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Female lead auditors, audit fees, and audit quality

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ABSTRACT

We investigate whether female lead auditors are associated with higher audit fees and audit quality. We expect female lead auditors to have a significant influence on these audit outcomes for two reasons. First, female auditors are more risk averse and less tolerant of opportunistic behaviours than their male counterparts. Second, lead auditors perform more numerous and varied tasks and spend more time on the audit of a given client than concurring auditors. Our results show that female lead auditors are associated with higher audit quality but not with higher audit fees. However, these results only hold for female lead auditors with low client-specific experience (i.e., in a riskier context). Finally, additional analyses suggest that female lead auditors and female concurring auditors have a different influence on audit fees and audit quality.

1. Introduction

Prior research has shown that female concurring audit partners are positively associated with audit fees (Burke et al., 2019; Hardies et al., 2015; Ittonen & Peni, 2012) and audit quality (Gul et al., 2013; Ittonen et al., 2013; Lee et al., 2019; Niskanen et al., 2011). Since audit fees and audit quality are related to the effort put into conducting an audit (DeFond & Zhang, 2014), these findings suggest that female concurring auditors make a greater effort than their male counterparts. Several reasons have been put forward to explain why auditor gender[1] is associated with differing effort. In particular, female auditors have notably been deemed more risk averse (Byrnes et al., 1999; Charness & Gneezy, 2012; Croson & Gneezy, 2009), but also less tolerant of opportunistic behaviours and more sensitive to ethical issues than men (Ambrose & Schminke, 1999; Bernardi & Arnold, 1997). These different characteristics lead female auditors to put more effort into the audit than their male counterparts.

Another stream of research, which is emerging and still underdeveloped, has explored the influence of other audit team members on audit outcomes. Cameran et al. (2018) consider several hierarchical levels within the audit team, while others concentrate on the two key leaders (i.e., the auditor dyad): the concurring auditor and the lead auditor (Downar et al., 2021a; He et al., 2021; Huang et al., 2021; Koh et al., 2023; Perry et al., 2023).[2] He et al. (2021) argue that focusing on the members of the dyad signing the audit report, a practice known as co-signature or joint signature, is crucial as those two auditors "have the potential to largely affect the audit work

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[1] We follow the prior auditing literature (Burke et al., 2019; Gul et al., 2013; Hardies et al., 2015; Ittonen et al., 2013; Ittonen & Peni, 2012; Lee et al., 2019; Niskanen et al., 2011) and use gender to refer to auditors' sex. However, we acknowledge that these two concepts are different (Borna & White, 2003).

[2] Other authors have referred to review and engagement/field auditors (e.g., Cheng et al., 2020; Lennox & Wu, 2018).

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and audit outcomes" (p. 27). However, prior research on that dyad has not explicitly considered the gender of both partners. In particular, the influence of female lead auditors on audit outcomes has been neglected so far in prior research. This study attempts to fill this gap in the literature.

We expect female lead auditors to significantly influence audit fees and audit quality for two reasons. First, female auditors differ from their male counterparts in terms of risk-taking and tolerance of opportunistic behaviours (e.g., Hardies et al., 2015; Ittonen & Peni, 2012). Second, lead auditors have more numerous and varied tasks and spend more time on the audit of a given client than concurring auditors. The former are responsible for audit program approval, personnel scheduling, working paper reviews, day-to-day client relationships, and the determination of billing for engagements, while the latter plan the audit strategy, oversee the activities of audit teams, and negotiate audit fees with the clients but have limited involvement in the day-to-day planning and execution of the audit itself (Cameran et al., 2018; Contessotto et al., 2019; Downar et al., 2021a).

To test our hypotheses, we take advantage of the Swiss setting, where both the concurring auditor and the lead auditor sign the audit report of publicly listed firms. Our research design consists of a comparison of two groups of audit teams: teams with two male auditors and teams with a male concurring auditor and a female lead auditor. Comparing these two groups allows for a precise identification of the influence of female lead auditors on audit outcomes. Since the characteristics of the clients may differ, the two groups are made more comparable with entropy balancing by assigning weights to the control sample (i.e., dyads with two male auditors) to equalize the first two moments of each covariate distribution with respect to the treatment sample of firms with a female auditor (Hainmueller, 2012; McMullin & Schonberger, 2020). We also include several fixed effects (i.e., audit firm, client firm, and year) in our models to control for unobservable factors.

Our two main results are the following. Female lead auditors are associated with higher audit quality (i.e., lower abnormal accruals) than their male counterparts, which is expected given gender-based differences (i.e., risk aversion and tolerance for opportunistic behaviour). However, female lead auditors are not associated with higher audit fees, probably because they do not directly negotiate audit fees with clients (Contessotto et al., 2019; Downar et al., 2021a).

We deepen our results by focusing on female lead auditors' client-specific experience because such experience may influence auditor effort (Contessotto et al., 2021). Our staggered difference-in-differences models highlight that audit quality increases when a female lead auditor with no client-specific experience replaces a male lead auditor. Moreover, cross-sectional analyses with entropy balancing show that female lead auditors with low client-specific experience are associated with higher audit quality when compared to their male counterparts. For female lead auditors with high client-specific experience, we do not find such a result. Based on these findings, we conclude that female lead auditors put more effort into the audit when they are not familiar with the client (i.e., in a riskier context). It is likely that women's greater risk aversion drives this additional effort to reduce the risk of material misstatement, especially if one considers that women are more sensitive to the negative impact of a material misstatement on their future job opportunities in the audit firm (Hardies et al., 2021).

Finally, in an additional analysis, we compare the influence of female lead auditors and female concurring auditors on audit fees and audit quality. We document the existence of a 'female audit fee premium' for concurring auditors, which is in line with the prior literature and expected because they negotiate audit fees with the client (Burke et al., 2019; e.g., Hardies et al., 2015; Ittonen & Peni, 2012). However, female concurring auditors are not associated with higher audit quality (i.e., lower abnormal accruals), probably because their involvement in the day-to-day planning and execution of the audit is more limited than that of female lead auditors (Cameran et al., 2018; Contessotto et al., 2019; Downar et al., 2021a). Overall, the various findings lead us to conclude that female lead and concurring auditors have a different impact on audit outcomes.

Our contribution is therefore twofold. First, we contribute to the scant literature on the importance of gender within the audit team (e.g., Cameran et al., 2018; Contessotto et al., 2019). More specifically, we confirm that gender diversity at the audit dyad level matters, along with prior findings (He et al., 2021; Koh et al., 2023; Perry et al., 2023). However, we extend these studies focusing on gender at the audit pair level by pointing out that the position within the dyad is key and the role female auditors occupy also matters. More broadly, our findings on the positive association between female lead auditors and audit quality complement previous ones regarding the impact of partners' characteristics on audit outcomes (Francis, 2023; Lennox & Wu, 2018). Second, we respond to the call from Contessotto et al. (2021) on the need for more research "that considers the relationship between client-specific experience and audit effectiveness or efficiency" (p. 252) by documenting that higher audit quality is conditional on female lead auditors' client-specific experience.

Our paper also raises the question of the number of signatories of audit reports. In the U.S., the disclosure of the engagement partner's name and other audit firms participating in an audit is now mandatory (PCAOB, 2015), while it is mandatory for the audit partner to sign the audit report in the U.K. and in Europe (e.g., Carcello & Li, 2013). Such disclosures have been found to have some positive effects on audit quality (Blay et al., 2019; Carcello & Li, 2013). In other countries, such as China (Perry et al., 2023), Germany (Downar et al., 2021a), Downar et al., 2021bnd Switzerland (this study), two auditors are required to sign the audit report.[3] Disclosing the identity of the lead auditor in more countries may be beneficial for investors and other stakeholders. Regulators could consider this issue going forward.

The remainder of the paper is organized as follows. Section 2 reviews the literature and develops the hypotheses. The research

[3] Switzerland has common features with Germany, such as institutional characteristics and accounting traditions (Windisch, 2021), and shares similarities regarding audit environments with Western countries (Downar et al., 2021b). However, it strongly differs from Anglo-Saxon countries in terms of litigation risk (e.g., Choi et al., 2008) and culture (e.g., Knechel et al., 2019). We acknowledge that such institutional differences may influence audit outcomes associated with female lead auditors.

design is described in Section 3. We discuss our results in Section 4. Finally, we conclude in Section 5.

2. Literature review and hypotheses development

2.1. Auditor gender

Over the last few decades, auditing research has largely investigated the influence of audit firm characteristics (e.g., Big 4 versus non–Big 4, industry specialization, office location) on the quality and price of audit services (DeFond & Zhang, 2014; Hay, Knechel, & Wong, 2006b; Hay, 2013). More recently, requirements for partners to identify (PCAOB, 2015) or to sign audit reports in many countries (Blay et al., 2014; Carcello & Li, 2013) prompted researchers to analyse the influence of audit partner characteristics on audit outcomes (Francis, 2023; Lennox & Wu, 2018). This developing literature has notably highlighted the importance of partner gender. Specifically, female concurring auditors have been found to be associated with higher audit fees (Burke et al., 2019; Hardies et al., 2015; Ittonen & Peni, 2012) and higher audit quality (Hardies et al., 2016; Ittonen et al., 2013; Lee et al., 2019; Niskanen et al., 2011). These results may appear somewhat surprising as auditing is a standardized[4] and highly regulated activity with stringent requirements that emphasize the importance of competence and independence in audit team formation (Knechel, 2016).

Two key arguments developed by economists and psychologists help explain why partner gender is important. First, women are more risk averse, more prudent, and less optimistic than men (e.g., Byrnes et al., 1999; Charness & Gneezy, 2012; Croson & Gneezy, 2009). Female auditors are therefore willing to put more effort than male auditors into reducing the risk of material misstatement, which is auditors' main concern. Moreover, auditors face litigation and reputational risks, which influence audit fees and the quality of audit services (Choi et al., 2008; DeFond & Zhang, 2014). Female auditors are especially motivated to increase their effort to mitigate those two types of risks.[5] Second, women are less tolerant of opportunistic behaviours and more sensitive to ethical issues than men (Ambrose & Schminke, 1999; Bernardi & Arnold, 1997). Such an attitude has one key consequence: female auditors are less willing to sacrifice audit quality by reducing audit effort and audit fees to please or to keep a client (Ittonen et al., 2013; Lee et al., 2019).

Overall, the existence of such differences between women and men, namely in terms of risk aversion and professional attitude, explains why female auditors are willing to put more effort into auditing a client than male auditors. This additional effort leads to higher audit fees and higher audit quality, two findings documented in prior research.

2.2. Concurring and lead auditors

While the prior literature has documented significant effects of the concurring auditor on the price and the quality of audit services, the influence of the lead auditor has largely remained unexamined (Cameran et al., 2018; H. A. Chen et al., 2024; Contessotto et al., 2019; Downar et al., 2021a; Francis, 2023). This is particularly due to the lack of public information about the identity of the lead auditors. Indeed, such information is available only in a limited number of countries (e.g., China, Taiwan, Germany, or Switzerland), where both the concurring and the lead auditor sign the audit reports.[6]

In China, researchers focus on the presence of at least one female partner but do not investigate the specific influence of the concurring auditor and the lead auditor (He et al., 2021; Koh et al., 2023; Perry et al., 2023). In Taiwan, Huang et al. (2021)report that prior co-working engagement experience between the lead and the concurring signing partners is positively associated with audit quality and audit efficiency, without considering gender. Downar et al. (2021a) focus on Germany, where the first signatory (on the left) on the audit report is the concurring auditor and the second (on the right) is the lead auditor. They do not find that an audit team comprising both a female concurring auditor and a female lead auditor is associated with higher audit quality compared to the case in which the audit team is composed of two male auditors. As suggested by Huang et al. (2021), more research is needed on lead auditors as they play a key role in the audit of the clients.

Lead auditors are responsible for audit program approval, audit working paper reviews, audit staff assignment, provision of feedback to junior-level staff, and the determination of billing for engagements. As Downar et al. (2021a) summarizes, lead auditors plan, direct, supervise, and conduct the audit. Conversely, concurring auditors are primarily involved in client relationship management (including the negotiation of audit fees), the oversight of activities of audit teams, and the determination of the appropriate audit opinion. Their involvement in the day-to-day planning and execution of the audit is therefore limited (Cameran et al., 2018; Contessotto et al., 2019; Downar et al., 2021a). In their descriptive statistics, Contessotto et al. (2019) found, for instance, that the proportion of hours charged by the lead auditor for a given client is 18% (with a standard deviation of 10%), while it is only 7% for the concurring auditor (with a standard deviation of 5%).

Overall, both partners (i.e., concurring and lead) play a key role in the audit process (Perry et al., 2023), are strongly incentivized to high-level performance (Huang 2021), and must agree on controversial issues, but they differ on the number and variety of tasks performed during the audit, as well as on the time spent on each client.

[4] In the E.U., the audit directive of May 2006 requires the use of the International Standards on Auditing (issued by the International Auditing and Assurance Standards Board) for all statutory audits.

[5] Developing a good reputation may notably allow female auditors to have more job opportunities in audit firms (Hardies et al., 2021).

[6] Note that these settings are different from the French joint-audit setting where two partners from two different audit firms sign the audit report (André et al., 2016). Nekhili et al. (2018) investigated the 'female audit fee premium' and the influence of gender diversity among partners on earnings management behaviour in France.

2.3. Hypotheses

Our hypotheses are based on the combination of the two arguments addressed in the preceding sections. First, female auditors are more risk averse than male auditors and have a different professional attitude, which influences their effort and ultimately translates into higher audit fees and audit quality. This leads to the emergence of an audit fee premium and higher audit quality, as documented in the prior literature (Burke et al., 2019; Hardies et al., 2015; Ittonen & Peni, 2012; Lee et al., 2019). Second, lead auditors may have a significant influence on audit outcomes because they perform numerous and varied tasks (Downar et al., 2021a). Since lead auditors are largely involved in the audit process (i.e., they allocate significant time to reduce the risk of material misstatement), they should affect audit fees[7] and audit quality. Thus, we formulate the two following hypotheses.

Hypothesis 1. Audit fees are positively associated with the presence of a female lead auditor, when compared to the presence of a male lead auditor.

Hypothesis 2. Audit quality is positively associated with the presence of a female lead auditor, when compared to the presence of a male lead auditor.

3. Research design

3.1. Sample selection

To test our hypotheses, we collected information on all Swiss publicly traded companies from 2010 to 2017 on LSEG Datastream. In Switzerland, all listed companies are subject to a full statutory audit, and each audit report included in the annual report must be signed by two auditors (i.e., the concurring and the lead auditors) belonging to the same audit firm. We initially obtained 1712 firm-year observations, from which we excluded financial firms (528 firm-year observations). We manually collected the corresponding annual reports and removed firms with missing or incomplete accounting and corporate governance information. Data on individual auditors were manually retrieved from audit reports. Following Downar et al. (2021a), we used the name provided in the audit report to assess auditor gender. In cases of uncertainty, to better inform our coding, we completed our analysis through the observation of the profile picture often produced on websites such as LinkedIn. Finally, we excluded eight observations when two female auditors (i.e., a female concurring auditor and a female lead auditor) are present, because performing statistical analyses on such a small number of cases may not be relevant.[8] Thus, our final sample includes 719 firm-year observations for a total of 103 firms and 313 different signing auditors.

The composition of this sample is as follows. The group of interest for the main analysis, composed of a female lead auditor and a male concurring auditor, includes 122 observations. The control group of two male auditors includes 543 observations. The group composed of a male lead auditor and a female concurring auditor includes 54 observations. We therefore consider 665 observations for our main analysis (i.e., 122 observations for the group composed of a female lead auditor and a male concurring auditor, and 543 observations for the control group).[9] Table 1 summarizes the sample composition per dyad (Panel A) and over time (Panel B).

3.2. Models

The following model allows us to test our two hypotheses:

$$LN\_AF_{it} \text{ (or } ABSABNACC_{it}) = \alpha_0 + \alpha_1\, LEAD\_WOMAN_{it} + CONTROLS_{it} + Audit\ firm\ FE + Client\ firm\ FE + Year\ FE + \varepsilon_{it} \quad \text{(eq. 1)}$$

Where the dependent variables are: LN_AF_{it}, the natural logarithm of audit fees for firm i at time t for the test of our first hypothesis, or $ABSABNACC_{it}$, the absolute abnormal accruals for firm i at time t that capture audit quality for the test of our second hypothesis.[10]

Abnormal accruals are defined as the residuals of a cross-sectional modified Jones model controlling for contemporaneous firm performance (Dechow et al., 1995; Jones, 1991; Kothari et al., 2005) as well as industry and year fixed effects. We consider this measure as a proxy for audit quality for two reasons. First, it is often used in auditing research because it detects "within GAAP" earnings manipulation (DeFond & Zhang, 2014). However, we acknowledge that abnormal accruals capture not only audit quality but also financial reporting quality, which is a limitation of this study. Second, the disclosures of restatements and going-concern opinions

[7] This should notably be the case if female lead auditors are less likely to underreport time spent on the engagement. Under-reporting by lead auditors is likely in audit firms. Agoglia et al. (2015) stated that, when compared to concurring auditors, lead auditors "are likely more influenced by shorter-term incentives to complete the engagement within the budgeted time (e.g., to avoid fee pressure on desirable clients; to impress partners with good realization rates)" (p. 2).

[8] We hope that future research will investigate this interesting case.

[9] In an additional analysis on female concurring auditors (see section 4.4.), we use 597 observations (i.e., 54 observations for the group composed of a female concurring auditor and a male lead auditor, and 543 observations for the control group).

[10] In our main model, we follow Francis et al. (2013) for the computation of absolute abnormal accruals (*ABSABNACC*). In an untabulated additional analysis, we replicate column 4 of Tables 3 and 6 following Chen et al. (2018) using the absolute total accruals as the dependent variable. The results remain unchanged.

Table 1
Sample composition.

Panel A. Number of observations per dyad

		Lead auditor		TOTAL
		Male	Female	
Concurring auditor	Male	543 *control group*	122	665 [a]
	Female	54	–	54
	TOTAL	597 [b]	122	719 [c]

Panel B. Number of observations per year

Year	Male concurring & male lead	Male concurring & female lead	Female concurring & male lead	Full sample
2010	61	12	8	81
2011	70	12	8	90
2012	73	11	7	91
2013	71	16	6	93
2014	72	14	5	91
2015	71	16	6	93
2016	64	20	7	91
2017	61	21	7	89
Total	**543**	**122**	**54**	**719**

Note: This table describes the number of observations per dyad. The control group, composed of a male concurring auditor and a male lead auditor, includes 543 observations.
Tables 4 and 5 are based on sub-samples which are explained in the text.
[a] 665 observations are used for our main analysis on the effect of female lead auditors (Table 3).
[b] 597 observations are used for our additional analysis on the effect of female concurring auditors (Table 6).
[c] 719 observations are used for our additional analysis (Table 7).

are extremely rare in Switzerland (Raffournier & Schatt, 2018). Thus, no other metric is available to measure audit quality.[11]

LEAD_WOMAN is a dummy variable equal to 1 if the lead auditor is a woman and 0 otherwise. We expect the α_1 coefficient to be positive: the presence of a female lead auditor should be associated with higher audit fees (hypothesis 1) and higher audit quality (hypothesis 2). Control variables are presented in sections 3.3. and 3.4.

In our context, the treated sample is composed of firms with one male concurring auditor and one female lead auditor, whereas the control group is composed of firms with two male auditors. If these two groups are not comparable, our results may be biased. It is indeed likely that the presence of female audit partners is not random (e.g., Lee et al., 2019), thereby generating differences in covariates across the control and treated samples. To tackle this issue, we use a matching technique, namely entropy balancing, to make our two groups more comparable. As McMullin and Schonberger (2022, p. 167) explain, "entropy balancing is an increasingly popular statistical method for identifying a control sample that is nearly identical to the treated sample with respect to observable covariates." The entropy balancing approach minimizes variations in covariates between the treated and the control groups (Hainmueller, 2012; McMullin & Schonberger, 2020), which allows us to estimate our two models using more comparable observations. We favour entropy balancing over propensity-score matching for three reasons. First, entropy balancing avoids losing observations in the matching process, thereby preserving our relatively small sample size. Second, entropy balancing has been shown to achieve superior specification, notably through the reduction in coefficient estimates bias (McMullin & Schonberger, 2020). Third, entropy balancing requires comparatively less discretion from researchers as regards model specification (McMullin & Schonberger, 2020).

3.3. Control variables

3.3.1. For the audit fee model

Based on the prior audit literature (e.g., Alhababsah & Alhaj-Ismail, 2023; André et al., 2016; Costa & Habib, 2023; Hay, 2013; Hay et al., 2006a), our control variables capture the demand for audit services by the audit committee, client attributes, as well as auditor and engagement characteristics.

3.3.1.1. Demand for audit services by the audit committee. Since audit fees are driven by client demand for audit services, we include several variables in our models to control for audit committee characteristics. The audit committee oversees the negotiation of the provision of audit services and audit fees and therefore plays a key role in safeguarding financial reporting integrity (Bédard & Gendron, 2010; Ittonen et al., 2010). We do not control for audit committee size (i.e., the number of committee members) and

[11] The data available in Audit Analytics Europe confirm the scarcity of such disclosures.

independence, as these two characteristics mostly do not vary over our sample period.[12] However, we control for gender diversity at the audit committee level (*AC_WOMAN*), as audit fees may be associated with the presence of women on the audit committee, even if the literature has provided mixed results on that association (Aldamen et al., 2018; Alkebsee et al., 2021; Ittonen et al., 2010; Lai et al., 2017; Sellami & Cherif, 2020; Sultana et al., 2020). We also consider the number of meetings the audit committee had during a given fiscal period (*AC_MEETINGS*).

3.3.1.2. Client attributes. Prior research has largely controlled for several key factors related to client attributes (Alhababsah & Alhaj-Ismail, 2023; André et al., 2016; Costa & Habib, 2023; Hay, 2013; Hay et al., 2006a). The most important one is the size of the audited firm (*SIZE),* which we measure with the natural logarithm of total assets. Certain audit components, such as receivables and inventories, are more subject to errors, which can impact audit fees. We measure inherent risk using the ratio of inventory and receivables to total assets (*INHERENT_RISK*). Auditors might be sued by investors when a firm goes bankrupt and the auditor fails to express a going-concern opinion. To capture bankruptcy risk, we use three variables: a solvency measure (*SOLVENCY),* which is the ratio of total debt divided by total assets; a liquidity measure (*LIQUIDITY*) equal to current assets divided by current liabilities (i.e., the current ratio); and a performance measure (*DLOSS*), which takes the value of 1 if the net income is negative and 0 otherwise. Given that audit fees paid to the auditor may be associated with the ownership structure of the client firm (i.e., a demand for audit services of greater quality for firms with diffused ownership), we also include the percentage of closely held shares *(OWN)*. Finally, as the presence of the chief executive officer (CEO) may significantly affect board independence and the demand for audit services of higher quality, we include a dummy variable equal to 1 if the CEO seats on the board of directors and 0 otherwise (*CEO_BOARD*).

3.3.1.3. Auditor and engagement characteristics. Audit fee models also include factors related to the auditors and the engagement characteristics (e.g., Hay, 2013). Non-audit fees paid to auditors may be important because they influence auditor independence. We therefore include the *NAAF* variable, which is the ratio of non-audit fees to audit fees. To account for the fact that an audit firm change might trigger a significant variation in audit fees, we use a dummy variable *AUDITOR_CHANGE*, which is equal to 1 if the firm changed its auditor during a given year and 0 otherwise. We also include two variables to control for changes in auditors.[13] *CONC_ CHANGE* is a dummy variable equal to 1 if the concurring auditor changes and 0 otherwise. *LEAD_ CHANGE* is a dummy variable equal to 1 if the lead auditor changes and 0 otherwise. Moreover, most firms' fiscal year-end is on December 31st (i.e., the busy season). As a result, firms with a different fiscal year-end might pay lower fees for being audited. We use a dummy variable *DECEMBER* that takes the value of 1 if the firm's fiscal year-end is on December 31st and 0 otherwise. In Switzerland, firms can apply IFRS or Swiss GAAP (Raffournier & Schatt, 2018). Finally, since audit fees are related to the accounting standards applied by firms (De George et al., 2016; Kim et al., 2012), we include a dummy variable *IFRS*, which is equal to 1 if the firm applies IFRSand 0 otherwise.

3.3.2. For the audit quality model

When the dependent variable is *ABSABNACC*, all regressions include first-step regressors used to calculate abnormal accruals, following the procedure recommended by Chen et al. (2018). We also include the aforementioned control variables following the previous literature on absolute abnormal accruals (e.g., Alhababsah & Alhaj-Ismail, 2023; Ittonen et al., 2013), with a few exceptions. Three variables (*INHERENT_RISK*, *LIQUIDITY*, and *DECEMBER*) are excluded, as these variables are relevant for the audit fee model only.

In all models, we include dummy variables related to audit firms,[14] client firms, and years. These fixed effects capture unobservable factors that may influence audit fees and audit quality. In all tests, all continuous variables are winsorized at 1% and 99%. Moreover, we run a Wooldridge test and a Breusch-Pagan/Cook-Weisberg test to analyse the presence of serial correlation and heteroscedasticity in the data, respectively. The use of robust standard errors clustered at the firm level allows us to mitigate these statistical issues. All variables are defined in Appendix A.

4. Empirical results

4.1. Descriptive statistics

We present the descriptive statistics in Table 2. Panel A shows the distribution of the full sample while Panel B distinguishes between the three groups of firms based on audit team composition. We notably show that audit fees are not statistically different across the three groups of audit pairs. However, *AC_MEETINGS*, *INHERENT_RISK*, *SOLVENCY*, *LIQUIDITY*, *OWN*, *NAAF*, *DECEMBER*, and *IFRS* have significantly different means and/or medians comparing the control group (i.e., two male auditors) to the two other groups (male concurring auditor and female lead auditor or female concurring auditor and male lead auditor). Appendix B reports the correlation matrix. Unreported variance inflation factors (VIF) indicate no collinearity issue, as all VIF remain below the commonly accepted threshold of five. Appendix C provides descriptive statistics (mean, variance, and skewness) for the control variables used in Table 3, before and after entropy balancing, for the treated and the control groups. After entropy balancing, all control variables are

[12] We verified that their inclusion in our models does not change our results.

[13] We thank an anonymous reviewer for this suggestion.

[14] In our sample, 97% of companies are audited by a Big 4. To control for variations across Big 4 companies in terms of audit pricing and quality, we include audit firm fixed effects in our models.

Table 2
Descriptive statistics.

Panel A. Full sample (N = 719)

	Mean	St. Dev.	Q1	Median	Q3
LN_AF	13.687	1.312	12.766	13.563	14.648
ABSABNACC	0.043	0.046	0.014	0.032	0.054
LEAD_WOMAN	0.170	0.376	0.000	0.000	0.000
LEAD_WOMAN_HIGHEXP	0.039	0.194	0.000	0.000	0.000
LEAD_WOMAN_LOWEXP	0.131	0.337	0.000	0.000	0.000
CONC_WOMAN	0.075	0.264	0.000	0.000	0.000
AC_WOMAN	0.224	0.417	0.000	0.000	0.000
AC_MEETINGS	3.834	1.690	3.000	3.000	5.000
SIZE	13.813	1.789	12.469	13.761	14.947
INHERENT_RISK	0.527	0.203	0.390	0.557	0.672
SOLVENCY	0.193	0.174	0.043	0.174	0.297
LIQUIDITY	2.285	1.503	1.435	1.925	2.558
DLOSS	0.185	0.389	0.000	0.000	0.000
OWN	0.330	0.251	0.116	0.306	0.536
CEO_BOARD	0.288	0.453	0.000	0.000	1.000
NAAF	0.321	0.351	0.077	0.219	0.454
CONC_CHANGE	0.193	0.395	0.000	0.000	0.000
LEAD_CHANGE	0.312	0.463	0.000	0.000	1.000
AUDITOR_CHANGE	0.046	0.209	0.000	0.000	0.000
DECEMBER	0.885	0.320	1.000	1.000	1.000
IFRS	0.783	0.412	1.000	1.000	1.000

Panel B. Sub-groups

	Male concurring & male lead (N = 543)		Male concurring & female lead (N = 122)		Female concurring & male lead (N = 54)	
	Mean	Median	Mean	Median	Mean	Median
LN_AF	13.655	13.464	13.756	13.602	13.554	13.789
ABSABNACC	0.045	0.032	0.041	0.029	0.039	0.031
LEAD_WOMAN_HIGHEXP	0.000	0.000	0.230	0.000	0.000	0.000
LEAD_WOMAN_LOWEXP	0.000	0.000	0.770	1.000	0.000	0.000
AC_WOMAN	0.255	0.000	0.221	0.000	0.222	0.000
AC_MEETINGS	3.755	3.000	4.221***	4.000*	3.722	3.500
SIZE	13.844	13.756	13.831	13.911	13.518	13.558
INHERENT_RISK	0.534	0.577	0.498*	0.530**	0.529	0.498
SOLVENCY	0.184	0.158	0.201	0.194	0.237**	0.227
LIQUIDITY	2.348	2.000	2.081*	1.805	2.115	1.846
DLOSS	0.192	0.000	0.180	0.000	0.204	0.000
OWN	0.335	0.311	0.323	0.311	0.239***	0.211
CEO_BOARD	0.279	0.000	0.270	0.000	0.204	0.000
NAAF	0.336	0.238	0.254**	0.148**	0.244*	0.197
CONC_CHANGE	0.188	0.000	0.246	0.000	0.056	0.000
LEAD_CHANGE	0.291	0.000	0.385	0.000	0.130	0.000
AUDITOR_CHANGE	0.058	0.000	0.041	0.000	0.352	0.000
DECEMBER	0.917	1.000	0.828***	1.000	0.778**	1.000
IFRS	0.714	1.000	0.877***	1.000	0.889**	1.000

Note: All variables are defined in Appendix A. *, **, and *** denote significance at a 10%, 5%, and 1% level respectively based on tests of difference in means (*t*-test) or medians (Wilcoxon test) between male-male and male-female dyads or between male-male and female-male dyads.

statistically aligned between the control and the treated groups.

4.2. Main results

4.2.1. Cross-sectional analyses

Table 3 provides the results for the association of the presence of one female lead auditor with audit fees (columns 1 and 2) and audit quality (columns 3 and 4). Columns 1 and 3 are dedicated to the results with non-adjusted data, while columns 2 and 4 use data adjusted with entropy balancing. In each column, we compare the group including a female lead auditor and a male concurring auditor with the control group including two male auditors.

The results in columns 1 and 2 indicate a non-significant coefficient on *LEAD_WOMAN,* which suggests that audit fees charged to clients are not significantly higher when a female lead auditor is present. This result, which holds with OLS estimations as well as with entropy balancing, leads us to reject our first hypothesis. Several control variables[15] are significant, and the sign of their coefficients is

[15] Running equation (1) without the variable of interest (*LEAD_WOMAN*) does not affect the sign and the significance of the control variables.

Table 3
The impact of female lead auditors on audit fees and audit quality.

	LN_AF		*ABSABNACC*	
	OLS	Entropy balancing	OLS	Entropy balancing
	(1)	(2)	(3)	(4)
LEAD_WOMAN	−0.03	−0.03	−0.01*	−0.01**
	(-0.65)	(-1.08)	(-1.92)	(-2.23)
AC_WOMAN	−0.01	−0.02	0.00***	0.00
	(-0.21)	(-0.40)	(4.46)	(0.11)
AC_MEETINGS	0.00	0.01	0.00	0.00
	(0.34)	(0.76)	(1.09)	(0.85)
SIZE	0.39***	0.41***	−0.01	−0.01
	(4.80)	(6.95)	(-0.71)	(-0.72)
INHERENT_RISK	−0.26	0.11		
	(-0.72)	(0.49)		
SOLVENCY	−0.07	−0.10	−0.03***	−0.05
	(-0.24)	(-0.58)	(-2.96)	(-1.40)
LIQUIDITY	−0.06***	−0.05*		
	(-3.40)	(-1.78)		
DLOSS	0.03	0.07**	0.02***	0.02**
	(0.74)	(2.13)	(2.76)	(2.18)
OWN	−0.06	0.12	−0.00	−0.00
	(-0.94)	(1.29)	(-0.09)	(-0.33)
CEO_BOARD	−0.09***	−0.13***	−0.00	−0.01
	(-2.64)	(-3.42)	(-1.60)	(-0.99)
NAAF	−0.19***	−0.19***	0.00	−0.00
	(-3.31)	(-3.87)	(0.15)	(-0.09)
AUDITOR_CHANGE	−0.18***	−0.10**	0.00	0.01
	(-3.43)	(-2.48)	(0.49)	(1.36)
CONC_CHANGE	0.03	−0.05	0.00	0.00
	(0.89)	(-1.38)	(0.70)	(0.16)
LEAD_CHANGE	0.03	0.04	0.00	0.00
	(1.31)	(1.07)	(0.70)	(0.61)
DECEMBER	0.24***	0.28**		
	(4.13)	(2.44)		
IFRS	0.11	0.19***	0.01**	−0.00
	(1.37)	(3.32)	(2.31)	(-0.28)
Constant	7.32***	6.39***	0.18	0.16
	(5.59)	(6.59)	(0.67)	(0.85)
Audit firm FE	Yes	Yes	Yes	Yes
Client firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	665	665	665	665
R-squared	0.98	0.98	0.49	0.57
F-statistic	88.9***	238.3***	26.4***	5.9***

Note: This table presents the regression results using OLS and entropy balancing estimations of equation (1). The 665 observations are composed of 122 observations with a female lead auditor and a male concurring auditor and 543 observations with a male lead auditor and a male concurring auditor. The dependent variables are the natural logarithm of audit fees (*LN_AF*) in columns 1 and 2 and the absolute abnormal accruals (*ABSABNACC*) in columns 3 and 4. All variables are defined in Appendix A. All continuous variables are winsorized at the 1 and 99 percentiles. *, **, and *** denote significance at a 10%, 5%, and 1% level respectively based on a two-tailed test.

in line with the prior literature. Audit fees are generally lower when (1) the risk of bankruptcy is lower (*LIQUIDITY*), (2) the CEO is sitting on the board of directors (*CEO_BOARD*), (3) auditors charge higher non-audit fees (*NAAF*), and (4) a new audit firm is hired (*AUDITOR_CHANGE*). Audit fees are higher when clients are larger (*SIZE*) and audited during the busy season (*DECEMBER*).[16]

In columns 3 and 4 of Table 3, we analyse the association of female lead auditors with audit quality. The results indicate a negative and significant coefficient ($p < 0.1$ in column 3, and $p < 0.05$ in column 4) on *LEAD_WOMAN*. In other words, the presence of a female lead auditor is associated with lower absolute abnormal accruals and, therefore, higher audit quality. This result supports hypothesis 2.

4.2.2. Staggered difference-in-differences models

To strengthen the reliability of our findings, we investigate the impact of the appointment of one female lead auditor on audit fees and audit quality in firms that were previously audited by two male auditors. For this analysis, we implement staggered difference-in-differences models (Dou et al., 2016; Giroud, 2013; Jiang et al., 2019; Kausar et al., 2016) to account for the fact that the arrival of a female lead auditor occurs in different firms at different points in time. We formulate the following model:

[16] Since R-squared values are close to 0.98, we consider that our model is well specified. In untabulated tests, we replaced firm fixed effects by industry fixed effects. R-squared values were lower and in line with those documented in the prior literature.

$$LN\_AF_{it}\ (\text{or}\ ABSABNACC_{it}) = \beta_0 + \beta_1 TREATED_{it} + \beta_2 TREATED{*}POST_{it} + CONTROLS_{it} + Audit\ firm\ FE + Client\ firm\ FE + Year\ FE + \varepsilon_{it} \quad \text{(eq. 2)}$$

where *TREATED* is a binary variable equal to 1 for firms that appointed a female lead auditor anytime over the sample period and 0 otherwise. *POST* takes the value of 1 on the year of the appointment of a new female lead auditor and 0 otherwise.[17] Consequently, *POST* only takes the value of 1 for treated firms, and time trends are captured through the inclusion of year fixed effects. For this reason, *POST* alone could not be estimated for non-treated firms. The coefficient on the *TREATED*POST* interaction variable measures the change in audit fees or audit quality, from the pre-to post-appointment periods for treated firms adjusted for changes over time in audit fees/quality for the control group. We replace the *LEAD_CHANGE* variable by *LEAD_MAN_CHANGE*, which is equal to 1 if the male lead auditor changes and 0 otherwise. The control group is composed of firms with two male auditors (i.e., lead and concurring) over the sample period.

Table 4 shows the results of OLS (columns 1 and 3) and entropy balancing (columns 2 and 4) estimations. Models are estimated on 393 firm-observations: 72 observations for the treated group (i.e., arrival of a female lead auditor when there was previously a male-male dyad) and 321 observations for the control group (i.e., male-male dyads if there was no female auditor the year before). Estimations in Table 4 are excluding the first year of the sample because we are unable to determine whether the presence of a female lead auditor was due to an audit partner change in the first year, or whether the audit partner was already in place in the prior year.

The results indicate that audit fees are not impacted by the appointment of a female lead auditor (columns 1 and 2), as evidenced by the non-significant coefficients on *TREATED*POST*. In contrast, audit quality increases upon the arrival of a female lead auditor, as documented by the negative and significant ($p < 0.05$) coefficient on *TREATED*POST* in column 4. In other words, the appointment of a new female lead auditor is associated with better audit quality (i.e., lower absolute abnormal accruals).

Overall, these results support the idea that the arrival of new female lead auditors has a positive influence on audit quality but does not significantly affect audit fees. However, these findings also raise the question of whether the impact of female lead auditors on audit quality is conditional on client-specific experience. Indeed, the arrival of a female lead auditor is synonymous with the arrival of an auditor without any client-specific experience, which might translate into more effort in the audit task and potentially into higher audit fees and audit quality. We explore this issue further.

4.3. Analysis of the lead auditor client-specific experience

Client-specific experience may significantly influence audit quality because auditors with such experience benefit from prior engagement knowledge (Chi et al., 2017; Contessotto et al., 2021). They know where to find specific information and who to question, and they spend less time understanding how the client firm operates. Therefore, experienced auditors can better identify the risks and key transactions that could lead to a material misstatement. In their studies, Contessotto et al. (2021) document that auditors' client-specific experience is associated with audit fees and effort, while Contessotto et al. (2019) show that lead auditors' client-specific experience is associated with risk responsiveness (i.e., the proportion of actual audit costs assigned to auditor-assessed client risks). Consequently, it is worth investigating whether the client-specific experience of female lead auditors is associated with different audit fees or audit quality compared to their male counterparts.

To investigate this issue, we compare the effect of the presence of female and male lead auditors with high client-specific experience on audit fees and audit quality, as well as the presence of female and male lead auditors with low client-specific experience on these two audit outcomes. In both cases, the concurring auditor is a man. We define experienced lead auditors as those with at least three years of experience with a given client firm (Contessotto et al., 2021).[18] This choice reduces our sample as we lose the first two years.[19] In Table 5, we split our variable of interest (*LEAD_WOMAN*) into *LEAD_WOMAN_HIGHEXP* (female lead auditors with high client-specific experience) and *LEAD_WOMAN_LOWEXP* (female lead auditors with low client-specific experience). *LEAD_WOMAN_HIGHEXP* is a dummy variable taking the value of 1 for experienced female lead auditors and 0 otherwise. *LEAD_WOMAN_LOWEXP* is a dummy variable taking the value of 1 for unexperienced female lead auditors and 0 otherwise.

Models are estimated on two sample sizes. In columns 1 and 3 of Table 5, sample size is equal to 208 observations including 28 observations where an experienced female lead auditor and a male concurring auditor are present, and 180 observations where an experienced male lead auditor and a male concurring auditor are present. In columns 2 and 4 of Table 5, sample size is 302 observations, which corresponds to 70 observations where there is an unexperienced female lead auditor and a male concurring auditor, and 232 observations where there is an unexperienced male lead auditor and a male concurring auditor.

Overall, the results in column 1 of Table 5 indicate that the audit fees charged to the client in the presence of a female lead auditor with high client-specific experience are not statistically different than those charged by their male counterparts. Such a result also holds with regards to audit quality (column 3). However, female lead auditors with low client-specific experience do not charge significantly higher audit fees than their male counterparts (column 2) but provide audit services of higher quality (than male lead auditors), as evidenced by the negative and significant ($p < 0.01$) coefficient on *LEAD_WOMAN_LOWEXP* (column 4).

[17] We follow a reviewer's suggestion to focus on the year of the change rather than on any consecutive years.

[18] In untabulated analyses, we replicated Table 5 measuring experience based on the sample median and mean, and the results hold.

[19] More precisely, a given auditor for a given firm must have been in the same position (e.g., lead auditor) for three years or more to be considered as experienced. Consequently, we dropped the first two years of the sample as we did not know whether the auditor was already in place for one or more years before the first sample year. In total, 81 observations were dropped in 2010 and 90 in 2011.

Table 4
Staggered difference-in-differences models.

	LN_AF		ABSABNACC	
	OLS	Entropy balancing	OLS	Entropy balancing
	(1)	(2)	(3)	(4)
TREATED	2.00***	1.92***	0.00	−0.01
	(8.55)	(12.39)	(0.01)	(-0.08)
*TREATED*POST*	0.08	0.16	−0.01	−0.02**
	(0.80)	(1.25)	(-0.89)	(-2.46)
AC_WOMAN	0.03	−0.03	0.00	0.01
	(0.56)	(-0.56)	(0.55)	(1.56)
AC_MEETINGS	0.00	−0.01	−0.00	0.00
	(0.21)	(-0.56)	(-0.12)	(0.54)
SIZE	0.39***	0.40***	−0.00	−0.01
	(3.20)	(5.44)	(-0.15)	(-0.61)
INHERENT_RISK	−0.34	−0.19		
	(-0.66)	(-0.71)		
SOLVENCY	−0.22	−0.26	−0.02	−0.00
	(-0.69)	(-1.47)	(-0.62)	(-0.08)
LIQUIDITY	−0.06***	0.07*		
	(-3.38)	(1.67)		
DLOSS	0.02	−0.02	0.02	0.01
	(0.39)	(-0.39)	(1.18)	(1.33)
OWN	−0.08	−0.22**	−0.01	−0.01
	(-0.87)	(-2.29)	(-0.72)	(-0.82)
CEO_BOARD	−0.03	−0.06*	−0.01*	−0.01
	(-0.71)	(-1.69)	(-1.96)	(-0.95)
NAAF	−0.22**	−0.30**	−0.01	−0.00
	(-2.32)	(-2.41)	(-0.66)	(-0.25)
AUDITOR_CHANGE	−0.23***	−0.14	0.00	0.01
	(-2.75)	(-1.05)	(0.22)	(0.40)
CONC_CHANGE	0.06	−0.02	0.00	0.00
	(0.86)	(-0.21)	(0.84)	(0.93)
LEAD_MAN_CHANGE	0.01	0.05	0.00	0.00
	(0.49)	(1.08)	(0.52)	(0.18)
DECEMBER	−1.37**	−0.81**		
	(-2.55)	(-2.32)		
IFRS	0.09	0.05	−0.00	−0.00
	(0.96)	(0.65)	(-0.22)	(-0.24)
Constant	10.45***	10.02***	0.09	0.15
	(4.07)	(6.57)	(0.43)	(0.89)
Audit firm FE	Yes	Yes	Yes	Yes
Client firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	393	393	393	393
R-squared	0,98	0,98	0,56	0,64
F-statistic	392.0***	5.8***	28.7***	108.7***

Note: This table presents regression results using OLS and entropy balancing estimations. The sample is composed of 393 observations: 72 treated observations (i.e., arrival of a female lead auditor when there was a male-male dyad before) and 321 control observations (i.e., male-male dyads if the year before there was no female auditor). The dependent variables are the natural logarithm of audit fees (*LN_AF*) in columns 1 and 2 and the absolute abnormal accruals (*ABSABNACC*) in columns 3 and 4. All variables are defined in Appendix A. All continuous variables are winsorized at the 1 and 99 percentiles. *, **, and *** denote significance at a 10%, 5%, and 1% level respectively based on a two-tailed test.

Thus, the findings in Table 5 support the idea that female lead auditors with lower client-specific experience put more effort into the audit, which ultimately leads to higher audit quality (i.e., lower absolute abnormal accruals). Since these women spend more time to find specific information and to understand how the client firm operates, they are willing to make more effort to better identify risks and implement the various procedures to audit the new client. After a few years, the need for significant additional effort fades away.

By showing that female lead auditors with no client-specific experience increase their effort to limit the risk of material misstatement, which leads to higher audit quality, our findings complement those of Contessotto et al. (2019) who found that audit managers' client-specific experience is associated with risk responsiveness.

4.4. Additional analysis on female concurring auditors

Previous results show that female lead auditors influence audit quality when compared to male lead auditors but it is not clear whether female lead auditors and female concurring auditors have a different effect on audit outcomes. We consider this issue in this additional analysis. More precisely, we investigate the association between female concurring auditors and the two audit outcomes of interest, namely audit fees and audit quality. We replace *LEAD_WOMAN* by *CONC_WOMAN* in equation (1). *CONC_WOMAN* is equal to

Table 5
Female lead auditors' client-specific experience.

	LN_AF		ABSABNACC	
	(1)	(2)	(3)	(4)
LEAD_WOMAN_HIGHEXP	−0.00		−0.02	
	(-0.04)		(-0.89)	
LEAD_WOMAN_LOWEXP		0.02		−0.02***
		(0.63)		(-2.72)
AC_WOMAN	−0.00	0.04	0.01	0.01
	(-0.05)	(0.70)	(1.06)	(0.71)
AC_MEETINGS	0.03	0.02	−0.00	0.01*
	(1.65)	(1.36)	(-0.90)	(1.86)
SIZE	0.69***	0.39***	0.05***	−0.01
	(7.30)	(6.14)	(3.73)	(-0.69)
INHERENT_RISK	0.85**	−0.08		
	(2.33)	(-0.33)		
SOLVENCY	−0.59**	−0.24	−0.04	−0.02
	(-2.31)	(-1.09)	(-0.94)	(-0.47)
LIQUIDITY	−0.06	−0.04		
	(-1.58)	(-0.94)		
DLOSS	0.23***	0.07**	−0.02	0.04***
	(4.09)	(2.03)	(-1.29)	(3.27)
OWN	0.01	−0.23*	−0.04	0.04
	(0.06)	(-1.83)	(-1.38)	(1.54)
CEO_BOARD	0.00	−0.25***	0.00	−0.01
	(0.06)	(-4.12)	(0.01)	(-1.23)
NAAF	−0.36***	−0.16**	−0.03	−0.00
	(-5.77)	(-2.07)	(-1.52)	(-0.44)
AUDITOR_CHANGE	−0.12	−0.14***	−0.10***	0.01
	(-0.82)	(-2.79)	(-6.78)	(0.91)
CONC_CHANGE	−0.02	−0.04	0.02***	−0.00
	(-0.43)	(-1.26)	(2.83)	(-0.53)
LEAD_CHANGE		0.08**		−0.01*
		(2.46)		(-1.79)
DECEMBER	−0.39	−1.29***		
	(-0.85)	(-4.23)		
IFRS	−0.22**	0.10	−0.01	−0.07***
	(-2.05)	(1.26)	(-0.53)	(-3.68)
Constant	4.13**	8.58***	−0.74***	0.14
	(2.11)	(6.66)	(-3.26)	(0.84)
Audit firm FE	Yes	Yes	Yes	Yes
Client firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	208	302	208	302
R-squared	0.99	0.99	0.67	0.81
F-statistic	142.1***	114.5***	87.2***	149.9***

Note: This table presents entropy balancing estimations of equation (1) where *LEAD_WOMAN* is replaced either by *LEAD_WOMAN_HIGHEXP* or by *LEAD_WOMAN_LOWEXP*. We compare experienced female lead auditors to experienced male lead auditors in columns 1 and 3 and non-experienced female lead auditors to non-experienced male lead auditors in columns 2 and 4. The 208 observations in columns 1 and 3 are composed of 28 experienced female lead auditors when there is a male concurring auditor, plus 180 experienced male lead auditors when there is a male concurring auditor. The 302 observations in columns 2 and 4 are composed of 70 unexperienced female lead auditors when there is a male concurring auditor, plus 232 unexperienced male lead auditors when there is a male concurring auditor. The dependent variables are the natural logarithm of audit fees (*LN_AF*) in columns 1 and 2 and the absolute abnormal accruals (*ABSABNACC*) in columns 3 and 4. All variables are defined in Appendix A. All continuous variables are winsorized at the 1 and 99 percentiles. *t*-statistics are reported in parentheses. *, **, and *** denote significance at a 10%, 5%, and 1% level respectively based on a two-tailed test.

1 when the concurring auditor is a woman and 0 otherwise.

Table 6 shows the results of our comparison of teams composed of a female concurring auditor and a male lead auditor with teams composed of two male auditors. This additional analysis is based on 597 observations (i.e., 54 observations for the group composed of a female concurring auditor and a male lead auditor, and 543 observations for the control group). The findings in columns 1 and 2 suggest that female concurring auditors, who negotiate audit fees with clients, charge higher fees than their male counterparts. These results are in line with the prior literature documenting a 'female audit fee premium' in other settings (Burke et al., 2019; Hardies et al., 2015; Ittonen & Peni, 2012; Lee et al., 2019). Regarding the impact of female concurring auditors on audit quality (columns 3 and 4 of Table 6), we do not find any significant association, as evidenced by the non-significant coefficients on *CONC_WOMAN*. The results are

Table 6
The impact of female concurring auditors on audit fees and audit quality.

	LN_AF		ABSABNACC	
	OLS	Entropy balancing	OLS	Entropy balancing
	(1)	(2)	(3)	(4)
CONC_WOMAN	0.08**	0.13***	0.00	0.01
	(2.34)	(2.68)	(0.64)	(1.22)
AC_WOMAN	−0.01	0.03	0.01*	0.01
	(-0.18)	(0.60)	(1.75)	(1.32)
AC_MEETINGS	−0.01	−0.03*	−0.00	−0.00
	(-0.80)	(-1.85)	(-0.05)	(-0.79)
SIZE	0.43***	0.48***	−0.00	0.01
	(6.01)	(7.26)	(-0.30)	(0.78)
INHERENT_RISK	−0.27	−0.45**		
	(-0.77)	(-2.26)		
SOLVENCY	−0.06	0.22*	−0.02	−0.04
	(-0.21)	(1.79)	(-0.71)	(-1.03)
LIQUIDITY	−0.05***	−0.04***		
	(-3.13)	(-3.35)		
DLOSS	−0.01	−0.05	0.01	0.01
	(-0.16)	(-0.87)	(1.46)	(0.86)
OWN	−0.10*	0.08	−0.00	−0.01
	(-1.76)	(0.96)	(-0.27)	(-0.93)
CEO_BOARD	−0.08**	−0.14***	−0.01	−0.02*
	(-2.04)	(-3.51)	(-0.99)	(-1.91)
NAAF	−0.15**	−0.12***	−0.00	−0.00
	(-2.46)	(-3.61)	(-0.10)	(-0.21)
AUDITOR_CHANGE	−0.20***	−0.15***	0.00	0.01
	(-3.48)	(-3.37)	(0.07)	(0.65)
CONC_CHANGE	0.08*	0.06*	0.00	−0.00
	(1.91)	(1.89)	(0.78)	(-0.22)
LEAD_CHANGE	0.01	−0.02	0.00	0.00
	(0.67)	(-0.62)	(0.27)	(0.11)
DECEMBER	0.26***	0.18		
	(7.40)	(1.32)		
IFRS	0.05	0.04	0.01	0.00
	(0.59)	(0.58)	(1.32)	(0.21)
Constant	6.75***	5.94***	0.07	−0.14
	(5.91)	(5.83)	(0.33)	(-0.64)
Audit firm FE	Yes	Yes	Yes	Yes
Client firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	597	597	597	597
R-squared	0.98	0.98	0.52	0.68
F-statistic	27.1***	86.9***	16.7***	25.7***

Note: This table presents the regression results using OLS and entropy balancing estimations of equation (1) where *LEAD_WOMAN* is replaced by *CONC_WOMAN*. The 597 observations are composed of 54 observations with a female concurring auditor and a male lead auditor and 543 observations with a male lead auditor and a male concurring auditor. The dependent variables are the natural logarithm of audit fees (*LN_AF*) in columns 1 and 2 and the absolute abnormal accruals (*ABSABNACC*) in columns 3 and 4. All variables are defined in Appendix A. All continuous variables are winsorized at the 1 and 99 percentiles. *, **, and *** denote significance at a 10%, 5%, and 1% level respectively based on a two-tailed test.

similar with or without entropy balancing.

To confirm that female lead auditors and female concurring auditors have a different effect on audit quality and audit fees, we perform another analysis on the full sample.[20] In Table 7, we include both *LEAD_WOMAN* and *CONC_WOMAN* variables in our tests. Columns 1 and 2 show that audit fees are significantly higher for pairs with a female concurring auditor and a male lead auditor than for any other dyad (except the female-female one which is excluded from our sample). Next, columns 3 and 4 show that audit quality is higher for teams with a male concurring auditor and a female lead auditor, compared to the other dyads.

Overall, our findings suggest that female lead auditors and male lead auditors are associated with different audit outcomes, probably due to differences in risk aversion and tolerance of opportunistic behaviours. However, the results are sensitive to client-specific experience. Moreover, we document significant differences between female concurring auditors and female lead auditors. While female lead auditors exert a greater influence on audit quality than female concurring auditors, the latter have a greater effect on audit fees. These findings can be explained by two facts: (1) Female lead auditors are more involved in the day-to-day planning and execution of the audit, which influences audit quality, and (2) Female concurring auditors are associated with higher audit fees (than

[20] We thank an anonymous reviewer for suggesting this analysis.

Table 7
The impact of female auditors on audit fees and audit quality.

	LN_AF		ABSABNACC	
	OLS	Entropy balancing	OLS	Entropy balancing
	(1)	(2)	(3)	(4)
LEAD_WOMAN	−0.02	0.00	−0.01**	−0.01**
	(-0.55)	(0.01)	(-2.41)	(-2.13)
CONC_WOMAN	0.09**	0.10**	0.01	0.00
	(2.00)	(2.05)	(0.83)	(0.06)
AC_WOMAN	−0.00	0.02	0.01	0.00
	(-0.00)	(0.47)	(1.12)	(0.61)
AC_MEETINGS	−0.00	−0.02*	0.00	0.00*
	(-0.17)	(-1.79)	(0.69)	(1.72)
SIZE	0.38***	0.52***	−0.01*	−0.02**
	(4.85)	(6.48)	(-1.87)	(-2.46)
INHERENT_RISK	−0.22	0.05		
	(-0.70)	(0.25)		
SOLVENCY	0.00	0.18	−0.01	−0.02
	(0.01)	(1.44)	(-0.70)	(-0.72)
LIQUIDITY	−0.06***	−0.03***		
	(-3.39)	(-2.90)		
DLOSS	0.01	−0.08	0.02***	0.02**
	(0.15)	(-1.64)	(3.44)	(2.56)
OWN	−0.07	−0.01	−0.00	−0.01
	(-1.20)	(-0.15)	(-0.42)	(-0.54)
CEO_BOARD	−0.09***	−0.15***	−0.00	−0.00
	(-2.61)	(-4.05)	(-0.92)	(-0.02)
NAAF	−0.19***	−0.19***	0.00	−0.00
	(-3.59)	(-4.05)	(0.16)	(-0.22)
AUDITOR_CHANGE	−0.19***	−0.18***	−0.00	0.00
	(-4.17)	(-3.46)	(-0.13)	(0.18)
CONC_CHANGE	0.04	0.01	0.00	0.00
	(1.09)	(0.17)	(0.91)	(0.77)
LEAD_CHANGE	0.03	−0.01	0.00	0.00
	(1.13)	(-0.47)	(0.95)	(0.05)
DECEMBER	0.23***	0.14		
	(4.44)	(1.10)		
IFRS	0.12*	0.05	0.01*	0.01
	(1.68)	(0.81)	(1.69)	(0.49)
Constant	7.65***	5.51***	0.16*	0.37**
	(6.18)	(4.57)	(1.77)	(2.51)
Audit firm FE	Yes	Yes	Yes	Yes
Client firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	719	719	719	719
R-squared	0.97	0.97	0.48	0.57
F-statistic	16.3***	151.4***	6.5***	14.9***

Note: This table presents the regression results using OLS and entropy balancing estimations of equation (1) where *CONC_WOMAN* is added. The 719 observations are composed of 54 observations with a male lead auditor and a female concurring auditor, 543 observations with a male lead auditor and a male concurring auditor, and 122 observations with a female lead auditor and a male concurring auditor. The dependent variables are the natural logarithm of audit fees (*LN_AF*) in columns 1 and 2 and the absolute abnormal accruals (*ABSABNACC*) in columns 3 and 4. All variables are defined in Appendix A. All continuous variables are winsorized at the 1 and 99 percentiles. *, **, and *** denote significance at a 10%, 5%, and 1% level respectively based on a two-tailed test.

female lead auditors), because negotiating these fees with the client is among their primary tasks.

5. Conclusion

In this paper, we examine the influence of female lead auditors on audit fees and audit quality in Switzerland. We find that female lead auditors provide audit services of higher quality than their male counterparts, but they do not influence audit fees charged to their clients. We explain this finding by the greater risk aversion and lower optimism of female lead auditors, as well as their different professional attitude (i.e., tolerance of opportunistic behaviours) compared to male lead auditors. However, this finding is sensitive to client-specific experience as audit quality is only higher when female lead auditors have low client-specific experience. It is likely that women' greater risk aversion and prudence drive the additional effort to reduce the risk of material misstatement in such a context, especially if one considers that women are more sensitive to the negative impact of a material misstatement on their future job opportunities in audit firms than their male counterparts (Hardies et al., 2021).

In an additional analysis, we also document that female lead auditors have a greater influence on audit quality than female

concurring auditors, probably because female lead auditors perform more varied tasks and spend more time on the audit of a given client, than female concurring auditors. While female lead auditors positively influence audit quality, female concurring auditors positively influence audit fees, which is expected as negotiating audit fees with the clients is one of their key tasks. This finding is in line with prior research. Overall, we conclude that the two key leaders of the audit teams have a different impact on audit outcomes.

We acknowledge that this study has some limitations. First, we focus on the Swiss market, where information on both the identity of the lead and the concurring auditors is publicly available. However, Switzerland has some specific features differentiating it from Anglo-Saxon countries. Switzerland has a relatively small stock market, minority shareholders' legal protection is considered weaker, litigation risk is limited, and its culture is different. Since prior research has shown that institutional features impact audit outcomes (e.g., Choi et al., 2008; Knechel et al., 2019), our results should be interpreted with caution and future research should replicate our analysis in other settings.

Second, we are not able to determine whether female lead auditors are associated with higher audit quality because of their greater risk aversion or prudence, their different professional attitude, or their greater involvement (i.e., time spent with the client) in the audit process. More work is needed in this regard, particularly research that employs other methods of investigation such as surveys or experiments, to better understand why female lead auditors provide audit services of higher quality.

Finally, the lack of information on auditors' client-specific experience before the beginning of the period under investigation led us to reduce the sample size for the empirical analysis. Future studies might focus on larger samples, which would also allow researchers to account for all possible dyads, including teams composed of a female lead auditor and a female concurring lead auditor, which is rare in Switzerland. With these limitations in mind, we nevertheless hope that our study will be of interest to human resources departments of audit firms, and to audit committees in charge of hiring the external auditors.

Declarations

The authors are unaware of any conflict of interest. Data is available from publicly available sources. Computer coding is available from the authors.

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Data availability

The authors do not have permission to share data.

Appendix A. Variable definitions

Variable	Definition
LN_AF	Natural logarithm of audit fees
ABSABNACC	Absolute abnormal accruals following Francis et al. (2013)
LEAD_WOMAN	Dummy variable equal to 1 if the lead auditor is a woman and 0 otherwise
LEAD_WOMAN_HIGHEXP	Dummy variable equal to 1 if the lead auditor is a woman and has at least three years of experience with a given client firm and 0 otherwise
LEAD_WOMAN_LOWEXP	Dummy variable equal to 1 if the lead auditor is a woman who has less than three years of experience with a given client firm and 0 otherwise
CONC_WOMAN	Dummy variable equal to 1 if the concurring auditor is a woman and 0 otherwise
AC_WOMAN	Dummy variable equal to 1 if at least one female is sitting on the audit committee and 0 otherwise
AC_MEETINGS	Number of meetings over the year for a given audit committee
SIZE	Natural logarithm of total assets
INHERENT_RISK	Inventories and receivables to total assets ratio
SOLVENCY	Total debt to total assets ratio
LIQUIDITY	Current assets to current liabilities ratio
DLOSS	Dummy variable equal to 1 if net income is negative and 0 otherwise
OWN	Percentage of closely held shares
CEO_BOARD	Dummy variable equal to 1 if the CEO seats on the board and 0 otherwise
NAAF	Non-audit fees to audit fees ratio
AUDITOR_CHANGE	Dummy variable equal to 1 if there is an audit firm change during a given year and 0 otherwise
CONC_CHANGE	Dummy variable equal to 1 if the concurring auditor changes and 0 otherwise
LEAD_CHANGE	Dummy variable equal to 1 if the lead auditor changes and 0 otherwise
LEAD_MAN_CHANGE	Dummy variable equal to 1 if the male lead auditor changes and 0 otherwise
DECEMBER	Dummy variable equal to 1 if the fiscal year-end is in December and 0 otherwise
IFRS	Dummy variable equal to 1 if the firm applies the IFRS and 0 otherwise
TREATED	Dummy variable equal to 1 for firms that appoint a female lead auditor anytime over the sample period and 0 otherwise
*TREATED*POST*	Dummy variable equal to 1 on the year of the appointment of a new female lead auditor and 0 otherwise. *POST* alone could not be estimated for non-treated firms since, in our model, *POST* takes the value of 1 for treated firms only

Appendix B. Correlation matrix

	1	2	3	4	5	6	7	8	9	10
1	1									
2	−0.2519*	1								
3	0.0241	−0.0204	1							
4	0.0918	−0.0117	0.4453*	1						
5	−0.0258	−0.016	0.8579*	−0.0781	1					
6	−0.0289	−0.0247	−0.1288*	−0.0574	−0.1105*	1				
7	0.2228*	−0.0437	−0.0028	0.0126	−0.0104	−0.0012	1			
8	0.3201*	−0.0503	0.1035*	0.0836	0.0673	−0.0189	0.1079*	1		
9	0.8740*	−0.2632*	0.0047	0.0821	−0.0419	−0.047	0.3032*	0.3686*	1	
10	−0.1666*	0.0029	−0.065	−0.0754	−0.0291	0.0029	−0.1253*	−0.1484*	−0.3309*	1
11	0.0718	0.0197	0.0218	0.0341	0.0047	0.0723	−0.0183	0.0738	0.0804	−0.4103*
12	−0.2343*	0.0064	−0.0615	−0.0281	−0.0523	−0.0323	0.0235	−0.1516*	−0.2072*	0.3715*
13	−0.2537*	0.3326*	−0.0054	0.0152	−0.0147	0.0137	−0.0669	0.0446	−0.2940*	−0.1476*
14	−0.2175*	0.0278	−0.0125	−0.0755	0.0294	−0.1033*	−0.1320*	0.0234	−0.1328*	−0.0482
15	0.0481	0.0537	−0.0174	0.0308	−0.037	−0.053	0.0195	−0.1468*	0.0038	−0.0362
16	−0.0618	−0.0231	−0.0866	−0.0174	−0.0865	−0.0623	−0.0204	−0.0368	−0.0212	0.0483
17	−0.0759	0.0475	−0.0106	−0.0442	0.0135	0.0132	−0.0222	0.0923	−0.0483	0.0349
18	0.0078	0.0377	0.0602	−0.0075	0.0713	−0.046	−0.018	0.1230*	0.0159	−0.0231
19	−0.0459	0.018	0.0719	−0.1354*	0.1578*	0.0248	−0.0372	0.0624	−0.0497	−0.059
20	0.0151	0.0378	−0.0802	−0.0848	−0.0407	−0.0952	0.0688	0.1037*	0.0475	−0.1534*
21	0.2951*	−0.078	0.1031*	0.1060*	0.054	0.0732	0.0723	0.0683	0.2710*	−0.1202*

	11	12	13	14	15	16	17	18	19	20
11	1									
12	−0.3477*	1								
13	0.2746*	0.0184	1							
14	0.0549	−0.1515*	0.1345*	1						
15	0.0604	0.1251*	0.1401*	−0.0652	1					
16	−0.0723	0.1057*	−0.1022*	0.0421	0.0193	1				
17	−0.0502	−0.0137	0.0153	0.0711	−0.0514	−0.0624	1			
18	0.029	0.0261	0.048	0.0266	−0.0313	0.0367	0.4144*	1		
19	0.0719	−0.0644	0.0276	0.0307	−0.043	−0.0408	0.2973*	0.3095*	1	
20	0.1051*	−0.029	0.1048*	0.0448	−0.0395	0.0114	0.0584	0.0225	0.0081	1
21	−0.1402*	0.0027	−0.0534	−0.0977*	0.0888	−0.0146	−0.0297	0.0099	−0.0612	−0.0846

Note: * denotes significance at the 1% level.

1: *LN_AF*; 2: *ABSABNACC*; 3: *LEAD_WOMAN*; 4: *LEAD_WOMAN_HIGHEXP*; 5: *LEAD_WOMAN_LOWEXP*; 6: *CONC_WOMAN*; 7: *AC_WOMAN*; 8: *AC_MEETINGS*; 9: *SIZE*; 10: *INHERENT_RISK*; 11: *SOLVENCY*; 12: *LIQUIDITY*; 13: *DLOSS*; 14: *OWN*; 15: *CEO_BOARD*; 16: *NAAF*; 17: *AUDITOR_CHANGE*; 18: *CONC_CHANGE*; 19: *LEAD_CHANGE*; 20: *DECEMBER*; 21: *IFRS*.

Appendix C. Descriptive statistics before and after entropy balancing

	Before entropy weighting					
	Control (N = 543)			Treated (N = 122)		
	Mean	Variance	Skewness	Mean	Variance	Skewness
AC_WOMAN	0.225	0.175	1.319	0.221	0.174	1.343
AC_MEETINGS	3.759	2.515	1.072	4.221	4.471	0.808
SIZE	13.84	3.224	0.434	13.83	3.718	−0.055
INHERENT_RISK	0.533	0.043	−0.44	0.498	0.039	−0.129
SOLVENCY	0.187	0.032	1.251	0.201	0.024	1.039
LIQUIDITY	2.348	2.4	2.12	2.081	1.128	1.582
DLOSS	0.184	0.151	1.63	0.18	0.149	1.663
OWN	0.341	0.065	0.389	0.323	0.065	0.309
CEO_BOARD	0.3	0.211	0.872	0.271	0.199	1.033
NAAF	0.343	0.136	2.409	0.254	0.093	1.958
AUDITOR_CHANGE	0.046	0.044	4.332	0.041	0.04	4.631
CONC_CHANGE	0.188	0.153	1.598	0.246	0.187	1.180
LEAD_CHANGE	0.291	0.207	0.920	0.385	0.239	0.472
DECEMBER	0.908	0.084	−2.822	0.828	0.144	−1.737
IFRS	0.751	0.187	−1.163	0.877	0.109	−2.296
	After entropy weighting					

(*continued on next page*)

(*continued*)

	After entropy weighting					
	Control (N = 543)			Treated (N = 122)		
	Mean	Variance	Skewness	Mean	Variance	Skewness
	Control (N = 543)			Treated (N = 122)		
	Mean	Variance	Skewness	Mean	Variance	Skewness
AC_WOMAN	0.223	0.174	1.331	0.221	0.174	1.343
AC_MEETINGS	4.218	4.467	0.813	4.221	4.471	0.808
SIZE	13.82	3.715	−0.037	13.83	3.718	−0.055
INHERENT_RISK	0.497	0.039	−0.122	0.498	0.039	−0.129
SOLVENCY	0.201	0.024	1.042	0.201	0.024	1.039
LIQUIDITY	2.079	1.127	1.588	2.081	1.128	1.582
DLOSS	0.182	0.149	1.65	0.18	0.149	1.663
OWN	0.323	0.065	0.313	0.323	0.065	0.309
CEO_BOARD	0.272	0.199	1.023	0.271	0.199	1.033
NAAF	0.253	0.093	1.962	0.254	0.093	1.958
AUDITOR_CHANGE	0.041	0.04	4.62	0.041	0.04	4.631
CONC_CHANGE	0.248	0.187	1.169	0.246	0.187	1.180
LEAD_CHANGE	0.387	0.238	0.465	0.385	0.239	0.472
DECEMBER	0.827	0.144	−1.724	0.828	0.144	−1.737
IFRS	0.876	0.109	−2.282	0.877	0.109	−2.296

Note: N = 665. This table presents the mean, variance, and skewness for all control variables used in Table 3 before and after entropy balancing, for the treated and the control groups. The treated group is composed of 122 observations with a female lead auditor and a male concurring auditor, while the control group is composed of 543 observations with a male lead auditor and a male concurring auditor.

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