

# The gender-diverse audit committee and audit report lag: Evidence from China

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This study investigates the relationship between gender-diverse audit committees and audit report lag. We examine a sample of Chinese listed companies during the period 2010–2018 and document a negative relationship between gender-diverse audit committees and audit report lag. This is consistent with the premise that a gender-diverse audit committee is able to better monitor the preparation of financial reports, communicate better with auditors in resolving disagreements between management and auditors and facilitate a more efficient audit engagement, thereby shortening the audit report lag. In additional analysis, we find that female audit committee members possessing professional accounting qualifications and accounting work experience are associated with shorter audit report lag.

## KEYWORDS

accounting work experience, audit committee, China, gender diversity, professional accounting qualifications

## 1 | INTRODUCTION

Timeliness is one of the key characteristics ensuring the usefulness of accounting information (Davies & Whittred, 1980; Munsif et al., 2012; Whittred, 1980). Lack of timely reporting leads to an increase in information asymmetry (Hakansson, 1977) and lower earnings quality (Chan et al., 2016; Easton & Zmijewski, 1993). The increasing demand for timely accounting information from investors and other stakeholders has long been recognized by regulators. For instance, in September 2002, the US Securities and Exchange Commission (SEC) launched a new regulation aimed at reducing the filing period from 90 to 75 days for those registered entities meeting the definition of 'accelerated filers'. From the fiscal year beginning 15 December 2006, this deadline was further reduced to 60 days for registered entities that are considered as 'large accelerated filers'.

The timeliness of accounting information hinges critically on audit report timeliness, or audit report lag (hereafter ARL). The ARL is defined as the period between a firm's fiscal year end and the firm's audit report date. ARL is considered to be the single most important determinant of the timeliness of the earnings announcement, and a better understanding of the determinants of ARL is likely to provide important insights into audit efficiency (Abernathy et al., 2017;

Givoly & Palmon, 1982). A plethora of empirical evidence suggests several audit and audit-related determinants of ARL, as well as corporate governance-related and firm-specific determinants (Habib et al., 2019). We attempt to enrich the literature on determinants of the ARL by investigating another factor: the gender-diverse audit committee in the context of China. Our study is motivated by the significant gap between the ratio of female members on audit committees in China and the global average ratio. According to the Deloitte China (2019) report on listed company female directors, females comprised approximately 12.5% of audit committee members in the 220 listed firms surveyed (Deloitte China, 2019). This is well below the global average of 21.1% (Deloitte, 2019). The newly launched 2018 Code of Corporate Governance for Listed Companies mandates at least one accounting professional on the audit committee, whereas gender diversity is not yet on the agenda (China Securities Regulatory Commission [hereafter CSRC], 2018). However, Chinese organizations may eventually be required to consider gender equality in corporate strategic decision-making and operational management. Furthermore, the rapid growth of the Chinese economy over the years has attracted a large pool of international investors<sup>1</sup> who are interested in the timeliness of accounting and financial information (Chan et al., 2016). Because a shorter ARL reflects an absence of unusual events

(Salterio, 2012), fewer disagreements with auditors (McCracken et al., 2008) and better reporting quality (Thiruvadi & Huang, 2011), whereas a longer ARL increases financial reporting opacity and stock price crash risk (Chan et al., 2016; Habib & Huang, 2019), findings from our study will also have important implications for foreign institutional investors wishing to make more informed investment decisions.

In the current study, we use a categorical variable (the presence of at least one female audit committee member) as well as the proportion of female audit committee members to operationalize gender diversity. We consider gender diversity in the audit committee, because the board has delegated authority to this subcommittee for overseeing the preparation of the financial reports and audit related matters of the firm (Bédard & Gendron, 2010). An audit committee could help mediate potential conflicts among shareholders and managers by performing active and diligent monitoring roles (Fama & Jensen, 1983).

Our study draws on agency theory and resource dependency theory to explain the association between audit committee gender diversity and ARL. A gender-diverse audit committee has been found to improve committee diligence (Thiruvadi, 2012), internal control of the firm (Chen et al., 2016), audit quality (Pucheta-Martinez et al., 2016), financial reporting quality (Gull et al., 2018) and the readability of key audit matters (Velte, 2018). In firms with strong corporate governance, excessive monitoring activities could be detrimental to firm value (Adams & Ferreira, 2009). However, this may not be relevant for Chinese listed firms, owing to their relatively weak corporate governance (Allen et al., 2005). Liu et al. (2014) argue that the effectiveness of gender-diverse boards and subcommittees depends on the quality of corporate governance, whereas Gul et al. (2011) find the strong monitoring roles played by female directors could partially strengthen weak governance. Besides, female committee members tend to be more conservative and risk-averse in finance-related matters (Eckel & Grossman, 2002; Lundeberg et al., 1994) and to be better communicators (Wood et al., 1985). Given that women are more risk-averse (Francis et al., 2014) and more conservative (Eckel & Grossman, 2002), a gender-diverse audit committee is more likely to hire a reputable industry specialist auditor (Lai et al., 2017), thereby supplying a high-quality audit in a more timely manner.

Resource dependence theory also suggests that gender diversity could bring in multiple perspectives, experiences and skills into the boardroom and, therefore, facilitate better decision-making (Barber & Odean, 2001; Barua et al., 2010). Although prior literature also suggests that a gender-diverse governance system could lead to excessive monitoring (Adams & Ferreira, 2009), which could be detrimental to firm value with strong corporate governance, we argue that the strong monitoring roles played by females on the audit committee could potentially strengthen weak governance in the Chinese context (Gul et al., 2011). Further, female directors are more likely to establish a strong internal control system (Chen et al., 2016), which will lower the control risk as assessed by the auditors. As a result, the amount of audit work required should be reduced, which, in turn, reduces the time required to complete the audit engagement.

Two published studies have examined the relation between a gender-diverse audit committee and the ARL, with one documenting no association, using data from Australia (Sultana et al., 2015) and the other, a positive association, using data from the United States (Harjoto et al., 2015). Our study differs from these two studies in two important and interesting aspects. First, we exploit the Chinese setting, which differs markedly from those of the United States and Australia. The aforementioned findings in developed countries cannot be directly applied to China. As noted by Jiang and Kim (2020), despite its weaknesses, corporate governance in the Chinese capital market has experienced dramatic development in recent years. However, many corporate governance mechanisms such as director independence, institutional investors and securities analysts still play somewhat limited monitoring role in China (Allen et al., 2005, 2019). Thus, the monitoring role played by a gender-diverse audit committee in Chinese listed firms could differ significantly from that in developed countries.<sup>2</sup> Second, previous studies on gender-diverse audit committees and ARL have examined the influence of various characteristics of female audit committee members, such as financial expertise, prior audit committee experience, independence, consulting and legal and management expertise, on the timeliness of audit reports (Harjoto et al., 2015; Sultana et al., 2015). However, these are more relevant to the institutional settings of the United States and Australia. Following the requirements of at least one accounting professional on the audit committee as specified in the Code of Corporate Governance for Listed Companies in China (CSRC, 2018), we included professional accounting qualifications and accounting work experience as relevant female audit committee characteristics to examine whether such characteristics influence the relationship between gender-diverse audit committees and ARL.

We examine a sample of Chinese listed companies during the period 2010–2018 and document a negative relationship between gender-diverse audit committees and ARL. We also perform a tokenism versus critical mass analysis and find that the ARL is shorter for firms with two or more female directors, a result supporting the ‘critical mass’ theory. Finally, we find that female audit committee members possessing professional accounting qualifications and accounting work experience are associated with shorter ARL. Our results remain robust to endogeneity tests to address concerns arising from unobserved heterogeneity driving both the appointment of female audit committee members and ARL.

We contribute to the corporate governance and the ARL literature in several important ways. First, our study provides empirical evidence on the effectiveness of a gender-diverse audit committee in improving the timeliness of the audit report in China: a country characterized by ongoing developments in the corporate governance environment, but also suffering from controlling shareholder-related agency problems (Jiang & Kim, 2020). Second, we contribute to the literature by documenting the beneficial role played by female audit committee members with professional accounting qualifications in reducing the ARL in China. Third, our results support the critical mass theory by providing empirical evidence that Chinese audit committees having more than one woman are likely to be more effective in

performing their monitoring role than those having only a single woman: a proxy for tokenism. Finally, our findings also have policy implications for Chinese regulators. In a capital market with relatively weak governance, such as China, we argue that a gender-diverse audit committee plays a crucial role in strengthening weak internal governance and facilitating effective communication with auditors. In China, the percentage of female representation on boards is significantly lower than it is in some countries with gender quotas, such as France (44.4%), the United Kingdom (30.3%) and Australia (29.6%) (Usman et al., 2018). According to the 2019 Deloitte China Listed Companies Female Directors Survey Report,<sup>3</sup> the ratio of female directors on audit committees in China is 12.5%, which is far below the global average of 21.1% (Deloitte, 2019). Our findings on the effectiveness of a gender-diverse audit committee in improving timeliness of audit report, therefore, provide empirical support for the necessity of gender quotas for the audit committees in Chinese listed firms.

The remainder of the paper proceeds as follows. Section 2 provides an institutional overview of the audit reporting regulations, audit committee composition and gender-diverse audit committees in China. Section 3 reviews the related literature and develops the hypotheses. Section 4 explains the sample selection and research design issues. Descriptive statistics and empirical results are discussed in Section 5. Section 6 discusses the endogeneity test results. Section 7 concludes the paper.

## 2 | INSTITUTIONAL BACKGROUND

Under the current regulatory framework, the Chinese auditing standards are drafted by the Chinese Institute of Certified Public Accountants (CICPA) and issued by the Ministry of Finance (International Federation of Accountants [IFAC], 2020). Article 61 of the first version of the Securities Law of the People's Republic of China issued in 1998 specifically required that listed firms should submit their financial reports to the CSRC and the stock exchanges within 4 months following the end of the fiscal year (Standing Committee of the National People's Congress of the People's Republic of China, 1998). Article 177 of the Securities Law 1998 stated that if a firm fails to submit financial reports within this stipulated deadline, then it must disclose the reasons for the delay, and will be fined up to 600,000 RMB. Further, the relevant stock exchange is likely to suspend the firm's shares from trading until the financial reports are submitted (Li et al., 2014). The Independent Auditing Standard No. 7 issued by the CICPA in 2003 specified some of the factors (e.g. the completion of the audit process and the management approval of financial reports) that should be considered by auditors in deciding when to release the audit reports (CICPA, 2003). In 2007, the CICPA issued Auditing Regulation No. 1501, which reaffirmed that auditors should not submit their audit reports before acquiring and verifying proper audit evidence (CICPA, 2007).

The CSRC launched its first standards of corporate governance for listed companies in 2002 (CSRC, 2002). In September 2018, the

Code of Corporate Governance for Listed Companies in China was launched to replace the previous standards. As specified in Article 38 of the Code, the audit committee should consist mainly of independent directors, including at least one accounting professional (CSRC, 2018).<sup>4</sup> The Code paved way for audit committees to become an important element of corporate governance in the Chinese capital market (Lin et al., 2008).

Board gender diversity in emerging markets like China differs significantly from that in developed nations such as the United Kingdom, the United States and Australia. This is partially because of the distinguishing institutional settings in China, in which family and state ownerships are the two predominant forms of corporate ownership structure. In addition, the Chinese capital market is generally characterized by institutional voids, including relatively weak contractual enforcement, poor legal infrastructure and a less developed market infrastructure (Saeed et al., 2017). Family ownership might weaken the effectiveness of a gender-diverse board, whereas state ownership might pursue social and economic goals other than profit maximization (Lin et al., 2014; You & Du, 2012).

The social status of Chinese women has gradually changed from housewife to social person since the gender equality policy adopted by the China's Communist Party in 1949 (Luo et al., 2017). After the adoption of opening policies since 1978, gender inequality has declined, and Chinese women have become more active in the labour market (Du, 2016). As a result, the traditional hostility towards working women started to improve within the Chinese mass population. According to the global gender gap report, the gender gap in China has decreased relatively from 2008 to 2013 (Du, 2016). More importantly, the proportion of working age women in China's workforce had reached almost 70%, which is, surprisingly, ranked as the top in the world (The Economist, 2011). With the continuous economic reforms towards a more market-oriented economy, along with the unique 'one-child policy' in the 1980s–1990s, the social status of females in China has increased significantly, and women increasingly have started playing critical roles in workplaces (Lee et al., 2014).

Extant empirical evidence also appears to suggest that women in Chinese corporations increase financial reporting quality. For example, Luo et al. (2017) find that female directors curb real activities manipulation in Chinese firms. However, the adoption of gender-diverse boards in China is still voluntary. According to the 2019 Deloitte China Listed Companies Female Directors Survey Report, there are about 12.5% female on the audit committees, and 8.59% are chaired by females, among the 220 Chinese listed companies that participated in the survey (Deloitte China, 2019).<sup>5</sup> The ratio of female members on audit committees in China remains far below the global average of 21.1% (Deloitte, 2019). Having said that, the percentage of female directors has grown from 8.0% in 2013 (Deloitte, 2013) to 10.9% in 2019 (Deloitte, 2019), reflecting a nearly 3% improvement in the gender diversity of the board. Liu et al. (2014) report that, on average, the percentage of women on boards in China has increased from 8.9% in 1999 to 12.0% in 2011. Usman et al. (2018) report that the average percentage of women on the compensation committee ranges from 10.52% to 16.8% between 2006 and 2015. Although China has made

great progress to promote gender diversity on boards and their subcommittees, the statistics are still notably lower than those in countries with mandatory gender quotas. Therefore, our study on the relationship between gender-diverse audit committees and ARL in China has important policy implications for Chinese regulators considering the implementation of gender quota.

### 3 | LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

#### 3.1 | ARL literature

A voluminous literature has examined the various determinants of ARL both in the United States and in several other economies. Numerous factors have been documented as vital determinants of ARL. Habib et al. (2019) identified a large number of explanatory variables, categorized into (1) audit engagement and/or auditor characteristics, (2) characteristics of corporate governance and (3) firm-specific characteristics. Their analyses find that audit-related variables such as audit fees, auditor change, audit opinion, internal control weakness and auditing season increase the ARL. In contrast, auditor-provided non-audit services reduce the ARL (Habib & Bhuiyan, 2011; Harjoto et al., 2015; Knechel & Payne, 2001; Knechel & Sharma, 2012; Owusu-Ansah & Leventis, 2006; Whitworth & Lambert, 2014). With respect to characteristics of corporate governance, Habib et al.'s (2019) meta-analysis finds that board independence and ownership concentration could shorten ARL (Chan et al., 2016; Henderson & Kaplan, 2000; Jaggi & Tsui, 1999; Wan-Hussin & Bamahros, 2013), but chief executive officer (CEO) duality increases ARL. Finally, previous studies of firm-level characteristics document consistent empirical evidence that profitability shortens ARL, whereas firm complexity increases it (Bamber et al., 1993; Carslaw & Kaplan, 1991; Ng & Tai, 1994).

Audit committee characteristics, especially audit committee size, financial expertise and meeting frequency, have also been found to be related to ARL. Abernathy et al. (2014) and Sultana et al. (2015) both find a negative association between audit committee members' financial expertise and ARL. Evidence on the relation between audit committee size and timeliness is mixed. Drawing on resource dependence theory, Sultana et al. (2015) argue that a large audit committee brings together sufficient resources and human capital with a broader set of qualities and these features, thereby improving reporting timeliness. However, agency theory suggests that a large audit committee may undermine group cohesion and increase the likelihood of opportunistic behaviours. This could hinder the formation of a collective mindset and discourage participation by some members, which could eventually weaken the audit committee's ability to reach consensus on decisions related to the monitoring of financial reporting and audit work (Jensen & Tang, 1993), thereby compromising reporting timeliness. With respect to gender composition in the audit committee, as mentioned before, Sultana et al. (2015) find no significant relation between female audit committee members and ARL using data from

Australia, whereas Harjoto et al. (2015) document that the presence of female directors on the audit committee increases ARL in the United States.

#### 3.2 | Literature on gender diversity

In recent decades, board diversity has received considerable attention in the corporate governance research. Board diversity is broadly defined as heterogeneity of members on corporate boards and subcommittees. Thus, diversity on corporate boards includes multiple dimensions, including: board members' age, nationality, religious background, relational skills, expertise and difference in sexual or political preference (Van Knippenberg et al., 2004). Diversity among board members fosters the integration of different expertise, beliefs and perspectives into the decision-making process (Post et al., 2011). Therefore, board diversity has been found to improve board effectiveness and firm performance (Carter et al., 2003; Erhardt et al., 2003). Among the various attributes of board diversity, gender diversity is of growing interest to researchers, practitioners and policymakers. There is growing consensus that females can also make notable contributions to corporate boards and committees. As a result, gender diversity has been proposed in regulatory reform of corporate governance in many countries (Financial Reporting Council [FRC], 2012).

Extant literature suggests that, compared with men, women are more conservative and risk-averse in finance-related matters (Eckel & Grossman, 2002; Fellner & Maciejovsky, 2007; Francis et al., 2014; Gavius et al., 2012; Lundeberg et al., 1994). As a result, client firms audited by female audit partners have been found to produce higher quality financial reporting as compared with firms audited by male audit partners (Ittonen et al., 2013). Furthermore, because of their different risk preferences, female board directors and committee members seem likely to demand more auditing effort than their male fellows (Adams & Ferreira, 2009): a demand that results in the production of high-quality financial reports. Srinidhi et al. (2011), using data from US listed firms, document that firms with more female directors are associated with higher earnings quality. Gender-diverse boards and/or subcommittees could also partially mitigate weakness in corporate governance (Gul et al., 2011). Willows and Van der Linde (2016) find positive relationships between increased women on the boards of large South African listed firms (more than three) and better corporate governance practices.

Although several studies on gender diversity document beneficial effects of having women on the board, some have documented either a negative effect or no effect. For instance, Marinova et al. (2016) using data from Netherlands and Denmark confirm that gender diversity is not related to firm performance. Using a sample of US firms, Adams and Ferreira (2009) document a negative association between board gender diversity and firm performance. Harjoto et al. (2015) argue that diverse viewpoints may lead to a lack of cohesion and, hence, impede better performance. These scholars also attribute the detrimental impact of having women on the board to the fact that female directors are tougher monitors, which works well in a weak governance context, but in firms with strong corporate governance,

excessive monitoring could be detrimental to firm value (Adams & Ferreira, 2009).

### 3.3 | The gender-diverse audit committee and ARL

Among the many theories that have been used to explain the effect of gender diversity on boards and board subcommittees, agency theory is the most commonly adopted theoretical framework (Nguyen et al., 2020). Agency problems occur when managers do not act in the best interest of the shareholders in their decision-making. To mitigate such conflicts of interest among shareholders and managers, Fama and Jensen (1983) posit that one solution is to enhance the monitoring of senior management. Prior literature on gender diversity has suggested that female directors are financially prudent and more active in monitoring activities (see Section 3.2). However, we also summarized literature that provides detrimental and/or inconclusive evidence on the beneficial effect of gender diversity for financial-related matters. For instance, prior literature documents that gender-diverse boards can lead to excessive monitoring and, thereby, affect firm value adversely (Adams & Ferreira, 2009; Almazan & Suarez, 2003). Therefore, the effect of gender diversity on boards and its subcommittees also depends on the quality of corporate governance (Liu et al., 2014). Gul et al. (2011) suggest that female directors can help strengthen weak governance. The legal institutions in China with respect to investor protections, accounting standards and corporate governance are weaker than those in the United States and other developed countries (Allen et al., 2005, 2019). Given the current state of weak corporate governance among Chinese listed firms, gender-diverse audit committees might have beneficial rather than detrimental effects on firms, owing to the aforementioned partial substitution effect.

Resource dependence theory is the second commonly adopted theoretical framework in board gender diversity studies (Nguyen et al., 2020). Resource dependence theory (Pfeffer & Salancik, 1978) posits that businesses rely on external resources for survival and success. These external resources can be cultivated by making connections via corporate boards with external parties that have control over these resources. Pfeffer and Salancik (1978) suggest three channels through which resources could be accessed and cultivated: the wise counsel, compliance and legitimacy and communication channels.

In terms of wise counsel, resource dependence theorists argue that board and subcommittees with no female directors are more likely to have major flaws in fulfilling their tasks because of the lack of diversity in mentality. Kim and Starks (2016) document that female directors possess greater skills in legal compliance, risk management, human resources and corporate governance. Thus, they can provide constructive advice to management in the audit and risk committee. As for compliance and legitimacy, Cox et al.'s (1991) 'value-in-diversity' hypothesis suggests that by having more females on boards and subcommittees, firms gain legitimacy and compliance with gender equality-related social norms and policies (Ali et al., 2014; Isidro & Sobral, 2015).

With respect to communication channels, prior literature has documented that gender-diverse boards and/or subcommittees

connect more efficiently with the external environment (e.g. female customers, female talents in the workforce and other stakeholders) (Hillman et al., 2007; Liao et al., 2018). According to the demographic information available from CICPA (2015), in China, 52% of the registered auditors are female. Therefore, we argue that a gender-diverse audit committee might facilitate more effective communication with auditors in the Chinese context, which could reduce ARL.

To sum up, prior literature has documented that women are more risk-averse, conservative and financially prudent than men (Eckel & Grossman, 2002; Lundeberg et al., 1994). Furthermore, women are better communicators (Wood et al., 1985) and can provide constructive advice to management. Therefore, a gender-diverse audit committee is more likely to hire reputable, industry-specialist auditors (Lai et al., 2017), thereby supplying high-quality audit work in a timelier manner (Habib & Bhuiyan, 2011). A gender-diverse audit committee may have the ability to identify the risk levels of accounting information, to better monitor auditor independence and coordinate with external auditors and to communicate with auditors more effectively (Lin et al., 2008). The audit committee, therefore, can facilitate a more efficient audit engagement, which leads to shorter ARL. Although prior literature has been inconclusive on the beneficial effect of gender diversity on monitoring financial reporting process and coordinating audit-related matters (Adams & Ferreira, 2009; Almazan & Suarez, 2003), we argue that the effect of gender diversity on ARL depends on the quality of corporate governance (Liu et al., 2014). As previously discussed, China has a relatively weak governance system owing to its weaker investor protections and less effective capital market monitoring mechanisms (Allen et al., 2019). We suggest that, among Chinese listed firms, gender-diverse audit committees could have beneficial rather than detrimental effects on reducing ARL. Therefore, we hypothesize as follows:

**H1.** ARLs of firms with gender-diverse audit committees are shorter than those of firms with non-gender-diverse audit committees.

### 3.4 | Female audit committee member characteristics and ARL

One of the significant board member characteristics found to be related to financial reporting quality and audit effectiveness is the presence of professional accountants on the board and its subcommittees. For example, directors with accounting expertise facilitate the audit committee's establishment of an effective internal control system, thereby lowering the control risk perceived by auditors and decreasing the audit scope and auditing efforts (Cohen et al., 2014). Accounting professionals are capable of assessing and evaluating events concerning lawsuits and warranties and, hence, demand more conservative reporting (Krishnan & Visvanathan, 2008). Zalata et al. (2018) find a positive relationship between female financial expertise and financial reporting quality. Kim et al. (2017) document that audit committees with accounting professionals are positively associated with audit fees. Sultana et al. (2015) find a negative relation



between the audit committee accounting expertise and ARL. Abernathy et al. (2014) document a significantly positive association between the accounting expertise of the audit committee and reporting timeliness. Abbasi et al. (2020) find that female directors with accounting expertise are positively associated with audit quality. DeFond et al. (2005) document that audit committees with accounting professionals are significantly associated with a positive market reaction.

We, therefore, argue that having female directors with accounting knowledge on the audit committee enhances its ability to better communicate with the auditor and, hence, improves audit reporting timeliness. Having accounting knowledge helps the audit committee understand audit judgments on material aspects of the accounts and mitigates disagreements between a firm and auditor (McDaniel et al., 2002). Accordingly, female directors with accounting professional qualifications could assist other members on the audit committee to understand accounting problems and adjustments required by the auditors, thereby reducing the time needed for negotiation on key audit matters and, hence, shortening the ARL. We, therefore, hypothesize as follows:

**H2a.** Female audit committee members with professional accounting qualifications are associated with shorter ARLs for Chinese listed firms.

A vast number of prior studies on audit committee characteristics have focused on independence, financial expertise and education level, with only a few studies examining the accounting work experience of an audit committee member as an important characteristic having implications for audit committee effectiveness. This is particularly important to the Chinese setting as 70% of the listed companies have at least one academic independent director (Pang et al., 2020). The female audit committee members with professional accounting qualifications could be professional accountants with relevant work experience or academics with a professional designation but without accounting work experience. We intend to examine the influence of female audit committee members possessing the former attribute. Previous literature has confirmed the importance of audit committees' work experience on improving financial reporting and audit quality. For instance, DeZoort (1998) finds that audit committees with work experience are associated with better judgements on financial reporting-related matters. DeZoort and Salterio (2001) report that audit committees with relevant work experience are likely to support the auditors when it comes to questionable accounting practiced by the management. Shepardson (2019) finds that audit committee task-specific experience is associated with financial reporting outcomes. An audit committee member's accounting work experience could enhance his/her cognitive ability, thereby enhancing the effectiveness of the audit committee (Gull et al., 2018). Lee and Park (2019) argue that audit committee directors with work experience are likely to improve the reporting quality to protect their reputation and decrease the litigation risk. Therefore, they are likely to hire top tier and industry specialist auditors: auditors who are expected to submit audit reports on time.

Our study, thus, proposes that relevant accounting work experience could help a gender-diverse audit committee to work more effectively on financial reporting-related matters. Female audit committee members having accounting work experience could communicate more effectively with the audit committee, and they are likely to receive better support from the committee on controversial accounting practices in the firm. This might result in smooth and efficient audit work, thereby leading to a shorter ARL.

**H2b.** Female audit committee members with accounting work experience are associated with shorter ARLs in Chinese listed firms.

## 4 | RESEARCH DESIGN

### 4.1 | Data source and sample

We started with all public firms, excluding financial institutions, listed on the Shenzhen and Shanghai stock exchanges for the period 2010–2018. Data on ARL and other financial information were collected from the China Security Market and Accounting Research (CSMAR) database. Corporate governance data, including the audit committee gender diversity, was hand-collected from the governance sub-database of the CSMAR. After removing data for the missing variables, we ended up with a final sample of 8564 firm-year observations.

Panel A in Table 1 presents the time series distribution of the sample observations and the minimum and maximum number of female directors on the audit committee across our sample period. Our sample size ranges from 656 observations in 2010 to 1406 observations in 2018, whereas the average number of female directors in the audit committee ranges from 0.70 in 2018 to 0.57 in 2012. The industry distribution of our sample is shown in Panel B of Table 1. The manufacturing industry represents the majority of our sample firms (57.55%), followed by the wholesale and retail business industry (7.19%) and the information transmission, software and information technology services industry with (6.75%) of the total observations.

### 4.2 | Empirical model and variables

We use the following OLS regression specification to test our H1. Our dependent variable is audit report lag (ARL), and the main independent variable is audit committee gender diversity (AC\_FEMALE).

$$\begin{aligned} \text{LN\_ARL}_{i,t} = & \beta_0 + \beta_1 \text{AC\_FEMALE}_{i,t} + \beta_2 \text{ACSIZE}_{i,t} + \beta_3 \text{ACIND}_{i,t} \\ & + \beta_4 \text{ACCHAIR\_F}_{i,t} + \beta_5 \text{ACFEXP}_{i,t} + \beta_6 \text{ACWEXP}_{i,t} \\ & + \beta_7 \text{BSIZE}_{i,t} + \beta_8 \text{BIND}_{i,t} + \beta_9 \text{BMEET}_{i,t} + \beta_{10} \text{CEO\_DUAL}_{i,t} \\ & + \beta_{11} \text{TOP10}_{i,t} + \beta_{12} \text{BIG4}_{i,t} + \beta_{13} \text{SPEC}_{i,t} + \beta_{14} \text{OPIN}_{i,t} \\ & + \beta_{15} \text{TENURE}_{i,t} + \beta_{16} \text{AF}_{i,t} + \beta_{17} \text{ICR}_{i,t} + \beta_{18} \text{SOE}_{i,t} \\ & + \beta_{19} \text{FAMILY}_{i,t} + \beta_{20} \text{SIZE}_{i,t} + \beta_{21} \text{DEBT}_{i,t} + \beta_{22} \text{ROA}_{i,t} \\ & + \beta_{23} \text{BTM}_{i,t} + \beta_{24} \text{LOSS}_{i,t} + \beta_{25} \text{GDP}_{i,t} + \text{Year effect} \\ & + \text{Industry effect} + \varepsilon_{i,t} \dots \end{aligned} \quad (1)$$

**TABLE 1** Sample distribution and industry distribution

Panel A: Time series distribution of firm-year observations and the number of female directors on the audit committees					
Year	N	Per cent	Average number of women on the AC	Minimum number of women on the AC	Maximum number of women on the AC
2010	656	7.66%	0.625	0	6
2011	801	9.35%	0.584	0	5
2012	750	8.76%	0.565	0	4
2013	887	10.36%	0.592	0	4
2014	973	11.36%	0.601	0	7
2015	963	11.24%	0.627	0	6
2016	1023	11.95%	0.631	0	5
2017	1105	12.90%	0.676	0	7
2018	1406	16.42%	0.695	0	8
Total	8564	100.00%	0.619		
Panel B: Industry distribution					
Industry	N	Per cent			
A: Agriculture, forestry, animal husbandry and fishery	129	1.51%			
B: Mining industry	215	2.51%			
C: Manufacturing industry	4929	57.55%			
D: Electricity, thermal, gas and water production and supply industry	414	4.83%			
E: Construction business	225	2.63%			
F: Wholesale and retail business	616	7.19%			
G: Transportation, warehousing and postal service	288	3.36%			
H: Accommodation and catering	35	0.41%			
I: Information transmission, software and information technology services	578	6.75%			
K: Real estate	553	6.46%			
L: Leasing and business services	141	1.65%			
M: Scientific research and technology services	70	0.82%			
N: Water conservancy, environment and public facilities industry	110	1.28%			
P: Education	11	0.13%			
Q: Health and social work	26	0.30%			
R: Culture, sports and entertainment	123	1.44%			
S:Comprehensive	101	1.18%			
Total	8564	100.00%			

We use the logarithm of the number of days from the firm's fiscal year end to the date of the audit report as a proxy for ARL, following prior research (Chan et al., 2016; Knechel & Payne, 2001; Munsif et al., 2012). We use two proxies for AC\_FEMALE. First, we use a categorical variable (AC\_FEMALE\_DUM) coded 1 if there is at least one female director on the audit committee and 0 otherwise. Second, we use the proportion of female directors on the audit committee (AC\_FEMALE\_PROP) calculated as female audit committee members divided by total audit committee members. We also include AC\_FEMALE\_MASS, an indicator variable coded 1 if the number of female directors on the audit committee is two or above and 0 otherwise. A negative and significant coefficient on  $\beta_1$  would support H1.

We include several control variables that have been found to be related to the determinants of ARL. First, we control for the effect of audit committee characteristics by including audit committee size (ACSIZE) defined as the number of the audit committee members, proportion of independent audit committee members (ACIND), having a female audit committee chair (ACCHAIR\_F), a dummy variable coded 1 if the chair of the audit committee is female and 0 otherwise; having audit committee financial expertise (ACFEXP), defined as the number of the audit committee members who have accounting expertise (i.e. who are Certified Public Accountants (CPA) or have Certified Internal Auditor (CIA) and/or Certified Financial Analyst (CFA) qualifications), audit committee work experience (ACWEXP) defined as the

number of audit committee members who have previous work experience in accounting, auditing, or finance and audit committees (Aldamen et al., 2018; Zalata et al., 2018).<sup>6</sup> We then include several other corporate governance variables, namely, board size (BSIZE) defined as the number of board members, board independence (BIND) defined as the proportion of independent board members, number of board meetings (BMEET) defined as number of board meetings during the year and CEO duality (CEO\_DUAL) defined as an indicator variable coded 1 if the chairman is also the CEO and 0 otherwise. We include Top 10 audit firms (TOP10) defined as an indicator variable coded 1 if the firm is audited by one of the Top 10 audit firms and 0 otherwise, big four audit firms (BIG4) defined as an indicator variable coded 1 if the firm is audited by one of the Big four audit firms and 0 otherwise and industry specialist auditor (SPEC) defined as a dummy variable coded 1 if the financial reports are audited by an industry specialist auditor and 0 otherwise; audit opinion (OPIN), a dummy variable coded 1 if a firm received a qualified audit opinion in a year and 0 otherwise (Chan et al., 2016); auditor tenure (TENURE), defined as the number of years an audit firm has audited its client; audit fees (AF) defined as the logarithm of audit fees; and internal control environment (ICR), a dummy variable coded 1 if the firm-year observations pertain to 2012–2018 and 0 otherwise. ICR captures the effect of Provision 26 of the ‘Guide of Internal Control Evaluation of Chinese firm’ that requires the submission of the audited internal control report jointly with the financial reports. We include two variables representing ownership structure, namely, FAMILY is a dummy variable, coded 1 if the firm is controlled by a family and 0 otherwise, and SOE, a dummy variable that equals 1 if the firm is an SOE and 0 otherwise. We include several firm-specific control variables such as firm size (SIZE) defined as the natural logarithm of total assets, leverage (DEBT) defined as total debts scaled by total assets, return on assets (ROA) defined as net income divided by total assets, book to market ratio (BTM) defined as book value of equity divided by market value of equity and negative earnings (LOSS), an indicator variable coded 1 if the firm reported losses during the year and 0 otherwise (Courtis, 1976; Jaggi & Tsui, 1999). Finally, we include provincial economic growth, proxied by provincial gross domestic product (GDP), to control for overall economic growth that might have implications for the financial reporting and auditing environment. Detailed variable definitions are provided in Appendix A.

We then expand Equation 1 above by including two female audit committee member characteristics as follows:

$$\begin{aligned} \text{LN\_ARL}_{i,t} = & \beta_0 + \beta_1 \text{PACF\_ACCEXP}_{i,t} + \beta_2 \text{PACF\_WEXP}_{i,t} \\ & + \text{Other control variables} + \text{Year effect} + \text{Industry effect} \\ & + \varepsilon_{i,t} \dots \end{aligned} \quad (2)$$

where PACF\_ACCEXP refers to female accounting expertise defined as the proportion of female directors on the audit committee who have accounting expertise, defined as audit committee members who have CPA, CIA and/or CFA qualifications. PACF\_WEXP refers to female work experience defined as the proportion of female directors

on the audit committee who have previous work experience in accounting, auditing or finance. Other variables are defined as before. A negative and significant coefficient on  $\beta_1$  and  $\beta_2$  would support H2a and H2b.

## 5 | EMPIRICAL RESULTS

### 5.1 | Descriptive statistics and correlation matrix

Table 2 reports the descriptive statistics for the regression variables. The mean (median) ARL is 91.73 (90) days with a standard deviation of 23.81 days. The reported ARL is slightly longer than that reported in previous Chinese studies.<sup>7</sup> Harjoto et al. (2015) and Sultana et al. (2015) reported an average ARL of 55 days and 81 days for the United States and Australia, respectively. The much shorter ARL for the US setting is attributed to the SEC requirement for shorter reporting deadlines for the accelerated filers. The mean AC\_FEMALE\_DUM is 46%, suggesting that 46% of the firm-year observations have at least one female audit committee member, which is much higher than, for example, Australian firms (only 15.4% reported by Aldamen et al., 2018). The mean proportion of female audit committee members to total audit committee members (AC\_FEMALE\_PROP) is 17.2%, suggesting that Chinese audit committees are dominated by male directors. Nekhili et al. (2020) report an average AC\_FEMALE\_PROP of 19.26% in France. The average AC\_FEMALE\_MASS is 12.9%, suggesting that 12.9% of firms with gender-diverse audit committees have two or more than two women on the audit committee. The mean proportion of female accounting expertise (PACF\_ACCEXP) and work experience (PACF\_WEXP) is 11.4 and 23.4%, respectively.<sup>8</sup> The average audit committee size is 3.48 members with 65% of the members being independent. Only 7.2% of the firm-year observations are chaired by a female audit committee director. The mean of audit committee financial expertise (ACFEXP) is 23.1%, with a median of 20%. The average number of audit committee members having work experience in accounting and finance (ACWEXP) is 47.9%. Average board independence (BIND) is 37%, with an average board size (BSIZE) of 8.83, and the boards, on average, meet (BMEET) 10.23 times a year. Around 22.9% of our sample firms have a chairman who is also the CEO of the firm (CEO\_DUAL). About 35.1% of the sample firms are audited by Top 10 (TOP10) audit firms, whereas the corresponding figure for Big 4 audit firms (BIG4) is just 4.6%. Around 20% of our sample firms are audited by a specialist auditor (SPEC), and 4.1% of the firm-year observations receive a qualified audit opinion (OPIN). Average auditor tenure (TENURE) is 2.22 years, the log of average audit fees (AF) is 13.55, and 82% of the firm-year observations pertain to the 2012–2018 period, which corresponds to the passage of the ICR regulation. Around 40% of our firm observations are SOEs (SOE), whereas 50% are family-owned (FAMILY) firms. The average firm size (SIZE) is 15.11 with a debt ratio (DEBT) of 0.471. The average ROA is 3.6%, the book-to-market ratio (BTM) is 0.91, and 9.7% of our sample firms reported a loss (LOSS) at the end of the year. The



**TABLE 2** Descriptive statistics

Variable	N	Mean	SD	p25	Median	p75
LN_ARL	8564	4.50	0.278	4.38	4.52	4.70
ARL (in days)	8564	91.73	23.81	80.00	90.00	110.00
ABN_ARL	8564	0.108	0.309	0.00	0.00	0.00
AC_FEMALE_DUM	8564	0.460	0.497	0.00	0.00	1.00
AC_FEMALE_PROP	8564	0.172	0.220	0.00	0.00	0.293
AC_FEMALE_MASS <sup>a</sup>	3850	0.129	0.320	0.00	0.00	0.00
PACF_ACCEXP <sup>a</sup>	3850	0.114	0.185	0.00	0.00	0.20
PACF_WEXP <sup>a</sup>	3850	0.234	0.224	0.00	0.333	0.333
ACSIZE	8564	3.48	1.26	3.00	3.00	4.00
ACIND	8564	0.648	0.187	0.625	0.667	0.667
ACCHAIR_F	8564	0.072	0.258	0.00	0.00	0.00
ACFEXP	8564	0.231	0.261	0.00	0.20	0.333
ACWEXP	8564	0.479	0.31	0.333	0.40	0.667
BSIZE	8564	8.83	1.734	8.00	9.00	9.00
BIND	8564	0.368	0.052	0.333	0.333	0.40
BMEET	8564	10.23	4.078	8.00	10.00	12.00
CEO_DUAL	8564	0.229	0.42	0.00	0.00	0.00
TOP10	8564	0.351	0.471	0.00	0.00	1.00
BIG4	8564	0.046	0.21	0.00	0.00	0.00
SPEC	8564	0.202	0.405	0.00	0.00	0.00
OPIN	8564	0.041	0.191	0.00	0.00	0.00
TENURE	8564	2.226	1.319	1.00	2.00	3.00
AF	8564	13.55	0.681	13.12	13.45	13.91
AF (in US\$)	8564	175,000	320,000	77519.38	109,000	138,000
ICR	8564	0.824	0.391	1.00	1.00	1.00
SOE	8564	0.404	0.498	0.00	0.00	1.00
FAMILY	8564	0.506	0.50	0.00	1.00	1.00
SIZE	8564	15.11	0.977	14.38	14.99	15.72
DEBT	8564	0.471	0.684	0.283	0.453	0.617
ROA	8564	0.036	0.070	0.013	0.035	0.064
BTM	8564	0.907	0.935	0.346	0.605	1.104
LOSS	8564	0.097	0.293	0.00	0.00	0.00
GDP	8564	10.89	0.563	10.55	10.98	11.31
DAC	8564	0.064	0.067	0.019	0.043	0.083
RESTATE	5028	0.098	0.297	0.00	0.00	0.00

Notes: The table presents the descriptive statistics of the variables used in the regression models. All variables are defined in Appendix A.

<sup>a</sup>These variables are calculated for firms with gender-diverse audit committee only.

log of average provincial GDP (GDP) is 10.89. The mean of absolute discretionary accruals (|DAC|) is 6.4% of lagged total assets, and 9.8% of firm-year observations restated (RESTATE) their financial statements.

Table 3 presents the Pearson correlation table. The correlation between LN\_ARL and AC\_FEMALE\_DUM is negative and significant (correlation  $-0.019$ ,  $p < 0.01$ ), as is the correlation between LN\_ARL and AC\_FEMALE\_PROP (correlation  $-0.027$ ,  $p < 0.01$ ). In addition, the correlations between LN\_ARL and PACF\_ACCEXP

and PACF\_WEXP are also negative and significant ( $-0.028$  and  $-0.047$ ,  $p < 0.01$ ) (untabulated, as the sample size is restricted to gender-diverse audit committees alone). Some of the correlation coefficients among the independent variables are well above 0.7 (e.g. the correlation between SOE and FAMILY is  $-0.81$ ). However, the mean variance inflation factor (VIF) is 1.68, and the highest VIF is 4.21 between AF and SIZE, which is well below the conventional threshold of 10. Multicollinearity, therefore, does not appear to be a concern.

TABLE 3 Correlation analysis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
LN_ARL (1)	1.000			1.000												
AC_FEMALE_DUM (2)	-0.019	1.000														
vAC_FEMALE_PROP (3)	-0.027	<b>0.828</b>	1.000													
ACSIZE (4)	-0.024	<b>0.098</b>	-0.085	1.000												
ACIND (5)	-0.010	-0.008	<b>0.019</b>	-0.021	1.000											
ACCHAIR_F (6)	0.015	<b>0.286</b>	<b>0.221</b>	0.010	-0.110	1.000										
ACFEXP (7)	0.012	<b>0.107</b>	<b>0.133</b>	<b>0.336</b>	0.002	<b>0.039</b>	1.000									
ACWEXP (8)	<b>0.056</b>	<b>0.109</b>	<b>0.245</b>	-0.085	<b>0.128</b>	<b>0.046</b>	<b>0.197</b>	1.000								
BSIZE (9)	<b>0.035</b>	-0.034	-0.000	-0.042	<b>0.045</b>	0.014	-0.020	<b>0.028</b>	1.000							
BIND (10)	-0.009	<b>0.021</b>	-0.043	<b>0.100</b>	-0.005	0.016	<b>0.019</b>	-0.031	-0.435	1.000						
BMEET (11)	-0.009	<b>0.034</b>	<b>0.066</b>	0.013	<b>0.031</b>	<b>0.091</b>	<b>0.030</b>	<b>0.029</b>	<b>0.123</b>	-0.157	1.000					
CEO_DUAL (12)	<b>0.059</b>	<b>0.018</b>	0.002	-0.049	-0.007	<b>0.042</b>	-0.035	<b>0.080</b>	<b>0.047</b>	-0.021	<b>0.007</b>	1.000				
TOP10 (13)	<b>0.070</b>	<b>0.037</b>	<b>0.060</b>	-0.126	-0.003	<b>0.031</b>	-0.000	<b>0.116</b>	<b>0.008</b>	<b>0.008</b>	<b>0.031</b>	<b>0.086</b>	1.000			
BIG4 (14)	-0.009	-0.048	-0.056	0.015	<b>0.034</b>	-0.026	-0.030	0.010	<b>0.018</b>	<b>0.103</b>	-0.064	0.010	-0.155	1.000		
SPEC (15)	-0.078	-0.029	-0.050	-0.001	0.016	-0.007	-0.054	<b>0.030</b>	-0.020	<b>0.169</b>	-0.074	<b>0.163</b>	<b>0.060</b>	<b>0.285</b>	1.000	
OPIN (16)	<b>0.058</b>	-0.017	-0.005	-0.020	-0.022	-0.020	-0.021	0.010	0.002	-0.006	-0.030	0.004	-0.013	-0.019	-0.008	1.000
Variables (17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)						
TENURE (17)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
AF (18)	<b>0.034</b>	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
ICR (19)	-0.030	<b>0.295</b>	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SOE (20)	<b>0.041</b>	<b>0.118</b>	-0.196	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
FAMILY (21)	-0.066	-0.119	<b>0.188</b>	-0.807	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
SIZE (22)	<b>0.061</b>	<b>0.737</b>	<b>0.161</b>	<b>0.285</b>	-0.247	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
DEBT (23)	<b>0.013</b>	<b>0.076</b>	-0.080	<b>0.096</b>	-0.075	<b>0.078</b>	<b>0.078</b>	<b>0.078</b>	<b>0.078</b>	<b>0.078</b>	<b>0.078</b>	<b>0.078</b>	<b>0.078</b>	<b>0.078</b>	<b>0.078</b>	<b>0.078</b>
ROA (24)	-0.016	<b>0.005</b>	<b>0.035</b>	-0.158	<b>0.139</b>	<b>0.139</b>	-0.002	-0.002	-0.002	-0.097	1.000	1.000	1.000	1.000	1.000	1.000
BTM (25)	<b>0.041</b>	<b>0.343</b>	-0.079	<b>0.318</b>	-0.277	<b>0.570</b>	<b>0.570</b>	<b>0.570</b>	<b>0.570</b>	<b>0.570</b>	<b>0.570</b>	<b>0.570</b>	<b>0.570</b>	<b>0.570</b>	<b>0.570</b>	<b>0.570</b>
LOSS (26)	0.008	-0.029	-0.029	<b>0.081</b>	-0.077	-0.069	-0.069	-0.069	-0.069	-0.069	-0.069	-0.069	-0.069	-0.069	-0.069	-0.069
GDP (27)	-0.030	<b>0.278</b>	<b>0.573</b>	-0.222	<b>0.209</b>	<b>0.113</b>	-0.073	<b>0.110</b>	-0.148	<b>0.110</b>	-0.148	<b>0.110</b>	-0.148	<b>0.110</b>	-0.148	<b>0.110</b>

Notes: This table presents Pearson correlation results among the regression variables. Bold-faced correlations are significant at  $p < 0.01$ . All variables are defined in Appendix A.

## 5.2 | Regression results

### 5.2.1 | ARL and financial reporting quality

Before we provide test results for the relationship between gender-diverse audit committee and ARL, we first examine the implications of ARL for financial reporting quality.<sup>9</sup> Longer ARL may be a manifestation of the existence of financial reporting problems. We first provide empirical evidence to determine whether this is indeed the case. We consider absolute discretionary accruals (|DAC|) and accounting

restatements (RESTATE) as two proxies for financial reporting quality (FRQ) and examine whether longer ARLs diminish financial reporting quality using the following equation:

$$LN\_ARL_{i,t} = \beta_0 + \beta_1 FRQ_{i,t} + \text{Other control variables} + \text{Year effect} + \text{Industry effect} + \varepsilon_{i,t} \dots \quad (3)$$

We use the same control variables as are used in the equations above. We report the OLS regression results in Table 4. The coefficient on LN\_ARL is positive but marginally significant (coefficient 0.007,

**TABLE 4** Audit report lag and financial reporting quality

Variables	(1)  DAC	(2) RESTATE	(3)  DAC	(4) RESTATE
LN_ARL	0.007* [1.79]	0.537** [2.14]		
ABN_ARL			0.010*** [4.38]	0.599*** [3.00]
ACSIZE	0.003*** [4.98]	-0.038 [-0.57]	0.003*** [5.11]	-0.034 [-0.51]
ACIND	0.000 [0.11]	-0.566* [-1.73]	0.001 [0.14]	-0.565* [-1.73]
ACCHAIR_F	0.001 [0.46]	0.402* [1.67]	0.001 [0.31]	0.364 [1.51]
ACFEXP	-0.000 [-0.11]	-0.003 [-0.04]	-0.000 [-0.10]	-0.003 [-0.05]
ACWEXP	0.001 [0.41]	-0.039 [-0.18]	0.001 [0.36]	-0.041 [-0.19]
BSIZE	-0.004 [-0.29]	1.642 [1.26]	-0.003 [-0.22]	1.729 [1.33]
BIND	-0.001*** [-2.80]	-0.005 [-0.11]	-0.001*** [-2.70]	0.000 [0.01]
BMEET	0.003* [1.72]	0.025 [0.16]	0.003* [1.81]	0.021 [0.13]
CEO_DUAL	0.001*** [3.89]	0.002 [0.14]	0.001*** [3.93]	0.002 [0.11]
TOP10	-0.005*** [-3.31]	-0.092 [-0.68]	-0.005*** [-3.25]	-0.079 [-0.58]
BIG4	-0.003 [-0.91]	-1.471** [-2.36]	-0.003 [-0.80]	-1.452** [-2.33]
SPEC	0.019*** [4.63]	0.852*** [2.97]	0.017*** [4.08]	0.762*** [2.62]
OPIN	-0.001* [-1.89]	-0.032 [-0.66]	-0.001** [-1.98]	-0.033 [-0.69]
TENURE	-0.009*** [-3.69]	0.021 [0.08]	-0.009*** [-3.74]	0.008 [0.03]
AF	0.004* [1.86]	0.044 [0.22]	0.004* [1.80]	0.049 [0.25]
ICR	-0.013*** [-3.82]	-0.497 [-1.52]	-0.012*** [-3.66]	-0.471 [-1.44]
SOE	-0.007*** [-2.76]	-0.065 [-0.27]	-0.007*** [-2.62]	-0.050 [-0.21]
FAMILY	0.002 [0.87]	0.051 [0.23]	0.002 [0.88]	0.058 [0.26]
SIZE	-0.001 [-0.50]	-0.016 [-0.16]	-0.001 [-0.70]	-0.018 [-0.19]
DEBT	0.033*** [12.38]	0.166 [1.38]	0.033*** [12.22]	0.160 [1.31]
ROA	0.065*** [4.45]	0.161 [0.14]	0.067*** [4.54]	0.123 [0.11]
BTM	-0.006*** [-5.51]	0.054 [0.60]	-0.006*** [-5.36]	0.064 [0.71]
LOSS	0.021*** [6.95]	0.056 [0.22]	0.020*** [6.76]	0.025 [0.10]
GDP	0.002 [1.10]	-0.323* [-1.84]	0.002 [1.14]	-0.326* [-1.85]
Constant	-0.050 [-1.40]	-3.876 [-1.20]	-0.026 [-0.78]	-1.628 [-0.53]
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Observations	8564	5028	8564	5028
Adj.R2/pseudo R2	0.15	0.07	0.09	0.07

Notes: This table presents the OLS (Columns 1 and 3) and the logistic regression (Columns 2 and 4) for the relationship between ARL and abnormal ARL (ABN\_ARL) and financial reporting quality as proxied by |DAC| and RESTATE. Robust t-statistics (Columns 1 and 3) and z-statistics (Columns 2 and 4) (clustered at the firm level) are reported in parentheses. Variable definitions are provided in Appendix A.

\*p < 0.10. \*\*p < 0.05. \*\*\*p < 0.01.

TABLE 5 Gender-diverse audit committees and audit report lag

	(1)	(2)	(3)	(4)	(5)	(6)
Variables DV = LN_ARL	OLS	OLS	Fixed effects	Fixed effects	OLS critical mass	OLS other AC female characteristics
AC_FEMALE_DUM	-0.015*** [-2.73]		-0.016** [-2.37]			
AC_FEMALE_PROP		-0.044*** [-2.92]		-0.046** [-2.08]		
AC_FEMALE_MASS					-0.036* [-1.90]	-0.012* [-1.74]
PACF_ACCEXP						-0.008* [-1.93]
PACF_WEXP						-0.004* [-2.02]
ACSIZE	-0.004** [-1.97]	-0.013*** [-2.80]	-0.001 [-0.40]	-0.002 [-0.19]	-0.024*** [-2.71]	-0.005 [-0.39]
ACIND	-0.005 [-0.37]	-0.016 [-0.74]	0.019 [1.26]	0.045* [1.81]	0.021 [0.34]	
ACCHAIR_F	0.003 [0.26]	0.003 [0.20]	-0.022 [-1.68]	-0.016 [-0.81]	-0.045* [-1.94]	0.001 [0.13]
ACFEXP	0.006** [2.21]	0.011** [2.49]	0.004 [1.13]	0.011* [1.78]	-0.000 [-0.03]	0.009*** [2.95]
ACWEXP	-0.004 [-0.41]	-0.005 [-0.38]	-0.004 [-0.41]	-0.020 [-1.19]	-0.102*** [-2.98]	-0.005 [-0.53]
BSIZE	0.003 [1.58]	0.004* [1.65]	0.006* [1.89]	0.005 [0.97]	0.277* [1.66]	0.003 [1.57]
BIND	0.018 [0.32]	0.052 [0.66]	0.114 [1.39]	0.218* [1.81]	0.016*** [2.81]	0.016 [0.28]
BMEET	-0.004*** [-5.58]	-0.006*** [-5.74]	-0.003*** [-3.07]	-0.004** [-2.93]	0.018 [0.97]	-0.004** [-5.56]
GEO_DUAL	0.000 [0.01]	0.004 [0.41]	-0.004 [-0.42]	0.000 [0.00]	-0.005** [-2.21]	0.000 [0.04]
TOP10	0.002 [0.34]	0.011 [1.18]	-0.016 [-1.63]	-0.022 [-1.55]	0.001 [0.07]	0.002 [0.37]
BIG4	-0.049*** [-3.43]	-0.020 [-1.03]	-0.018 [-0.67]	0.013 [0.32]	-0.033 [-1.44]	-0.048*** [-3.38]
SPEC	-0.010* [-1.66]	-0.006* [-1.65]	-0.012 [-1.03]	-0.004 [-0.23]	0.064*** [2.74]	0.000 [0.05]
OPIN	0.079*** [5.17]	0.066*** [3.19]	0.099*** [5.78]	0.100*** [3.91]	-0.005* [-1.68]	0.078*** [5.12]
TENURE	-0.000 [-0.25]	-0.002 [-0.64]	-0.000 [-0.05]	-0.001 [-0.27]	0.003 [0.23]	-0.001 [-0.26]
AF	0.038*** [4.81]	0.029*** [2.60]	0.037*** [3.12]	0.013 [0.64]	0.037*** [3.07]	0.038*** [4.80]
ICR	0.167*** [6.92]	0.046 [1.50]	0.056 [1.33]	0.022 [0.37]	0.198*** [5.07]	0.167*** [6.92]
SOE	-0.024*** [-2.61]	0.014 [1.02]	0.028 [1.30]	0.027 [0.83]	-0.021 [-1.50]	-0.025*** [-2.64]
FAMILY	0.021** [2.41]	0.045*** [3.32]	-0.014 [-0.77]	-0.007 [-0.24]	0.006 [0.45]	0.021** [2.44]
SIZE	-0.003 [-0.73]	0.001 [0.21]	0.045*** [6.51]	0.041*** [3.62]	0.003 [0.51]	-0.003 [-0.76]
DEBT	-0.005 [-1.11]	-0.004 [-0.77]	-0.000 [-0.09]	-0.004 [-0.54]	-0.003 [-0.73]	-0.005 [-1.18]
ROA	-0.258*** [-5.08]	-0.259*** [-3.77]	-0.294*** [-5.10]	-0.302*** [-3.61]	-0.209*** [-2.63]	-0.259*** [-5.11]
BTM	0.016*** [3.68]	0.018*** [3.08]	0.008 [1.53]	0.018** [2.23]	0.009 [1.33]	0.016*** [3.69]
LOSS	0.050*** [4.35]	0.051*** [3.30]	0.065*** [5.37]	0.064*** [3.68]	0.060*** [3.47]	0.050*** [4.37]
GDP	-0.328*** [-2.58]	-0.201*** [-2.18]	0.032 [1.24]	0.042 [1.17]	0.024** [2.37]	0.203*** [3.18]
Constant	3.704*** [31.56]	3.821*** [23.58]	2.456*** [8.13]	2.644*** [5.55]	3.702*** [31.54]	3.703*** [31.55]

TABLE 5 (Continued)

	(1)	(2)	(3)	(4)	(5)	(6)
Variables DV = LN_ARL	OLS	OLS	Fixed effects	Fixed effects	OLS	OLS other AC female characteristics
Firm	No	No	Yes	Yes	No	No
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	No	No	Yes	Yes
Observations	8564	8564	8564	8564	3850	3850
Adj.R2	0.10	0.06	0.19	0.42	0.10	0.10

Notes: This table reports the ordinary least squares (OLS) and firm-fixed effect regression results of the relationship between gender-diverse audit committees and audit report lag. Robust t-statistics (clustered at the firm level) are reported in parentheses. Variable definitions are provided in Appendix A. \* $p < 0.10$ . \*\* $p < 0.05$ . \*\*\* $p < 0.01$ .

$p < 0.10$ ) when |DAC| is used as the proxy for financial reporting quality (Column 1). The logistic regression result for RESTATE is reported in Column 2 and shows that the coefficient on LN\_ARL is again positive and significant (coefficient 0.54,  $p < 0.05$ ). The number of observations for RESTATE regression is smaller than the |DAC| regression, because we do not have data on RESTATE beyond 2015. Taken together, the evidence supports the notion that longer ARLs diminish financial reporting quality. Columns 3 and 4 report results for the abnormal ARL (ABN\_ARL) measure and provide stronger evidence of the detrimental effects of abnormal ARLs on financial reporting quality. ABN\_ARL is defined as an indicator variable equal to 1 for observations in the top 10% of the ARL distribution and 0 otherwise. The coefficients on |DAC| and RESTATE are 0.01 ( $p < 0.01$ ) and 0.60 ( $p < 0.01$ ), respectively.

### 5.2.2 | The gender-diverse audit committee and ARL

Table 5 presents the main regression results for the relation between gender-diverse audit committees and ARL. Columns 1 and 2 present the OLS regression results, and Columns 3 and 4 present the firm-fixed effect regression results. The coefficient on AC\_FEMALE\_DUM is  $-0.015$  ( $p < 0.01$ ) (Column 1), thereby supporting the hypothesis that the presence of female audit committee members is associated with shorter ARL. The corresponding coefficient for AC\_FEMALE\_PROP is  $-0.044$  ( $p < 0.01$ ). In terms of economic magnitude, the coefficient on AC\_FEMALE\_PROP indicates that when the proportion of women on the audit committee increases by 10%, the ARL decreases by 0.44%. This, therefore, implies that firms with a gender-diverse audit committee submit their audited financial reports earlier than firms with an all-male audit committee by around 7.2 days [antilog of 4.5 (average LN\_ARL)\*0.44]. The results of firm-fixed effects also reveal a negative and significant association between gender-diverse audit committees and ARL (the coefficient on AC\_FEMALE\_DUM is  $-0.016$  [ $p < 0.05$ ] [Column 3], and the coefficient on AC\_FEMALE\_PROP is  $-0.046$  [ $p < 0.05$ ] [Column 4]). Our results, therefore, support H1. We also examine whether the presence of female audit committee members supports the ‘critical mass theory’ or merely proxies for tokenism. The coefficient on AC\_FEMALE\_MASS is negative and significant (coefficient  $-0.036$ ,  $p < 0.10$ ) (Column 5), thereby supporting the ‘critical mass’ theory. Finally, Column 6 reports the estimates of the relationship between female accounting and work experience on the audit committee and ARL using the OLS model. The coefficients on PACF\_ACCEXP (coefficient  $-0.012$ ,  $p < 0.10$ ) and PACF\_WEXP (coefficient  $-0.008$ ,  $p < 0.10$ ) are both negative and significant, thereby supporting both H2a and H2b.

With respect to control variables, we find that ARL is longer for firms with more financially expert audit committee members and for firms with large board sizes, whereas ARL is shorter for firms with large audit committees and for firms with more frequent board meetings. Habib et al.'s (2019) meta-analysis on the determinants of ARL



also suggests mixed results for some of the board characteristics. Out of the nine studies examining board size and board meeting frequency, only three reported positive and significant coefficients, whereas two studies documented significant but negative results, and the remaining studies found no association. This may be because board characteristics differ significantly across countries, in particular between the Anglo-Saxon countries and Asian countries. ARL is shorter for firms with female audit committee chairs, but only in Column 3, shorter for firms audited by Big 4 audit firms and for firms audited by industry specialist auditors, but longer for firms paying high

audit fees. ARL is shorter for SOEs but longer for family-owned firms. With respect to firm fundamental controls, results reveal that ARL is longer for larger firms, firms with low growth opportunities and firms incurring losses, but shorter for profitable firms. Our results are consistent with Habib et al. (2019), who document that firm size, growth prospects and firm profitability are important determinants of ARL.

Table 6 reports the regression results for ABN\_ARL measure. The coefficient on AC\_FEMALE\_DUM remains negative and significant ( $-0.012$ ,  $p < 0.10$ ) (Column 1). The coefficient on AC\_FEMALE\_PROP also remains negative and significant ( $-0.019$ ,  $p < 0.10$ ) (Column 2).

**TABLE 6** Gender-diverse audit committees and abnormal audit report lag

Variables DV = ABN_ARL	(1) Logit regression	(2) Logit regression	(3) Other AC female characteristics (logit regression)
AC_FEMALE_DUM	-0.012** [-1.99]		
AC_FEMALE_PROP		-0.019* [-1.68]	
PACF_ACCEXP			-0.019** [-2.56]
PACF_WEXP			0.001 [0.31]
ACSIZE	-0.009*** [-4.01]	-0.006* [-1.66]	-0.010*** [-4.36]
ACIND	-0.014 [-0.91]	0.013 [0.72]	-0.014 [-0.90]
ACCHAIR_F	0.036*** [2.95]	0.026* [1.85]	0.033*** [2.78]
ACFEXP	0.003 [1.02]	0.000 [0.07]	0.007** [1.96]
ACWEXP	0.011 [1.11]	0.013 [1.16]	0.009 [0.86]
BSIZE	-0.003 [-1.28]	0.000 [0.01]	-0.003 [-1.25]
BIND	-0.040 [-0.63]	0.011 [0.17]	-0.040 [-0.63]
BMEET	-0.001 [-1.13]	-0.002* [-1.88]	-0.001 [-1.09]
CEO_DUAL	-0.014** [-2.04]	0.001 [0.15]	-0.015** [-2.09]
TOP10	-0.007 [-1.04]	-0.007 [-0.92]	-0.007 [-1.02]
BIG4	-0.060*** [-3.79]	-0.041** [-2.43]	-0.060*** [-3.76]
SPEC	-0.021* [-1.94]	-0.023* [-1.86]	-0.021* [-1.96]
OPIN	0.223*** [13.02]	0.179*** [10.16]	0.222*** [12.98]
TENURE	0.005** [2.46]	0.004* [1.68]	0.005** [2.45]
AF	0.014 [1.57]	0.002 [0.17]	0.014 [1.54]
ICR	0.009 [0.34]	-0.101*** [-3.86]	0.008 [0.30]
SOE	-0.033*** [-3.16]	-0.019 [-1.59]	-0.033*** [-3.15]
FAMILY	0.012 [1.29]	0.009 [0.76]	0.012 [1.29]
SIZE	0.018*** [4.08]	0.006 [1.18]	0.018*** [4.10]
DEBT	0.008* [1.68]	0.005 [1.15]	0.008 [1.64]
ROA	-0.211*** [-3.73]	-0.168*** [-2.88]	-0.216*** [-3.81]
BTM	-0.003 [-0.67]	0.003 [0.57]	-0.003 [-0.67]
LOSS	0.078*** [6.13]	0.060*** [4.55]	0.078*** [6.14]
GDP	0.005 [0.07]	0.006 [0.08]	0.005 [0.76]
Constant	-0.528*** [-4.03]	-0.171 [-1.25]	-0.533*** [-4.07]
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
Observations	8564	8564	3850
Pseudo R2	0.08	0.08	0.08

Notes: This table reports the logistic regression results of the relationship between gender-diverse audit committees and abnormal audit report lag. Robust z-statistics (clustered at the firm level) are reported in parentheses. Variable definitions are provided in Appendix A.

\* $p < 0.10$ . \*\* $p < 0.05$ . \*\*\* $p < 0.01$ .

**TABLE 7a** Endogeneity tests: generalized method of moment (GMM) and difference-in-difference (DiD) test

Variables DV = LN_ARL	(1) GMM	(2) GMM	(3) DiD
L.LN_ARL	0.288*** [5.15]	0.299*** [5.77]	
AC_FEMALE_DUM	-0.197*** [-3.06]		
AC_FEMALE_PROP		-0.148* [-1.65]	
POST			-0.010 [-0.82]
TREAT			-0.012** [-2.16]
POST*TREAT			-0.042*** [-3.34]
ACSIZE	-0.051** [-2.06]	-0.027 [-1.33]	-0.004** [-1.98]
ACIND	0.283 [1.21]	0.208 [1.01]	-0.005 [-0.38]
ACCHAIR_F	-1.399*** [-2.63]	-0.075 [-0.24]	0.003 [0.25]
ACFEXP	0.255*** [2.66]	0.001 [0.01]	0.006** [2.19]
ACWEXP	-0.016 [-0.07]	-0.006 [-0.02]	-0.004 [-0.42]
BSIZE	-0.044* [-1.82]	-0.013 [-0.44]	0.003 [1.63]
BIND	-1.426*** [-3.02]	-0.823** [-2.04]	0.021 [0.38]
BMEET	-0.049*** [-5.16]	-0.032*** [-3.89]	-0.004*** [-5.68]
CEO_DUAL	0.029 [0.38]	0.073 [1.07]	0.000 [0.05]
TOP10	-0.761** [-2.20]	0.083 [0.27]	0.002 [0.33]
BIG4	-0.849* [-1.74]	-0.892* [-1.73]	-0.048*** [-3.39]
SPEC	0.281 [0.79]	0.631* [1.91]	0.001 [0.06]
OPIN	1.725*** [3.52]	3.541*** [6.54]	0.079*** [5.17]
TENURE	0.182** [2.16]	0.125 [1.38]	-0.001 [-0.28]
AF	0.677** [2.24]	0.154 [0.57]	0.038*** [4.80]
ICR	-3.929 [-1.01]	-0.213 [-1.18]	0.150*** [5.82]
SOE	-0.864** [-1.98]	-0.586 [-1.28]	-0.024*** [-2.58]
FAMILY	-0.114 [-0.26]	-0.061 [-0.14]	0.020** [2.37]
SIZE	0.133 [0.89]	0.243 [1.54]	-0.002 [-0.55]
DEBT	-1.031** [-2.33]	-1.323*** [-3.24]	-0.005 [-1.13]
ROA	-9.333*** [-5.53]	-7.556*** [-4.87]	-0.250*** [-4.91]
BTM	0.223* [1.71]	0.219* [1.91]	0.016*** [3.59]
LOSS	0.606* [1.80]	0.978*** [3.14]	0.051*** [4.44]
GDP	1.130*** [2.93]	1.550*** [3.77]	0.022*** [3.35]
Constant	0.698 [1.00]	-3.527 [-1.00]	3.708*** [31.59]
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
Observations	2155	2155	5240
Adj.R2			0.10
AR(1)	$z = -2.37, p > 0.023$	$z = -3.07, p > 0.002$	
AR(2)	$z = 0.17, p > 0.481$	$z = 0.67, p > 0.450$	
Sargan test	$\text{Chi}^2 = 1233.79, p > 0.000$	$\text{Chi}^2 = 1140.48, p > 0.000$	
Hansen test	$\text{Chi}^2 = 41.77, p > 0.953$	$\text{Chi}^2 = 57.52, p > 0.456$	

Notes: This table reports the DiD and GMM results of the relationship between gender-diverse audit committees and audit report lag. Robust *t*-statistics (clustered at the firm level) are reported in parentheses. Variable definitions are provided in Appendix A.

\* $p < 0.10$ . \*\* $p < 0.05$ . \*\*\* $p < 0.01$ .

The coefficient on PACF\_ACCEXP is also negative and significant ( $-0.019, p < 0.05$ ), documenting that having audit committees with female accounting expertise is associated with shorter ARL. However,

the coefficient on PACF\_WEXP is insignificant (Column 3). Taken together, our results using this alternative ARL measure are generally consistent with the baseline result.

TABLE 7b Endogeneity tests: propensity score matching (PSM) results

Covariates matching					
Variable	Treated	Controls	Difference	S.E.	t-stat
ACSIZE	3.615	3.590	0.025	0.030	0.850
ACIND	0.661	0.669	-0.008	0.004	-1.670*
ACCHAIR_F	0.059	0.061	-0.002	0.005	-0.130
ACFEXP	0.924	0.911	0.013	0.023	0.590
ACWEXP	0.544	0.541	0.003	0.008	0.380
BSIZE	8.845	8.830	0.015	0.041	0.370
BIND	0.368	0.368	-0.000	0.001	-0.050
BMEET	10.254	10.252	0.002	0.096	0.020
CEO_DUAL	0.237	0.237	-0.000	0.010	-0.030
TOP10	0.381	0.375	0.007	0.011	0.580
BIG4	0.040	0.039	0.001	0.005	0.130
SPEC	0.223	0.222	0.001	0.010	0.070
OPIN	1.035	1.034	0.001	0.004	0.180
TENURE	2.295	2.273	0.022	0.032	0.680
AF	13.546	13.542	0.004	0.016	0.280
ICR	0.684	0.681	0.002	0.011	0.220
SOE	0.440	0.437	0.003	0.012	0.280
FAMILY	0.461	0.461	-0.001	0.012	-0.070
SIZE	21.892	21.885	0.007	0.030	0.220
DEBT	0.461	0.459	0.002	0.009	0.220
ROA	0.039	0.039	-0.001	0.002	-0.360
BTM	0.880	0.875	0.006	0.022	0.270
LOSS	0.088	0.087	0.001	0.007	0.130
GDP	10.853	10.850	0.003	0.013	0.240
PSM regression results					
DV = LN_ARL	(1)		(2)		
AC_FEMALE_DUM	-0.010* [-1.71]				
AC_FEMALE_PROP			-0.043** [-2.25]		
ACSIZE	-0.005* [-1.73]		-0.013** [-2.49]		
ACIND	0.008 [0.44]		0.005 [0.20]		
ACCHAIR_F	0.002 [0.14]		0.001 [0.10]		
ACFEXP	0.009** [2.30]		0.012** [2.34]		
ACWEXP	-0.006 [-0.56]		-0.008 [-0.56]		
BSIZE	0.007*** [3.00]		0.008*** [3.07]		
BIND	0.107 [1.56]		0.146 [1.62]		
BMEET	-0.004*** [-5.02]		-0.005*** [-4.65]		
CEO_DUAL	-0.003 [-0.34]		-0.002 [-0.16]		
TOP10	0.010 [1.34]		0.020* [1.94]		
BIG4	-0.046*** [-3.34]		-0.027 [-1.56]		
SPEC	0.008 [0.74]		0.011 [0.68]		
OPIN	0.085*** [3.76]		0.075** [2.53]		
TENURE	-0.003 [-1.07]		-0.004 [-1.28]		
AF	0.036*** [3.50]		0.026* [1.94]		
ICR	0.174*** [4.63]		0.051 [1.27]		
SOE	-0.015 [-1.21]		0.012 [0.72]		

TABLE 7b (Continued)

PSM regression results		
DV = LN_ARL	(1)	(2)
FAMILY	0.027** [2.27]	0.043** [2.53]
SIZE	-0.001 [-0.19]	0.004 [0.57]
DEBT	-0.011 [-0.84]	-0.009 [-0.64]
ROA	-0.269*** [-3.09]	-0.281** [-2.56]
BTM	0.017*** [3.47]	0.016*** [2.65]
LOSS	0.045*** [3.32]	0.045** [2.57]
GDP	0.020** [2.34]	0.018 [1.62]
Constant	3.649*** [23.65]	3.733*** [19.76]
Year	Yes	Yes
Industry	Yes	Yes
Observations	3348	3348
Adj.R2	0.08	0.05

Notes: This table reports PSM regression results relating gender-diverse audit committees to ARL. Robust t-statistics are in brackets. Variable definitions are provided in Appendix A.

\* $p < 0.10$ . \*\* $p < 0.05$ . \*\*\* $p < 0.01$ .

## 6 | ENDOGENEITY TESTS

One could argue that the relationship between audit committee gender diversity and ARL is endogenous, because this relationship may be driven by heterogeneity in firm characteristics that causes both variables to move together. Our regression model includes several control variables to reduce the omitted variable concern: an important source of endogeneity. We conduct additional tests to alleviate the concern that our results may be biased because of endogeneity.

### 6.1 | Generalized method of moment test

We perform the generalized method of moment (GMM) approach developed by Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998) to address the endogeneity problem that arises from the simultaneity bias, that is, when two variables might be simultaneously affecting each other. The GMM is also appropriate when the dependent variable is dynamic (Roodman, 2009). In order to detect the dynamic specifications of ARL and gender-diverse audit committee, we use Arellano and Bond's (1991) (AR1) and (AR2) autocorrelation tests by utilizing the two period lags (0 2) of gender-diverse audit committee and control variables as instruments. The GMM approach presents two normative tests: overidentification through the Sargan test and homogeneity of the instruments through the Hansen test. In applying the GMM approach, we include the lagged values of ARL (L.LN\_ARL) as an additional independent variable and test the following equation:

$$LN\_ARL_{i,t} = \beta_0 + \beta_1 L.LN\_ARL_{i,t} + \beta_2 AC\_FEMALE_{i,t} + \text{Other control variables} + \text{Industry effect} + \varepsilon_{i,t} \dots \quad (4)$$

Columns 1 and 2 in Table 7a present the GMM results for the ARL regression model. The coefficient on AC\_FEMALE\_DUM is negative and significant (coefficient  $-0.197$ ,  $p < 0.01$ ) (Column 1). The corresponding coefficient for AC\_FEMALE\_PROP is also negative but marginally significant (coefficient  $-0.15$ ,  $p < 0.10$ ) (Column 2). These findings confirm our main results. In addition, the coefficient of AR(1) is significant at  $p < 0.05$  in both columns, indicating the presence of autocorrelation in the first difference. The coefficient on AR(2), on the other hand, is insignificant, indicating the absence of correlation in the error terms. Additionally, the  $p$ -value of the Sargan test is significant (Column 1 = 1233.79,  $p > 0.000$  and Column 2 = 1140.48,  $p > 0.000$ ), whereas that of the Hansen test is insignificant (Column 1 = 41.77,  $p > 0.953$  and Column 2 = 57.52,  $p > 0.456$ ).

### 6.2 | Difference-in-difference analysis

To test the causal effect of hiring women in the audit committee on ARL, we perform a difference-in-difference (DiD) analysis. To execute the DiD analysis, we first excluded firms with non-gender-diverse audit committees over our study period to focus on testing the causal effect of the presence of women in the audit committee. We then identify firms that hired women for the first time in the audit committee and create an indicator variable (POST) coded 1 for such firms and 0 otherwise. Our sample size for this analysis is 5240 firm-year observations and differs from the gender-diverse audit committee sample of 3850 firm-year observations because we included observations that did not have women on the audit committee previously, but had hired them for the first time. Our treatment variable, TREAT, is defined as an indicator variable coded 1 if there is at least one woman on the audit committee and 0 otherwise. Our variable of primary

interest for the DiD analysis is the sign and significance of the interactive variable, POST\*TREAT. Column 3 in Table 7a reports that the coefficient on POST\*TREAT is negative and significant (coefficient =  $-0.042$ ,  $p < 0.01$ ). The coefficient for the ARL implies that the ARL was reduced by 4.2% after hiring female directors on the audit committee. This translates into an average reduction of close to 4 days (antilog of mean LN\_ARL (90.02 days)\*0.042). Our results, therefore, provide some evidence supporting the causal effect of hiring women in the audit committee on reducing the ARL.

### 6.3 | Propensity score matching test

Finally, we conduct the propensity score matching (PSM) test to control for endogeneity that arises from observable, rather than unobservable, factors (Rosenbaum & Rubin, 1985). One key aspect of PSM is to test the distribution of regression variables between the treatment and the matched sample. PSM requires that no systematic differences exist in the chosen variables between the treatment and matched groups except for the variable of interest, that is, ARL (Austin, 2011). We select the nearest neighbour (NN) technique without replacement to match the variables using a calliper of 0.1. Table 7b shows that the  $t$ -statistics of all variables are insignificant except for ACSIZE, indicating that the matching process was successful in getting a balance for all covariates. The PSM regression results show that the coefficients of AC\_FEMALE\_DUM (coefficient  $-0.01$ ,  $p < 0.10$ ) and AC\_FEMALE\_PROP (coefficient  $-0.043$ ,  $p < 0.05$ ) are negative and significant. These findings, therefore, suggest that our main results are robust to potential endogeneity concerns.

## 7 | CONCLUSION

The purpose of this study is to explore the influence of audit committee gender diversity on audit report lag in China. As one of the very few externally observable audit-related output variables, a shorter audit report lag is suggested by prior literature to have many benefits, such as signalling: fewer unusual events (Salterio, 2012), a smooth audit process with less auditor disagreement (McCracken et al., 2008), better financial reporting quality and lower stock price crash risk (Chan et al., 2016; Habib & Huang, 2019). Thus, investigating the role of a gender-diverse audit committee on improving timeliness of audit reports has important economic consequences for investors in making informed investment decisions.

Using a sample of China's listed firms over the period from 2010 to 2018, we find a negative association between the presence of female directors on the audit committee and audit report lag. Our findings support the theoretical argument that having women on the audit committee could strengthen the monitoring role of the audit committee in financial reporting and auditing-related matters. We further find that female audit committee members possessing professional accounting qualifications and accounting work experience are associated with shorter audit report lag.

Our study makes incremental contributions to the inconclusive literature on gender diversity and audit report lag in countries with different institutional settings and offers important policy implications to Chinese capital market regulators. Our study is the first attempt that explores the governance role of female audit committee members with accounting professional qualifications or accounting work experience in influencing audit report lag in China. Our study also contributes to the critical mass theory by providing empirical evidence that for a gender-diverse audit committee to be more effective, there should be more than one woman on the audit committee. Given the positive role of a gender-diverse audit committee in reducing audit report lag as documented in our study, China's regulatory authorities may consider improving gender diversity in audit committees. Despite the fact that China has one of the largest female workforces worldwide, female representation on audit committees in China remains much lower than the global average. Therefore, our study has important policy implications for Chinese regulators in implementing a gender quota for audit committees.

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### CONFLICT OF INTEREST

There are no conflicts of interest for any authors.

### ETHICS STATEMENT

The authors confirm that they have read the 'Guidelines on Publishing and Research Ethics in Journal Articles'.

### AUTHOR CONTRIBUTION

**Alkebsee Radwan Hussien:** conceptualization (equal); data analysis (lead); methodology (equal); writing—original draft preparation (equal); writing—review and editing (equal). **Ahsan Habib:** conceptualization (equal); data analysis (minor); methodology (equal); writing—original draft preparation (equal); writing—review and editing (equal). **Hedy Jiaying Huang:** writing—original draft preparation (minor); writing—review and editing (minor). **Gaoliang Tian:** writing—review and editing (minor).

### DATA AVAILABILITY STATEMENT

Data derived from public domain resources.

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### ENDNOTES

<sup>1</sup> The Qualified Foreign Institutional Investor (QFII) Programme was introduced by the Chinese authorities in 2002. The purpose of the QFII programme was to further internationalize the local financial market. Foreign investors who are qualified under the QFII programme are allowed to invest in A-shares, convertible and corporate bonds and treasuries traded on the Chinese stock exchanges (CFA Institute, 2007). According to Qiao and Li (2019), on average, foreign institutional investors own 16% of total outstanding shares in the Chinese listed firms.



From 2003 to 2015, QFII's investment quota has risen rapidly from 1.7–81.1 billion USD, indicating the significant influence of international investors in the Chinese capital market. Previous study has confirmed that the QFII programme can stabilize the Chinese capital market and enhance financial liberalization (Han et al., 2015).

<sup>2</sup> Allen et al. (2019, p.40), in a follow-up review on the institutional development of China, notes the following: 'Despite continuing reforms in China's law and legal system, banking, and financial markets, some of which are based on Western models, the development of the financial system and overall economic growth still do not converge toward the path followed in the West'.

<sup>3</sup> Deloitte, (2019). Women in the Boardroom: a Global Perspective - 6th edition. Deloitte's Global Center for Corporate Governance, Available at: <https://www2.deloitte.com/global/en/pages/risk/articles/women-in-the-boardroom-global-perspective.html>

<sup>4</sup> Article 39 of the same Code defines the main responsibilities of an audit committee as the following (CSRC, 2018): (1) to supervise and assess external audit work and to make recommendations on the appointment and/or change of external auditor; (2) to supervise and assess the internal audit work and to coordinate the communication between internal and external auditors; (3) to review company's financial reporting information and its disclosure; and (4) to supervise and review the company's internal control system; and (5) to be responsible for regulation, constitution and other matters as delegated by the Board.

<sup>5</sup> Deloitte China, (2019). 2019 Deloitte China Listed Companies Female Directors Survey Report, Deloitte China Center for Corporate Governance, Available at: <https://www2.deloitte.com/content/dam/Deloitte/cn/Documents/about-deloitte/deloitte-cn-report-on-female-directors-of-listed-companies-in-china-zh-190531.pdf>

<sup>6</sup> The CSMAR database does not provide the minimum time period for which a female audit committee director held an accounting position. It mentions only a job title, that is, CFO, internal auditor and the like.

<sup>7</sup> For example, Chan et al. (2016) reported a mean ARL of 84 days during the sample period 2004–2010. The mean ARL reported by Habib and Huang (2019) is 86 days during the sample period 2002–2013. Given that our sample spans the period 2010–2018, the slightly different ARL reported in our study can be due to different sample periods used in these studies.

<sup>8</sup> These variables are calculated for firms with gender-diverse audit committees only. There are two reasons for this. First, the descriptive values for PACF\_ACCEXP and PACF\_WEXP become much smaller in magnitude when we calculate these variables for the entire sample (an average of 5.3% and 12%, respectively) (untabulated). Second, and more importantly, we focus on the role of qualified female audit committee directors rather than non-qualified female audit committee directors. Therefore, it makes sense to restrict the sample to gender-diverse audit committees and examine the within sample variation.

<sup>9</sup> Prior research using data from Chinese listed companies reveal that longer ARL increases the risk of future stock price crash (Habib & Huang, 2019), more likely to restate their financial reports and receive qualified audit opinions (Chan et al., 2016). We re-examine the financial reporting quality implications of longer ARL using discretionary accruals and accounting restatements as proxies for financial reporting quality.

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## APPENDIX A

## VARIABLE DEFINITIONS

Variable	Definition
LN_ARL	Natural logarithm of the time between the firm's fiscal end year and the audit report date
ABN_ARL	An indicator variable equals 1 for an observation in the top 10% of ARL distribution and 0 otherwise
AC_FEMALE_DUM	An indicator variable coded 1 for firms with at least one woman on the audit committee and 0 otherwise
AC_FEMALE_PROP	The proportion of female directors on the audit committee
AC_FEMALE_MASS	An indicator variable coded 1 if the number of female directors on the audit committee is two or above and 0 otherwise
PACF_ACCEXP	The proportion of female directors on the audit committee who have accounting expertise, defined as audit committee members who hold CPA, CIA and/or CFA qualifications
PACF_WEXP	The proportion of female directors on the audit committee who have previous work experience in accounting, auditing or finance (e.g. CFO and internal auditors)
ACSIZE	Number of the audit committee members
ACIND	The proportion of independent directors on the audit committee
ACCHAIR_F	An indicator variable coded 1 if the audit committee chair is female director and 0 otherwise
ACFEXP	The proportion of the audit committee members who have accounting expertise, defined as audit committee members who have CPA, CIA and/or CFA qualifications
ACWEXP	The proportion of the audit committee members who have previous work experience in accounting, auditing or finance
BSIZE	Number of board members
BIND	The proportion of independent directors on the board
BMEET	Number of board meetings during the year
CEO_DUAL	An indicator variable coded 1 if the chairman is also the CEO and 0 otherwise
TOP10	An indicator variable coded 1 if a firm hired one of Top 10 auditors and 0 otherwise
BIG4	An indicator variable coded 1 if a firm hired one of Big 4 auditors and 0 otherwise
SPEC	A dummy variable coded 1 if a firm audited by an industry specialist auditor and 0 otherwise. Industry specialization is calculated using auditor's market share based on the audit fees in respective industries
OPIN	A dummy variable coded 1 if a firm received non-standard opinion in a year and 0 otherwise
TENURE	The number of years the auditor has audited its clients
AF	The natural logarithm of total audit fees
ICR	A dummy variable equals 1 if the firm-year observations pertain to 2012–2018 and 0 otherwise. It captures the effect of Provision 26 of the 'Guide of Internal Control Evaluation of Chinese firm' that requires the submission of the audited internal control report jointly with the financial reports
SOE	An indicator variable that equals one if the firm is a state-owned enterprise (SOE) and 0 otherwise
FAMILY	An indicator variable coded 1 if a firm is controlled by family and 0 otherwise
SIZE	The logarithm of total assets
DEBT	Total debts scaled by total assets
ROA	Return on assets defined as net income divided by total assets
BTM	Book to market ratio defined as book values of equity divided market-value of equity
LOSS	An indicator variable equalling 1 if a firm reported a loss in its financial reports at the end of the fiscal year and 0 otherwise
GDP	The natural logarithm of provincial GDP per capita

(Continues)



Variable	Definition
DAC	<p>The absolute value of discretionary accruals, calculated following the modified Jones model (Dechow et al., 1995) as follows: We estimate the following equation for all firms in the same industry with at least 20 observations for an industry in a particular year:</p> $\frac{ACC_{i,t}}{TA_{i,t-1}} = \gamma_0 \left( \frac{1}{TA_{i,t-1}} \right) + \gamma_1 \left[ \frac{\Delta SALES_{i,t} - \Delta RECEIV_{i,t}}{TA_{i,t-1}} \right] + \gamma_2 \left( \frac{PPE_{i,t}}{TA_{i,t-1}} \right) + \varepsilon_{i,t} \quad (A.1)$ <p>where ACC is total accruals calculated as earnings before extraordinary items and discontinued operations minus operating cash flows; TA is total assets in year <math>t - 1</math>; <math>\Delta SALES</math> is change in sales from year <math>t - 1</math> to year <math>t</math>; <math>\Delta RECEIV</math> is change in accounts receivable from year <math>t - 1</math> to year <math>t</math>; and PPE is gross property plant and equipment. The coefficient estimates from Equation A.1 are used to estimate the non-discretionary component of total accruals (NDAC) for our sample firms. The discretionary accruals are then the residuals from Equation A.1, that is, <math>DAC = ACC - NDAC</math></p>
RESTATE	An indicator variable coded 1 if a firm restated its financial reports in a particular year ( $t$ ) and 0 otherwise