partner switch occurs from a male to a female audit partner, fewer KAMs are newly added and fewer KAMs are dropped from the previously reported KAMs. The coefficient MF is also negative and significant when the dependent variable is KAM_CHANGE and NKAM_CHANGE, respectively. This evidence implies that when the auditor switch takes place from a male audit partner to a female audit partner, the relative change in the KAMs and the absolute change in the number of KAMs decrease. These results are consistent with our baseline finding that female audit partners report less time-variant KAMs. Nevertheless, we caution readers that due to the small number of audit partner switches, our results from the DiD analysis may lack statistical power.

## 5. Discussions and conclusions

Previous studies have linked auditors' personal attributes to financial reporting quality, earnings restatements and accrual quality. Earnings restatements and accrual quality represent indirect proxies for audit quality. Although auditors provide opinion as to the fairness of the financial statements, it is difficult to prove a direct causal link between auditors' attributes and the quality of accruals. Compared to earnings restatements or

accrual quality, KAMs represent direct audit outcomes. Accordingly, the disclosure of KAMs represents an opportunity to examine the effect of audit partners' gender on the audit outcome. The current study establishes a relationship between audit partners' gender and KAMs reporting. We examine the effect of audit partners' gender on the time variances of KAMs, i.e. year-to-year addition and drop of KAMs. We rely on the cognitive and psychological differences between male and female audit partners, using the theoretical lens of female audit partners' preference for anchoring, availability heuristics, risks aversion and less aggressive negotiation. We find that female audit partners disclose more stable and less time-variant KAMs in terms of the addition of new KAMs and the drop of old KAMs. Furthermore, we examine if the female audit partners' experience, an accounting degree and narcissism help reduce the gender gap in their KAMs reporting and find evidence that female audit partners' experience, accounting degree and narcissism have significant influence in reducing the gender gap in reporting of KAMs in terms of time variance of KAMs (addition of new KAMs, drop of old KAMs and overall changes in KAMs).

Abdelfattah *et al.* (2021) and Bepari *et al.* (2022) have documented that female audit partners report a higher number of KAMs than their male counterparts. Our findings in the present study are not conflicting with Abdelfattah *et al.* (2021) and Bepari *et al.* (2022) in that these two studies have examined the cross-sectional variations in the absolute total number of KAMs, whereas the current study focuses on the year-to-year intracompany variations in KAMs (time variance of KAMs). Each of the companies A and B may have three KAMs reported. For Company A, the auditor has reported the same three KAMs that were also reported in the previous year. Hence, KAMs added during the year 0, KAMs dropped is 0 and KAMs constant is 3. For Company B, the auditor may have added two new KAMs, and dropped two KAMs from the previous period, and one KAM constant from the previous year. Although auditors have reported three KAMs for both companies, qualitatively, the KAMs reported for Company B are more time variant and instable. Hence, the context and research questions of the current study and that of Abdelfattah *et al.* (2021) and Bepari *et al.* (2022) are different.

In terms of effectiveness and alignment of KAMs reporting to the essence of ISA 701, our findings corroborate the findings of Abdelfattah *et al.* (2021) in the UK context that female audit partners write less readable and lengthier KAMs in negative tones, possibly obfuscating the key message in the KAMs. Hossain *et al.* (2018) documented that female audit partners have a lower tendency to issue modified opinions and going concern opinions. Bepari *et al.* (2022) documented that female audit partners report fewer number of pervasive entity-level KAMs than their male counterparts. We find that female audit partners are less likely to change previously reported KAMs than their male counterparts. The finding that female audit partners report fewer time-variant KAMs may support the conjecture that female audit partners are more risk averse and prefer to maintain the status quo in their audit reports. Because the addition of new KAMs and the dropping of old KAMs enhance jurors' perceptions about auditors' negligence and liability if later on misstatements are detected in the reported areas, and because risk averse auditors usually tend to maintain the status quo by reporting a standardized list of KAMs (Pelzer, 2021), female audit partners prefer to report more stable KAMs. Hence, the risk aversion preference of female audit partners may be aimed at avoiding cumbersome negotiations and conflicts with clients. This conjecture is corroborated by the fact that female audit partners' experience and narcissism reduce the gender gap in time variances (which requires renewed negotiations with the client every year) of KAMs reporting. Our findings also support the conclusion of Pelzer (2021) that risk averse auditors prefer to report a set of standardized KAMs. Our findings are consistent with the female audit partners' cognitive and psychological traits of anchoring and reliance on availability heuristics.

Interpreted together, the findings of the current study along with the findings of Hossain *et al.* (2018), Abdelfattah *et al.* (2021), Pelzer (2021) and Bepari *et al.* (2022) may imply that female audit partners' cognitive and psychological differences with their male counterparts affect KAMs disclosures.

Our findings also suggest that female audit partners risk averse attitudes may have significant implications for the audit process, audit quality and audit reports. The implications of gender differences of audit partners extend beyond audit opining and affect audit partners' identification and disclosure of key risks areas in auditing, the KAMs. The findings also imply that there are fundamental differences between female and male audit partners in the way audit risks assessments are conducted, audits are planned and the professional judgement is applied.

The fact that female audit partners report more stable KAMs and have a lower tendency to add new KAMs or drop old KAMs imply that the KAMs reporting by female audit partners has more possibility of turning into standardized boilerplate disclosures over years than that of their male counterparts, and the standardized boilerplate disclosures of KAMs are against the essence of the ISA 701. The essence of ISA 701 is that the KAMs should be audit-specific and should not turn out to be routine "boilerplate" disclosures. Moreover, Zhang and Shailer (2021) suggested that the addition of new KAMs signifies an increasing level of audit transparency. Our findings imply that female audit partners' experience, accounting education and narcissistic personality can play a significant role in producing consistent audit outcomes by the male and the female audit partners, mitigating the regulators' and audit firms' concerns in this regard.

Although the signature-based measure of narcissism has been validated in the clinical setting, a general caveat applies to our measure of narcissism (because we cannot observe if the electronic signatures in our setting have been resized). Because actual narcissism is best measured in clinical settings by experiment, our proxy measure for narcissism may not be the best measure. Nevertheless, to measure narcissism for a large number of observations, early studies have used signature-based measures. Future studies can measure narcissism clinically. Interview-based qualitative studies are also imperative. We have not examined the year-to-year change in the contents or types of KAMs. Future studies can examine if audit partners' gender affects the year-to-year change in contents and types of KAMs. Future studies can also examine if audit partners' gender affects the transparency and information contents of reported KAMs. Further studies examining whether audit partners' gender affects the number of audit procedures used and the number of valuation specialists used can also provide useful information for audit firms and policy makers.

## Notes

1. We thank the reviewer for suggesting reporting these statistics.
2. We recognize that finding of a perfect instrument variable is difficult.
3. ROA defined as net profit divided by total assets.

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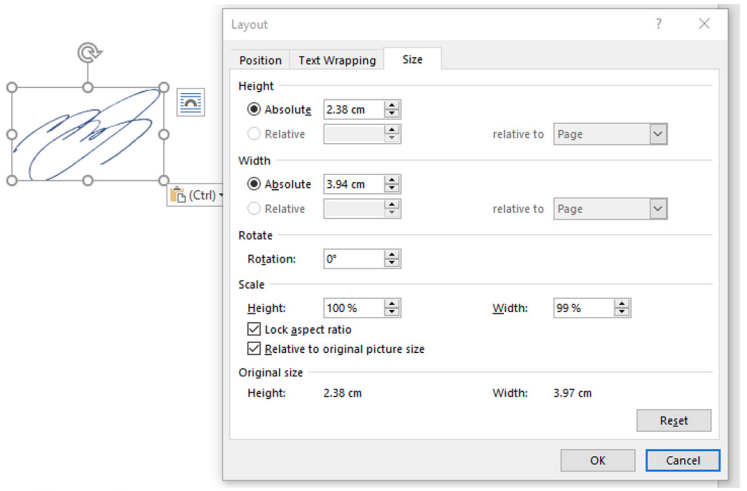
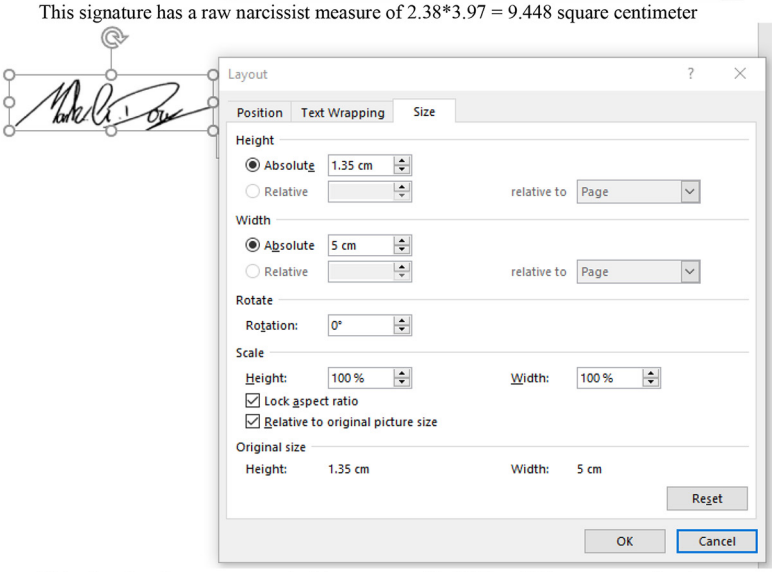
## Appendix 1. Measures for audit partners' narcissism




This signature has a raw narcissist measure of 2.38*3.97 = 9.448 square centimeter




This signature has a raw narcissist measure of 1.35*5 = 6.75 square centimetres

**Source:** Authors' own work

## Appendix 2

| Variable | Description and coding of the variable | Source |
|---|---|---|
| *Dependent variables* | | |
| KAM_ADD | Number of new KAMs added during current year; | Audit reports |
| KAM_DROP | Number of KAMs dropped during current year | Audit reports |
| KAM_CON | Number of KAMs unchanged from previous period | Audit reports |
| KAM_CHANGE | A dummy variable taking the value of 1 if the reported KAMs has changed during current period either by addition or drop, 0 otherwise; | Audit reports |
| NKAM_CHANGE | Net change in KAMs estimated as the sum of KAM_ADD and KAM_DROP standardized by the number of KAMs in the prior year | Audit reports |
| *Independent variables* | | |
| GENDER | A binary variable taking the value of 1 if the signing audit partner for firm *i* in year *j* was a female auditor, 0 otherwise. For audit reports signed by two audit partners, we consider the gender of the lead audit partner | Based on auditor s' name and linked profile and audit report |
| EXP | Audit partner's years of experience in the audit profession | Based on auditor name and linked profile |
| ACCEDU | A binary variable taking the value of 1 if the audit partner has a bachelor's degree in accounting, 0 otherwise | Based on auditor name and linked profile |
| NARCISSISM | Measured using the size of the signature of the audit partner in square centimetres following Chou *et al.* (2021), Ham *et al.* (2018) and Ham *et al.* (2017) | Audit Reports |
| *Control variables* | | |
| RISK | Annual dispersion in the share price for company *i* during year *t* = (highest share price − lowest share price) | Yahoo Finance |
| SIZE | Natural log of total assets for firm *i* in year *j* | Annual report/ OSIRIS |
| COMPLEX | Number of business segments, a measure for complexity | Annual report/ OSIRIS |
| INT | Intangible assets (including goodwill) as a percentage of total assets | Annual report/ Osiris |
| FEE | Natural log of audit fee paid by firm *i* during year *t* | Annual report/ Osiris |
| NAF | Natural log of nonaudit fee paid by firm *i* during year *t* | Annual report/ Osiris |
| REVENUE | Revenue as a percentage of total assets for firm *i* in year *j* | Annual report/ Osiris |
| SWITCH | 1 if the audit partner has changed during the period, 0 otherwise | Annual report/ Osiris |
| INV | Inventory as a percentage of total assets for firm *i* in year *j* | Annual report/ Osiris |
| PPE | Property, plants and equipment (PPE) as a percentage of total assets for firm *i* in year *j* | Annual report/ Osiris |
| ROA | Net profit before tax divided by total assets for firm *i* in year *j* | Annual report |
| LOSS | 1 if company *i* has reported loss in year *j*, 0 otherwise | Annual report/ Osiris |
| LEV | Total liability divided by total assets | Annual report/ Osiris/ |
| QUICK | Quick ratio | Osiris/Annual report |
| SPAU | To control for differences in KAMs reporting by industry specialist auditors and nonspecialist auditors, taking the value of 1 if the company's auditor has listed the client's industry as one of the first three of his/her specialization area in his/her LinkedIn or audit firm profile, 0 otherwise | Based on auditor profile/Or profile in the audit firm's website |
| Year | Year fixed effect | Annual Reports |
| Audit firm | Audit firm fixed effect | Annual Reports |
| Industry | Industry fixed effect | Yahoo Finance/ Osiris |

**Source:** Authors' own work

**Table A1.** Descriptions and sources of variables

**Appendix 3**

| Variables | *N* | Sample mean | Mean female | Mean male | Mean difference female vs male | *t*-stats |
|---|---|---|---|---|---|---|
| KAM_ADD | 206 | 0.519 | 0.507 | 0.532 | −0.025*** | −16.755 |
| KAM_DROP | 206 | 0.629 | 0.614 | 0.644 | −0.030*** | −19.772 |
| KAM_CON | 206 | 1.957 | 2.036 | 1.879 | 0.157*** | 16.859 |
| KAM_CHANGE | 206 | 0.559 | 0.542 | 0.575 | −0.034*** | −23.241 |
| NKAM_CHANGE | 206 | 0.443 | 0.434 | 0.451 | −0.018 | −2.183 |
| EXP | 206 | 22.954 | 22.770 | 23.137 | −0.367 | −1.692 |
| GENDER | 206 | 0.500 | NA | NA | NA | NA |
| ACCEDU | 206 | 0.466 | 0.490 | 0.441 | 0.049*** | 5.137 |
| NARCISSISM | 206 | 4.635 | 4.495 | 4.775 | −0.280*** | −5.583 |
| SIZE (million$) | 206 | 17,250.614 | 17,194.205 | 17,307.024 | −112.819 | −2.306 |
| FEE (million$) | 206 | 1.393 | 1.388 | 1.398 | −0.009 | −1.632 |
| NAF (million$) | 206 | 0.793 | 0.790 | 0.796 | −0.005 | −1.903 |
| INT (million$) | 206 | 780.480 | 777.928 | 783.032 | −5.104 | −0.091 |
| INV (million$) | 206 | 336.960 | 335.858 | 338.062 | −2.204 | −1.931 |
| LEV (million$) | 206 | 6,952.467 | 6,897.033 | 7,007.902 | −110.869 | −2.261 |
| PROFIT (million$) | 206 | 340.283 | 339.170 | 341.395 | −2.225** | −3.191 |
| LOSS | 206 | 0.178 | 0.177 | 0.178 | −0.001 | −0.926 |
| PPE (million$) | 206 | 1,315.604 | 1,311.302 | 1,319.906 | −8.604 | −1.938 |
| REVENUE(million$) | 206 | 3,962.286 | 3,949.329 | 3,975.242 | −25.913 | −2.331 |
| COMPLEX | 206 | 3.168 | 3.158 | 3.178 | −0.021 | −1.733 |
| QUICK | 206 | 1.075 | 1.072 | 1.079 | −0.007 | −0.925 |
| RISK | 206 | 0.672 | 0.670 | 0.674 | −0.004 | −1.090 |
| SWITCH | 206 | 0.065 | 0.063 | 0.066 | −0.003 | −0.812 |
| SPAU | 206 | 0.363 | 0.362 | 0.364 | −0.002 | −1.736 |

**Notes:** ***Significant at 1% level; **significant at 5% level. Variables are defined in Section 3.2. For SIZE, FEE and EXP, we use natural log values in the regressions. We deflate LEV, PROFIT, PPE, INT, INV and REVENUE by total assets to remove the scale difference

**Source:** Authors' own work

**Table A2.** Univariate tests of variables for the propensity score matched sample

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