

The impact of governance complementarity and artificial intelligence on sustainable financial reporting quality in commercial banks in emerging economies

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ABSTRACT

This study investigates the joint influence of corporate governance practices, internal audit quality, and Artificial Intelligence (AI) adoption on sustainable financial reporting quality in Indian commercial banks. While prior research has predominantly examined governance mechanisms in isolation, limited empirical attention has been given to their complementary interaction within digitally enabled sustainability oriented reporting environments. Drawing on Agency Theory and the governance complementarity perspective, this study conceptualizes AI as a strategic monitoring and assurance tool that enhances transparency, strengthens internal controls, and improves reporting reliability. A quantitative research design

was employed using survey data collected from licensed commercial banks operating in India. Hierarchical regression analysis was conducted to examine both direct and interaction effects, with bank size and bank age included as control variables. The results indicate that internal audit quality ($r = 0.664$, $p < 0.01$) and corporate governance practices ($r = 0.598$, $p < 0.01$) are positively associated with sustainable financial reporting quality. AI adoption also demonstrates a significant positive influence by enabling automated anomaly detection, predictive analytics, and real-time compliance monitoring, thereby improving data integrity and financial transparency. Furthermore, the interaction between internal audit quality and

corporate governance remains positive and significant ($\beta = 0.362$, $p < 0.05$), with AI strengthening this complementary relationship. The study contributes to governance literature by demonstrating that sustainable financial reporting quality in commercial banks emerges from synergistic governance mechanisms supported by AI-enabled monitoring capabilities.

Keywords: Governance Complementarity, Corporate Governance, Internal Audit Quality, Artificial Intelligence, Sustainable Financial Reporting Quality

INTRODUCTION

Sustainable financial reporting quality has emerged as a critical governance priority in the banking sector, particularly in emerging economies where financial stability, regulatory oversight, and digital transformation increasingly intersect. Unlike traditional financial reporting quality, which focuses primarily on short-term compliance and accounting accuracy, sustainable financial reporting quality emphasizes the long-term reliability, transparency, consistency, and forward-looking relevance of financial disclosures [1,2]. It reflects a reporting system's ability to sustain stakeholder confidence, maintain institutional credibility, and support financial system stability across economic cycles and governance disruptions [3,4].

India's banking sector has experienced significant structural reforms and strengthened regulatory oversight in recent years. Nevertheless, persistent concerns regarding Non-Performing Asset (NPA) recognition, governance failures, and regulatory interventions by the Reserve Bank of India continue to highlight weaknesses in internal control systems and institutional oversight mechanisms (Reserve Bank of India, 2023). These developments underscore the importance of robust governance frameworks capable of ensuring durable and sustainability-oriented financial reporting beyond

formal regulatory compliance. At the same time, the increasing integration of Artificial Intelligence (AI) in banking operations is transforming governance, auditing, and financial reporting processes. AI-driven technologies including machine learning algorithms, Robotic Process Automation (RPA), predictive analytics, and Natural Language Processing (NLP) are increasingly used to enhance fraud detection, risk assessment, automated reconciliation, and real-time monitoring systems [5,6]. These technologies improve reporting accuracy, strengthen internal control analytics, and reduce operational errors. However, existing research suggests that technological adoption alone does not guarantee improved governance outcomes. Rather, the effectiveness of AI depends on strong oversight mechanisms, organizational integration, and strategic alignment with governance structures [7].

Corporate governance mechanisms, particularly boards of directors and audit committees, play a fundamental role in mitigating agency conflicts and strengthening monitoring effectiveness [8,9]. Internal audit functions complement board oversight by providing independent assurance regarding risk management processes, internal controls, and the reliability of financial information [10]. In digitally enabled banking environments, internal audit quality increasingly includes technological competence, data analytics capabilities, and the ability to evaluate AI-driven systems and algorithmic risks [11,12]. Consequently, governance effectiveness is increasingly shaped by the interaction between traditional oversight structures and digital intelligence systems. Despite India's relatively advanced regulatory framework, institutional heterogeneity, information asymmetry, and governance disparities between public and private sector banks remain significant challenges [13,14]. In such contexts, the effectiveness of governance mechanisms may depend not only on their individual presence but also on their complementarity. The governance complementarity perspective suggests

that organizational mechanisms generate greater effectiveness when they operate synergistically rather than independently [15]. Evidence from emerging economies indicates that governance relationships between corporate governance, internal audit quality, and financial reporting quality, several important research gaps remain [17,18]. First, most studies rely on linear analytical models that examine governance mechanisms independently rather than exploring their interaction effects. Second, limited research has examined sustainable financial reporting quality as a long-term governance outcome. Third, the integration of Artificial Intelligence within governance complementarity frameworks remains underexplored, particularly within the banking sectors of emerging economies. As AI increasingly mediates financial data generation, monitoring, and disclosure processes, understanding its interaction with corporate governance and internal audit quality becomes theoretically and practically important. AI technologies can strengthen governance effectiveness by improving monitoring capabilities, enhancing audit analytics, and reducing discretionary financial reporting manipulation. However, without effective board oversight and high-quality internal audit functions capable of interpreting AI outputs and managing algorithmic risks, technological adoption may not translate into sustainable improvements in reporting quality [6,7]. Grounded in Agency Theory Jensen & Meckling and the governance complementarity framework [15], this study argues that sustainable financial reporting quality in Indian commercial banks emerges from the synergistic interaction between corporate governance practices, internal audit quality, and AI adoption. Agency Theory explains how monitoring structures reduce managerial opportunism and information asymmetry Fama & Jensen, while complementarity theory suggests that governance mechanisms produce greater effectiveness when implemented jointly rather than independently

mechanisms and internal control systems may fail to achieve optimal reporting outcomes when implemented in isolation [16].

Within this framework, AI functions as both a monitoring enhancer and a strategic governance resource. Accordingly, this study examines the direct and interaction effects of corporate governance practices, internal audit quality, and AI adoption on sustainable financial reporting quality in Indian commercial banks. By integrating digital transformation into governance complementarity theory, the study contributes to emerging discussions on technology-enabled governance, financial transparency, and sustainability-oriented reporting in emerging markets. Specifically, the study makes three contributions. First, it extends governance complementarity theory by incorporating AI as a digital monitoring and assurance mechanism. Second, it provides empirical evidence from India's rapidly digitizing banking sector. Third, it offers policy-relevant insights for regulators, boards, and audit committees seeking to align governance reforms with AI-enabled systems to enhance long-term financial transparency and financial system stability.

LITERATURE REVIEW

Sustainable financial reporting quality in banking

Sustainable Financial Reporting Quality (SFRQ) extends beyond conventional financial reporting by emphasizing the long-term reliability, transparency, and forward-looking relevance of financial disclosures that address the information needs of diverse stakeholders [1,2]. In the banking sector, SFRQ encompasses reporting practices that integrate environmental, social, and governance (ESG) information with financial disclosures, reflecting an institution's capacity to maintain financial stability and stakeholder trust in complex and dynamic environments [3,4]. This broader conceptualization signals a shift from traditional compliance-oriented

reporting toward sustainability-oriented governance outcomes [19]. Emerging economies such as India face particular challenges in achieving high-quality sustainability reporting due to institutional variability, information asymmetry, and evolving regulatory frameworks [13,14]. Although regulatory reforms have strengthened financial reporting standards and ESG disclosure expectations in India, banks continue to experience governance and transparency challenges that influence the quality of sustainability reporting [20]. These challenges highlight the importance of understanding how governance mechanisms and technological innovation jointly influence SFRQ in the banking sector.

Corporate governance and sustainable financial reporting quality

Corporate governance mechanisms including board independence, audit committee effectiveness, ownership structure, and governance transparency are widely recognized as critical determinants of financial reporting quality and organizational accountability [21,22]. Within banking institutions, strong governance structures reduce earnings management, improve ESG disclosure quality, and strengthen stakeholder confidence [23,24]. Empirical evidence suggests that banks with well-structured governance frameworks are more likely to provide transparent and reliable sustainability disclosures. For instance, Rajawat and Mahajan demonstrate that Indian banks characterized by independent boards and active audit committees exhibit higher-quality sustainability reporting practices. However, emerging studies also highlight that governance mechanisms may not always translate into improved reporting quality, particularly in environments where enforcement is weak or governance structures are implemented symbolically rather than substantively [25-27]. These findings indicate that governance structures may require complementary internal assurance mechanisms and technological capabilities to achieve their full effectiveness.

Internal audit quality and sustainable financial reporting quality

Internal Audit Quality (IAQ) represents an essential internal control mechanism that enhances financial reporting reliability through independent assurance, risk evaluation, and verification of financial and non-financial information [28,29]. In banking institutions, internal audit functions play a critical role in evaluating sustainability-related risks, validating ESG disclosures, and strengthening internal transparency systems [30,31]. Despite its importance, research in emerging markets indicates that internal audit effectiveness may be constrained by limited independence, resource constraints, and a compliance-focused orientation, which can reduce the impact of IAQ on financial reporting quality [32,33]. These limitations suggest that internal audit functions may produce stronger outcomes when they operate alongside effective governance structures and advanced technological systems capable of enhancing monitoring and data analysis.

Artificial intelligence as a governance enabler

Recent scholarship highlights the transformative potential of Artificial Intelligence (AI) in enhancing governance, auditing, and financial reporting processes. AI technologies including machine learning, Natural Language Processing (NLP), Robotic Process Automation (RPA), predictive analytics, and anomaly detection systems are increasingly integrated into financial reporting systems and internal control frameworks [5,6]. These technologies enable continuous auditing, real-time risk monitoring, automated reconciliation, and enhanced data analytics, thereby strengthening reporting accuracy and operational transparency [7,11]. Within the banking sector, AI-enabled tools facilitate the processing of large volumes of financial data, early identification of reporting anomalies, and improved monitoring of sustainability-related risks [5,6]. However, research also emphasizes that AI adoption alone does not guarantee improved

governance outcomes. The effectiveness of AI technologies depends on strong governance oversight, audit interpretation capabilities, and organizational accountability mechanisms [7]. Without appropriate governance structures and high-quality internal audit functions capable of evaluating algorithmic outputs and managing digital risks, AI systems may create new governance vulnerabilities. Consequently, AI should be viewed not only as a technological tool but also as a strategic governance enabler that interacts with existing oversight mechanisms.

Governance complementarity and AI integration

The concept of governance complementarity suggests that governance mechanisms including corporate boards, audit committees, internal audit functions, and technological systems may interact synergistically to produce more effective reporting outcomes than when implemented independently [15,16]. Empirical evidence indicates that Corporate Governance (CG) and Internal Audit Quality (IAQ) operate most effectively when they reinforce each other, enabling stronger oversight and improved information flows within organizations [33,34]. The integration of AI technologies further strengthens this complementary relationship by enhancing internal audit capabilities through continuous monitoring and automated testing, while providing governance bodies with real-time intelligence and predictive insights [12,36]. Studies suggest that organizations adopting integrated governance frameworks supported by AI technologies demonstrate higher levels of transparency and sustainability reporting quality compared to those relying solely on traditional governance structures [5,11]. In this integrated framework, AI functions both as a governance enabler and as a source of timely, high-quality information that enhances the oversight capabilities of boards and audit committees.

Summary of research gaps

Despite growing interest in governance and sustainability reporting, several research gaps remain. First, the integration of Artificial Intelligence within governance and financial reporting research remains limited, particularly in emerging economy contexts such as India [6,7]. Second, many studies examine corporate governance and internal audit quality independently, relying on linear models that overlook potential interaction effects between governance mechanisms [16,34]. Third, empirical research examining sustainable financial reporting quality within the Indian banking sector remains scarce, particularly studies that simultaneously consider governance structures, audit quality, and technological innovation [20,22]. Addressing these gaps, the present study investigates the joint influence of corporate governance, internal audit quality, and AI adoption on sustainable financial reporting quality in Indian commercial banks.

From literature to hypotheses

The literature reviewed above establishes important relationships among Corporate Governance (CG), Internal Audit Quality (IAQ), Artificial Intelligence (AI) adoption, and Sustainable Financial Reporting Quality (SFRQ). Prior evidence suggests that both CG and IAQ positively influence reporting quality, although their effectiveness may depend on their complementary interaction. In addition, AI adoption enhances governance effectiveness by improving monitoring capabilities, audit analytics, and data integrity within financial reporting systems. Accordingly, the conceptual framework developed in this study proposes that SFRQ in Indian commercial banks is influenced by the complementary interaction of corporate governance, internal audit quality, and AI-driven capabilities. These relationships form the basis for the hypotheses presented in the subsequent section.

OBJECTIVES

The primary objective of this study is to examine how governance mechanisms and technological capabilities jointly influence sustainable financial reporting quality in the Indian banking sector. Specifically, the study aims to:

1. To examine the effect of corporate governance practices on sustainable financial reporting quality in Indian commercial banks.
2. To analyze the impact of internal audit quality on sustainable financial reporting quality in Indian commercial banks.
3. To investigate the influence of Artificial Intelligence adoption on sustainable financial reporting quality in Indian commercial banks.
4. To assess the complementary interaction between corporate governance and internal audit quality in improving sustainable financial reporting quality.

To examine whether Artificial Intelligence strengthens the relationship between governance mechanisms (corporate governance and internal audit quality) and sustainable financial reporting quality.

METHODOLOGY

Research design

This study adopts a positivist research paradigm, emphasizing objectivity, hypothesis testing, and empirical verification to examine the relationships between Corporate Governance Practices (CGP), Internal Audit Quality (IAQ), Artificial Intelligence (AI) adoption, and Sustainable Financial Reporting Quality (SFRQ) in Indian commercial banks. A quantitative research design was employed to enable precise measurement of latent constructs and robust statistical evaluation of both direct and interaction effects. The quantitative approach is widely used in governance and financial reporting research as it

facilitates statistical testing of theoretical relationships and generalizable findings [37-39]. In this study, AI is conceptualized as a strategic governance enabler that enhances real-time monitoring, predictive risk assessment, and automated reporting systems, thereby strengthening governance and audit mechanisms [40,41].

Population and sampling

The target population consisted of all licensed commercial banks operating in India, based on the official database of the Reserve Bank of India (RBI, 2024). To ensure adequate representation across different banking structures, a stratified random sampling technique was employed. Banks were categorized into large, medium, and small institutions based on asset size and operational scale, ensuring proportional representation of governance structures, technological adoption levels, and reporting maturity. Using Yamane's (1967) sampling formula with a 5% margin of error, a final sample of 31 commercial banks was determined. Only operational banks during the study period were included to minimize survivorship bias and ensure the relevance of governance and AI adoption practices.

Unit of analysis and respondents

The unit of analysis in this study is the commercial bank. Data were collected from key informants occupying governance-relevant positions, including: Chief Financial Officers (CFOs), Heads of Internal Audit, Senior Accountants, Senior governance and compliance officers. These respondents possess direct involvement in governance oversight, financial reporting, internal auditing, and AI-enabled monitoring systems. Their expertise ensures informed responses regarding governance practices, internal audit quality, and AI integration within banking operations [42,43].

Data collection instrument

Primary data for this study were collected using a structured questionnaire consisting of closed-ended questions adapted from previously validated instruments in governance and financial reporting research [44-46]. The questionnaire was carefully modified to align with the operational context of Indian commercial banks and to incorporate indicators measuring Artificial Intelligence (AI) adoption within financial reporting, governance, and internal audit systems. All measurement items were evaluated using a five-point Likert scale, where 1 = Strongly Disagree and 5 = Strongly Agree. This scaling approach allows for consistent measurement of respondents' perceptions regarding governance practices, internal audit quality, AI adoption, and sustainable financial reporting quality. AI adoption was operationalized through multiple indicators capturing the extent to which banks utilize advanced digital technologies in governance and reporting processes. These indicators included the use of machine learning systems, predictive analytics, Robotic Process Automation (RPA), AI-based decision support tools, and automated anomaly detection systems for monitoring financial transactions, detecting irregularities, and enhancing reporting accuracy. Prior to the full-scale survey administration, the questionnaire was pilot-tested with a small group of banking professionals and academic experts to ensure clarity of wording, contextual relevance, and measurement reliability. Feedback from the pilot test led to minor refinements in wording and structure, thereby enhancing the instrument's validity, reliability, and suitability for the Indian banking environment.

Operationalization of variables: The variables used in this study were operationalized based on established

constructs from prior literature on corporate governance, internal auditing, financial reporting, and emerging digital technologies. Each construct was measured using multiple indicators to capture the multidimensional nature of governance and reporting practices within banking institutions. The dependent variable, Sustainable Financial Reporting Quality (SFRQ), reflects the extent to which financial reporting in banks demonstrates accuracy, transparency, completeness, timeliness, and sustainability orientation. This construct captures both traditional financial reporting reliability and the integration of sustainability-related disclosures. The independent variables include Corporate Governance Practices (CGP), Internal Audit Quality (IAQ), and Artificial Intelligence Adoption (AI). Corporate governance practices capture board independence, board structure, audit committee effectiveness, and ethical oversight mechanisms that influence reporting integrity. Internal audit quality measures the competence, independence, scope, and effectiveness of internal auditing processes that ensure the credibility of financial and sustainability information. Artificial intelligence adoption represents the extent to which banks utilize AI-based technologies such as predictive analytics, machine learning, and automated anomaly detection to improve monitoring, risk assessment, and reporting accuracy. Additionally, bank size and bank age were included as control variables to account for structural differences among banks that may influence reporting quality. Bank size was measured using total assets, while bank age was measured as the number of years since establishment Table 1. All perceptual variables were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Table 1. Operationalization and Measurement of Variables

Variable type	Variable	Measurement indicators	Measurement scale
Dependent variable	Sustainable Financial Reporting Quality (SFRQ)	Accuracy, relevance, completeness, transparency, timeliness, understandability, sustainability orientation of financial reports	5-point Likert scale
Independent variable	Corporate Governance Practices (CGP)	Board independence, board size and structure, audit committee effectiveness, governance transparency, ethical oversight	5-point Likert scale
Independent variable	Internal Audit Quality (IAQ)	Auditor competence, audit planning, audit scope, objectivity, reporting effectiveness, independence	5-point Likert scale
Independent variable	Artificial Intelligence Adoption (AI)	Use of machine learning, predictive analytics, automated reporting, anomaly detection, AI-based decision support	5-point Likert scale
Control variable	Bank Size (SIZE)	Total assets of the bank (INR)	Continuous variable
Control variable	Bank Age (AGE)	Number of years since bank establishment	Continuous variable

Data analysis

The collected data were analyzed using SPSS version 28. Descriptive statistics were first used to summarize the characteristics of the variables, including mean and standard deviation. Reliability analysis using Cronbach’s alpha was conducted to assess the internal consistency of the measurement scales.

Pearson correlation analysis was performed to examine the relationships between Corporate Governance Practices (CGP), Internal Audit Quality (IAQ), Artificial Intelligence adoption (AI), and sustainable financial reporting quality (SFRQ). To test the study hypotheses, multiple linear regression and hierarchical regression analysis were applied to evaluate the direct and interaction effects of CGP,

IAQ, and AI on SFRQ. Bank size and bank age were included as control variables. Diagnostic tests such as Variance Inflation Factor (VIF) and heteroscedasticity checks were conducted to ensure the robustness and validity of the regression results.

Model specification

The baseline model is expressed as:

$$SFRQ_i = \beta_0 + \beta_1 CG_i + \beta_2 IAQ_i + \beta_3 AI_i + \beta_4 (CG_i \times IAQ_i) + \beta_5 (CG_i \times AI_i) + \beta_6 (IAQ_i \times AI_i) + \beta_7 SIZE_i + \beta_8 AGE_i + \epsilon_i$$

Where:

SFRQ_i = Sustainable financial reporting quality of bank i

CG_i = Corporate governance practices

IAQ_i = Internal audit quality

AI_i = Artificial intelligence adoption

$CG_i \times IAQ_i$, $CG_i \times AI_i$, $IAQ_i \times AI_i$ = Interaction terms representing governance complementarity effects

$SIZE_i$ = Bank size

AGE_i = Bank age

ϵ_i = Error term

This model captures direct, moderating, and complementary relationships among governance mechanisms and technological capabilities. It allows the study to assess how AI adoption strengthens the interaction between corporate governance and internal audit quality, thereby improving sustainable financial reporting quality in Indian commercial banks [24,40,47].

Ethical considerations

Participation in the study was voluntary, and informed consent was obtained from all respondents prior to data collection. The confidentiality and anonymity of participants and their institutions were strictly maintained. All data were used solely for academic research purposes and handled in accordance with established institutional ethical guidelines.

Results and Discussion

Measurement validity and reliability

Table 2 presents the validity and reliability statistics for all latent constructs, including Artificial Intelligence (AI) adoption. Exploratory Factor Analysis (EFA) confirmed a clear and theoretically consistent factor structure. Sampling adequacy was strong ($KMO > 0.80$), and Bartlett's Test of Sphericity was significant ($p < 0.001$), indicating suitability for factor analysis. All standardized factor loadings exceeded 0.70, ranging from 0.704 to 0.891, demonstrating strong convergent validity. No significant cross-loadings were observed among Corporate Governance Practices (CGP), Internal Audit Quality (IAQ), AI Adoption (AI), and Sustainable Financial Reporting Quality (SFRQ), confirming discriminant validity.

Internal consistency reliability was high across constructs:

SFRQ: $\alpha = 0.921$; IAQ: $\alpha = 0.854$; CGP: $\alpha = 0.832$; AI Adoption: $\alpha = 0.887$

Composite reliability values were above 0.80 for all constructs, confirming measurement stability. The strong reliability of the AI construct indicates consistent measurement of machine learning systems, predictive analytics, automated reporting, and anomaly detection tools used in Indian commercial banks. Bank size and bank age were measured using objective secondary data and were therefore excluded from reliability testing.

Table 2. Measurement Validity and Reliability Results

Construct	Items	Cronbach's α	CR	Factor Loadings	KMO	Bartlett (χ^2 , p)
SFRQ	7	0.921	0.946	0.722–0.882	0.865	<0.001
IAQ	6	0.854	0.878	0.725–0.862	0.853	<0.001
CGP	9	0.832	0.864	0.704–0.862	0.826	<0.001
AI Adoption	6	0.887	0.904	0.731–0.891	0.842	<0.001
SIZE	1	N/A	N/A	–	–	–
AGE	1	N/A	N/A	–	–	–

Demographic profile

A total of 100 questionnaires were distributed across Indian commercial banks, yielding 86 valid responses, representing an 86% response rate. This high response rate supports the reliability and representativeness of the data. Respondents occupied governance-relevant positions, including Chief Financial Officers (32%), Internal Auditors (38%), Senior Accountants (19%), and Senior Bank Officers (11%). Most respondents held postgraduate degrees and professional certifications (CPA/ACCA), strengthening the credibility of responses related to AI-enabled governance and financial reporting systems.

Table 3 presents the descriptive statistics of the study variables.

The results indicate a high level of sustainable financial reporting quality (Mean = 4.54) among Indian commercial banks. Internal Audit Quality (Mean = 4.41) and Corporate Governance Practices (Mean = 4.36) also exhibit strong perceived effectiveness.

AI adoption shows a mean score of 4.28 (SD = 0.41), suggesting that Indian banks are actively integrating AI-driven monitoring, predictive analytics, and automated reporting tools into governance and audit functions Table 3.

Table 3. Descriptive Statistics

Variable	Min	Max	Mean	SD
SFRQ	1.00	5.00	4.54	0.24
IAQ	1.00	5.00	4.41	0.38
CGP	1.00	5.00	4.36	0.34
AI Adoption	1.00	5.00	4.28	0.41
Bank Size	–	–	10.74	0.82
Bank Age	–	–	13.06	5.41

Correlation and multicollinearity

Correlation analysis shows that SFRQ is positively associated with:

Internal Audit Quality ($r = 0.664, p < 0.01$)

Corporate Governance Practices ($r = 0.624, p < 0.01$)

AI Adoption ($r = 0.589, p < 0.01$)

These results indicate that stronger governance mechanisms and AI integration are associated with higher levels of sustainable financial reporting quality.

Multicollinearity diagnostics indicate acceptable levels, with Variance Inflation Factor (VIF) values below 2.0 (Mean VIF = 1.41).

Regression analysis

Main Effects Regression results indicate positive and significant effects:

Corporate Governance → SFRQ ($\beta = 0.228, p < 0.01$)

Internal Audit Quality → SFRQ ($\beta = 0.742, p < 0.01$)

AI Adoption → SFRQ ($\beta = 0.314, p < 0.01$)

These results confirm that AI adoption enhances sustainable financial reporting through automated anomaly detection, predictive analytics, and real-time compliance monitoring.

Interaction Effects

The interaction model shows significant complementarity:

CGP × IAQ: $\beta = 0.612$, $p < 0.05$

CGP × AI: $\beta = 0.284$, $p < 0.05$

IAQ × AI: $\beta = 0.319$, $p < 0.05$

This demonstrates that high-quality internal audit strengthens corporate governance, while AI further enhances both governance oversight and audit effectiveness. The model's explanatory power improved substantially ($R^2 = 0.721$), highlighting the synergistic effect of governance mechanisms and AI.

DISCUSSION

Robustness checks

Robustness analysis was conducted by standardizing CGP, IAQ, and AI variables. The results remained consistent:

AI remained significant ($\beta \approx 0.309$, $p < 0.01$)

Interaction effects remained stable.

This confirms that the findings are not sensitive to scaling or model specification.

CONCLUSION

This study demonstrates that Sustainable Financial Reporting Quality (SFRQ) in Indian commercial banks is shaped not only by Corporate Governance (CG) and Internal Audit Quality (IAQ) individually, but also by their synergistic interaction, which is further strengthened through Artificial Intelligence (AI) adoption. Empirical results reveal that IAQ exerts the strongest direct effect on SFRQ, followed

The results extend Agency Theory and Governance Complementarity Theory:

AI as a governance enabler: AI reduces information asymmetry, strengthens internal monitoring, and enhances ESG reporting accuracy.

Complementarity of mechanisms: Sustainable financial reporting quality emerges from integrated governance, where boards, internal audits, and AI-enabled systems reinforce each other.

Practical relevance: In emerging markets like India, where regulatory complexity and digital transformation are high, isolated governance reforms are insufficient. Technology-enabled auditing enhances oversight efficiency and reporting transparency.

These findings indicate that AI is not a substitute but an amplifier of traditional governance mechanisms, emphasizing the importance of integrating digital tools into audit and reporting systems

by AI adoption and corporate governance practices. Importantly, the interaction effects confirm that high-quality internal audit enhances governance effectiveness, and AI amplifies both oversight and audit capabilities, producing superior sustainability-oriented reporting outcomes. These findings extend Governance Complementarity Theory by highlighting the triple interaction of structural governance, monitoring functions, and technological governance, positioning AI as a strategic enabler rather than a mere technological tool. Practically, the study suggests that Indian banks can enhance transparency, accountability, and stakeholder trust by integrating AI-enabled auditing within robust governance frameworks, while regulators may consider policy frameworks to encourage technology-assisted governance and sustainability reporting.

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