

## The moderating effect of the effectiveness of the internal audit function on the relationship between CAATS and corporate governance and the quality of financial reports in commercial banks: Evidence from the Kingdom of Saudi Arabia

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### ABSTRACT

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This study sought to determine how CAATS, corporate governance (CG), and EIAF positively and directly influence the quality of financial reports (QFR). In addition to identifying the moderating effect of EIAF on the links between CAATS, CG and QFR in Saudi commercial banks. To this end, data was collected from 293 participants, including administrative managers, board members, internal auditors, certified public accountants, and staff members from the audit and internal audit departments as well as the accounting departments. Using structural equation modelling (SEM) via SmartPls, data was analyzed. The study showed that QFR is positively and significantly affected by CAATS, CG, and EIAF. Moreover, EIAF does not moderate the effect of CAATS and CG on QFR. Hence, this study enriches accounting literature and has implications for both practitioners and policymakers.

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### 1. Introduction

Accounting professionals are increasingly required to follow CG and employ CAATS due to growing concerns about accounting fraud jeopardizing banking operations, as well as worldwide corporate failure and widespread social corruption (Hazaea et al., 2021). Internal audit (EIAF) is a critical element in ensuring the efficiency of controls in response to past accounting events (Jarrah et al., 2022). To properly monitor and supervise their activities, banks must implement the EIAF. Because internal audit has historically been viewed as a means of ensuring QFR quality as well as compliance with financial quality security standards, it is essential to ensure that CAATS meets the needs of stakeholders. Internal audit measures alone have not succeeded in significantly reducing the incidence of fraudulent financial transactions, despite this perception (Ogoun & Atagboro, 2020). The risks of accounting errors must be recognized and examined by internal auditors (Drábková & Pech, 2022). The effectiveness of the EIAF, audit experience, and impartiality all have an impact on the effectiveness of internal audit. While internal auditors are responsible for identifying financial anomalies (Betti et al., 2021), their ability to detect fraud is contingent on their education and professional experience. Although internal audit is important (Drogalas et al., 2017). Research indicates that QFR may be affected by elements such as CG. Effective CG has been shown to improve process management and control. Internal auditors have increased the level of requesting quotations. According to stakeholder theory, companies should establish effective checks and balances, including CG (Naluking et al., 2017). In their investigation of the effects of CG and EIAF internal controls on IFRQ compliance, Nalukeng et al. (2017, 2018) found a significant relationship between QFR compliance and CG compliance.

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Through market participants, capital markets effectively contribute to the smooth operation of the economy (Beuselinck et al., 2017; Ellili, 2022). Financial statements are used by businesses to FRQ and status to stock market participants, who rely on the accuracy of the data in these statements to make financial decisions. According to Biddle et al. (2009), FRQ measures how transparently an entity's financial statements convey information about its predicted cash flows, financial condition, and operating performance. According to Gomariz and Ballesta (2014), FRQ lowers the cost of capital and enhances resource allocation, both of which promote economic growth.

Since FRQ influences economic decisions, which may ultimately have an impact on society, it is therefore of great concern not only to potential stakeholders but also to society (Gerged et al., 2020). This has been proven by several accounting crimes and the failure of financial institutions. This undermines stakeholder confidence in the reliability of FRQ, while the more important societal goal supports the organization of the activity (Cohen et al., 2004). The Organization for Economic Co-operation and Development (OECD) 2015 defines CG as the rules, laws and procedures for the management and operation of a business. It also refers to the monitoring system used to ensure FRQ and raise the level of transparency. Within financial reporting procedures. According to Cohen et al. (2004), the basic CG mechanisms are ownership structure, audit committee, and board composition. By putting these procedures and best practices into practice, capital market authorities are working ceaselessly to ensure that all stakeholders have access to relevant and trustworthy information in addition to the FRQ (OECD, 2015). While the spotlight has recently turned to emerging markets (Cumming et al., 2015; Clay & Omri, 2011), the relationship between CG practices and FRQ is often explored from the perspective of established economies (Beuselinck et al., 2017; Arun et al., 2015).

Because of the modern environment, CAATS are being created to help auditors undertake internal audits, identify fraud risks, and improve audit quality (Bradford et al., 2020; Omoteso, 2012; Razi & Madani, 2013). Current financial statements, request for proposals, capital raising, decision-making, and information for external users are all necessary for today's business decisions (Bradford et al., 2020; Chan & Vasarhelyi, 2011; Khattak & Mustafa, 2019). The benefits of CAATS include enhanced knowledge, transferability of experience, and comprehension of EIAF audit procedures (Omoteso, 2012).

Because it affects his work performance and QFR, the internal auditor needs to be informed of the nature of audit procedures and audit assessment in the CAATS context. According to Byrnes et al. (2018), the internal auditor's present task is to give audit opinions and judgments using real-time methodology and CAATS. Statement of Auditing Standards (SAS) No. 316.52 requires the auditor to employ computer-assisted CAATS in order to acquire more thorough evidence regarding data in important accounts or electronic transaction files (International Association of Certified Public Accountants, 2006). By extending the scope of transactions examined and delivering evidence promptly, utilizing going concern equations or QFRs, or integrating CAATS within a logical and structured audit, CAATS may enhance the caliber of audit evidence supplied to auditors (Brown et al., 2007).

## **2. Literature study and hypothesis development**

### *2.1 Corporate governance and quality of financial reporting*

Across a variety of corporate governance systems, agency theory provides a theoretical basis for the management and oversight of corporate organizations (Gonzalez & Garcí'a-Meca, 2014). Investors use financial data to make their economic decisions, and these methods increase the value, reliability, and quality of this data (Gerged et al., 2020). Research indicates that the basic mechanisms of corporate governance are ownership structure, audit committee, and board composition (Cohen et al., 2004). The crucial governance mechanism that sets the direction of a company and supervises its management to achieve its goals is the composition of the board of directors (Allegrini & Greco, 2013; Torchia & Calabro, 2016). Because it affects management incentives, business performance, disclosure standards, and the quality of financial reporting, ownership structure is the cornerstone of the corporate governance framework (Alnabsha et al., 2018; Aygun et al., 2014). To maintain the integrity and quality of the financial reporting process, the audit committee establishes effective procedures for monitoring decisions and oversight within the organization (Fodio et al., 2013; Sharma & Kuang, 2014). Corporate governance affects how well the oversight function is performed as well as how the quality of financial reporting of corporate organizations develops (Cumming et al., 2015; Williamson, 2008; Zadeh et al., 2018). The FRQ of UK organizations is positively influenced by corporate governance, as emphasized by Pesnell et al. (2005).

Internal audits, corporate governance, and financial reporting quality Since the early 1930s, the importance of bank governance (BG), especially about the division of ownership and management, has been recognized. Economic crises, the need to change governance systems and standards, and the need for guarantees and trust have contributed to the global momentum gained by BG. As a key element of market discipline, BG gives banks with strong governance systems a competitive advantage. For banks to comply with their legal obligations and fiduciary responsibilities to investors, effective corporate governance practices are essential (Levis, 2006). The resilience of the financial system is influenced by the effectiveness of corporate governance procedures, which also help resolve conflicts between CEOs, shareholders, and other stakeholders (Oino, 2019). IA is positively associated with high-quality BG. Strong corporate governance, audit committees and senior management are the means through which financial reporting quality is achieved, with the literature showing a high relationship between BG efficiency and financial reporting quality (Johnstone et al., 2011). It is recognized that internal

audit is a vital part of the Border Guard, serving as a vital source of assurances and suggestions to assist in the oversight of the Border Guard (Abdullah, 2014).

Al-Adim (2017) notes that while the Kingdom of Saudi Arabia's corporate governance structure is thought to be superior to that of other Middle Eastern nations (Al-Aali et al., 2014: 1332), the deficiency in high-quality financial reporting contributes to the low efficiency of the Saudi capital market (Al Ramahi, 2007; Al-Zahrani, 2010; Al-Abbas, 2008). As a result, weak efficiency is assumed in most studies examining the efficacy of corporate governance in Saudi Arabia (Al-Adeem & Al-Sugair, 2019). Nonetheless, the patterns noted in the Saudi capital market are comparable to those found in most other nations (Alhazaimeh & Al-Ghamdi, 2015). The quality of listed financial reports and voluntary disclosure in Saudi companies' annual reports are influenced by ownership structure and corporate governance (Alhazaimeh, 2014). According to Al-Janadi, et al. (2016), government ownership has an impact on Saudi enterprises' corporate governance and disclosure. Government ownership (Al- Al-Janadi, et al., 2016) and institutional ownership (Hamdan & Sartawi, 2013) generally have differing effects on many aspects of corporate governance. While disclosure and governorate governance are impacted by government ownership. From what was mentioned above, the following hypothesis was formulated

*CG positively and directly affects the QFR.*

## *2.2 CAATS and quality of financial reporting*

Technology for Audits (CAATS) Research has been done on the integrity, quality, and adaptability of audit technology in various nations to guarantee the transparency and quality of financial reports (Thottoli & Ahmed, 2023; Widuri et al., 2016). Modern technology and audit technology (CAATS) enable auditors to obtain complete, rapid, and accurate information assurance, automate repetitive operations involving few or simple judgments, and collect vast amounts of data in real-time (Dai & Vasarhelyi, 2016). To preserve data integrity, safeguard assets, enable companies to accomplish their objectives, and make the most use of their resources, (CAATS) was developed. It also aims to collect and evaluate audit evidence as well as the accuracy and caliber of financial reporting (Tajul et al., 2020; Zainal et al., 2017). To verify data integrity, completeness, and validity of the information obtained as well as to identify odd or unexpected relationships, audit technology tools, or CAATS, extract data from computer systems and evaluate it (Braun & Davis, 2003; Ferri et al., 2020). In the context of technology, it enables the auditor and the audit function to be more productive (Chaverug, 2010). By accomplishing the general audit objectives of accuracy, completeness, ownership, evaluation, reliability, classification, and disclosure of data provided by audit software (Ahmi & Kent, 2012; Debrececi et al., 2005), CAATS will assist the auditor in identifying any error or fraud in the financial statements and quality of financial reports. Only the acceptance and uptake of (CAATS) in audit duties have been found in prior studies. Therefore, more study should be done to find out how using audit technology influences an auditor's capacity to detect audit fraud more accurately.

Because of the modern environment, (CAATS) was created to help auditors carry out audits, identify fraud threats, and improve the integrity of financial reporting (Bradford et al., 2020; Omoteso, 2012; Razi & Madani, 2013). According to (Bradford et al., 2020; Chan & Vasarhelyi, 2011; Khattak & Mustafa, 2019), and other authors, modern business decisions demand rapid, reliable, and up-to-date financial data for strategic planning and forecasting, capital raising, decision making, and information for external users. The benefits of CAATS include enhanced knowledge, the ability to share expertise, and an understanding of audit techniques (Omuteso, 2012). Because it affects his ability to do his work, the external auditor needs to understand the nature of audit procedures and audit evaluation in the CAATS context. According to Byrnes et al., (2018), the external auditor's present task is to offer audit opinions and judgments using real-time methodology and audit tools. Statement of Auditing Standards (SAS) No. 316.52 states that the auditor should use CAATS to gather more thorough proof about data in important accounts or electronic transaction files (Hatunoglu, 2011). According to Brown et al., (2007), CAATS may enhance the caliber of financial reporting and incorporate AI into auditing and organization. Therefore, it becomes sense to look into how external auditors are using CAATS to conduct audit assessments for the caliber of financial reporting. Based on the above, the following hypothesis was formulated:

*CAATS positively and directly affect QFR.*

## *2.3 The effectiveness of the internal audit function and the quality of financial reports*

Concerns that extend beyond financial statements and risks, such as a company's reputation, development, environmental effects, and employee management, are among the broader issues that the internal audit function addresses and which are crucial to the sustainability and success of businesses (Erasmus & Coetzee, 2018; Abbott, Daugherty, Parker, & Peters, 2016). To put it briefly, internal auditors are crucial to a company's success, and their combination of assurance and consultation helps them do just that. Communicating the effectiveness of the company's systems and procedures to governors and management is part of this mix. The accomplishment of predetermined goals and the function's assistance to other corporate governance parties in effectively carrying out their duties are indicators of the efficacy of the internal audit function (Turetken, Jethefer, & Ozkan, 2019). The effectiveness of the internal audit function and the caliber of financial reporting are the subjects of the current study. This influence can be connected to internal audit function operations. Abbott, Dougherty, Parker, and Peters (2016) state that internal auditors can directly impact the quality of financial reporting through a minimum of four

activities: compliance auditing, supporting the audit of financial statements, auditing subsidiary financial statements, and special consulting projects. Examining transactions or journal entries to make sure they adhere to the company's financial reporting policy is one aspect of a compliance audit (Abbott, Daugherty, Parker, & Peters, 2016; Chen & Zhang, 2010). Internal auditors looking into accounting issues involving more difficult decisions made by the preparer, like impairment of property, plant, and equipment, fund to cover expected risks of warranty claims, and decreases in inventory value, may also be involved in special consulting projects (Abbott, Daugherty, Parker, & Peters, 2016; Ćular, Slapnicar, & Vuko, 2020). Reviewing the book-closing procedure, the recording process for one-time or unusual transactions and post-closing adjustments and reviewing critical account issues like inventory valuation and the allowance for the estimate of doubtful accounts are among the tasks associated with supporting the audit of financial statements and subsidiaries (Abbott, Dougherty, Parker, and Peters, 2016). It has been suggested that the internal audit function may run into troublesome, high-risk regions in any of the duties (Abbott, Daugherty, Parker, & Peters, 2016; Spira, & Page, 2003). It is recommended by the Institute of Internal Auditors as a quality control measure for the financial reporting process.

*Effect EIAF has a positive and direct impact on the QFR.*

*EIAF modifies the relationship between CAATS and QFR.*

*EIAF modifies the relationship between CG and QFR*

### **3. Research Methodology**

#### *3.1 Measurement development*

To confirm the suggested theories, English and Arabic versions of questionnaires were used. Items from the CAATS, CG, EIAF, QFR investigations were used in the questionnaire, and scales pertinent to the study context were retained. Furthermore, the developed questionnaire was reviewed by three experts in the fields of CAATS, CG, EIAF, and QFR. Following this, a first pilot pre-test was carried out, and the results showed that the questionnaire needed to be evaluated in this regard (Mumtaz et al., 2017). Consequently, four managers employed by listed firms in the Kingdom of Saudi Arabia and five senior accountants, particularly those with prior expertise with CAATS and CG, administered the test. According to Sekaran and Bougie (2016), the pretest verifies that the items and questionnaire design are adequate and clear. Following the pretest, a few items were modified to make the questionnaire easier to read. The items were rated using a Likert scale, where 1 denoted strongly disagree and 5 denoted strongly agree.

#### *3.2 Data collection*

The survey was done over a period of two and a half months (March 1, 2024–May 15, 2024) with decision makers utilizing CAATS, CG as the target audience. The online survey was sent to 20 Saudi banks with listings in the financial, services, and industrial sectors. 350 users of CAATS, CG, EIAF, and QFR who were engaged in automated accounting work in governed banks received 350 questionnaires, of which 293 copies were recovered. The guidelines (Hwang et al., 2016) that stipulate that the minimum sample size should be ten times the maximum number of approaches leading to internal constructs were applied in order to establish the sample size for the research. Consequently, the least sample size needed was  $n = 60$ . According to Hair et al. (2019), in a comparable setting, the sample size ought to be at least eight times more than the total number of study constructs (Alrawad, et al., 2022; Alshira'h, 2019; Alshirah et al., 2021, 2022). Consequently, the minimal sample size needed for this proposal was  $n = 48$ . Using G\* Power software, an a priori power analysis was used to create a sample size estimate based on Cohen (Cohen, J., 1992). Statistical power analyses were conducted for this estimate in order to determine its precision. To achieve an alpha of 0.05, a mean effect size of 0.15, and a power of 0.80, 96 respondents would be needed in the sample. For SEM-PLS analysis, a sample size of 187 answers was deemed sufficient (Bani Khaled et al., 2022; Al-Shira et al., 2022; Al-Shira et al., 2021).

#### *3.3 Study criteria*

5 items for the “CAATS” variable were adopted from (Bradford et al., 2020), 5 items for the “CG” variable were adopted from (Gerged et al., 2020), and 5 items for the rate variable “EIAF” were adopted from (Erasmus & Coetzee, 2018), while 5 items were adopted for the dependent variable “QFR” from (Vuko, 2020).

### **4. Analysis and Results**

To test the relationship in the study model, PLS-SEM via SmartPLS 4 software has been used, according to the guidelines of Ringle et al. (2015). PLS-SEM is widely utilized in management and social sciences research due to its numerous advantages (Al-Hakimi et al., 2021; Al-Kahtani et al., 2024; Al-Kahtani & Al-Mekhlafi, 2024; Al-Swidi et al., 2023, 2024; Goail et al., 2023). It is particularly appropriate for studies with smaller sample sizes and where the main goal is prediction (Hair et al., 2022). Compared to covariance-based SEM, PLS-SEM offers greater statistical power when applied to complex models with small sample sizes (Hair et al., 2022).

4.1 Measurement model analysis

Internal consistency reliability, according to Hair et al. (2019), is the degree to which all (sub)scale indicators are focused on evaluating the same notion.

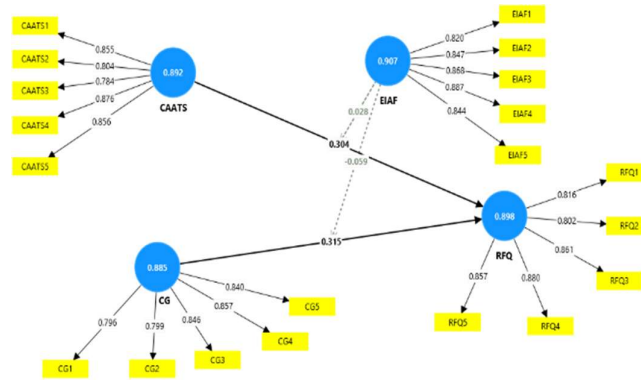


Fig. 1. Measurement model

Using particular questions, the convergent and discriminant validity of the latent variables were evaluated as part of the measurement model evaluation process. Based on the collected data, the measurement models complied with the requirements. Higher external factor loadings were found when the external loading was analyzed to evaluate the model (Hair et al., 2014). There were 20 distinct items in the study as a result of the retention of items with an external loading larger than 0.60. To provide a more precise measure of data consistency, further evaluations were carried out, including Cronbach's alpha and CR. The degree to which every item on a single scale measures the same variable is measured by EFA, CFA. The AVE test results for all variables were in fact higher than 0.5, showing a high degree of internal consistency. Convergent validity required the AVE for each latent variable to be larger than 0.50. The model appears to be valid and reliable based on the data shown in Table 1 and Fig. 1. Consequently, it can be said that the measuring technique currently in use in this work is appropriate for carrying out additional investigations.

Table 1 Reliability and Convergent Validity

Variables	Element	Factor Loadings	Cronbach's Alpha	Composite reliability	AVE
CAATS	CAATS1	0.855	0.892	0.920	0.699
	CAATS2	0.804			
	CAATS3	0.784			
	CAATS4	0.876			
	CAATS5	0.856			
CG	CG1	0.796	0.885	0.916	0.686
	CG2	0.799			
	CG3	0.846			
	CG4	0.857			
	CG5	0.840			
EIAF	EIAF1	0.820	0.907	0.931	0.728
	EIAF2	0.847			
	EIAF3	0.868			
	EIAF4	0.887			
	EIAF5	0.844			
QFR	QFR1	0.816	0.898	0.925	0.712
	QFR2	0.802			
	QFR3	0.861			
	QFR4	0.880			
	QFR5	0.857			

This study addressed discriminant validity, a crucial evaluation criterion that shows how distinct a variable is from others (Hair et al., 2019; Duarte & Raposo, 2010). The stronger the discriminatory validity of a variable, the more distinct it is in capturing the phenomenon when compared to other factors. The study took into account the square root of the AVE as well as the importance of the correlations between the latent components in order to guarantee discriminant validity (Hair et al., 2019). The constructs' squared AVE values were analyzed in order to prove discriminant validity and guarantee external consistency. The findings were as follows: EIAF (0.728), CG (0.686), CAATS (0.699), QFR (0.712).

**Table 2**

Discriminant validity-HTMT criterion

Variables	CAATS	CG	EIAF
CAATS			
CG	0.906		
EIAF	0.925	0.931	
QFR	0.950	0.958	0.956

The results of the Fornell-Larcker criterion are shown in Table 3. Square roots of AVEs that are larger than the construct correlations are indicated by the bolded values on the diagonals. The constructs have substantial relationships with their respective indicators, indicating their robust discriminant validity when compared to other model constructs (Hult et al., 2017; Tatham et al., 2010; Fornell, 1981; Chin, 1998). Furthermore, the exogenous component correlation, which is smaller than 0.87, validates each construct's excellent discriminant validity.

**Table 3**

Discriminant validity-Fornell-Larcker criterion

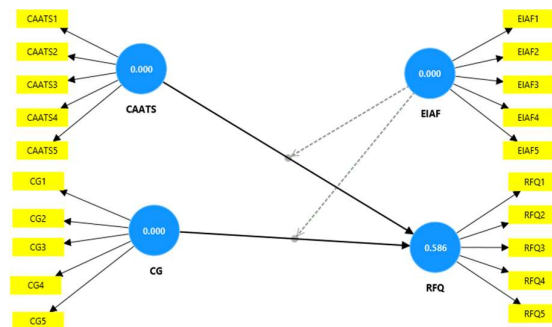
Variables	CAATS	CG	EIAF	QFR
CAATS	<b>0.836</b>			
CG	0.806	<b>0.828</b>		
EIAF	0.833	0.835	<b>0.854</b>	
QFR	0.851	0.856	0.863	<b>0.844</b>

Additionally, the He emphasizes that to forge a solid connection between these components, banks must cultivate a positive culture. The study's findings showed that the research variables had a substantial link with one another and that the modifying variable EIAF had an impact on how CAATS, CG, and QFR related to one another. Furthermore, as recommended by Chen (1998) the study looked at cross-loading constructs, evaluating whether items demonstrated stronger loadings on related constructs as opposed to unrelated ones. The things that regularly loaded heavier than the other items on their respective structures are highlighted in the results Table 4. The precise nature of the measurement strategy employed in the study is shown by this analysis.

**Table 4**

Cross loadings

Element	CAATS	CG	EIAF	QFR
CAATS1	<b>0.855</b>	0.722	0.735	0.731
CAATS2	<b>0.804</b>	0.603	0.619	0.678
CAATS3	<b>0.784</b>	0.643	0.666	0.677
CAATS4	<b>0.876</b>	0.711	0.745	0.743
CAATS5	<b>0.856</b>	0.685	0.709	0.724
CG1	0.624	<b>0.796</b>	0.645	0.652
CG2	0.655	<b>0.799</b>	0.642	0.678
CG3	0.719	<b>0.846</b>	0.754	0.743
CG4	0.673	<b>0.857</b>	0.707	0.716
CG5	0.664	<b>0.840</b>	0.704	0.748
EIAF1	0.710	0.694	<b>0.820</b>	0.746
EIAF2	0.686	0.707	<b>0.847</b>	0.722
EIAF3	0.744	0.732	<b>0.868</b>	0.749
EIAF4	0.725	0.714	<b>0.887</b>	0.738
EIAF5	0.686	0.717	<b>0.844</b>	0.725
QFR1	0.668	0.726	0.738	<b>0.816</b>
QFR2	0.682	0.696	0.693	<b>0.802</b>
QFR3	0.758	0.739	0.751	<b>0.861</b>
QFR4	0.749	0.721	0.728	<b>0.880</b>
QFR5	0.727	0.725	0.729	<b>0.857</b>

**Fig. 2.** Prediction ability of model (Q2)

4.1 Structural model analysis

Within the PLS-SEM framework, we evaluated model fit using a set of indicators from SmartPLS 4. The standardized root mean square residual, or SRMR, is a crucial metric that illustrates the covariance between the observed correlations and the model's correlation matrix (Hair et al. 2016). A saturated model SRMR value of 0.058 indicates a significant fit, while values less than 0.08 typically indicate an adequate match (Hu and Bentler, 1998). A considerable good fit is indicated by the saturated model's SRMR value of 0.716, which is significantly larger than the estimated model's value. Chi-square values relative to the null or standard model are examined by the NFI in order to assess model fit, adhering to Bentler and Bonett's (1980) ideal criterion of 0.90 (Lohmoller, 1989). In accordance with standard procedures, the covariance matrix suggested by the composite factor model and the empirical covariance matrix were compared using the geodesic distance ( $d_G$ ) and unweighted least squares ( $d_{ULS}$ ) discrepancy functions (Hair et al., 2021; Daneshvar, 2020). Larger values of 0.573 for  $d_G$  and 0.704 for  $d_{ULS}$  were displayed by the estimated model, further corroborating the saturated model's better relative fit. The values of  $d_G$  and  $d_{ULS}$ , according to the saturated model, were 0.567 and 0.716, respectively. The chi-square results, which indicate that the estimated model has a value of 1114.758 and the saturated model has a value of 1134.331, support this viewpoint. This suggests that the PLS-SEM model's goodness-of-fit magnitude was sufficient to show the general validity of the PLS model. The results are summarized in Table 5.

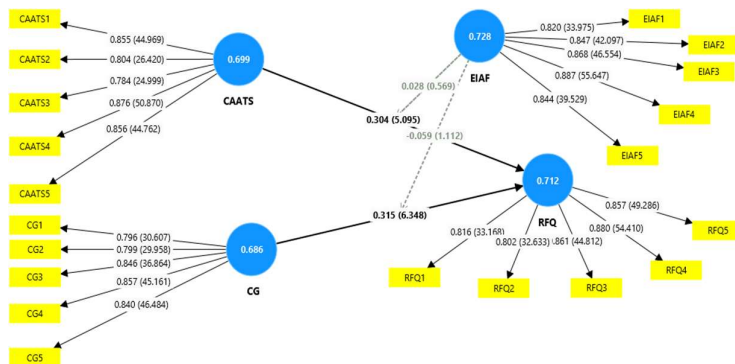
**Table 5**  
Model fit

Variables	Saturated model	Estimated model
SRMR	0.058	0.058
d_ ULS	0.716	0.704
d_ G	0.567	0.573
Chi-square	1134.331	1114.758
NFI	0.812	0.815

Prior to evaluating the hypotheses, the structural model's fit was assessed using R2 values. Hair et al. (2018) evaluated the suggested correlations between constructs using the structural model to validate the features of the measurement model. To evaluate how well the structural model fit the data, R2 values of 0.832 were employed. the percentage of the endogenous volatility of the dependent variable that the R2 value explains. Moreover, Stone-Geisser's was used to evaluate the model's prediction ability (Q2). Peng & Lai (2012) state that the Q2 values of the endogenous constructs are QFR (0.586) as shown in Fig. 2, which indicates sufficient prediction and is larger than zero (see Table 6).

**Table 6**  
R<sup>2</sup> and Q<sup>2</sup>

Variable	R <sup>2</sup>	Q <sup>2</sup>
QFR	0.832	0.586



**Fig. 3.** Structural model

**Table 7**  
Hypotheses testing

Variables	Beta	Sample mean (M)	S. d	T values	P values	decision
CAATS → QFR	0.304	0.301	0.060	5.095	0.000	Supported
CG → QFR	0.315	0.317	0.050	6.348	0.000	Supported
EIAF → QFR	0.290	0.289	0.063	4.612	0.000	Supported
EIAF × CAATS → QFR	0.028	0.036	0.050	0.569	0.569	Not Supported
EIAF × CG → QFR	-0.059	-0.069	0.053	1.112	0.266	Not Supported

## 5. Discuss the results

Evaluation of the structural model in Table 7 and Fig. 3 clearly shows the direct and indirect relationships between the study variables. The hypotheses supported by the study have a t-value greater than 2. Thus, all theories have been validated and approved. The first hypothesis: "CAATS positively affects the QFR." The study proved that CAATS positively affects the QFR, and that the relationship between CAATS and QFR is positive where (beta value = 0.304;  $T = 5.095$ ;  $P = 0.000$ ) where ( $T > 2$ ,  $P < 0.05$ ), and therefore the first hypothesis, which is the hypothesis, was accepted. Accepted and supported. The first hypothesis's results from the current study were in agreement with those from studies (Thottoli & Thomas, 2020; Widuri et al., 2016), (Dai & Vasarhelyi, 2016), (Tajul et al., 2020; Zainal et al., 2017), which all attested to the beneficial and significant influence of (CAATS) on the precision and caliber of QFR in commercial banks, companies, and the business sector. The second hypothesis: "CG positively affects QFR." The study proved that CG positively affects the QFR, and that the relationship between CG and EIAF is positive as (beta value = 0.315;  $T = 6.348$ ;  $P = 0.000$ ) as ( $T > 2$ ,  $P < 0.05$ ), and therefore the second hypothesis was accepted, which is the hypothesis Accepted and supported. Regarding the second hypothesis, the current study's findings varied from those of studies (Dimitropoulos and Asteriou, 2010; Rahman and Ali, 2006). Specifically, the current study found that CG positively influences FRQ and the relationship between CG and FRQ, whereas comparable studies verified CG's significant and negative impact. Regarding FRQ for Pakistani and British businesses alike. The current study's results for the same hypothesis were in line with previous research showing the value of CG in improving FRQ (Gonzalez and Garcí'a-Meca, 2014; Terjesen et al., 2016) and (Fodio et al., 2013; Iraya, et al., 2015). Similarly, research (Cumming et al., 2015; Gonzalez and Garcí'a-Meca, 2014) supporting the role of CG in improving FRQ was supported by the current investigation. But the Pakistani background has no bearing on the CG. This discrepancy in CG structures between developed and emerging economies is explained by empirical research (Gonzalez and Garcí'a-Meca, 2014; Yasser et al., 2017). The findings also demonstrate that, for Pakistani and British businesses, foreign ownership has a positive correlation with FRQ. According to the findings (Fang et al., 2015; LeI, 2019), foreign investors improve CG capacity and the financial reporting process's credibility. These findings are in line with earlier research and lend credence to the second theory (An, 2015; Beuselinck et al., 2017). The third hypothesis: "The EIAF positively affects the QFR." The study proved that EIAF positively affects QFR, and that the relationship between EIAF and EIAF is positive where (beta value = 0.290;  $T = 4.612$ ;  $P = 0.000$ ) where ( $T > 2$ ,  $P < 0.05$ ), and therefore the third hypothesis was accepted, which is the hypothesis Accepted and supported. The current study agreed with the study of Abbott, Daugherty, Parker, and Peters (2016) and (Abbott, Daugherty, Parker, & Peters, 2016; Chen & Zhang, 2010) on the importance of EIAF to directly influence the QFR. (Abbott, Daugherty, Parker, & Peters, 2016; Chen & Zhang, 2010). Fourth hypothesis: "CAATS positively affects QFR when using the modified variable EIAF." The study demonstrated that the CAATS does not positively affect the QFR when using the modified variable EIAF, and that the relationship between the CAATS and the QFR is positive, meaning that the EIAF does not modify the relationship between the CAATS and the QFR, where (beta value = 0.028;  $T = 0.569$ ;  $P = 0.569$ ) where ( $T < 2$ ,  $P > 0.05$ ), and therefore the fourth hypothesis was rejected, which is an unacceptable and unsupported hypothesis. Fifth hypothesis: "CG positively affects QFR when using the modified variable EIAF." The study demonstrated that CG does not positively affect the QFR when using the modified variable EIAF, and that the relationship between the CAATS and the QFR is negative, meaning that the EIAF modifies the relationship between the CAATS and the QFR, where (beta value = -0.059;  $T = 1.112$ ;  $P = 0.266$ ) where ( $T < 2$ ,  $P > 0.05$ ), and therefore the fifth hypothesis was rejected, which is an unacceptable and unsupported hypothesis.

## 6. Conclusions

### 6.1 Theoretical implications

This research contributes to the body of knowledge previously available in CAATS, CG, EIAF, and QFR by fostering synergies between these domains. Furthermore, by putting out a sophisticated model that incorporates CAATS, CG, EIAF, and QFR from an accounting and economic standpoint as solid as the Kingdom of Saudi Arabia, the study counterbalances the literature. Additionally, by analyzing the moderating impacts of EIAF amongst CAATS, CG, and QFR, this work offered a substantial contribution. Prior studies conducted in this field have not taken into account CAATS and CG as precursors to EIAF and QFR. Further research on the connections between CAATS, CG, EIAF, and QFR is recommended by Inman and Green (2018) as a means of advancing our understanding of CAATS and corporate governance. The synergy of CAATS, CG, EIAF, and QFR has never been studied jointly in Saudi commercial banks or in any other Saudi Arabian company before, therefore this study's analysis of it is a major contribution to the literature. This sets the current study apart from other earlier research since it is the first to consider all of these variables together in Saudi commercial banks.

### 6.2 Practical outcomes

In order to promote CAATS, CG (Green et al., 2019) as a means of attaining higher QFR, managers in Saudi commercial banks will find the paper's conclusions to be a useful foundation for implementing CAATS, CG, EIAF, and QFR. This work has significance for practitioners in QFR, CAATS, CG, and EIAF. It is well recognized that the relationships between CAATS, CG, EIAF, and QFR are positive and fundamental, as they collaborate inside Saudi commercial banks to improve profitability and the caliber of financial performance. Banks are urged to employ CAATS, CG, and EIAF in order to minimize automated



accounting errors, expedite preparation, and do away with all manual and traditional accounting tasks. Furthermore, the research proposes that managers in Saudi commercial banks, individuals engaged in automated accounting tasks, and internal auditors execute prompt initiatives like emphasizing customers, depositors, owners, shareholders, and stakeholders. This will enhance the bank's standing and confidence in safeguarding customers' and depositors' funds. through enhancing QFR, cutting CAATS and CG expenses, growing loan market share, and raising deposit volume. This has an impact on return on assets and profitability. The report also recommends managers to deploy CAATS, CG and CAATS, CG concurrently to enhance the bank's capacity to mitigate the adverse effects of CAATS, CG. This will lessen waste and raise the caliber of QFRs for banks. This means that by combining CAATS, CG, and EIAF, businesses can enhance both QFR at the same time.

### 6.3 Limitations

It is acknowledged that the limitations of this study pave the way for future research opportunities. Firstly, this paper utilized a quantitative approach for analysis and investigation; future studies could adopt qualitative or mixed methods for a more in-depth exploration of related issues. Secondly, data was collected from employees in commercial banks in Saudi Arabia. Expanding the data collection to include multiple countries could enhance the study's scope and generalizability. Lastly, this study was conducted in Saudi Arabia, a developing country, therefore, it is difficult to generalize the results for developed or even less developed countries.

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### Ethical approval

The present article was conducted based on the opinions of employees in commercial banks in the Kingdom of Saudi Arabia, i.e., it is not concerned with any individual or specific organization. As a study in social science, it is devoid of any human experiment performed by any of the authors.

### Informed consent

Consent was not deemed necessary for this study, as the data collected using the anonymous identity of the respondent. All sources used in this study have been considered and cited.

### Data availability

The data used in this study are available on request from the corresponding author.

### Competing interest statement

The authors declare no conflict of interest.

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