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The Impact of Audit Quality and Female Audit Committee Characteristics on Earnings Management: Evidence from the UK

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Abstract: This study explores the impact of audit quality and the proportion of women on an audit committee on earnings management. Moreover, we examined how age diversity and the presence of non-foreign women on audit committees influence earnings management. Our study utilizes data from 165 UK-based listed companies between 2011 and 2021. A combination of static and dynamic analysis was used to empirically reveal our results. The results show a negative and significant relationship between audit quality and earnings management, as per the Kothari model. The presence of a female audit committee does not affect earnings management. However, when we control for demographic variables like age and nationality, we found that non-foreign female members of the audit committee reduced earnings management, while age diversity among female members had no effect. Additional analysis using the Dechow model revealed that both the presence of a female audit committee and their nationality affected earnings management. Our findings contribute to ongoing discussions on corporate governance by providing evidence that female audit committees and audit quality influence earnings management in UK-listed companies. This study is one of the few that examines demographic attributes (e.g., nationality or age).

Keywords: accrual earnings management; female audit committee; audit quality; agency theory; UK

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1. Introduction

In the world of corporate finance, there is a constant battle against earnings management (EM). This is where companies manipulate their performance numbers to look better than they are and mislead investors (M. W. A. Saleh & Mansour, 2024). As a result, financial scandals and company failures (Enron, WorldCom, Northern Rock, and MG Rover Group) have increased investor concerns about corporate governance (Abdou et al., 2021). EM is a big problem for companies and society as a whole (Zalata et al., 2022). The term has been defined in many ways. Schipper (1989) described EM as an "intentional intervention in the external financial reporting process to get private gain", which sums it up nicely. According to Healy et al. (1998), EM is the process by which managers employ their discretion in financial reporting and transaction structuring to potentially mislead stakeholders about the company's true economic performance. This manipulation can

also influence contractual outcomes that are contingent upon the reported numbers. EM can be effected through accrual EM, real EM, and classification EM (Alsayani et al., 2023; Al-Matari, 2022; Qamhan et al., 2020). Managers can perform EM opportunistically to misrepresent or hide the true financial position of the company for their own benefit and thereby harm shareholders' interests.

By manipulating accounting practices, EM can undermine investor confidence in a company's financial statements, thereby distorting its financial performance (Alshdaifat et al., 2024a; Aziz et al., 2024; Abu-AlSondos et al., 2024). This conduct undermines investor confidence by prioritizing managers' interests over the presentation of a genuine financial position (Habbash et al., 2013; Alhasnawi et al., 2024a). Consequently, regulatory bodies, including the Financial Conduct Authority in the United Kingdom, have implemented preventive measures to discourage managers' exploitative behavior and to encourage transparent financial reporting. It is imperative to conduct a comprehensive analysis of the influence of EM on UK businesses, given the significance of this subject. Nevertheless, the prior literature has primarily focused on the characteristics of boards of directors (Aleqab & Ighnaim, 2021; Shubita & Shubita, 2010; Qamhan et al., 2018). However, the characteristics of female AC members have been largely disregarded and neglected, despite the attention that they have received, and although this supervision is of particular significance due to the critical role that female AC members play in a company's governance structure.

The audit committee (AC) is considered essential in corporate governance, especially in the UK, following Cadbury's 1992 recommendations. They should have three independent non-executive directors, meet at least twice a year, and be well-constituted. After the Enron scandal, the UK Corporate Governance Code recommended that committees should have at least three members, include one member with financial expertise, and hold annual meetings (Ghafran et al., 2022). The UK is an interesting place on which to conduct our study, as it has unique financial accounting standards, incentives for AC, and a variety of regulatory and enforcement features. Therefore, female board representation in the UK could mean the deliberate appointment of experienced women rather than just filling quotas to meet regulatory requirements, which could have a positive impact on strategic control, effectiveness, and firm value on the board. However, few studies have examined the impact of female representation on the AC. To our knowledge, there is no previous study that has dealt with the demographic attributes of female committee members, such as nationality and age, and its impact on the EM. We focus on the UK context for a variety of reasons. First and foremost, the United Kingdom is a G8 member and is one of the world's most industrialized countries. Second, it has a common law system and a market-based economy that relies heavily on capital markets and security issuance to fund business investments. Third, the UK is regarded as low in corruption, indicating a commitment to transparency and integrity in government (Abdou et al., 2021).

This investigation augments the accounting literature in numerous ways. To begin with, it first enhances our comprehension of audit quality and its correlation with EM by employing audit fees as a proxy for audit quality. This shows how higher audit fees, indicating more thorough audits, can reduce EM practices and improve financial reporting quality (Al Rob et al., 2025). Secondly, by looking at the representation of women on AC, this paper highlights the importance of governance diversity, broadening the debate on gender in corporate management. Thirdly, it examines how characteristics of female AC members such as age and nationality affect EM, providing insights for companies on their hiring practices and training programs. Additionally, these findings can inform policy recommendations and increase gender diversity in senior management positions. Finally, this paper outlines potential avenues for future research on gender, audit quality, and financial practices, so we can better understand the elements that shape corporate governance.

We analyzed a sample of 1815 observations from UK nonfinancial companies listed on the FTSE 350 from 2011 to 2021. The results show a negative and significant relationship between audit quality and earnings management. We also found that earnings were diminished by the presence of female members on the AC. The findings suggest that the non-foreigner status of female members of the AC significantly reduces EM, whereas the age diversity of female members of the AC has no impact, as indicated by demographic characteristics.

The remainder of this paper is organized in the following manner. Section 2 evaluates the literature on female executives, delineates our research query, and examines the theoretical framework. Section 3 examines the data and research design. The empirical findings are presented and evaluated in Sections 4 and 5. The paper is concluded in Section 6.

2. Literature Review and Hypotheses Development

2.1. Theoretical Perspective

This study is based on agency theory, a fundamental concept in corporate governance and earnings management (Jensen & Meckling, 1976). Agency theory says that one of the main responsibilities of a company's board is to monitor management (Arioglu, 2020). Elghuweel et al. (2017) argue that most of the existing research has used agency theory to investigate the reasons behind managers' decisions to manipulate earnings, and to highlight the importance of good corporate governance mechanisms. A key insight from agency theory is the role of audit quality as a control mechanism (Alharasis, 2025, 2024).

According to Alzoubi (2018), audit quality can curb managers' tendency to manipulate earnings. Healy et al. (1998) state that managers often exploit information asymmetry between themselves and any external investors to hide the company's true financial performance and to enhance their own compensation and job security (Abu-AlSondos, 2023; Aldulaimi et al., 2025; Atta et al., 2024). Therefore, agency theory posits that implementing good governance mechanisms, particularly on the board of directors, can lead to more transparent financial reporting and reduce EM (Abdou et al., 2021). As a result, Jensen and Meckling (1976) suggest that agency conflicts and information asymmetry between management and shareholders can be reduced.

In this context, AC is key in monitoring accounting and financial reporting processes, hence reducing EM (Al-Absy et al., 2019). Alkebsee et al. (2021) emphasize the relationship between agency theory and corporate governance, particularly the role of female representation in the AC. Diverse boards are likely to make the board more effective in addressing various corporate challenges (Marei et al., 2024; Ab Aziz et al., 2024; Alshdaifat et al., 2024b). Moreover, Ali Aribi et al. (2021) highlight the importance of female members on boards in enhancing monitoring effectiveness, which, in turn, improves financial disclosures through transparency. Therefore, agency theory provides a framework for understanding the relationship between management, governance mechanisms, and financial reporting practices. By including diverse perspectives within the board, particularly with female members in the AC, organizations can strengthen their monitoring capabilities and, hence, corporate governance, and thereby reduce EM.

2.2. Audit Committees and Earnings Management

EM is a strategy employed by managers to achieve certain goals by selecting specific accounting policies. These are typically achieved through two methods: accrual and real activities manipulation (Sanjaya & Jati, 2015). Whether EM is implemented for opportunistic or legitimate reasons, it involves a manager's utilization of accounting methods. Managers employ accrual earnings management (AEM) to provide more accurate insights and aid stakeholders in making better judgments and projections. Unlike fraud, EM involves the application of accounting procedures and estimates that align with the principles of GAAP (Rahman &

Mohamed Ali, 2006; Alharasis, 2023; Tumewang et al., 2025). Prior research has investigated the opportunistic perspective, characterizing it as an unethical practice in which managers exploit shareholders for personal gain. By providing false information, the EM may influence investors (Xie et al., 2003), obscure actual problems within firms, and mislead shareholders.

The study of ACs and their characteristics has experienced substantial growth, since AC membership is essential for overseeing a company's financial reporting processes and ensuring accurate and reliable financial reporting, requiring members to fulfill this responsibility (Alhasnawi et al., 2024b). Audit committee members must possess the necessary knowledge, technical expertise, and impartiality regarding upper management (Arioglu, 2020). Previous research has revealed that the AC serves to reduce the prevalence of accrual EM within organizations (Sanjaya & Jati, 2015). However, a prior study by reveals that board or AC characteristics are unconnected to EM, while AC independence is the sole factor that has a substantial impact on it (Amara et al., 2025; Alshdaifat et al., 2024c). The focus of a substantial part of this research has been to analyze the impact of the characteristics that are recommended by regulatory bodies, namely, the size of the AC, the frequency of meetings, and the committee's independence, on various aspects of AC performance. As an example, Davidson et al. (2005) found that an AC with a greater degree of independence has a negative relationship with EM. A previous study conducted by Xie et al. (2003) showed that greater meeting frequency is associated with a lower level of EM in organizations.

Ghafran et al. (2022) examined the impact of AC on EM among FTSE 350 companies between 2007 and 2013. According to their findings, AC members are detrimental to earnings quality, so directors who hold multiple board seats are not as effective at monitoring management and curbing earnings manipulation. According to Habbash et al. (2013), AC attributes and EM in FTSE 350 companies are related. Their criteria included size, the frequency of meetings, independence, and the remuneration of directors. Only firms in regulated industries showed a significant correlation between absolute discretionary accruals and these AC characteristics.

2.3. Female Presence on the Audit Committee and Earnings Management

Deangelo (1981) defines audit quality as the likelihood that an external auditor will find and report irregularities in financial statements. However, Safari Gerayli et al. (2011) argued that variations in audit quality can lead to different levels of credibility being assigned to auditors, which, in turn, affect the earnings quality of their clients. Many studies have examined the relationship between audit quality and EM. For example, Lin and St. Petersburg (2005) suggest that higher payments to auditors can undermine their independence and, thus, reduce audit quality and increase EM, thereby compromising earnings. Similarly, Lin and St. Petersburg (2005) reported that paying higher fees to external auditors can create a closer financial relationship between the auditors and their clients and, thus, compromise their independence.

Over the past thirty years, there has been a push for gender diversity in leadership roles, particularly on boards. Research shows that the number of female directors in organizations has increased, but the extent of this increase varies by country. In response to these disparities, some countries like Norway and Spain have introduced or proposed mandatory gender quotas for corporate boards. In UK legislation, as well as significant recommendations to increase women's representation on boards, this is also being discussed (Abdou et al., 2021). For effective corporate governance, contends that the composition of the board ensures that management's interests are aligned with those of stakeholders. Orazalin (2020) claim that the presence of female directors mitigates EM in this context.

In emerging markets, M. Saleh et al. (2023) found that female board members have a negative impact on EM. In contrast, research in developed markets, such as France,

conducted by Lakhal et al. (2015) found that having women on the board decreased AEM for French-listed companies. Similarly in the European context, Kyaw et al. (2015) found that female directors reduced EM, especially in a high gender-equality environment. In the UK, Gull et al. (2018) found a negative relationship between female directors and EM. Nevertheless, they noted that assessing earnings quality requires particular skills and competencies, as well as taking into account the statutory and demographic characteristics of female directors. Among UK firms with a high proportion of independent outside directors, smaller board sizes, and fewer female board members, Abdou et al. (2021) found a lower EM. According to Ali Aribi et al. (2021), women on the board limit EM, provide important and diverse human capital and oversight, and will improve decision-making. Sun et al. (2011) conducted a study to determine whether EM could be mitigated by female directors on wholly independent ACs. A significant correlation was observed between the proportion of female directors in the AC and EM. Zalata et al. (2018) have found that the prevalence of executive malfeasance among ACs can be reduced by the presence of female financial experts. There is no correlation between the proportion of women on AC and EM, as per Arioglu (2020). Based on these findings, we formulated our initial hypotheses as follows:

H1a. *Audit quality has a negative impact on earnings management.*

H1b. *Female presence on the audit committee is negatively associated with earnings management.*

2.4. Demographic Characteristics of Female Audit Committee Members and Earning Management

Pålsson (1996) looked at the impact of AC members' ages on firms and found that companies led by older individuals tend to be more risk-averse than those led by younger individuals. As a result, board diversity is not just about demographic factors but is also about deeper characteristics like personality traits (Walker et al., 2015). Mahadeo et al. (2012) categorized board members by age: older members bring experience, networks, and financial resources; middle-aged members take on primary executive responsibilities, while younger members focus on learning and understanding the business. Building on this, Talavera et al. (2018) offered two opposing views on age diversity on boards. On the one hand, it can bring more collective experience, resources, and networks and lead to better profitability (Sultana et al., 2019; Aljundi et al., 2024). On the other hand, it can also lead to cognitive conflicts and reduced group cohesion and profitability. Ferrero-Ferrero et al. (2015) referenced a working document by the European Commission, titled "Corporate Governance in Financial Institutions: Lessons to be drawn from the current financial crisis". This document said that diversity in the boardroom leads to broader discussions and mitigates the risks of groupthink.

However, research on age diversity within ACs remains scarce and under-stimulated. A study by Sanjaya and Jati (2015) failed to find an association between the age of members and real activities manipulation. Additionally, Dao et al. (2013) found that an AC with senior members was more likely to decrease the cost of equity capital. Thus, firms may face less pressure to manipulate earnings. Furthermore, Komal et al. (2023) found that the age diversity of AC financial experts was correlated with low earnings management. Given our prior research, we propose the following hypothesis. We expect that EM will decrease due to the greater age of female members of the AC.

H2a. *The age of females on the audit committee is negatively associated with earnings management.*

Researchers have looked at both domestic and foreign directors and found that local directors have an advantage in terms of information (Bolor-Erdene et al., 2024; Marei, 2023; Lim & Nguyen, 2021). Firoozi et al. (2019) noted that both domestic and foreign directors

face information asymmetry issues, whereas foreign directors have additional hurdles in navigating country-specific regulations and accounting standards, which can make their decision-making process more complicated. According to Wan (2008), a director is considered local if their residence is within 50 miles of the corporate headquarters. Arıoglu (2014) found that firms with foreign directors on the board provide a lower overall quality of advice compared to those without any foreign directors. Ramaswamy (2001) found that domestic independent directors can maintain the same level of monitoring and control as foreign directors and can work with them to bring diverse skills and perspectives to governance. Since local directors are geographically closer to the firm's operations and the local environment, they have an information advantage and can gather valuable insights and make informed decisions (Wan, 2008). Therefore, we propose the following hypothesis:

H2b. *The female members of the audit committee who are non-foreign are negatively associated with earnings management.*

3. Methodology and Research Design

3.1. Sample and Data Collection

Our sample is made up of FTSE 350 companies and the study covers 11 years from 2011 to 2021. This allowed us to look at the financials of the companies over a long period. We started with 333 companies; banks, financials, and utilities were excluded as they have different regulatory frameworks and are unique. We also removed companies with incomplete data and ended up with 1815 definitive observations. Data were sourced from annual reports and Thomson Reuters Eikon. The sample selection is detailed in Table 1 and distribution of samples across industries in Table 2.

Table 1. Sample selection.

Sample	Number of Firms
Initial sample	333
Less: Financial Firms	130
Less: Missing data variables	38
Final sample	165
Period of study	11 years
Total observation	1815

Source: Created by the authors.

Table 2. Distribution of samples across industries.

Industry	Number	Percentage
Real Estate	18	10.90
Consumer Staples	17	10.30
Health Care	9	5.45
Industrials	49	29.69
Technology	9	5.45
Consumer Discretionary	40	24.24
Telecommunications	3	7.87
Basic Materials	14	8.48
Energy	16	9.69
Total	165	100

Source: Created by the authors.

3.2. Variable Definitions

In the following subsection, we first define the variables of the model and describe their main statistical properties. In the second step, we present and discuss the results obtained. Our study employed a specific set of measurements to evaluate its chosen variables pertaining to internal auditing quality, including audit fees, female representation on the AC, and earnings management.

3.2.1. Dependent Variable (Earnings Management)

We followed the methodology of Kothari et al. (2005) in our research. Accordingly, discretionary accrual is used as a proxy for EM (Lakhal et al., 2015; Salem et al., 2023). EM is measured using this model, which is considered to be more reliable and accurate than the modified Jones model (1991) (Sun et al., 2011). Thus, the following model is adopted to measure EM:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \alpha_{0,t} + \alpha_{1,t}\ \frac{1}{A_{i,t-1}} + \alpha_{2,t}\ \frac{\Delta\ (REV - REC)_{i,t}}{A_{i,t-1}} + \alpha_{3,t}\ \frac{PPE_{i,t}}{A_{i,t-1}} + \alpha_{4,t}\frac{ROA_{i,t}}{A_{i,t-1}} + \varepsilon_t$$

where:

$TA_{i,t}$ represents the total accruals;

$A_{i,t-1}$ reflects the total assets;

$\Delta\ (REV - REC)_{i,t}$ is the change in sales, less accounts receivable;

$PPE_{i,t}$ represents property, plant, and equipment; and

$ROA_{i,t}$ is the return on assets, while:

ε_t is the residual, and the absolute values of this residual are employed as a proxy for discretionary accruals.

Also, the subscripts i and t reference the firm and the period, respectively.

3.2.2. Independent Variables

The independent variable in this study is the quality of audits, measured using the proxy of audit fee (AUD_FEES) (Sitanggang et al., 2020), which is measured by the natural logarithm of audit fees paid to the auditor (Nwoye et al., 2021; Lin & St. Petersburg, 2005).

This measure aligns with the argument that increased fees for either type of service would likely strengthen the economic relationship (Lin & St. Petersburg, 2005). By examining the relationship between earning management and audit fees, this measure allows us to explore their respective connections:

- Females in the AC, i.e., the proportion of females on the AC (PFAC);
- Females on the AC who are non-foreign: the percentage of female members of ACs who are non-foreign in the UK (FAC UKNat);
- The age of female directors on the AC (FAC_Age), measured by the average age of female directors on the committee (Mnif Sellami & Cherif, 2020; Xiang & Qin, 2017).

3.2.3. Control Variables

Our study controls for several variables in the econometric model that are theoretically related to EM and corporate governance, as suggested by Mansour et al. (2024). These variables are firm size, leverage, market-to-book ratio, and return on assets (ROA). Table 3 below explains each variable in detail.

Table 3. Description and measurement of variables. Top of Form.

Variables	*Abbreviations*	*Definitions*	*Sources*
		Dependent Variable	
AEM proxy	|DAC| i, t	The absolute value of discretionary accruals for firm i in year t, computed according to the model of Kothari et al. (2005).	Thomson Reuters Eikon
		Independent Variables	
Audit fees	AUD_FEES	The natural logarithm of total audit fees	Thomson Reuters Eikon
The proportion of females on the AC	*PFAC*	The number of females on the AC, divided by the total number of directors on the AC, taken as a percentage	Hand-collected from the company's annual report/website
Non-foreign females on the AC	*FAC UKNat*	The number of non-foreign females on the AC, divided by the total number of directors on the AC and taken as a percentage	Hand-collected from the company's annual report/website
Age of females on the AC	*FAC_Age*	The average age of females on the AC	Hand-collected from the company's annual report/website
		Control Variables	
Leverage	Lev	Long-term debt, divided by total assets	Thomson Reuters Eikon
Firm size	SIZE	Natural logarithm of total assets	Thomson Reuters Eikon
Market value to book	MVB	The market value of common equity/the book value of common equity	Thomson Reuters Eikon
Return on assets	ROA	The return on assets ratio for firm i in year t	Thomson Reuters Eikon

Source: Authors' own creation.

3.2.4. Study Model

We employed the following models to examine the relationship between female representation on the AC and earnings management:

Under Hypotheses 1a and 1b model (1) is estimated as follows:

$$DAC_{i,t} = \alpha_0 + \beta_1 AUD - FEES_{i,t} + \beta_2 PFAC_{i,t} + \beta_3 LEV_{i,t} + \beta_4\ Size_{i,t} + \beta_5 ROA_{i,t} + \varepsilon_{i,t} \quad (1)$$

Under Hypotheses 2a and 2b, model (2) is estimated in the following manner:

$$DAC_{i,t} = \alpha_0 + \beta_1 AUD - FEES_{i,t} + \beta_2 FAC - NON - FOREIGN_{i,t} + \beta_3 FAC - Age_{i,t} + \beta_4 Lev_{i,t} + \beta_5 Size_{i,t} + \beta_6 MVB_{i,t} + \beta_7 ROA_{i,t} + \varepsilon_{i,t} \quad (2)$$

4. Results and Analysis

4.1. Descriptive Statistics

Table 4 presents the summary statistics, including the average, standard deviation, maximum value, and minimum value, for the study's sample period from 2011 to 2021, encompassing all the variables used. The table shows descriptive statistics for several variables related to AC characteristics, firm performance, and financial metrics. DAKh05 (discretionary accruals) has a mean of 0.052, std. 0.058, min 0.001, and max 0.323. Audit Fees has a mean of 1.971, is not skewed (0.037), and has moderate kurtosis (2.46). PFAC

has a mean of 34.6%, min 0, and max 1. FAC UKNat (female audit committee members with UK nationality) has a mean of 0.365, std 0.484, min 0, and max 1. It is moderately skewed (0.588) and has kurtosis (1.425). AC_Age has a mean of 56.88, std. 7.53, min 34, and max 81. Firm size (Fsize) has a mean of 2.683, std. 1.43, min 1, and max 6. It is not skewed (0.114) and has nearly normal kurtosis (2.984). Leverage (Lev) has a mean of 20.9%, std 14.4%, min 0.3%, and max 80.4%. It is right-skewed (1.036) and has kurtosis (5.107). The market-to-book (MTB) ratio has a mean of 0.932, std 0.234, min 0.315, and max 2.183. Finally, return on assets (ROA) has a mean of 1.998, std. 6.53, min −14.5%, and max 24.2%.

Table 4. Descriptive statistics.

Variables	N	SD	Mean	Min	Max	Kurtosis	Skewness
DAKh05	1815	0.058	0.052	0.001	0.323	2.329	2.3
AUD FEES	1815	0.182	1.971	1.557	2.362	2.46	0.037
PFAC	1815	0.255	0.346	0	1	1.945	0.464
FAC UKNat	1815	0.484	0.365	0	2	1.425	0.588
AC_Age	1815	8.087	56.877	32	79	1.319	0.298
Fsize	1815	0.107	2.683	2.407	2.947	1.984	0.114
Lev	1815	0.16	0.209	0	0.854	2.107	1.036
MTB	1815	0.896	0.932	−1.273	3.701	1.299	0.418
ROA	1815	0.852	1.998	−0.968	4.138	1.726	−0.74

Source: Created by the authors.

4.2. Collinearity Analysis

Table 5 shows the Pearson correlations for the variables in our regression models. Previous research has found a positive relationship between EM and audit fees, but our results show a negative correlation between the two. We also see the coefficients varying across the variables. A Pearson correlation of 0.8 or higher usually means multicollinearity between independent variables. However, as shown in Table 5, none of the independent variables in our model have a correlation of 0.8 or higher; therefore, there is no multicollinearity issue. These results mean that there is a significant relationship between audit fees and EM, and the low correlations among independent variables indicate no multicollinearity in our regression models. To further check for multicollinearity, we performed a variance inflation factor (VIF) test, and the results ranged from 1.04 to 1.84, which is below the critical value of 10. We also tested for heteroscedasticity, using the Breusch–Pagan/Cook–Weisberg test, which showed heteroscedasticity ($chi^2(1) = 169.71$, prob > $chi^2 = 0.0000$). Autocorrelation was tested using the Wooldridge test, which showed autocorrelation (Prob > F = 0.0020). To mitigate the effect of extreme values, all variables were winsorized at 5%.

Table 5. Pearson correlations for independent variables in UK firms.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	VIF
(1) DAKh05	1.000									–
(2) AUD_FEES	−0.155 ***	1.000								1.84
(3) PFAC	−0.029	0.071 ***	1.000							1.10
(4) FAC_UKNat	0.026	−0.313 ***	0.221 ***	1.000						1.22
(5) AC_Age	−0.042 *	0.163 ***	0.062 **	−0.060 **	1.000					1.04
(6) Fsize	−0.114 ***	0.760 ***	0.090 ***	−0.181 ***	0.150 ***	1.000				1.12
(7) Lev	0.061 **	0.150 ***	0.098 ***	−0.057 **	−0.041 *	0.204 ***	1.000			1.05
(8) MTB	−0.079 ***	−0.008	0.118 ***	0.063 **	0.036	−0.268 ***	0.010	1.000		1.64
(9) ROA	0.197 ***	−0.237 ***	0.002	0.091 ***	−0.080 ***	−0.307 ***	−0.163 ***	0.446 ***	1.000	1.43

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Source: Created by the authors.

4.3. Regression Results for the Determinants of Discretionary Accruals

This study looks at the impact of audit quality and female AC members on EM. We used OLS regression analysis to see how the explanatory and control variables affect discretionary accruals. The absolute value of discretionary accruals (DAC) is a better measure of EM as it captures both income-decreasing and income-increasing effects. Discretionary accruals were estimated using the cross-sectional variation of the performance-adjusted model of Kothari et al. (2005). The control variables in the model were firm size, market value to book, leverage, and return on assets (ROA). Table 6 shows the OLS regression results. The results show a negative relationship between audit fees and EM, with coefficients of −0.07, −0.0822, and −0.0888 at a 1% level. This means that higher audit fees are associated with less earnings management activity; thus, increased auditor scrutiny improves financial reporting quality (Ozili, 2022).

Table 6. OLS model estimation.

	Model 1			Model 2
VARIABLES	**OLS: Audit Fees**	**OLS: PFAC**	**OLS: Audit Fees and PFAC**	**OLS**
AUD_FEES	−0.07 *** (0.012)	–	−0.0822 *** (0.0120)	−0.0888 *** (0.0126)
PFAC	–	−0.0561 (0.0175)	−0.0051 (0.0052)	–
AC_Age		–	–	−0.00343 (0.00542)
Nationality		–	–	−0.00557 * (0.00285)
F_size	0.05 ** (0.022)	−0.05 *** (0.014)	0.0690 *** (0.0219)	0.0711 *** (0.0220)
Lev	0.03 *** (0.010)	0.04 *** (0.010)	0.0332 *** (0.0099)	0.0333 *** (0.00998)
MTB	−0.01 *** (0.010)	−0.02 *** (0.002)	−0.0093 *** (0.0018)	−0.00930 *** (0.00186)
ROA	0.01 *** (0.002)	0.02 *** (0.002)	0.0138 *** (0.0018)	0.0140 *** (0.00182)
Constant	0.04 (0.043)	0.15 *** (0.038)	−0.0016 (0.0434)	0.00320 (0.0441)
Observations	1815	1815	1815	1815
R-squared	11.4	9.54	12.76	12.3

Notes: *** $p < 0.01$; ** $p < 0.05$, * $p < 0.1$. Source: Created by the authors.

In Model 2, the proportion of PFAC has a negative but insignificant coefficient (−0.0561), so there is no direct effect on earnings management. However, in Model 3, audit fees remain significant, so audit fees are crucial in curbing earnings manipulation. The results are consistent with the audit quality literature, which suggests that audit fees mitigate agency conflicts and enhance financial transparency. Table 6 supports this view, showing a negative correlation between audit fees and EM (p-value = 0.01), suggesting that higher audit fees come from stricter scrutiny rather than economic ties with clients. This is consistent with the findings of Gandía and Huguet (2021) and contradicts earlier studies. Most control variables are significant regarding earnings management, so they are relevant when explaining its variation. Although PFAC is insignificant, this might be due to limited female representation or gender stereotypes.

The joint effect of audit fees and female AC representation shows that audit fees reduce EM, while PFAC has a negative but not significant effect. Regarding the second hypothesis, no significant relationship was found between the age of female AC members and earnings management, which is similar to the findings of Al-Absy et al. (2019) but contrary to research on the age of board chairs and firm performance. However, H2b shows that non-foreign female AC members have a significant effect on earnings management; thus, their traits, such as conservatism and accountability, make them more effective in monitoring and improving financial reporting quality (Djajadikerta & Zhang, 2015).

4.4. Robustness Checks Analysis—Different Model

Our results are fortified by the utilization of four distinct estimation methods: Lewbel's (2012) heteroscedastic identification, dynamic panel data analysis, random effects, and fixed effects. We can confirm that the coefficient of the interaction term is consistent with our primary findings from OLS by employing these methodologies. The negative coefficients of audit fees in both fixed-effect (-0.0379 and -0.0355) and random-effect (-0.0351 and -0.0377) models at the 5% level are consistent with our findings. This implies that higher audit fees are associated with lower earnings management activity. Intriguingly, the PFAC variable has negative coefficients (-0.0005 and -0.0006) in both fixed- and random-effects models, although they are not statistically significant. Even though the presence of female members in the AC is associated with reduced earnings management, the effect is not sufficiently significant to draw a conclusion within the context of this study.

By using Lewbel's (2012) method, which does not require exclusion restrictions, we further confirmed our results. The heteroskedasticity used for identification in this method allows us to achieve consistent estimates, even when traditional assumptions do not hold. The procedure involves regressing each endogenous variable on a vector of exogenous variables (Z) and then deriving the residuals (ê) for instrument construction. This method provides an alternative way to verify our results, emphasizing the need for good instruments in the presence of heteroskedasticity. The implication of these results is important for corporate governance and financial reporting. The consistently negative relationship between audit fees and EM across different estimation methods means that the role of good auditing practices in promoting transparency is vital. Although the effect of female AC members needs further investigation, these results contribute to the ongoing debate on gender diversity in the governance structure and its impact on financial integrity.

The "Hausman test" shows that a fixed effect is the best choice for all models. To validate our main results, we ran multiple robustness tests, and the results are consistent with our initial findings. We also ran additional analyses using random-effects and fixed-effects regression to check the robustness of our previous analysis. Tables 6 and 7 show a minimal difference in random-effects regression, with only board size varying. In Table 7, firm size (FSIZ) is significant, while in Table 8, it is insignificant. The rest of the variables in Tables 6 and 7 are consistent. Our study aims to show that our results are robust, regardless of the estimation method used for our two models. Thus, we used Lewbel's (2012) identification method based on heteroskedasticity.

In addition, we implemented a dynamic generalized method of moments (GMM) panel estimator, which capitalized on the dynamic relationships between the explanatory variables. To eliminate any bias resulting from time-invariant unobserved heterogeneity, we initially compared the variables. We then employed GMM to estimate the model, using lagged values of the explanatory variables as instruments for the current variables. This approach mitigated the risk of omitted variable bias. Our results are consistent across these assumptions, as we presume that both noncompliance and the interaction term are endogenous. Our conclusions are robust across various estimation methodologies, as the results are consistent.

Table 7. Random-effects and fixed-effects estimation model results.

	Model 1		Model 2	
VARIABLES	**Fixed-Effect Regression**	**Random-Effect Regression**	**Fixed-Effect Regression**	**Random-Effect Regression**
AUD_FEES	−0.0379 ** (0.0241)	−0.0351 ** (0.0169)	−0.0355 ** (0.0338)	−0.0377 ** (0.0171)
PFAC	−0.0005 (0.0063)	−0.0006 (0.0055)	-	-
AC_Age	-	-	0.000377 (0.000283)	0.000252 (0.000214)
Nationality	-	-	−0.000956 (0.00379)	−0.00157 (0.00304)
Fsize	−0.0429 (0.0579)	0.0053 (0.0325)	−0.0529 (0.0927)	0.00412 (0.0326)
Lev	0.0588 *** (0.0163)	0.0520 *** (0.0129)	0.0607 *** (0.0222)	0.0529 *** (0.0130)
MTB	−0.0063 ** (0.0032)	−0.0094 *** (0.0024)	−0.00643 * (0.00383)	−0.00961 *** (0.00242)
ROA	0.0141 *** (0.0020)	0.0138 *** (0.0018)	0.0144 *** (0.00412)	0.0141 *** (0.00185)
Constant	0.0525 (0.1433)	0.0733 (0.0691)	0.0622 (0.213)	0.0674 (0.0696)
Observations	1815	1815	1815	1815
Hausman test	22.36 ***		29.04 ***	
R-squared	10.81	16.67	15.7	19.32

Notes: *** $p < 0.01$; ** $p < 0.05$, * $p < 0.1$. Source: Created by the authors.

Table 8. Lewbel (2012) and GMM estimation model.

VARIABLES	Model 1		Model 2	
	Lewbel (2012)	**GMM**	**Lewbel (2012)**	**GMM**
L.DAKh05		0.0475 (0.0516)	-	0.057 (0.051)
AUD_FEES	−0.1053 *** (0.0355)	−0.2249 *** (0.0531)	−0.0851 *** (0.0462)	−0.263 *** (0.054)
PFAC	−0.0055 (0.0053)	−0.0263 * (0.0137)	-	-
FAC_nonforeign	-	-	−0.0816 *** (0.0135)	−0.017 (0.014)
AC_Age	-	-	−0.00566 (0.00523)	−0.014 *** (0.004)
Fsize	0.1018 * (0.0521)	0.1751 (0.1084)	0.0690 *** (0.0221)	0.210 ** (0.107)
Lev	0.0308 *** (0.0105)	0.1186 *** (0.0294)	0.0331 *** (0.0105)	0.117 *** (0.029)
MTB	−0.0079 *** (0.0028)	−0.0041 (0.0067)	−0.00934 *** (0.00247)	−0.003 (0.007)
ROA	0.0130 *** (0.0021)	−0.0066 (0.0059)	0.0139 *** (0.00275)	−0.005 (0.006)
Constant	−0.0434 (0.0744)	0.0173 (0.2253)	−0.00274 (0.0410)	−0.025 (0.214)
Observations	1815	1815	1815	1815
R-squared	11.8	-	14.19	-

Notes: *** $p < 0.01$; ** $p < 0.05$, * $p < 0.1$. Source: Created by the authors.

4.5. Robustness Analysis for Different Measurements

To support our primary findings, we implemented an alternative EM metric. The Dechow et al. (1995) model is intended to estimate discretionary accruals (DAC) through a modified Jones-type approach. This model was employed to evaluate the robustness of our primary analysis, using a distinct economic profit (EM) metric. In particular, we employed the cash flow method, which calculates accruals as the difference between earnings and operating cash flow (Al-Absy et al., 2019; M. W. A. Saleh & Mansour, 2024). The proportion of DAC to total accruals was employed as a proxy for EM. We selected the Dechow et al. (1995) model for this study, even though there are other models available to measure EM. This is due to the fact that it addresses the limitations of earlier models, such as the Jones (1991) model. The Jones model does not include accounts receivable, which is why the Dechow et al. model provides a more precise estimation of DAC. The Dechow et al. model, like the Jones model, divides total accruals into DAC and non-DAC categories; however, it possesses greater specification capabilities.

$$\frac{TAC}{A_{it}} - 1 = \alpha 1(\frac{1}{A_{it}} - 1) + \alpha 2(\frac{\Delta REV_{it}}{A_{it}} - 1) + \alpha 3\,(\frac{PPE_{it}}{A_{it}} - 1) + \mu\,\mathrm{i}\,\mathrm{t} - 1$$

Discretionary accruals (DAC) during the event period were:

$$DAC_{it} = \frac{TAC}{A_{it}} - 1 - (\alpha 1\,(\frac{1}{A_{it}} - 1) + \alpha 2(\frac{\Delta REV_{it}}{A_{it}} - 1) + \alpha 3\,(\frac{PPE_{it}}{A_{it}} - 1))$$

where:

TACit = total accruals for firm i in year t, calculated as PBT-CFO;
PBT = profit before tax;
CFO = cash flow from operating activities;
Ait − 1 = total assets for firm i in the previous year;
$\frac{\Delta REV_{it}}{A_{it}} - 1$ = change of revenue from i in year t;
ΔREC = a change in accrued receivables for firm i in period t;
$\frac{PPE_{it}}{A_{it}} - 1$ = property, plant, and equipment, in gross, for firm i in year t; and
μ i t − 1 = error term for firm i in year t.

α1, α2, and α3 are industry- and year-specific. Absolute discretionary accruals (EM proxy) represent the residuals (M. W. A. Saleh & Mansour, 2024).

Table 9 shows some interesting relationships between audit fees, the presence of female AC members (PFAC), and earnings management. The negative coefficients for audit fees across all models indicate a consistent relationship, where higher audit fees are associated with less earnings management activity. Note that the GMM model has the strongest significance (−0.206), which means that increased audit scrutiny leads to better financial reporting. PFAC yielded more mixed results (Ozili, 2022). The OLS and fixed-effects models were not significant, while Lewbel's (2012) model and the GMM model show a small negative relationship with earnings management. This means that while female AC members may help reduce earnings management, the effect is small and needs to be investigated further. The results highlight the importance of audit quality in promoting transparency and ethical practices in financial reporting. They also show that gender diversity in AC may impact financial integrity but that other factors may also play a role. These results have practical implications for organizations, which should improve their governance structure by considering both audit fees and gender diversity as important components in mitigating earnings management.

Table 9. Robustness test model 1.

VARIABLES	OLS	FE	RE	Lewbel (2012)	GMM
L.DAJM95	-	-	-	-	0.093 ** (0.045)
AUD_FEES	−0.08 *** (0.012)	−0.0397 ** (0.0250)	−0.0328 * (0.0173)	−0.100 *** (0.0366)	−0.206 *** (0.043)
PFAC	−0.01 (0.005)	0.000751 (0.00655)	−0.00024 (0.00567)	−0.00545 * (0.00541)	−0.021 * (0.011)
Fsize	0.06 *** (0.023)	−0.0622 (0.0600)	0.000374 (0.0334)	0.0949 * (0.0537)	0.260 *** (0.097)
Lev	0.03 *** (0.010)	0.0596 *** (0.016)	0.0516 *** (0.0133)	0.0314 *** (0.0108)	0.117 *** (0.025)
MTB	−0.01 *** (0.002)	−0.00664 ** (0.00333)	−0.00978 *** (0.00248)	−0.00821 *** (0.00289)	−0.004 (0.006)
ROA	0.01 *** (0.002)	0.0148 *** (0.00203)	0.0144 *** (0.00190)	0.0137 *** (0.00217)	−0.004 (0.005)
Constant	0.00 (0.045)	0.0997 (0.149)	0.0814 (0.0707)	−0.0357 (0.0767)	−0.259 (0.198)
Observations	1815	1815	1815	1815	1815
Breusch and Pagan test		271.86 ***			
Hausman test			20.62 ***		
R-squared	15.73	11.09	17.51	11.2	-

Notes: *** $p < 0.01$; ** $p < 0.05$, * $p < 0.1$. Source: Created by the authors.

The results of Table 10 illustrate the relationships between audit fees, AC age, the nationality of AC members, and DAJM95. The results demonstrate that audit fees are consistently negative across all models, suggesting that higher audit fees are associated with reduced DAJM95. In other words, increased audit scrutiny enhances the quality of financial reporting and reduces earnings management (Ozili, 2022). Mixed results can be observed regarding the nationality of AC members. FE and RE are not significant, and OLS is negative. Lewbel (2012) and SYS-GMM are marginally negative, suggesting that a diverse background in the AC enhances oversight. The age results of the AC are more inconsistent; the majority of models are not statistically significant. The Lewbel (2012) model exhibits a negative coefficient, which suggests that an older committee is more effective at managing earnings; however, this is not consistently significant. These findings underscore the significance of audit quality in financial reporting and the potential for diversity in the AC to mitigate earnings management. However, additional research is required to determine the significance of AC member age, as it appears to be less significant than audit fees and diversity.

Table 10. Robustness Test Model 2.

	(OLS)	(FE)	(RE)	Lewbel (2012)	(SYS-GMM)
VARIABLES	DAJM95	DAJM95	DAJM95	DAJM95	DAJM95
L.DAJM95	-	-	-	-	0.103 *** (0.0218)
AUD_FEES	−0.0852 *** (0.0129)	−0.0371 ** (0.0251)	−0.0357 ** (0.0176)	−0.0797 *** (0.0126)	−0.132 *** (0.0355)
FAC_UKNat	−0.00576 * (0.00294)	−0.00118 (0.00345)	−0.00185 * (0.00315)	−0.0256 * (0.0196)	−0.0174 *** (0.00542)
AC_Age	0.00534 (0.00165)	0.00404 (0.00281)	0.00279 (0.00220)	−0.0386 (0.00229)	0.000464 (0.000343)

Table 10. *Cont.*

	(OLS)	(FE)	(RE)	Lewbel (2012)	(SYS-GMM)
VARIABLES	**DAJM95**	**DAJM95**	**DAJM95**	**DAJM95**	**DAJM95**
Fsize	0.0663 *** (0.0227)	−0.0729 (0.0607)	−0.000814 (0.0334)	0.0723 *** (0.0240)	−0.245 *** (0.0886)
Lev	0.0337 *** (0.0103)	0.0616 *** (0.0171)	0.0525 *** (0.0134)	0.0339 *** (0.0103)	0.0841 *** (0.0198)
MTB	−0.00955 *** (0.00192)	−0.00676 ** (0.00335)	−0.00994 *** (0.00249)	−0.00851 *** (0.00218)	−0.0182 *** (0.00508)
ROA	0.0145 *** (0.00187)	0.0151 *** (0.00205)	0.0147 *** (0.00191)	0.0141 *** (0.00190)	0.00899 *** (0.00321)
Constant	0.00949 (0.0455)	0.110 (0.149)	0.0761 (0.0713)	−0.00919 (0.0464)	0.912 *** (0.212)
Observations	1815	1815	1815	1815	1815
Breusch and Pagan test		308.67 ***			
Hausman test			27.22 ***		
R-squared	11.17	9.18	16.23	10.5	-

Notes: *** $p < 0.01$; ** $p < 0.05$, * $p < 0.1$. Source: Created by the authors.

4.6. Endogeneity Tests

The results of the instrumental variable (IV) two-stage least squares (2SLS) regression are presented in Table 11. The coefficient for AUD_FEES is −0.085 ***, which is both significant and negative. This implies that the dependent variable is lower when audit fees are higher, which is in accordance with previous findings showing that increased audit scrutiny will result in improved financial reporting and reduced earnings management (Ozili, 2022). In the same vein, the coefficient for PFAC is −0.045*, which is also significant at 10% and is negative. This implies that having a higher proportion of foreign AC members is associated with a lower dependent variable. Consequently, the inclusion of individuals from a variety of backgrounds on an AC may enhance supervision and reduce earnings management. The 2SLS results corroborate the previous findings that the diversity of AC members and audit fees are significant factors in the management of earnings and the transparency of financial reporting.

Table 11. Results of the 2SLS regression.

VARIABLES	IV 2SLS
AUD_FEES	−0.085 *** (0.012)
PFAC	−0.045 * (0.23)
Fsize	0.085 *** (0.024)
Lev	0.034 *** (0.01)
MTB	−0.007 *** (0.002)
ROA	0.013 *** (0.002)
_cons	−0.026 (0.046)
Observations	1815
R-squared	0.084

Note: Standard errors are in parentheses: *** $p < 0.01$ and * $p < 0.1$. Source: Created by the authors.

5. Conclusions and Implications

The objective of this investigation was to offer novel evidence regarding the association between earnings management, audit quality, and the presence of women on the AC in non-financial enterprises in the United Kingdom. Audit quality (as measured by audit fees) has a substantial adverse effect on earnings management, as demonstrated by our examination of data on 165 publicly traded companies between 2011 and 2021. The administration of earnings is not directly affected by the presence of women on the AC. However, when we controlled for demographic factors, we found that non-foreign female AC members reduced earnings management, suggesting that cultural and regulatory familiarity may enhance their oversight effectiveness. Age diversity does not have any meaningful impact on earnings management. Robustness tests using the Dechow et al. (1995) model showed that both the presence and nationality of female AC members had a negative effect on EM, whereas the results of the Kothari et al. (2005) model showed otherwise.

These results are useful for businesses, regulators, and investors, helping them to see the importance of audit quality and the subtleties of female AC membership in financial reporting in the UK. Our findings suggest that corporate governance reforms should include women on ACs and consider their demographic details to improve oversight. This is consistent with the agency theory, which posits that skilled board members including female representation can more effectively supervise financial transactions, thereby reducing the probability of earnings management. Our findings are significant because they are pertinent for policymakers and regulators worldwide who are committed to fostering diversity in all facets of economic life through the implementation of laws and regulations. Our research supports the critical mass theory, which posits that a minimum of 25% female representation on the AC is necessary to achieve substantial progress in female AC membership and reduce EM. We also demonstrate the beneficial influence of women on the performance of UK firms. Lastly, we demonstrate the advantages of having women in positions of authority and decision-making in organizations.

6. Limitations and Future Studies

This research has certain limitations that could be considered as a way to improve the results of future research. Initially, the data are limited to the period before 2021 and may not apply to a broader audience. Secondly, we did not incorporate additional gender dimensions, including educational qualifications, years of experience, cultural heritage, and other demographic variables that could have a significant impact on corporate performance. Besides this, our study did not control for the overall characteristics of the AC, such as the average age of all AC members; these variables may be integrated into future research. We exclusively employed quantitative methodologies and refrained from incorporating qualitative data. Qualitative methods could be incorporated into future research to gain a more profound understanding of the correlation between EM and female representation on ACs. Finally, our dataset covers the COVID-19 period (2020–2021), during which remote audits became prevalent; we believe that recent transformations in auditing practices will play a more significant role in shaping the future dynamics of audit quality and trends in earnings management. Therefore, further study is necessitated to examine the role of video conferencing, AI-based audit procedures, and digital collaboration tools in audit quality.

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