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Do the educational profile, gender, and professional experience of audit committee financial experts improve financial reporting quality?

Bilal [a,*], Bushra Komal [b], Ernest Ezeani [c], Muhammad Usman [d], Frank Kwabi [e], Chengang Ye [f]

[a] Department of Accounting, Durham University Business School, Durham University, Durham DH13LB, UK
[b] Business School, University of International Business and Economics, Beijing 100029, China
[c] Edinburgh Business School, Heriot-Watt University, Edinburgh EH14 4AS, UK
[d] School of Business, University of Central Lancashire, Preston PR21HE, UK
[e] Leicester Castle Business School, De Montfort University, LE19BH Leicester, UK
[f] School of Accounting, Xijing University, Xian 710123, China

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ABSTRACT

Going beyond the mere presence of the audit committee financial experts (ACFEs) within the audit committee, we examine whether the educational profile, gender, and professional experience of ACFEs reduces the extent of earnings management. Using a sample of Chinese listed companies, we find evidence suggesting that ACFEs with postgraduate qualifications and other professional certifications mitigate earnings management. Female ACFEs with postgraduate qualifications are more effective in mitigating earnings management than their male counterparts. Also, the professional experience of ACFEs helps them reduce the extent of earnings management. Results are more pronounced in the case of female ACFEs with more professional experience. In addition, we found that ACFEs working in privately-owned Chinese firms better mitigate earnings management compared to those in state-owned Chinese firms. Overall, our results remain robust after controlling for potential endogeneity problems and using alternative earnings management proxies. Our study provides implications for regulators about necessary policy reforms regarding audit committee composition and recommends that companies appoint female ACFEs in China.

1. Introduction

The contributions of audit committee financial experts (ACFEs) have recently gained regulators' attention due to their influence on the audit committee's effectiveness (Abernathy, Herrmann, et al., 2013; Alhababsah & Yekini, 2021; Bilal et al., 2018; Komal et al., 2021; Usman et al., 2023). It is well documented that ACFEs are more likely to deal with complex financial reporting processes, control managerial opportunism, and understand the judgment made by auditors (Abernathy et al., 2015; Bilal et al., 2018). Previous studies show that financial expertise mitigates earnings management of United States (US) firms (Badolato et al., 2014; Usman, Ezeani, et al., 2022; Usman, Nwachukwu, et al., 2022; Usman, Salem, et al., 2022; Zalata et al., 2018). However, these studies are based on the US Sarbanes-Oxley Act of 2002 (SOX)'s definition of expertise. Unlike the current study, they failed to examine the impact of ACFEs' educational qualification on earnings management. Zalata et al. (2018) suggest that country-level factors are likely to influence ACFEs' effectiveness in detecting earnings management, implying that the impact of ACFEs on earnings management may depend on the country investigated.

One key question that is likely to arise is whether ACFEs' educational level (i.e., postgraduate education), gender, and professional experience mitigate earnings management among Chinese firms. This question is important because the upper echelons theory suggests that the demographic characteristics of leaders, such as gender, education, and work experience, influence their effectiveness (Hambrick & Mason, 1984). Consistent with the upper echelons theory, we examine whether ACFEs with postgraduate education and experience mitigate earnings management compared with other ACFEs without postgraduate qualification and lower experience. We are also interested in finding out whether educated and experienced female ACFEs mitigate earnings management better than their male counterparts.

* Corresponding author.
E-mail addresses: bilal.bilal@durham.ac.uk (Bilal), bushrakomal@hotmail.com (B. Komal), e.ezeani@hw.ac.uk (E. Ezeani), musman5@uclan.ac.uk (M. Usman), frank.kwabi@dmu.ac.uk (F. Kwabi), yechengang@126.com (C. Ye).

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Table 1
Sample selection.

Criteria	Observations
The initial sample of Chinese non-financial companies from 1999 to 2018	22,580
Less: Missing data of audit committee before 2006	(3,308)
Less: Non-financial experts on the audit committee	(7,901)
Less: Missing demographic data of financial experts	(1,979)
Less: Missing data of control variables	(616)
Final firm-year observations from 2006 to 2018	8,776

Table 2a
Descriptive statistics.

Variable	N	Mean	St.Dev	p1	Median	p99
Dak	8776	0.24	0.27	0.02	0.16	1.71
REM	8776	−0.002	0.20	−0.68	0.02	0.57
ACFE_post	8776	0.51	0.50	0.00	1.00	1.00
ACFE_exp	8776	2.52	1.16	0.24	2.94	5.92
ACFE_female	8776	0.22	0.41	0.00	0.00	1.00
SOE	8776	0.56	0.50	0.00	1.00	1.00
CrossList	8776	0.03	0.18	0.00	0.00	1.00
ACFE_age	8776	3.88	0.17	3.50	3.89	4.26
AC_ind	8776	1.39	0.26	0.00	1.39	1.79
OWN	8776	6.50	14.72	0.00	5.64	60.67
AC_size	8776	1.08	0.52	0.00	1.10	2.20
CFVOL	8776	0.10	0.19	0.00	0.06	1.24
SGVOL	8776	0.13	0.13	0.00	0.09	0.76
BIG4	8776	0.07	0.26	0.00	0.00	1.00
LEV	8776	1.49	0.57	0.82	1.51	2.67
SIZE	8776	21.60	1.26	18.93	21.46	25.22
ROA	8776	0.03	0.07	−0.31	0.03	0.20
AC_meetings	8776	2.12	0.38	1.39	2.08	3.04

Our motivation for undertaking this study is as follows: First, previous studies have not considered the impact of educational qualification on ACFEs' monitoring effectiveness (Badolato et al., 2014; Bedard et al., 2004; Zalata et al., 2018). For instance, Bedard et al. (2004) and Badolato et al. (2014) measured financial expertise by focusing on the individual's experience of the financial reporting process. Armstrong et al. (2015) and Zalata et al. (2018) measure financial expertise using ACFEs' job biography. These studies follow the strict definition of ACFE provided by SOX (2002). However, Article 54 of the 2002 corporate governance code of the Chinese Securities Regulatory Commission (CSRC) recognizes the importance of the educational background alongside professional qualification and experience (Chinese Securities Regulatory Commission, 2002). Unlike earlier US studies, we examine the impact of higher educational achievement and experience on ACFEs' ability to mitigate earnings management. Focusing on education and experience should help close the gap between theory and empirical findings.

Second, prior studies document the impact of gender on various organizational outcomes (Abou-El-Sood, 2021; Cardillo et al., 2021; Ezeani et al., 2022; Ezeani et al., 2021). These studies show that female directors constrain earnings management compared to their male counterparts. However, they failed to consider the financial expertise of female directors. Recently, Zalata et al. (2021) examined the impact of female directors' financial background on earnings management. However, unlike the current study, Zalata et al. (2021) focused on audit committee membership instead of ACFEs and defined financial background (expertise) based on work experience.

Third, our study is also motivated by previous studies, which suggest that the qualification and experience of directors will influence their effectiveness (Fernández-Temprano & Tejerina-Gaite, 2020; Ponomareva, 2019). Extant literature also shows that managers with a higher level of education, reputation, and professional experience exhibit superior financial knowledge that improves the company's performance (Francis et al., 2008; Li et al., 2016). In line with these studies, we expect ACFEs' qualifications and experience to influence their monitoring role positively.

Finally, most studies on ACFEs are conducted using data from US firms (Abernathy et al., 2015; Abernathy et al., 2013; Badolato et al., 2014; Bedard et al., 2004; DeFond et al., 2005; Zalata et al., 2021; Zalata et al., 2018) and relied on SOX's definition. These studies often assume that their findings are generalizable to emerging economies. However, Zalata et al. (2021) argue that their findings based on US firms are not easily generalizable to other countries. This view suggests the need to examine ACFEs' effectiveness within different institutional contexts. As an emerging economy, the Chinese institutional environment differs from the Anglo-American system (Komal et al., 2021). It is characterized by concentrated ownership, government interference, lower investor protection, a weak legal structure, and a two-tier board structure. In China, the prevailing conflict of interest between minority and controlling shareholders often results in an agency cost (Gul et al., 2010). In such an environment, we expect the educational profile, gender, and professional experience of ACFEs to have a significant negative impact on earnings management.

Using a sample of Chinese listed companies, our study explores the impact of ACFEs' educational background and professional experience on earnings management. We find that ACFEs' postgraduate

Table 2b
Univariate analysis.

Variable	ACFEs with Postgraduate degrees (n = 4512)	ACFEs with no postgraduate degree (n = 4264)	t-statistic	ACFEs with more experience (n = 5616)	ACFEs with less experience (n = 3160)	t-statistic
DAk	0.24	0.41	3.21***	0.25	0.37	4.70***
REM	−0.002	−0.003	0.13	−0.004	−0.001	0.09
ACFE_post				0.59	0.46	−14.05***
ACFE_exp	2.43	2.63	14.05***			
ACFE_female	0.30	0.21	−11.50***	0.26	0.24	−2.55**
SOE	0.52	0.46	−4.75***	0.48	0.55	7.55***
CrossList	0.04	0.06	3.10***	0.04	0.03	−2.05**
ACFE_age	3.86	3.89	9.99***	3.92	3.85	−3.91***
AC_ind	1.37	1.40	6.50***	1.38	1.40	3.60***
OWN	7.10	6.00	−3.8***	7.60	5.60	−6.85***
AC_size	1.03	1.13	10.45***	1.18	0.99	−9.55***
CFVOL	0.11	0.09	−5.15***	0.09	0.11	4.00***
SGVOL	0.12	0.12	1.10	0.11	0.13	7.80***
BIG4	0.07	0.07	1.35	0.07	0.08	3.15***
LEV	1.62	1.40	−7.90***	1.51	1.50	−0.80
SIZE	21.72	21.51	−9.65***	21.63	21.49	−8.25***
ROA	0.03	0.03	0.10	0.04	0.03	−6.35***
AC_meetings	2.10	2.13	5.10***	2.13	2.10	−4.05***

Notes: ***p < 0.01 and **p < 0.05. Definitions of the variables given in Appendix 1.

Table 3
Pearson correlation analysis.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. ACFE_post	1.00															
2. ACFE_exp	−0.18*	1.00														
3. ACFE_female	0.11*	−0.02*	1.00													
4. SOE	0.01	0.02*	0.07*	1.00												
5. CrossList	−0.03*	0.05*	0.04*	0.06*	1.00											
6. ACFE_age	−0.10*	−0.14*	0.02*	0.04*	0.12*	1.00										
7. AC_ind	0.07*	−0.03*	0.00	0.00	0.09*	0.18*	1.00									
8. OWN	−0.03*	−0.03*	−0.05*	−0.37*	−0.03*	−0.04*	−0.04*	1.00								
9. AC_size	0.10*	−0.14*	0.06*	0.08*	0.02*	0.18*	0.26*	−0.11*	1.00							
10. CFVOL	0.05*	−0.03*	0.02*	−0.09*	−0.04*	−0.02*	−0.04*	−0.04*	0.00	1.00						
11. SGVOL	0.02	0.01*	0.02*	−0.02*	−0.04*	0.01	0.00	−0.04*	0.01	0.19*	1.00					
12. BIG4	0.02	0.02*	0.03*	0.07*	0.22*	0.05*	0.04*	−0.03*	0.05*	−0.01*	−0.05*	1.00				
13. LEV	0.06*	−0.05*	0.02*	0.07*	0.07*	0.05*	0.08*	−0.10*	0.09*	0.04*	0.09*	0.01*	1.00			
14. SIZE	0.09*	0.03*	0.03*	0.17*	0.30*	0.22*	0.30*	0.02*	0.13*	−0.28*	−0.04*	0.16*	0.25*	1.00		
15. ROA	0.00	0.06*	0.00	−0.05*	0.04*	0.03*	0.04*	0.07*	−0.04*	−0.23*	0.02*	0.01*	−0.25*	0.16*	1.00	
16. AC_meetings	0.05*	−0.06*	0.00	−0.13*	0.10*	0.09*	0.10*	0.09*	0.06*	0.01	0.02*	0.02*	0.15*	0.22*	−0.03*	1.00

Notes: * represents 5% level of significance. Definitions of the variables given in Appendix 1.

qualifications and professional experience reduce earnings management, thus, contributing to higher financial reporting quality. We also find that female ACFEs with postgraduate degrees mitigate earnings management more effectively than their male counterparts. Likewise, female ACFEs with higher experience are significantly better at constraining earnings management than their male counterparts. Furthermore, in an additional analysis, we find that the ACFEs working in privately-owned Chinese firms better mitigate earnings management compared to those in state-owned Chinese firms. These findings are consistent with the results of robustness tests.

Our study contributes to contemporary corporate governance and accounting literature in three ways. First, unlike previous studies informed by SOX regulation, this study reflects the CSRC (2002) regulations' explicit goal to ensure that ACFEs' academic and professional qualification matches their monitoring role. These regulations require a firm to discuss the professional and educational qualifications, specific experiences, skills, and attributes of audit committee members, including whether they are a Certified Public Accountant (CPA).

Second, previous studies document contradictory evidence due to differences in the definition of financial expertise. We broadened the definition of expertise by going beyond mere accounting and financial expertise to include academic qualification and professional experience. We contribute to this ongoing debate by showing the monitoring effectiveness of ACFEs with postgraduate qualifications and professional experience.

Third, consistent with studies that suggest that female managers are more risk-averse and ethical (Doan & Iskandar-Datta, 2020; Hodges, 2020; Zalata et al., 2019), we show that female ACFEs in Chinese firms mitigate earnings management more than their male counterparts. Finally, because China is significantly different from the Anglo-American countries, our study provides important implications for China's regulators and opens horizons for future research.

The remainder of our paper is as follows: Section 2 provides background information on ACFEs and financial reporting quality in China. Section 3 discusses our theoretical perspectives. Section 4 presents a review of the relevant literature and covers the hypothesis development. The sample selection, methodology, and variables are discussed in Sections 5 and 6. The empirical results and discussion are presented in Section 7, and Section 8 presents the conclusion.

2. ACFEs and financial reporting quality in China

Audit committee roles and responsibilities in China were imported from the Anglo-American model (Wu et al., 2015). However, whether the Western corporate governance model is compatible in China is debatable, despite China's transition from a planned to a market-based economy. Major sources of this incompatibility between China and the Anglo-American system include the CSRC definition of ACFE and the variation in the institutional environment.

The CSRC (2002) required listed companies to set up an audit committee under the corporate governance code. In China, firms are expected to have independent audit committee members. The CSRC's code of corporate governance defines the responsibilities and roles of audit committee members in its 2002 code (Article 54). The CSRC recommends including academic qualification and professional experience alongside accounting and finance expertise. The State-Owned Assets Supervision and Administration Commission (SASAC) oversees, regulates, and manages state-owned enterprises (SOEs). The Shanghai and Shenzhen Stock Exchanges ensure compliance with CSRC regulations regarding the governance of the listed companies.

Previous studies examined the impact of ACFEs on financial reporting quality (Abernathy et al., 2015; Abernathy et al., 2013; Badolato et al., 2014; Bedard et al., 2004). We provide another piece of evidence on whether the monitoring role of ACFEs enhances the financial reporting quality of Chinese firms. Our study is relevant due to the prevalence of type II agency issues in China (Jiang et al., 2010). Huang

Table 4
Main OLS regression results.

Variables	(1) DAk	(2) DAk	(3) DAk	(4) DAk	(5) DAk	(6) DAk
ACFE_post	−0.041**	−0.039**	−0.040***			−0.045**
	(0.019)	(0.019)	(0.012)			(0.021)
ACFE_female		−0.090***	−0.098***	−0.076***	−0.077***	−0.079***
		(0.024)	(0.028)	(0.026)	(0.028)	(0.029)
ACFE_post * ACFE_female			−0.069***			−0.067***
			(0.026)			(0.025)
ACFE_exp				−0.025**	−0.028**	−0.039***
				(0.009)	(0.013)	(0.015)
ACFE_exp * ACFE_female					−0.051** (0.021)	−0.076*** (0.010)
SOE	−0.028	−0.030	−0.031	0.010	0.007	−0.026
	(0.026)	(0.026)	(0.029)	(0.015)	(0.013)	(0.024)
CrossList	−0.071***	−0.073***	−0.073***	−0.068***	−0.069***	−0.072***
	(0.010)	(0.010)	(0.009)	(0.009)	(0.010)	(0.010)
ACFE_age	−0.076***	−0.077***	−0.077***	−0.068***	−0.064***	−0.080***
	(0.013)	(0.011)	(0.013)	(0.014)	(0.012)	(0.014)
AC_ind	−0.026**	−0.028**	−0.027**	−0.040***	−0.043***	−0.029***
	(0.011)	(0.010)	(0.011)	(0.007)	(0.006)	(0.011)
OWN	−0.064***	−0.064***	−0.064***	−0.061***	−0.063***	−0.069***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
AC_size	−0.010**	−0.011**	−0.010**	−0.013***	−0.013***	−0.012***
	(0.004)	(0.005)	(0.004)	(0.003)	(0.004)	(0.004)
CFVOL	0.517***	0.519***	0.517***	0.510***	0.506***	0.511***
	(0.031)	(0.030)	(0.031)	(0.030)	(0.031)	(0.032)
SGVOL	1.035***	1.034***	1.034***	1.035***	1.040***	1.040***
	(0.032)	(0.030)	(0.032)	(0.034)	(0.032)	(0.033)
BIG 4	−0.020**	−0.022**	−0.022**	−0.026***	−0.028***	−0.020**
	(0.008)	(0.009)	(0.009)	(0.006)	(0.004)	(0.009)
LEV	0.009***	0.010***	0.008***	0.004***	0.006***	0.010***
	(0.002)	(0.002)	(0.004)	(0.001)	(0.002)	(0.002)
SIZE	0.029***	0.030***	0.029***	0.028***	0.027***	0.028***
	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.005)
ROA	0.331***	0.330***	0.330***	0.329***	0.338***	0.342***
	(0.040)	(0.040)	(0.042)	(0.040)	(0.038)	(0.041)
AC_meetings	0.007	0.008	0.006	0.006	0.009	0.010*
	(0.006)	(0.006)	(0.004)	(0.005)	(0.006)	(0.006)
Constant	−0.257***	−0.245***	−0.245***	−0.271***	−0.278***	−0.226***
	(0.069)	(0.069)	(0.069)	(0.069)	(0.069)	(0.069)
Observations	8,776	8,776	8,776	8,776	8,776	8,776
R-squared	0.306	0.320	0.336	0.305	0.308	0.351

Notes: Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.10. Definitions of the variables given in Appendix 1.

et al. (2016) argue that large Chinese investors are likely to channel resources away from the firm to the detriment of minority shareholders. The implication of control rights on the quality of financial reports makes it relevant to examine the impact of ACFEs' qualifications, professional experience, and gender on the financial reporting quality of Chinese firms.

3. Theoretical literature review

The upper echelons theory highlights that the top management's perception, values, and cognitions have a significant impact on the outcomes and choices of the firm (Hambrick & Mason, 1984). The theory posits that observable demographic characteristics such as gender, education, and work experience are suitable proxies to represent an individual's psychological attributes. Such management characteristics will ultimately manifest in a company's outcomes, choices, and strategies. Consistent with the upper echelon theory, prior studies found that gender, education, age, and experiences of the top management teams (TMTs) influence the extent of earnings management (Qi et al., 2018; Qi & Tian, 2012).

Raimo et al. (2021) highlighted that the audit committee's monitoring effectiveness and supervisory functions depend strictly on their demographic characteristics. Likewise, the human capital theory suggests that directors' academic knowledge and experience enable them to deal with complicated issues, such as earnings management (Martínez-Ferrero et al., 2016). Consistent with the upper echelons theory, gender-diverse boards should effectively understand markets (Carter et al., 2003). Hence, it would be interesting to examine the impact of the ACFEs characteristics, including gender, education, and experience, on earnings management among Chinese firms.

The earnings management issue is considered an agency conflict between managers and principals (Type I) or minority and majority shareholders (Type II) (Claessens et al., 2000). Li and Zhang (2010) pointed out that Chinese firms face severe Type II agency problems compared to Type I agency conflicts prevalent in Western firms. This type of agency problem arises among controlling and non-controlling shareholders. The Type II agency problem is due to the significant stock ownership of controlling shareholders that allows greater control over the board of directors (Huang et al., 2016).

Huang et al. (2016) show that the interests of large investors might not coincide with those of other investors, managers, and employees. Similarly, Jiang et al. (2010) argued that controlling shareholders have clear incentives to divert corporate wealth by tunnelling inter-corporate loans to exploit their interests. Previous studies show that the political interference and type II agency problem for SOEs is usually at the expense of the firm's profitability (Claessens et al., 2000; Jiang et al., 2010). The impact of control rights on earnings management is in line with the notion that controlling shareholders will manage the firm so that they can obtain private benefits. Thus, the type II agency conflict can increase the extent of earnings management among Chinese firms.

Regarding ACFEs, it is suggested that the audit committee's financial experience helps influences effective monitoring and constrains aggressive accounting practices (Zalata et al., 2018). The audit committee members need to have sufficient financial expertise given that

Table 5
Additional analyses: Company ownership and ACFEs education and experience levels.

Variables	SOEs	Non-SOEs	ACFEs with Post-graduate degrees	ACFEs with no post-graduate degrees	ACFEs with more experience	ACFEs with less experience
ACFE_post	−0.012	−0.029***			−0.026***	−0.018
	(0.007)	(0.009)			(0.008)	(0.021)
ACFE_female	−0.011	−0.093***	−0.068***	0.008	−0.048***	−0.022
	(0.008)	(0.020)	(0.015)	(0.026)	(0.014)	(0.020)
ACFE_post * ACFE_female	0.042	−0.092***			−0.079***	−0.027
	(0.028)	(0.021)			(0.024)	(0.020)
ACFE_exp	−0.017**	−0.032**	−0.036***	−0.031		
	(0.007)	(0.016)	(0.011)	(0.022)		
ACFE_exp * ACFE_female	−0.039***	−0.125***	−0.072***	0.012		
	(0.010)	(0.010)	(0.016)	(0.019)		
SOE			−0.006	0.004	−0.033*	0.030*
			(0.007)	(0.007)	(0.017)	(0.016)
CrossList	−0.084***	−0.061***	−0.085***	−0.092***	−0.088***	−0.077***
	(0.022)	(0.010)	(0.010)	(0.019)	(0.015)	(0.011)
ACFE_age	−0.087***	−0.053***	−0.109***	−0.040*	−0.053**	−0.093***
	(0.021)	(0.019)	(0.021)	(0.021)	(0.025)	(0.016)
AC_ind	−0.024	−0.036***	−0.035**	−0.01	0.015	−0.037**
	(0.017)	(0.013)	(0.015)	(0.016)	(0.015)	(0.016)
OWN	−0.068***	−0.398	−0.046***	−0.060***	−0.129***	−0.020
	(0.014)	(0.264)	(0.015)	(0.022)	(0.024)	(0.014)
AC_size	−0.017**	−0.007	−0.004	−0.013**	−0.017***	0.002
	(0.007)	(0.005)	(0.005)	(0.007)	(0.006)	(0.005)
CFVOL	0.525***	0.529***	0.443***	0.713***	0.619***	0.465***
	(0.043)	(0.035)	(0.026)	(0.099)	(0.052)	(0.037)
SGVOL	1.059***	1.025***	1.187***	0.846***	1.065***	0.969***
	(0.047)	(0.040)	(0.042)	(0.045)	(0.040)	(0.045)
BIG 4	−0.042	0.007*	−0.048	0.026	−0.018	−0.012
	(0.030)	(0.004)	(0.032)	(0.019)	(0.013)	(0.013)
LEV	−0.015	−0.057**	0.034	−0.130***	−0.092***	−0.037
	(0.026)	(0.023)	(0.023)	(0.030)	(0.025)	(0.026)
SIZE	0.048***	0.012***	0.024***	0.037***	0.028***	0.029***
	(0.006)	(0.003)	(0.004)	(0.005)	(0.004)	(0.005)
ROA	0.301***	0.370***	0.271***	0.473***	0.330***	0.298***
	(0.057)	(0.060)	(0.058)	(0.070)	(0.058)	(0.061)
AC_meetings	−0.015*	0.013*	0.009	−0.000	−0.017**	0.027
	(0.009)	(0.007)	(0.007)	(0.009)	(0.008)	(0.18)
Constant	−0.595***	0.011	−0.098	−0.534***	−0.274**	−0.252***
	(0.123)	(0.092)	(0.081)	(0.130)	(0.113)	(0.092)
Observations	8,776	8,776	8,776	8,776	8,776	8,776
R-squared	0.290	0.260	0.310	0.339	0.340	0.349

Notes: Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.10. Definitions of the variables given in Appendix 1.

they are responsible for the financial reporting processes of the firm. Also, previous studies claimed that female directors' presence is one way to enhance board monitoring (Ezeani et al., 2022; Ezeani et al., 2021; Srinidhi et al., 2011; Zalata et al., 2021). Chizema et al. (2015) provided a view from social role theory that female directors enhance the breadth and depth of deliberations and discussion, specifically those linked to challenging issues such as earnings management. Similarly, Adams and Ferreira (2009) argued that female directors are likely to provide greater monitoring and oversight because they do not belong to the "old-boy" network. Based on psychological and behavioral theories, Srinidhi et al. (2011) highlighted that female directors have stronger monitoring incentives, exhibit better attendance, and demand great accountability from their Chief Executive Officers (CEOs). The close monitoring by female directors reduces information asymmetry and encourages more public disclosure by restraining managers from using insider information for their gains (Srinidhi et al., 2011). Likewise, female directors tend to be more risk-averse and conservative than their male counterparts and are less likely to allow managerial opportunism (Harris et al., 2019; Zalata et al., 2021). Therefore, it would be interesting to examine whether female ACFEs help Chinese firms to mitigate earnings management.

4. Empirical literature review and hypotheses development

4.1. ACFEs educational level and earnings management

The directors' educational profile is considered a crucial asset for public companies. Human capital theory suggests that the educational background and knowledge of directors' are beneficial to the firms because it allows them to provide unique human capital to the boardroom (Becker, 2009). Fama and Jensen (1983) argue that managers require substantial expertise to carry out their board duties. Consistent with this view, firms increasingly recognize the importance of human capital as a driver to enhance overall firm performance (Volonté & Gantenbein, 2016). Prior studies also show that managers' education ensures effective monitoring (Bonner & Walker, 1994). Malmendier and Tate (2009) pointed out that higher education and certification are critical to gaining sufficient expertise and knowledge of the monitored domain.

Consistent with the upper echelons theory, Li et al. (2016) found that directors and TMTs with higher education levels are likely to have superior financial knowledge that improves the firm's operating performance. Wang et al. (2017) found that highly educated boards of Taiwanese listed firms provide effective monitoring and efficient advisory function. Similarly, Khanna et al. (2014) used a sample of Fortune 1000 and reported that a company's performance is positively linked

Table 6
Robust analysis using REM as alternative proxy of earnings management.

Variables	(1) REM	(2) REM	(3) REM	(4) REM	(5) REM	(6) REM
ACFE_post	−0.021**	−0.019**	−0.020**			−0.024**
	(0.009)	(0.008)	(0.010)			(0.011)
ACFE_female		−0.022**	−0.027**	−0.024***	−0.021***	−0.034**
		(0.011)	(0.013)	(0.008)	(0.007)	(0.017)
ACFE_post * ACFE_female			−0.032***			−0.042**
			(0.010)			(0.021)
ACFE_exp				−0.031***	−0.035***	−0.042***
				(0.008)	(0.009)	(0.013)
ACFE_exp * ACFE_female					−0.045***	−0.063***
					(0.014)	(0.019)
SOE	0.003	0.002	0.004	0.002	0.004	0.005
	(0.005)	(0.004)	(0.005)	(0.003)	(0.004)	(0.005)
CrossList	−0.028***	−0.030***	−0.030***	−0.028***	−0.028***	−0.030***
	(0.010)	(0.011)	(0.010)	(0.011)	(0.009)	(0.010)
ACFE_age	−0.062***	−0.065***	−0.065***	−0.062***	−0.064***	−0.071***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
AC_ind	0.051***	0.053***	0.052***	−0.009*	−0.012*	0.054**
	(0.012)	(0.013)	(0.012)	(0.005)	(0.007)	(0.023)
OWN	−0.013	−0.011	−0.013	−0.013	−0.012	−0.014
	(0.017)	(0.016)	(0.017)	(0.015)	(0.014)	(0.017)
AC_size	−0.018***	−0.016***	−0.016***	−0.017***	−0.017***	−0.016***
	(0.006)	(0.004)	(0.004)	(0.006)	(0.005)	(0.004)
CFVOL	−0.094***	−0.093***	−0.092***	−0.096***	−0.094***	−0.090***
	(0.022)	(0.021)	(0.018)	(0.021)	(0.020)	(0.020)
SGVOL	0.082***	0.080***	0.081***	0.080***	0.078***	0.079***
	(0.020)	(0.021)	(0.019)	(0.021)	(0.018)	(0.021)
BIG4	−0.011	−0.010	−0.011	−0.009	−0.012	−0.012
	(0.008)	(0.009)	(0.007)	(0.008)	(0.009)	(0.008)
LEV	0.003***	0.001***	0.004***	0.003***	0.001***	0.002***
	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
SIZE	0.006**	0.005**	0.005**	0.006**	0.004**	0.004**
	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
ROA	−0.627***	−0.629***	−0.628***	−0.629***	−0.633***	−0.631***
	(0.044)	(0.040)	(0.044)	(0.042)	(0.041)	(0.040)
AC_meetings	0.009**	0.004**	0.006**	0.004**	0.007*	0.005**
	(0.004)	(0.002)	(0.003)	(0.002)	(0.004)	(0.002)
Constant	0.105	0.124*	0.123*	0.120*	0.124*	0.144**
	(0.065)	(0.066)	(0.066)	(0.066)	(0.066)	(0.067)
Observations	8,776	8,776	8,776	8,776	8,776	8,776
R-squared	0.279	0.280	0.287	0.279	0.281	0.328

Notes: Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.10. Definitions of the variables given in Appendix 1.

with the education level of directors.

Hence, it is expected that ACFEs with postgraduate education are likely to have a higher cognitive ability in analyzing information effectively, thereby reducing misrepresentation of earnings. Abernathy et al. (2015) highlighted that the contribution of ACFEs is higher if they possess a higher level of education in auditing or accounting. Hillman and Dalziel (2003) argued that the board of directors' human capital shapes their capacity to govern and provide guidance to the management. The independent (outside) director is expected to be actively involved in strategic decisions and reduce managerial opportunism (Zalata et al., 2018). Therefore, educational attainment is of utmost importance as they enable directors to understand the company's operations, technology, and overall industry conditions. Although not much is known about how the educational achievement of board members influence earnings management, prior studies found that highly educated board members positively impact firm performance (Fernández-Temprano & Tejerina-Gaite, 2020; Volonté & Gantenbein, 2016).

In the Chinese context, few studies, such as Li et al. (2016), found a negative association between TMTs who hold a master's degree and real earnings management among Chinese listed firms, meaning that higher levels of education mitigates earnings management. Qi et al. (2018) reported that TMTs' knowledge and level of education constrain accrual earnings management. However, previous studies have not covered ACFEs education's impact on earnings management. Thus, we infer from prior literature and human capital theory that ACFEs with a postgraduate qualification are more likely to constrain earnings management and hypothesized that:

H1: There is a negative association between postgraduate ACFEs and earnings management.

4.2. *ACFEs gender and earnings management*

Prior studies suggest that women value academic qualifications because it increases their credibility and helps them gain recognition in their area of expertise (Bennouri et al., 2018). The upper echelons theory highlights that management's values, perceptions, and cognitions predict organizational outcomes, such as performance and strategic choices (Hambrick & Mason, 1984). It is also suggested that education helps an individual demonstrate the required cognitive ability that influences the quality of the outcomes (Du et al., 2018; Papadakis & Barwise, 2002; Wiersema & Bantel, 1992).

Also, Hillman et al. (2002) pointed out that female directors are better educated and have more business degrees than male directors. This higher qualification helps them develop their cognitive abilities and acquire the technical skills required for their monitoring role. Regarding the impact of female executives on earnings management, a considerable body of literature suggest that female directors ensure effective monitoring (Ezeani et al., 2023;Usman, Ezeani, et al., 2022; Usman, Nwachukwu, et al., 2022; Usman, Salem, et al., 2022; Zalata et al., 2019). Female directors are more conservative (Vähämaa, 2014) and,

Table 7
Robust analysis using GMM estimation.

VARIABLES	ACFEs and postgraduate degrees (ACFE_post)			ACFE and experience level (ACFE_exp)		
	(1) DAk	(2) DAk	(3) DAk	(4) DAk	(5) Dak	(6) DAk
Lag (1)	0.565***	0.581***	0.486***	0.439***	0.535***	0.625***
	(0.049)	(0.043)	(0.035)	(0.034)	(0.032)	(0.041)
ACFE_post	−0.052***	−0.059***	−0.059**			−0.004**
	(0.015)	(0.017)	(0.025)			(0.002)
ACFE_female		−0.055**	−0.125***	−0.009*	−0.040*	−0.062**
		(0.024)	(0.047)	(0.005)	(0.021)	(0.030)
ACFE_post * ACFE_female			−0.220***			−0.101**
			(0.090)			(0.046)
ACFE_exp				−0.040***	−0.032**	−0.040**
				(0.012)	(0.016)	(0.017)
ACFE_exp * ACFE_female					−0.91**	−0.103**
					(0.037)	(0.047)
SOE	0.016	0.019	0.051	0.072	0.034	0.035
	(0.028)	(0.022)	(0.034)	(0.061)	(0.028)	(0.026)
CrossList	−0.007	−0.012*	−0.013*	−0.004	0.005	−0.014*
	(0.010)	(0.007)	(0.007)	(0.010)	(0.010)	(0.008)
ACFE_age	−0.016	−0.016	−0.016	−0.061**	−0.062**	−0.016
	(0.049)	(0.070)	(0.052)	(0.030)	(0.031)	(0.063)
AC_ind	−0.029**	−0.061**	−0.048**	−0.042***	−0.038***	−0.042**
	(0.013)	(0.030)	(0.023)	(0.014)	(0.013)	(0.021)
OWN	0.009	0.009	0.004	0.007*	0.007*	0.006
	(0.005)	(0.005)	(0.006)	(0.004)	(0.004)	(0.005)
AC_size	−0.004	−0.004	−0.005	−0.012*	−0.017*	−0.006
	(0.017)	(0.019)	(0.018)	(0.007)	(0.009)	(0.014)
CFVOL	0.006***	0.005***	0.007***	0.004***	0.004***	0.008***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
SGVOL	0.440***	0.435***	0.429***	0.440***	0.434***	0.427***
	(0.048)	(0.047)	(0.047)	(0.046)	(0.047)	(0.048)
BIG4	−0.012	−0.017	−0.017	0.018	0.016	−0.018
	(0.021)	(0.020)	(0.020)	(0.019)	(0.018)	(0.024)
LEV	0.008	0.009	0.013*	0.019*	0.017*	0.005
	(0.017)	(0.014)	(0.007)	(0.011)	(0.009)	(0.012)
SIZE	0.008***	0.009***	0.011***	0.010***	0.010***	0.010***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
ROA	0.012**	0.014***	0.010*	0.015***	0.014***	0.013**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
AC_meetings	0.249**	0.267**	0.219**	0.254	0.250	0.246
	(0.120)	(0.130)	(0.102)	(0.260)	(0.270)	(0.250)
Constant	−0.219*	−0.120*	−0.145*	−0.165***	−0.168***	−0.138*
	(0.131)	(0.065)	(0.080)	(0.064)	(0.062)	(0.076)
Observations	7,477	7,477	7,477	7,477	7,477	7,477
Hansen p-value	0.182	0.174	0.198	0.165	0.201	0.194
AR(2) p-value	0.145	0.131	0.128	0.162	0.175	0.159

Notes: Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.10. Definitions of the variables given in Appendix 1.

most times, better educated (Hillman et al., 2002). Likewise, several studies document that female presence in TMTs significantly mitigates earnings management (Li et al., 2021). However, these studies focus on females' role in TMTs. Our study contributes to the literature by examining the impact of female ACFEs education on earnings management. We contend that the technical skills and fresh perspectives these female directors bring to the board will help them develop more effective strategies to detect earnings management. In line with these studies, we formulate the following hypothesis:

H2: Female ACFEs are more likely to mitigate earnings management than male ACFEs.

4.3. ACFEs' professional experience

Professional experience is skill and knowledge acquired through work experience (Hillman & Dalziel, 2003). The behavioral decision theory suggests that the performance of an individual is based on their experience (Ye et al., 2014). Prior literature indicates that experienced managers reduce information asymmetry (Haleblian & Finkelstein, 1993; Li et al., 2016), thereby mitigating earnings management. For instance, Hsieh et al. (2018) reported that TMTs with more extensive professional experience reduce the extent of earnings management because they possess more experience and knowledge regarding the costs of earnings manipulation. However, these studies failed to consider whether ACFEs with more professional experience mitigate earnings management.

The resource dependence theory suggests that directors access resources through their human capital through knowledge and skills gained from professional experience. Kaplan et al. (2011), and Ittonen et al. (2015) highlighted that more extensive professional experience reduces the risk of any potential earnings manipulation and improves earnings quality. Prior studies in the Chinese setting documented that CEO professional experience (Jiang et al., 2013) and TMTs working experience (Qi et al., 2018) constrain managers' opportunistic behavior. Based on these arguments, our study extends the prior literature by examining the ACFEs' professional experience role in mitigating earnings management and formulates the following hypothesis:

H3: There is a negative association between ACFE's professional experience and earnings management.

Table 8
Robust analysis with Heckman two-stage model.

Variables	ACFE and postgraduate degrees (ACFE_post)			ACFE experience level (ACFE_exp)		
	(1) DAk	(2) DAk	(3) DAk	(4) DAk	(5) DAk	(6) DAk
ACFE_post	−0.090***	−0.084***	−0.118***			−0.071***
	(0.010)	(0.010)	(0.019)			(0.018)
ACFE_female		−0.042***	−0.036***	−0.028**	−0.050***	−0.063***
		(0.007)	(0.008)	(0.012)	(0.016)	(0.020)
ACFE_post * ACFE_female			−0.126***			−0.074***
			(0.028)			(0.020)
ACFE_exp				−0.018***	−0.005**	−0.014***
				(0.004)	(0.002)	(0.004)
ACFE_exp * ACFE_female					−0.036**	−0.064***
					(0.016)	(0.009)
SOE	−0.009	−0.010	−0.009	−0.008	−0.008	−0.007
	(0.007)	(0.008)	(0.007)	(0.007)	(0.008)	(0.006)
CrossList	−0.061***	−0.061***	−0.060***	−0.053***	−0.055***	−0.060***
	(0.012)	(0.010)	(0.012)	(0.011)	(0.010)	(0.010)
ACFE_age	−0.095***	−0.095***	−0.095***	−0.097***	−0.093***	−0.111***
	(0.018)	(0.017)	(0.017)	(0.019)	(0.019)	(0.020)
AC_ind	−0.038**	−0.033**	−0.037**	−0.035***	−0.043***	−0.029***
	(0.014)	(0.016)	(0.015)	(0.010)	(0.006)	(0.011)
OWN	−0.077***	−0.077***	−0.074***	−0.071***	−0.074***	−0.083***
	(0.020)	(0.022)	(0.020)	(0.021)	(0.022)	(0.022)
AC_size	−0.012	−0.013	−0.014	−0.019	−0.020	−0.019
	(0.017)	(0.018)	(0.017)	(0.016)	(0.017)	(0.019)
CFVOL	0.593***	0.593***	0.590***	0.584***	0.577***	0.579***
	(0.040)	(0.037)	(0.039)	(0.037)	(0.038)	(0.037)
SGVOL	1.063***	1.063***	1.061***	1.067***	1.073***	1.072***
	(0.039)	(0.037)	(0.040)	(0.039)	(0.035)	(0.039)
BIG4	−0.037***	−0.036***	−0.034***	−0.035***	−0.034***	−0.030***
	(0.010)	(0.011)	(0.009)	(0.011)	(0.010)	(0.011)
LEV	0.005***	0.006***	0.004***	0.004***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
SIZE	0.034***	0.034***	0.033***	0.033***	0.032***	0.032***
	(0.004)	(0.006)	(0.004)	(0.005)	(0.004)	(0.003)
ROA	0.420***	0.419***	0.414***	0.416***	0.419***	0.421***
	(0.053)	(0.053)	(0.052)	(0.053)	(0.053)	(0.052)
AC_meetings	0.019**	0.016**	0.015*	0.009*	0.007*	0.010*
	(0.009)	(0.008)	(0.008)	(0.005)	(0.004)	(0.006)
IMR	0.230***	0.234***	0.228***	0.298***	0.243***	0.266***
	(0.002)	(0.002)	(0.006)	(0.005)	(0.004)	(0.004)
Constant	−0.356***	−0.351***	−0.336***	−0.321***	−0.323***	−0.257***
	(0.076)	(0.077)	(0.076)	(0.076)	(0.076)	(0.076)
Observations	8,776	8,776	8,776	8,776	8,776	8,776
R-squared	0.351	0.354	0.355	0.353	0.359	0.363

Notes: Standard errors in parentheses. ***p < 0.01, **p < 0.05, *p < 0.10. Definitions of the variables given in Appendix 1.

4.4. ACFEs gender, professional experience, and earnings management

Prior studies find that the professional experience of executives influences their overall decision-making (Malmendier & Nagel, 2011; Owusu et al., 2022). Malmendier and Nagel (2011) show that CEOs' who have experienced macroeconomic shocks are more risk-averse in their financing decision. In line with the human capital theory, it has also been suggested that the working experience of audit committee members influences their effectiveness in mitigating earnings management behavior (Xie et al., 2003). Female directors are less likely to have extensive experience than male directors (Singh et al., 2008). Van Velsor and Hughes (1990) suggests that women's careers are mostly interrupted, hindering their chances of acquiring extensive work experience. Women aspirants to the board are driven to gain more experience than male colleagues to overcome the glass ceiling. Mathisen et al. (2013) suggest that women who successfully climbed the corporate ladder as directors have greater career experience. Abbasi et al. (2020) argue that female directors or audit committee members accumulate more human capital, such as experience and knowledge, which assists them in improving their monitoring of financial reporting quality. Thus, previous studies in the Chinese context show that females in TMTs reduce the extent of earnings management (Li et al., 2021; Qi et al., 2018). Based on the above argument, we infer that female ACFEs experience assists them in constraining earnings management. We hypothesized that:

H4: Female ACFEs with professional experience have a negative impact on earnings management than male ACFEs.

5. Research design

5.1. Data and sample

Our sample comprises Chinese non-financial companies listed on Shanghai and Shenzhen stock exchanges from 2006 to 2018. The data regarding earnings management, the company's characteristics, and control variables were collected from the China Stock Market and Accounting Research (CSMAR) database. We manually[1] extracted ACFEs' data related to their academic qualifications and professional experience after merging two data sets from CSMAR: 'the independent directors' personal characteristics' dataset with the 'audit committee members' information' dataset by matching their names. After merging the data of all variables, we obtained a final sample of 8,776 firm-year observations,

[1] For accuracy, we manually calculated the ACFEs data after removing the overlapping or duplicates records for each year in the same company.

as shown in Table 1.

The current study explores the impact of ACFEs education and experience on earnings management by applying a static ordinary least square (OLS) and the difference generalized method of moments (GMM) model. The static model supposes that company accruals management is easily observed.

On the other hand, the dynamic model has several advantages because it estimates companies' unobserved target earnings manipulation and shows their overall adjustment behavior. GMM offers robust estimates, thereby mitigating endogeneity and short panel bias.

To test our hypotheses, we used the following static regression model:

$$\begin{aligned} DAk_{it} = {} & \beta_{0i} + \beta_1 ACFE\_post_{it} + \beta_2 ACFE\_female_{it} \\ & + \beta_3 ACFE\_post_{it} * ACFE\_female_{it} + \beta_4 ACFE\_exp_{it} \\ & + \beta_3 ACFE\_exp_{it} * ACFE\_female_{it} + \beta Controls + u_{it} \end{aligned} \quad (1)$$

6. Measurement of variable

6.1. Dependent variable

The most widely used proxies to measure discretionary accruals (DA) are the Jones (1991) model and the modified Jones models (Dechow et al., 1995). However, previous studies argue that measuring DA without controlling for the company's performance will produce misspecification in the earnings management model (Dechow et al., 1995; Salem et al., 2020; Salem et al., 2021). Therefore, they propose a model that includes an intercept and controls for the firm's performance using return on assets (ROA). They argue that this model mitigates heteroskedasticity and avoids misspecification in the aggregate accruals models. Therefore, we used the performance-adjusted model of Kothari et al. (2005) as presented in Eq. (2).

$$\frac{TA_{it}}{A_{it-1}} = \alpha_1 \frac{1}{A_{it-1}} + \alpha_2 \frac{(\Delta REV_{it} - \Delta REC_{it})}{A_{it-1}} + \alpha_3 \frac{PPE_{it}}{A_{it-1}} + \alpha_3 \frac{ROA_{it}}{A_{it-1}} + \varepsilon_{it} \quad (2)$$

where

TA_{it} = total accruals in year t divided by total assets in year $t-1$,
ΔREV_{it} = the change in revenues of a company i between years t and $t-1$,
ΔREC_{it} = the change in revenues of the company i between years t and $t-1$,
PPE_{it} = gross property plant and equipment in year t,
ROA_{it} = return on assets of the company i in year t.
A_{it-1} = total assets in year $t-1$,
ε_{it} = discretionally accruals/ residuals in year t.

Our dependent variable of earnings management is DAk_{it}, measured through the standard deviation of the residuals of the discretionary accruals from the performance-adjusted model during the 5 years before the year t. In additional tests, we used real activities earnings management (REM) as an alternative proxy of earnings management, and followed Roychowdhury (2006) by measuring it by totaling abnormal cash from operations, abnormal production costs, and abnormal discretionary expenses.

6.2. Independent variables

There are three main independent variables. $ACFE\_post_{it}$ is a dummy variable coded 1 if ACFEs have post-graduation qualification, such as master's and doctoral degrees, and 0 otherwise. $ACFE\_exp_{it}$ is the professional experience of ACFEs, measured by total number of years of experience working as a financial expert. $ACFE\_female_{it}$ is coded 1 if female financial expert, and 0 if male financial expert.

6.3. Moderating variables

We include two moderating variables. $ACFE\_post_{it}$ * $ACFE\_female_{it}$ is the interaction variable of post-graduate ACFEs and female ACFEs. $ACFE\_exp_{it}$* $ACFE\_female_{it}$ is the interaction variable of professional experience of ACFEs and female ACFEs.

6.4. Control variables

Based on the prior literature, several control variables are included. SOE_{it} is coded 1 if a Chinese listed company is a state-owned enterprise, and 0 otherwise. $CrossList_{it}$ is coded 1 if a Chinese listed company is also listed in the Hong Kong stock exchange, and 0 otherwise. $ACFE\_age_{it}$ is the natural log of the age of the ACFE in years. AC_ind_{it} is the total number of independent directors on an audit committee. OWN_{it} is the natural log of the number of shares held by top management of a company. AC_size_{it} is the natural log total members of an audit committee. $CFVOL_{it}$ is the standard deviation of cash flows scaled by total assets over the previous 5-year window. $SGVOL_{it}$ is the standard deviation of sales scaled by total assets over the previous 5-year window. $BIG4_{it}$ is coded 1 if the auditor is from a big 4 audit firm, and 0 otherwise. LEV_{it} is leverage, measured by the ratio of debt to total assets. $SIZE_{it}$ is the natural log of the total assets. ROA_{it} is the return on total assets. $AC\_meetings_{it}$ is the total number of audit committee meetings in a year.

To check the robustness of the results, we performed the following tests: 1) we split the sample into state-owned and privately-owned Chinese companies; 2) we split the sample into ACFEs with and without postgraduate qualifications; and 3) we split the sample as ACFEs with higher and lower experience. We also used real earnings management as an alternative proxy of earnings management and the difference GMM model. Following Zalata, Ntim, Choudhry, et al. (2019), we used the industry average proportion of postgraduate ACFEs, female ACFEs, and ACFE experience in their respective models as shown in Eq. (1). Finally, we employed Heckman's two-stage models as an alternative method for robust results.

7. Empirical results and discussion

Table 2a shows the descriptive statistics of our sample. The dependent variable, earnings management (DAk), has 0.24 as an average value of the standard deviation of the residuals of the discretionary accruals from the performance-adjusted model during the five years before the year t. This is consistent with Qi et al. (2018), which reported.203. The average value of ACFEs with postgraduate qualifications (ACFE_post) is 0.51, showing that half of the ACFEs in our sample have a postgraduate qualification. The average professional experience of ACFEs (ACFE_exp) with multiple directorships is 2.52 years. Descriptive statistics of the control variables are also reported in Table 1.

Table 2b provides the univariate analysis, comparing the different samples, such as ACFEs with and without postgraduate qualifications, using t-tests. ACFEs with postgraduate qualifications have lower performance-adjusted accruals (earnings management) value of 0.24 than their counterpart ACFEs without postgraduate qualifications with a mean value of 0.41 ($p < 0.01$). We found that ACFEs with higher experience have lower performance-adjusted accruals (earnings management) values than ACFEs with less experience.

Table 3 describes the Pearson correlation coefficients between independent and control variables used to detect the possible chances of multicollinearity. The correlations between independent and control variables is less than the 0.70. Thus, the model has little chance of multicollinearity.

Table 4 presents the results that examine the main and interaction relationship between ACFEs' education, gender, experience, and financial reporting quality. Model 1 on Table 4 shows a negative relationship between ACFEs with postgraduate qualifications and earnings management ($\beta = -0.041$, $p < 0.05$). Our empirical finding shows that

Chinese ACFEs with postgraduate qualifications in auditing or accounting significantly reduce managerial opportunism in firms. Thus, it supports H1 in line with upper echelon and human capital theories. These findings support previous studies on the impact of corporate governance on earnings management (Habib & Jiang, 2015; Hsieh et al., 2018; Wang et al., 2017). Our results support the view that postgraduate ACFEs significantly enhance the audit committee's effectiveness in ensuring the quality of financial reports (Alhababsah & Yekini, 2021; Cohen et al., 2014). Therefore, our finding provides implications for the regulators and top management of companies because it suggests the effectiveness of ACFEs with postgraduate qualifications.

Model 2 on Table 4 shows the relationship between female ACFEs and earnings management. We find that female ACFEs negatively and significantly affect earnings management ($\beta = -0.090$, $p < 0.01$). Consistent with our expectations, our findings show that female ACFEs mitigate managerial opportunism and supports previous studies (Abou-El-Sood, 2021; Alhababsah & Yekini, 2021; Zalata et al., 2018). Model 3 of Table 4 shows the moderating effect of female ACFEs with postgraduate qualifications. The coefficient value ($\beta = -0.069$) of the interaction variable indicates that female ACFEs with postgraduate qualification significantly mitigates earnings management. These findings support H2. Our findings align with the upper echelon theory and prior studies that claim postgraduate female ACFEs significantly mitigate earnings management (Alhababsah & Yekini, 2021; Qi et al., 2018; Zalata et al., 2019). Thus, this finding has practical implications for companies' regulators and top management to have more female postgraduate ACFEs in an audit committee to better monitor financial reporting quality.

Model 4 of Table 4 presents the results of the ACFEs' experience and earnings management. We find that the ACFEs' professional experience has a negative impact on earnings management ($\beta = -0.025$, $p < 0.05$). Thus, it supports H3 and behavioral decision and resource dependence theories. Our finding supports prior literature, highlighting the significance of professional experience in mitigating earnings management (Hsieh et al., 2018; Ittonen et al., 2015). Model 5 shows the moderating effect of female ACFEs and ACFEs experiences. The result of the interaction variable (ACFE experience × ACFE female) indicates that female ACFEs with experience significantly mitigate earnings management ($\beta = -0.051$, $p < 0.05$). Our findings support the prior research, which argues that female ACFEs with experience effectively constrain earnings management (Abbasi et al., 2020; Belaounia et al., 2020). These findings support H4. Hence, another practical implication encourages the regulators and top management of companies to hire more experienced female postgraduate ACFEs to enhance a company's financial reporting quality. Finally, Model 6 presents the results when using all the variables of interest, and our findings are hold as all the variables of interest are significant.

Table 5 presents additional results by splitting the sample into state-owned (SOEs) in Model 1 and privately-owned enterprises (non-SOEs) in Model 2. In the case of SOEs, we find that financial reporting quality is not significantly associated with ACFEs with a postgraduate qualification and female ACFEs. However, we find a significant relationship between ACFE experience, its interaction (ACFE experience and ACFE female), and financial reporting quality. On the other hand, in the case of non-SOEs, the results show a significant relationship between our variables of interest (e.g., ACFEs with a postgraduate qualification, female ACFEs, ACFEs' experience, and their interaction) and earnings management. Our findings are more pronounced in the case of privately-owned firms.

This finding highlights that ACFEs are relatively more effective in mitigating earnings management in privately-owned companies with better corporate governance than ACFEs in SOEs, and is consistent with previous studies (D'souza & Megginson, 1999; Gaio & Pinto, 2018). Prior research in the Chinese context has inconclusive evidence regarding the ownership structure and financial reporting quality. On the one hand, studies such as Chen et al. (2011) and Gompers et al. (2003) found that SOE managers are more unlikely to manipulate earnings than non-SOEs. On the other hand, few studies argue that SOEs frequently have political interference, insufficient monitoring procedures, and significant agency issues, which may increase managers' motivation to engage in unethical practice (Fan & Wang, 2019; Huang et al., 2011). Our research guides regulators and management of state-owned high-polluting firms in China. It advises addressing institutional challenges, like CEO authority and government influence, to strengthen ACFEs' oversight of financial reporting quality.

Table 5 also presents additional results by splitting the sample into ACFEs' education and experience categories. Models 3 and 4 of Table 5 report the results of the sample with and without ACFEs with a postgraduate qualification, respectively. We found significant results only in the sample of postgraduate ACFEs. Model 5 and 6 of Table 5 report the results of ACFEs with higher and lower experience, respectively, and we find significant results only in the case of higher experience ACFEs sample.

Table 6 presents the robust results using an alternative and widely used proxy of earnings management, real earnings management (REM). As described in section 6.1, it is the sum of abnormal cash flows from operations, abnormal production costs and abnormal discretionary expenses. Consistent with our expectations, our findings are similar to our main results.

Finally, we reran the results with difference GMM and Heckman's two-stage model. The dynamic GMM model addresses the possible endogeneity issues in our model and checks the robustness of our results. Our findings in Table 7 indicate that our results still hold after employing dynamic GMM. The Hansen value is as expected ($p > 0.10$). All the variables of interest have similar signs and significance to the main results in Table 4.

Table 8 reports the results of the Heckman two-stage model. Following Heckman (1976), we compute the inverse Mills ratio (*IMR*) from a probit model in the first-stage model. As treatment variables, we used ACFEs with postgraduate qualifications. We employed ACFEs with higher and lower experience as dummy variables. Following Zalata et al. (2019), we also used the independent and control variables shown in Eq. (1) and average education and experience of ACFEs in the industry as our instrumental variables for ACFEs with postgraduate qualification and ACFEs' experience models. In the second stage, we add the inverse Mills ratio as an additional variable to Eq. (1) to address any possible chances of endogeneity. Our findings reported in Table 8 are qualitatively similar to the results documented under the main analysis in Table 4.

We expect that the findings so far have various imperative implications for practice. First, the regulatory bodies in China, such as the CSRC, need to have an active role in improving the transparency and independence of an audit committee for better monitoring of financial reporting quality, and this might be done by ensuring that ACFEs have higher education and experience. Prior studies reveal that the lack of independence is the fundamental issue affecting the operation of audit committees. The influence of management in selecting the audit committee and shaping its operations often resulted in compromising independence (Wu et al., 2015). We recommend that the CSRC require listed companies to have an independent and transparent oversight board. The independent board should appoint an audit committee to enhance their independence, thereby assisting ACFEs in performing their active monitoring role. We also recommend that the SASAC ensure the lesser involvement of management in the audit committee decisions in SOEs to ensure better financial reporting quality. The board should independently select the audit committee without the involvement of the influential executives (e.g., CEO and Chief Financial Officer (CFO)) and ensure the recognition and authority of the audit committee. During their term, the board should actively eliminate any organizational factors, such as political connections of management and controlling shareholders, that might influence the effectiveness of ACFEs in performing their functions (Boivie et al., 2016).

The US Securities and Exchange Commission (SEC) (2015) revisions regarding audit committee disclosures mainly focus on the audit committee's oversight of the external auditor and ignore important policy reforms to audit committee composition. Our results have important implications for regulators in China (e.g., CSRC and SASAC) and other developing countries. ACFEs with higher knowledge and expertise should be appointed to audit committees.

8. Conclusions

The crucial role of ACFEs in overseeing the financial reporting process is well recognized in the corporate governance literature. Prior research explored the mere presence of ACFEs in the audit committee and their monitoring role in constraining the management's opportunistic behavior. However, there is no evidence regarding the role of human capital elements in ACFEs, such as the education profile and professional experience, in mitigating earnings management. Although recent accounting studies considered the impact of human capital elements of TMTs, including directors/CEOs/CFOs, on financial reporting quality, these studies ignored audit committee members, including ACFEs. As a result, our study contributes to the accounting and corporate governance literature by highlighting the impact of the monitoring role of female ACFEs with postgraduate qualifications and professional experience on financial reporting quality.

Using Chinese listed firms' data, our findings show that the ACFEs with postgraduate qualifications mitigate earnings management and improve the quality of financial reporting. Furthermore, the professional experience of ACFEs reduces the likelihood of earnings manipulation. We find that female ACFEs with postgraduate qualifications and more experience significantly constrain earnings management more than their male counterparts. Our results have implications for regulators and the top management of companies regarding the composition of the audit committee. Choosing female ACFEs with postgraduate qualifications and experience may yields better outcomes. Results remain robust using alternative measures of earnings management and after addressing different econometrics approaches.

Despite the importance of our results, we recognize the following limitations. First, our findings are limited to the Chinese context, which might yield different outcomes in contrast to the Western settings due to its weak institutional environment. Although this study is useful for emerging economies with weak institutional settings, our results may not be easily generalizable due to the uniqueness of the Chinese institutional environment and the CSRC's broader view of ACFEs. Therefore, we suggest that future studies contribute to this literature by examining the impact of ACFEs qualification, gender, and experience in other settings. Second, our findings need to be interpreted with caution as the proxies of earnings management which measures the opportunistic managerial behavior may or may not reflect practice. Therefore, future studies may conduct in-depth interviews with directors, auditors, academics, executives (such as CEOs and CFOs), and regulators to discuss such issues. Third, we used various tests to address the issue of endogeneity that may influence the results, but we admit that it is not possible to eliminate such issues. Therefore, we recommend that our findings should be interpreted with some caution.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author.

Declaration of Competing Interest

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

Data availability

Data will be made available on request.

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Appendix 1. Variable Definitions

Variable type	Variable name	Definition
Dependent variable	Earnings management (DAk_{it})	The standard deviation of the performance-adjusted model residual values during the five years window before the year t.
	Real earnings management (REM_{it})	The sum of abnormal cash follows from operations, abnormal production costs, and abnormal discretionary expenses.
Main variables	Post-graduate audit committee financial experts ($ACFE\text{-}post_{it}$)	Dummy variable coded 1 if ACFEs have post-graduation qualification (e.g., master's or doctoral degree), and 0 otherwise.
	Professional experience of audit committee financial experts ($ACFE\_exp_{it}$)	Professional experience of ACFEs, measured through the total number of years' experience of ACFE working as a financial expert.
	Gender ($ACFE\_female_{it}$)	Dummy variable coded 1 if female financial expert and 0 if male financial expert.
Control variables	Ownership structure (SOE)	Dummy variable coded 1 for state-owned enterprises, and 0 otherwise.
	Cross listing ($CrossList_{it}$)	Dummy variable coded 1 if a Chinese listed company is also listed in the Hong Kong stock exchange, and 0 otherwise.
	Age of audit committee financial experts ($ACFE\_age_{it}$)	Natural log of the age of the ACFE in years.
	Audit committee independence (AC_ind_{it})	Natural log of total number of independent directors in an audit committee.
	Shareholding of the senior leadership (OWN_{it})	The percentage of shares held by top management of a company.
	Audit committee size (AC_size_{it})	Natural log of total members of an audit committee.
	Cash flow volatility ($CFVOL_{it}$)	The standard deviation of cash flows scaled by total assets over the previous 5-year window.
	Sales growth volatility ($SGVOL_{it}$)	The standard deviation of sales scaled by total assets over the previous 5-year window.
	Auditor selection ($BIG4_{it}$)	Dummy variable coded 1 if the auditor is from a big 4 audit firm, and 0 otherwise.
	Leverage (LEV_{it})	Measured by the ratio of debt to total assets.
	Firm size ($SIZE_{it}$)	Natural log of the total assets.
	Profitability (ROA_{it})	Return on total assets.
	Audit committee meetings ($AC\_meetings_{it}$)	Natural log of total number of audit committee meetings in a year.
	Lag (1)	The lage value of the earnings management (DAK_{it}) in the GMM estimation.
	Inverse mills ratio (IMR_{it})	Invere mills ratio calculated from the first stage of the Heckman two-stage model.

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