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Value For Money Audit And Operational Efficiency Of Listed Deposit Money Banks In Nigeria

[1]Samson Aluya, Ph.D, ACA, ACTI & [2]Edidiong Justine John

[1]Department of Accountancy,
Faculty of Management Sciences,
Covenant Polytechnic Owerrinta, Aba, Abia State, Nigeria
sparkledeheart@yahoo.com

[2]Department of Accounting,
Faculty of Management Sciences,
Akwa Ibom State University, Obio Akpa Campus, Akwa Ibom State, Nigeria
edidiongjohn1000@gmail.com

ABSTRACT
Operational efficiency remains a major governance concern for listed deposit money banks in Nigeria because banks are exposed to rising operating costs, digital transformation pressure, cyber-risk exposure, risk governance demands and shareholders' expectation of sustainable value creation. This study examined the relationship between value for money audit and operational efficiency of listed deposit money banks in Nigeria. Value for money audit was decomposed into economy audit, efficiency audit, effectiveness audit, ethics audit and equity audit, while operational efficiency was proxied by the cost-to-income ratio. The study adopted an ex-post facto and content-analysis research design. A balanced panel of one hundred and thirty firm-year observations was obtained from thirteen listed deposit money banks and banking holding companies for the ten-year period 2015-2024. Data were analysed with descriptive statistics, correlation analysis, variance inflation factors, residual diagnostics, fixed effects regression with robust standard errors, panel-corrected standard errors, feasible generalized least squares and dynamic panel robustness checks. The empirical outputs were presented in the EViews 10.0 result format. The findings revealed that economy audit has a significant negative relationship with cost-to-income ratio (coefficient = -0.0198; p = 0.0000), efficiency audit has a significant negative relationship with cost-to-income ratio (coefficient = -0.0259; p = 0.0000), and effectiveness audit has a significant negative relationship with cost-to-income ratio (coefficient = -0.0143; p = 0.0000). Ethics audit and equity audit also showed negative coefficients, but their effects were not significant at the 5% level in the main fixed-effects model. The study concluded that value for money audit improves operational efficiency when audit work is strongly linked to cost discipline, process productivity and strategic outcome assessment. It recommended that boards, audit committees and internal audit departments of listed deposit money banks should institutionalize value for money audit scorecards across procurement, branch operations, digital platforms, outsourcing arrangements, customer-service processes and strategic projects.

Keywords: Value for Money Audit; Operational Efficiency; Deposit Money Banks; Economy Audit; Efficiency Audit; Effectiveness Audit; Nigeria.

1.1 INTRODUCTION
Deposit money banks occupy a central position in the financial system because they mobilize deposits, allocate credit, support payment services, provide trade finance and transmit financial intermediation benefits to households, firms and public-sector actors. Their operational efficiency therefore affects shareholders, depositors, borrowers, employees and the broader economy. Recent Nigerian banking studies describe the sector as risk-sensitive, governance-driven and increasingly dependent on the quality

of audit oversight, risk management, digital transformation and board monitoring (Bamidele et al., 2026; Oyamendan et al., 2026; Zubairu et al., 2026).

Operational efficiency in banking refers to the extent to which a bank converts inputs such as staff, branches, information technology, risk systems, capital and administrative resources into banking services and operating income at reasonable cost. In empirical banking research, the cost-to-income ratio remains a useful measure because it captures the operating cost incurred to generate operating income; a lower ratio generally indicates better cost discipline and stronger productivity (Salemcity, 2025; Umeagukwu, 2025). Recent evidence on Nigerian deposit money banks further shows that operational performance is affected by bank-specific risk, credit discipline, governance quality and the strength of monitoring arrangements (Adesola & Oyeniran, 2026; Oyamendan et al., 2026).

Value for money audit provides a performance-oriented accountability mechanism for addressing operational efficiency concerns. It examines whether resources are acquired economically, used efficiently and directed toward the achievement of intended objectives. Contemporary audit-related research links audit quality, audit technology, internal audit practice and monitoring mechanisms with performance, financial reporting quality and risk control in Nigerian banks and listed firms (Abonyi & Nwaorgu, 2026; Orji, 2026; Oladejo & Oladejo-Otunbosun, 2026). For listed deposit money banks, value for money audit is particularly useful because it moves audit work beyond routine compliance and places emphasis on cost, process, outcome, ethics and fairness.

The banking sector is a relevant setting for value for money audit because banks operate with large transaction volumes, complex technology platforms, public trust and strict governance expectations. Inefficient operations can lead to excessive personnel cost, weak branch productivity, delayed complaint resolution, duplicated controls, high fraud losses, underutilized digital platforms and poor returns from technology investments. Audit functions in banks must therefore provide evidence on whether operations are economical, efficient, effective, ethical and equitable. Orji (2026) shows that artificial intelligence-driven audit technology can improve auditor performance in listed deposit money banks, while Zubairu et al. (2026) found that audit committee independence strengthens aspects of risk management and financial stability. These findings support the need for performance-based audit systems.

Recent Nigerian evidence also shows that governance and audit-related variables are important for bank performance and reporting quality. Bamidele et al. (2026) found that corporate governance mechanisms, including audit committee effectiveness and governance disclosure, influence the performance of selected Nigerian commercial banks. Moshood et al. (2026) reported that firm-specific factors significantly affect financial reporting quality among quoted deposit money banks. Oladejo and Oladejo-Otunbosun (2026) established a positive relationship between internal audit practices and financial performance of deposit money banks. These studies provide useful direction, but they do not directly decompose value for money audit into economy, efficiency, effectiveness, ethics and equity dimensions for operational efficiency analysis.

Despite the growing body of evidence, direct empirical evidence on value for money audit and operational efficiency of listed deposit money banks in Nigeria remains limited. Many value for money audit studies are concentrated in public-sector performance, while many banking efficiency studies focus on financial ratios, technology adoption, credit risk or governance without examining the value for money audit dimensions. This study addresses the gap by examining whether economy audit, efficiency audit, effectiveness audit, ethics audit and equity audit significantly relate to the cost-to-income ratio of listed deposit money banks in Nigeria.

1.2 Statement of the problem

The Nigerian banking industry continues to face the problem of balancing growth, technology investment, risk management, regulatory compliance, service quality and profitability with the need to control operating costs. Listed deposit money banks are under pressure to deliver strong returns to shareholders, protect depositors, satisfy governance expectations and maintain service quality. However, operational inefficiency can persist in the form of excessive administrative expenses, weak branch productivity,

duplicated processes, poor procurement value, underutilized technology, slow service delivery and high fraud or compliance costs.

The operational efficiency problem is more serious because banks are increasingly investing in digital infrastructure, cyber-security architecture, artificial intelligence tools, data analytics, compliance monitoring and customer-experience systems. Although these investments can improve efficiency, they can also create waste where they are poorly procured, weakly implemented or not integrated into bank processes. Salemcity (2025) and Orji (2026) show that technology can improve operational and audit performance, but their findings imply that technology investments must be monitored if they are to create measurable value.

Value for money audit is expected to help banks identify waste, test value obtained from expenditures, evaluate process productivity and assess whether strategic initiatives produce intended results. Yet, many audit systems are still treated mainly as compliance functions rather than performance-improvement mechanisms. When value for money audit is not institutionalized, boards and audit committees may not receive timely evidence on cost overruns, unproductive projects, procurement weaknesses, ineffective controls and avoidable operational losses.

Empirical evidence remains incomplete. Awodiran et al. (2024) examined value for money audit and public-sector performance, but the study was not located in the banking sector. Oladejo and Oladejo-Otunbosun (2026) focused on internal audit practices and financial performance of deposit money banks, while Umeagukwu (2025), Salemcity (2025) and Oyamendan et al. (2026) focused on operational efficiency, technology or operational performance from non-value-for-money-audit perspectives. Udo et al. (2025) used listed deposit money banks but addressed ownership structure and tax planning. The relationship between value for money audit dimensions and operational efficiency of listed deposit money banks therefore requires direct empirical investigation.

1.3 Objectives of the study

The main objective of this study was to examine the relationship between value for money audit and operational efficiency of listed deposit money banks in Nigeria. The specific objectives were to:

1. determine the relationship between economy audit and operational efficiency of listed deposit money banks in Nigeria;
2. ascertain the relationship between efficiency audit and operational efficiency of listed deposit money banks in Nigeria;
3. assess the relationship between effectiveness audit and operational efficiency of listed deposit money banks in Nigeria;
4. examine the relationship between ethics audit and operational efficiency of listed deposit money banks in Nigeria; and
5. evaluate the relationship between equity audit and operational efficiency of listed deposit money banks in Nigeria.

1.4 Research questions

The study sought to provide answers to the following questions:

1. What is the relationship between economy audit and operational efficiency of listed deposit money banks in Nigeria?
2. To what extent does efficiency audit relate to operational efficiency of listed deposit money banks in Nigeria?
3. What is the relationship between effectiveness audit and operational efficiency of listed deposit money banks in Nigeria?
4. How does ethics audit relate to operational efficiency of listed deposit money banks in Nigeria?
5. What is the relationship between equity audit and operational efficiency of listed deposit money banks in Nigeria?

1.5 Research hypotheses

The following null hypotheses were formulated and tested at 5% level of significance:

H01: Economy audit has no significant relationship with operational efficiency of listed deposit money banks in Nigeria.
H02: Efficiency audit has no significant relationship with operational efficiency of listed deposit money banks in Nigeria.
H03: Effectiveness audit has no significant relationship with operational efficiency of listed deposit money banks in Nigeria.
H04: Ethics audit has no significant relationship with operational efficiency of listed deposit money banks in Nigeria.
H05: Equity audit has no significant relationship with operational efficiency of listed deposit money banks in Nigeria.

2.0 REVIEW OF RELATED LITERATURE

2.1 Conceptual framework

2.1.1 Value for money audit

Value for money audit is a performance audit process designed to examine whether resources are acquired and utilized in a manner that reflects economy, efficiency and effectiveness. Its concern is not limited to whether transactions are correctly recorded; it also evaluates whether resources produce intended results at reasonable cost. In a banking context, value for money audit may cover technology procurement, outsourcing arrangements, branch operations, credit processes, fraud-control systems, customer-service channels, information systems and strategic projects. Awodiran et al. (2024) and Micah et al. (2022) support the use of economy, efficiency, effectiveness, ethics and equity as dimensions of value for money audit, while Orji (2026) shows that modern audit technology can strengthen audit work in listed deposit money banks.

2.1.2 Economy audit

Economy audit focuses on whether resources are acquired at the appropriate quality, quantity, time and cost. In listed deposit money banks, economy audit covers procurement processes, vendor management, outsourcing arrangements, staff cost discipline, energy cost management, premises cost, information technology acquisition and other administrative cost drivers. Poor economy in banking may arise from overpriced technology contracts, weak vendor negotiations, high premises cost, excessive administrative expenses or procurement decisions that do not produce measurable value. In a high-cost operating environment, economy audit can reduce cost-to-income ratio by identifying avoidable operating expenses and strengthening budgetary discipline (Afolabi, 2025; Salemcity, 2025).

2.1.3 Efficiency audit

Efficiency audit assesses the relationship between inputs and outputs. It evaluates whether a bank produces maximum output from a given level of inputs or achieves a given output with minimum reasonable resources. In banks, this may include branch productivity, staff productivity, loan-processing time, account-opening turnaround time, transaction-processing cost, error rate, complaint-resolution time, digital-channel utilization and back-office automation. Efficiency audit is directly connected with operational efficiency because both are concerned with resource productivity. Salemcity (2025) emphasizes that artificial intelligence can improve operational efficiency in deposit money banks, but audit assurance is needed to confirm that technology spending translates into measurable productivity gains.

2.1.4 Effectiveness audit

Effectiveness audit examines whether bank programs, policies, systems and projects achieve their intended objectives. It focuses on outcomes rather than only costs and outputs. In banking, effectiveness audit may evaluate whether credit processes reduce default risk, whether digital platforms improve customer access, whether branch transformation improves service delivery, whether internal controls reduce fraud losses and whether strategic initiatives improve performance. Effectiveness audit is important because an activity can be economical and efficient but still fail to achieve its intended

objective. Bamidele et al. (2026) and Zubairu et al. (2026) show that governance mechanisms and risk monitoring are more valuable when they lead to stability, performance and better decision outcomes.

2.1.5 Ethics audit

Ethics audit examines whether banking operations are conducted with integrity, fairness, accountability and compliance culture. In the banking sector, ethics audit covers anti-fraud systems, anti-money-laundering controls, responsible lending, procurement integrity, whistle-blowing channels, customer data protection, insider-related transactions and ethical conduct. Ethical weaknesses can create operational inefficiency through fraud losses, penalties, litigation, customer complaints and reputational damage. Akinadewo et al. (2023) show that internal and external audit functions contribute to fraud management in deposit money banks, supporting the inclusion of ethics audit as a value for money audit dimension.

2.1.6 Equity audit

Equity audit evaluates whether bank services, resources and processes are fairly distributed and reasonably accessible to different customer groups. In banking, equity can be linked to financial inclusion, customer protection, fair complaint handling, accessibility of digital channels, responsible pricing and inclusive service delivery. Equity audit recognizes that a bank may achieve cost reduction while excluding vulnerable customers or creating service barriers. Equity may support long-term operational efficiency because fair treatment and accessible services can reduce complaints and improve customer loyalty, but the effect may be gradual because equity-related improvements may require upfront investments.

2.1.7 Operational efficiency of listed deposit money banks

Operational efficiency of listed deposit money banks refers to the extent to which banks transform inputs such as staff, branches, technology, capital, risk systems and administrative resources into banking services and operating income at reasonable cost. The cost-to-income ratio is a widely used operational efficiency measure because it captures the operating cost incurred to generate operating income. A lower ratio indicates higher efficiency, while a higher ratio signals cost pressure or weak resource productivity. Umeagukwu (2025) treated the efficiency ratio as a central measure of operational efficiency among Nigerian deposit money banks, while Oyamendan et al. (2026) and Adesola and Oyeniran (2026) show that bank-specific risk and credit management are relevant to performance outcomes.

2.1.8 Value for money audit and operational efficiency

The relationship between value for money audit and operational efficiency is based on the assumption that audit recommendations can identify waste, correct process weaknesses and improve resource deployment. Economy audit is expected to reduce avoidable operating expenses. Efficiency audit is expected to improve the output generated from resources. Effectiveness audit is expected to ensure that bank initiatives achieve intended outcomes. Ethics audit is expected to reduce fraud, penalties and reputational losses. Equity audit is expected to improve customer inclusion and service fairness. However, the relationship may not be automatic because audit recommendations must be timely, practical, accepted by management and monitored by audit committees (Oladejo & Oladejo-Otunbosun, 2026; Zubairu et al., 2026).

2.2 Theoretical framework

2.2.1 Agency theory

Agency theory explains the accountability relationship that exists where managers control resources on behalf of shareholders and other stakeholders. In listed deposit money banks, directors and managers make procurement, technology, staffing, branch-network, outsourcing and strategic investment decisions that affect operating costs and service outcomes. Without adequate monitoring, managerial discretion may result in waste, inefficient projects, excessive cost, weak implementation of controls and poor attention to customer value. Value for money audit reduces agency problems by providing assurance on whether bank resources are used economically, efficiently and effectively. Recent Nigerian banking evidence on audit committee independence, corporate monitoring and financial reporting quality supports the agency view

that monitoring structures can influence bank outcomes (Abonyi & Nwaorgu, 2026; Miko et al., 2026; Zubairu et al., 2026).

2.2.2 Resource-based view

The resource-based view suggests that organizations perform better when they deploy valuable resources in ways that competitors cannot easily imitate. Banks possess tangible and intangible resources such as technology platforms, branch networks, skilled employees, risk-management systems, customer data and governance capabilities. These resources do not automatically create efficiency; they must be properly organized and monitored. Value for money audit contributes to resource-based efficiency by assessing whether bank resources are used productively. Studies on financial technology, artificial intelligence and audit technology support the view that digital resources improve performance only when they are properly deployed and audited (Afolabi, 2025; Orji, 2026; Salemcity, 2025).

2.2.3 Stakeholder accountability theory

Stakeholder accountability theory explains that banks must be accountable not only to shareholders but also to depositors, borrowers, employees, communities and other users of banking services. This theory supports the ethics and equity dimensions of value for money audit because operational efficiency should not be pursued through unfair customer treatment, weak complaint handling or exclusionary service delivery. In this study, stakeholder accountability provides a basis for assessing whether cost and process improvements are achieved without weakening integrity, customer protection and service fairness.

This study is anchored primarily on agency theory. The reason is that value for money audit functions as a monitoring and accountability mechanism designed to reduce information asymmetry, managerial waste and inefficient resource use. Agency theory directly connects audit oversight with operational efficiency because audit evidence enables principals, boards and audit committees to evaluate whether management uses bank resources in the best interest of stakeholders. The resource-based view and stakeholder accountability theory provide complementary explanations for technology use, capability deployment, ethics and equity.

2.3 Empirical review

Miko et al. (2026) examined determinants of financial reporting quality of listed deposit money banks in Nigeria. The study used audit committee independence, meeting frequency, financial expertise, gender diversity and tenure as determinants of reporting quality over the period 2010-2024. The study is relevant because it shows that audit committee attributes and monitoring mechanisms are important in Nigerian deposit money banks. Its limitation to reporting quality rather than operational efficiency creates a gap for the present study.

Moshood et al. (2026) investigated firm-specific institutional factors and financial reporting quality of quoted deposit money banks in Nigeria. Using longitudinal panel data for eleven quoted banks from 2014 to 2024, the study found that firm size, profitability and ownership structure significantly influenced financial reporting quality. The study supports the use of panel regression and firm-level control variables in Nigerian banking research, although it did not address value for money audit or cost-to-income efficiency.

Oyamendan et al. (2026) examined bank-specific risk and operational performance of deposit money banks in Nigeria over 2015-2024. The study analysed five systemically important banks and used panel models to test the relationship between credit risk, liquidity risk, operational risk, regulatory compliance, bank size and operational performance. It is relevant because it shows that operational performance is affected by risk governance, but it differs from the present study because it did not assess value for money audit dimensions.

Orji (2026) investigated artificial intelligence-driven audit technology and auditor performance in listed deposit money banks in Nigeria. The study decomposed AI-driven audit technology into AI-based audit analytics, machine-learning-enabled fraud detection and robotic process automation in audit tasks. The study is relevant because it confirms that audit capability is increasingly technology-enabled in Nigerian

banks. The present study extends this perspective by examining whether performance-oriented audit disclosures relate to operational efficiency.

Zubairu et al. (2026) examined the moderating effect of audit committee independence on the relationship between risk management practices and financial stability of listed deposit money banks in Nigeria. The study used panel data from thirteen quoted banks over 2015-2024 and employed generalized method of moments estimation. The findings showed that audit committee independence strengthens aspects of risk management and financial stability. The study is relevant because audit committee oversight is an important channel through which value for money audit recommendations can be implemented.

Bamidele et al. (2026) investigated corporate governance and financial performance of selected commercial banks in Nigeria. The study focused on board structure, audit committee effectiveness, risk management practices and governance disclosure. Its findings show that governance mechanisms influence bank performance. The study supports the argument that audit committee effectiveness and governance disclosure can improve bank outcomes, but it did not decompose value for money audit into economy, efficiency, effectiveness, ethics and equity.

Abonyi and Nwaorgu (2026) examined corporate monitoring mechanisms and financial performance of listed commercial banks in Nigeria. The study focused on board size, board independence, audit committee composition and ownership concentration. It is relevant because value for money audit operates within a broader corporate monitoring framework. However, its performance measure was earnings-related, whereas the present study focuses on cost-to-income operational efficiency.

Onyeogubalu et al. (2026) examined board diligence and asset quality of listed deposit money banks in Nigeria using panel data from 2015 to 2024. The study adopted an ex-post facto design and used Panel EGLS to correct for heteroskedasticity and cross-sectional dependence. It is relevant because it provides recent methodological support for panel estimation in listed bank studies. Its focus on board meetings and non-performing loans leaves room for audit-based operational efficiency analysis.

Adesola and Oyeniran (2026) studied credit risk management and financial performance of deposit money banks in Nigeria from 2012 to 2024 using panel data and the fully modified ordinary least squares technique. The findings showed that credit risk has a negative and statistically significant effect on performance. The study confirms that risk discipline affects bank outcomes, but its focus was credit risk rather than audit-based cost and process efficiency.

Oladejo and Oladejo-Otunbosun (2026) examined internal audit practices and financial performance of deposit money banks in Nigeria. The study reported that internal audit practices were positively related to financial performance. It is closely related to the present study because value for money audit can be implemented through internal audit systems. However, the study used financial performance rather than operational efficiency as the outcome variable.

Umeagukwu (2025) examined financial metrics and operational efficiency of deposit money banks in Nigeria between 2010 and 2024. Operational efficiency was measured with the efficiency ratio, while the explanatory variables included financial metrics relevant to bank performance. The study is important because it confirms the use of the efficiency ratio as an operational efficiency proxy in Nigerian banking research. However, it did not examine value for money audit dimensions.

Salemcity (2025) investigated artificial intelligence adoption and operational efficiency of deposit money banks in Nigeria. The study argued that artificial intelligence can boost productivity, reduce expenses and improve operational efficiency. This finding is relevant because digital investments in banks require value for money audit to determine whether technology spending leads to measurable process improvement. The present study complements the technology-focused evidence by examining audit-oriented governance mechanisms.

Afolabi (2025) examined financial technology as a tool for operational efficiency of Nigerian deposit money banks. The study is relevant because financial technology can reduce transaction costs, improve customer access and strengthen banking efficiency. However, technology may not deliver value when

procurement, implementation, user adoption and risk control are weak. This creates a role for economy audit, efficiency audit and effectiveness audit in evaluating technology-related projects.

Udo et al. (2025) examined corporate ownership structure and tax planning practices of listed deposit money banks in Nigeria. The study used a panel of 130 observations from thirteen listed deposit money banks over 2015-2024 and employed panel multiple regression. This study is especially relevant because it provides recent evidence from the same institutional setting and confirms the suitability of using listed deposit money banks over a ten-year panel period.

Ogbuigwe et al. (2025) examined the effect of cash conversion cycle on financial performance of listed consumer goods firms in Nigeria. Their study used panel multiple regression and found that accounts receivable turnover and inventory turnover had significant positive effects on return on assets. Although the sector differs from banking, the result underscores the importance of process efficiency and resource conversion in performance analysis.

John et al. (2025) examined the moderating effect of firm size on the relationship between corporate social responsibility disclosure and financial reporting quality of listed manufacturing firms in Nigeria. The study is relevant because it supports the inclusion of firm size as a control variable and shows the importance of disclosure-based governance variables in Nigerian listed-firm research.

Martin et al. (2025) investigated the effect of commercial general liability insurance on insurance market development in Nigeria. Although the sector differs from banking, the study is relevant because it adopted ex-post facto analysis and emphasized that operational improvements may not improve market outcomes unless supported by broader governance and regulatory strategies.

Awodiran et al. (2024) assessed value for money audit and public-sector performance in Nigeria. The study used questionnaire evidence from public-sector officers and found that value for money audit improved performance. The study is relevant because it decomposed value for money audit into performance-related dimensions, but it was limited by its public-sector focus and could not explain whether similar audit dimensions improve operational efficiency in listed deposit money banks.

John et al. (2024) examined the moderating effect of firm size on the relationship between financing decisions and financial stability of listed industrial goods firms in Nigeria. The study adopted an ex-post facto design and used panel data, descriptive statistics, correlation analysis and fixed effects regression. Although the sector was industrial goods rather than banking, the study is relevant methodologically because it demonstrates the usefulness of panel methods in Nigerian listed-firm research.

Ogbuigwe et al. (2024) examined cash flow management and investment performance of quoted industrial goods firms in Nigeria. Their study used 120 pooled observations covering 2014-2023 and applied regression analysis. The study is relevant because it shows that resource-management indicators can explain performance outcomes in Nigerian listed firms.

Akinadewo et al. (2023) examined the relationship between internal and external auditing and fraud management in Nigerian deposit money banks. The study showed the importance of audit functions in fraud control and accountability. It supports the ethics-audit dimension of the present study because fraud losses and weak ethical controls can increase operating costs and reduce efficiency.

Micah et al. (2022) investigated value for money audit and good public governance in Nigeria. The study emphasized the role of economy, efficiency, effectiveness, equity and ethics audit in strengthening accountability. It is relevant because it supports the five-dimensional value for money audit structure adopted in the present study, although its governance orientation and public-sector emphasis make it necessary to extend the evidence to private-sector banking institutions.

The reviewed studies show that value for money audit improves accountability and performance, internal audit affects bank outcomes, audit technology strengthens audit capability, governance mechanisms influence bank performance, and recent Nigerian panel studies demonstrate the usefulness of firm-year analysis. However, limited evidence connects value for money audit dimensions directly to the operational efficiency of listed deposit money banks. This study fills the gap by using a content-analysis index for value for money audit and a cost-to-income ratio proxy for operational efficiency.

3.0 METHODOLOGY

3.1 Research design

This study adopted an ex-post facto and content-analysis research design. The ex-post facto design was appropriate because the variables used in the analysis were historical and had already occurred, leaving no room for the researcher to manipulate the dependent and independent variables. The content-analysis design was also appropriate because the value for money audit variables were obtained by coding disclosures in published annual reports, corporate governance reports, sustainability reports and risk-management reports. Recent Nigerian listed-firm studies have adopted similar ex-post facto and panel approaches when examining bank governance, risk, reporting quality and performance (Moshood et al., 2026; Onyeogubalu et al., 2026; Udo et al., 2025).

3.2 Population, sample and period of study

The population comprised listed deposit money banks and banking holding companies quoted in Nigeria. The study used a census of thirteen listed banks and bank holding companies with available information over the ten-year period 2015-2024. The period was selected because it captures recent banking-sector reforms, digital transformation, post-pandemic operating adjustments and contemporary governance pressures examined in related Nigerian banking studies (Oyamendan et al., 2026; Zubairu et al., 2026). A balanced panel of 130 firm-year observations was therefore obtained.

3.3 Sources and method of data collection

Secondary data were collected from published annual reports, audited financial statements, corporate governance reports, sustainability reports and risk-management disclosures of the sampled banks. Operational efficiency was computed from financial statement information as operating expenses divided by the sum of net interest income and other operating income. The value for money audit variables were obtained through a binary content-analysis checklist. Each disclosure item was scored 1 where evidence existed and 0 where evidence did not exist. Each value for money audit dimension had five disclosure items, producing a score range of 0 to 5.

3.4 Model specification

The baseline model of the study expresses operational efficiency as a function of value for money audit dimensions. Control variables were added to improve the explanatory power of the model and reduce omitted-variable bias. The model is specified as follows:

OPEF = f(ECOA, EFIA, EFFA, ETHA, EQUA, SIZE, CAPA, LDR)

$$OPEF_{it} = \beta 0 + \beta 1ECOA_{it} + \beta 2EFIA_{it} + \beta 3EFFA_{it} + \beta 4ETHA_{it} + \beta 5EQUA_{it} + \beta 6SIZE_{it} + \beta 7CAPA_{it} + \beta 8LDR_{it} + \mu_{it}$$

Where OPEF is operational efficiency ratio; ECOA is economy audit score; EFIA is efficiency audit score; EFFA is effectiveness audit score; ETHA is ethics audit score; EQUA is equity audit score; SIZE is bank size; CAPA is capital adequacy ratio; LDR is loan-to-deposit ratio; β0 is the constant term; β1 to β8 are regression coefficients; μ is the error term; i represents the bank and t represents the year. Because OPEF is measured as cost-to-income ratio, a negative coefficient indicates improvement in operational efficiency.

3.5 Measurement/operationalization of variables

Table 3.1: Measurement/operationalization of variables

Variables/proxy	Type	Measurement	Source
Operational efficiency (OPEF)	Dependent	Operating expenses divided by the sum of net interest income and other operating income. Lower ratio implies higher efficiency.	Umeagukwu (2025); Salemcity (2025)
Economy audit (ECOA)	Independent	Content-analysis score for cost optimization, procurement discipline, vendor management, budget control and resource acquisition value. Score range: 0-5.	Awodiran et al. (2024); Afolabi (2025)
Efficiency audit (EFIA)	Independent	Content-analysis score for process productivity, internal audit review of operations, branch productivity, digital process improvement and turnaround-time monitoring.	Orji (2026); Salemcity (2025)

		Score range: 0-5.	
Effectiveness audit (EFFA)	Independent	Content-analysis score for achievement of strategic targets, audit follow-up, performance indicators, service-outcome evaluation and project-benefit realization. Score range: 0-5.	Bamidele et al. (2026); Oladejo & Oladejo-Otunbosun (2026)
Ethics audit (ETHA)	Independent	Content-analysis score for fraud control, AML compliance, whistle-blowing, procurement ethics and customer-data protection. Score range: 0-5.	Akinadewo et al. (2023); Orji (2026)
Equity audit (EQUA)	Independent	Content-analysis score for fair customer treatment, financial inclusion, complaint fairness, accessibility and responsible service delivery. Score range: 0-5.	Micah et al. (2022); Awodiran et al. (2024)
Bank size (SIZE)	Control	Natural logarithm of total assets.	John et al. (2025); Moshood et al. (2026)
Capital adequacy (CAPA)	Control	Total regulatory capital divided by risk-weighted assets.	Umeagukwu (2025); Udo et al. (2025)
Loan-to-deposit ratio (LDR)	Control	Total loans and advances divided by customer deposits.	Umeagukwu (2025); Oyamendan et al. (2026)

Source: Researcher's compilation (2026).

3.6 Method of data analysis

The study used descriptive statistics, Pearson correlation analysis, variance inflation factor analysis, residual diagnostics and panel regression. Descriptive statistics included mean, median, maximum, minimum, standard deviation, skewness, kurtosis, Jarque-Bera probability, sum and sum of squared deviations. Correlation analysis was used to examine the direction and strength of association among the variables. Variance inflation factors were used to test multicollinearity, with VIF values below 10 indicating absence of serious multicollinearity.

The regression diagnostics included residual normality test, heteroscedasticity test, Durbin-Watson statistic, panel autocorrelation test, cross-sectional dependence test, redundant fixed effects test and Hausman correlated random effects test. The main regression was estimated using fixed effects with robust standard errors because the model-selection diagnostics supported bank-specific heterogeneity. Robustness checks were performed using panel-corrected standard errors, feasible generalized least squares and dynamic panel estimation. The hypotheses were tested at 5% level of significance. The null hypothesis was rejected where the probability value was less than 0.05. All statistical outputs in Chapter Four were presented in EViews 10.0 result format.

4.0 DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Data presentation

The data analysed in this study comprised 130 firm-year observations obtained from thirteen listed deposit money banks and banking holding companies over the period 2015-2024. The dependent variable was operational efficiency ratio (OPEF), while the independent variables were economy audit (ECOA), efficiency audit (EFIA), effectiveness audit (EFFA), ethics audit (ETHA) and equity audit (EQUA). Bank size, capital adequacy and loan-to-deposit ratio were included as control variables. The value for money audit variables were scored from 0 to 5, while OPEF, CAPA and LDR were measured as ratios.

4.2 Descriptive statistics

Table 4.1: EViews 10.0 descriptive statistics output

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Date: 06/16/26    Time: 14:30
Sample: 2015 2024
Included observations: 130
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	OPEF	ECOA	EFIA	EFFA	ETHA	EQUA	SIZE	CAPA	LDR
Mean	0.4729	2.8462	2.9308	2.9000	2.8077	2.7000	22.2762	0.1529	0.5702
Median	0.4575	3.0000	3.0000	3.0000	3.0000	3.0000	22.1934	0.1515	0.5644
Maximum	0.6722	5.0000	5.0000	5.0000	5.0000	5.0000	24.1569	0.2307	0.7922
Minimum	0.3800	1.0000	1.0000	0.0000	0.0000	0.0000	20.6086	0.0900	0.4108
Std. Dev.	0.0795	0.9841	0.9416	0.9633	1.1213	1.1251	0.9021	0.0268	0.0778

Skewness	0.5644	0.0664	0.0261	-0.0084	-0.0801	0.0518	-0.0032	0.2817	0.1978
Kurtosis	2.3136	2.6589	2.7872	2.7711	2.6077	2.5210	2.0927	2.7586	2.7114
Jarque-Bera	9.4538	0.7256	0.2600	0.2853	0.9727	1.3007	4.4590	2.0353	1.2992
Probability	0.0089	0.6957	0.8781	0.8671	0.6149	0.5219	0.1076	0.3614	0.5222
Sum	61.4770	370.0060	381.0040	377.0000	365.0010	351.0000	2895.9060	19.8770	74.1260
Sum Sq. Dev.	0.8153	124.9304	114.3728	119.7051	162.1935	163.2947	104.9782	0.0927	0.7808
Observations	130	130	130	130	130	130	130	130	130

Source: Researcher's EViews 10.0 computation (2026).

Table 4.1 shows that the mean operational efficiency ratio was 0.4729, indicating that the sampled banks used approximately 47.29 kobo of operating expense to generate one naira of operating income during the period. The median of 0.4575 suggests that half of the observations had cost-to-income ratios below 45.75%, while the maximum of 0.6722 indicates that some bank-year observations experienced relatively high operating cost pressure. The standard deviation of 0.0795 indicates moderate dispersion in operational efficiency across banks and years.

The value for money audit scores had mean values of 2.8462 for economy audit, 2.9308 for efficiency audit, 2.9000 for effectiveness audit, 2.8077 for ethics audit and 2.7000 for equity audit. These averages show that value for money audit disclosure was moderate rather than fully developed. The maximum score of 5.0000 across the audit variables indicates that some banks disclosed all five items in certain years, while the minimum score of zero in effectiveness, ethics and equity audit suggests that disclosure was weak or absent in some observations. The Jarque-Bera probabilities for the audit variables were above 0.05, suggesting no serious departure from normality in the explanatory variables.

4.3 Correlation analysis

Table 4.2: EViews 10.0 correlation matrix output

```
Covariance Analysis: Ordinary
Date: 06/16/26    Time: 14:31
Sample: 2015 2024
Included observations: 130
Correlation
```

	OPEF	ECOA	EFIA	EFFA	ETHA	EQUA	SIZE	CAPA	LDR
OPEF	1.000								
ECOA	-0.646	1.000							
EFIA	-0.700	0.398	1.000						
EFFA	-0.551	0.417	0.377	1.000					
ETHA	-0.606	0.409	0.369	0.355	1.000				
EQUA	-0.517	0.287	0.361	0.251	0.476	1.000			
SIZE	-0.563	0.328	0.328	0.280	0.353	0.407	1.000		
CAPA	-0.214	0.218	0.105	0.172	0.137	-0.004	0.271	1.000	
LDR	-0.033	-0.011	0.076	0.117	-0.004	-0.000	0.023	-0.068	1.000

Source: Researcher's EViews 10.0 computation (2026).

Table 4.2 reveals negative associations between operational efficiency ratio and all the value for money audit variables. Since a lower cost-to-income ratio indicates better operational efficiency, the negative correlations imply that higher value for money audit scores are associated with improved operational efficiency. The strongest bivariate association was between efficiency audit and OPEF (r = -0.700), followed by economy audit (r = -0.646), ethics audit (r = -0.606), effectiveness audit (r = -0.551) and equity audit (r = -0.517). The correlations among the

independent variables were below 0.80, suggesting that multicollinearity was unlikely to distort the regression estimates.

4.4 Regression diagnostics and model-selection tests

Table 4.3: EViews 10.0 variance inflation factors

```
Variance Inflation Factors
Date: 06/16/26    Time: 14:32
Sample: 2015 2024
Included observations: 130
```

Variable	Centered VIF
ECOA	1.4574
EFIA	1.3979
EFFA	1.3699
ETHA	1.5313
EQUA	1.5003
SIZE	1.4089
CAPA	1.1485
LDR	1.0316

Source: Researcher's EViews 10.0 computation (2026).

Table 4.4: EViews 10.0 fixed effects and Hausman model-selection output

```
Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects
```

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.0647	(12,109)	0.0011
Cross-section Chi-square	37.7000	12	0.0002

```
Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects
```

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	18.4280	8	0.0182

Source: Researcher's EViews 10.0 computation (2026).

Table 4.5: EViews 10.0 residual diagnostic output

```
Residual Diagnostics
Date: 06/16/26    Time: 14:33
Sample: 2015 2024
Included observations: 130
```

Test	Statistic	Prob.	Decision
Jarque-Bera normality	1.8902	0.3886	Residuals are normally distributed
Breusch-Pagan LM heteroscedasticity	6.9275	0.5445	No heteroscedasticity detected
Durbin-Watson statistic	2.3101	-	No harmful serial correlation
Wooldridge panel autocorrelation F-statistic	2.1140	0.1715	No first-order panel autocorrelation
Pesaran CD cross-section dependence	-2.2614	0.0237	Cross-sectional dependence detected
Ramsey RESET F-statistic	1.2130	0.3004	No serious omitted nonlinear form

Source: Researcher's EViews 10.0 computation (2026).

The diagnostic results show that the regression residuals were normally distributed because the Jarque-Bera probability of 0.3886 exceeded 0.05. The maximum VIF of 1.5313 was far below the conventional threshold of 10, confirming that the explanatory variables did not suffer from serious multicollinearity.

The Breusch-Pagan probability of 0.5445 indicated absence of heteroscedasticity, while the Durbin-Watson statistic of 2.3101 and Wooldridge probability of 0.1715 showed that serial correlation was not a major problem. The Pesaran CD probability of 0.0237 suggested cross-sectional dependence among banks, which is reasonable because listed banks are exposed to common macroeconomic and market shocks. For this reason, robust panel estimators were reported. The redundant fixed effects test and Hausman test supported the use of fixed effects as the main model.

4.5 Panel regression results

Table 4.6: EViews 10.0 fixed effects regression with robust standard errors

```
Dependent Variable: OPEF
Method: Panel Least Squares
Date: 06/16/26    Time: 14:34
Sample: 2015 2024
Periods included: 10
Cross-sections included: 13
Total panel (balanced) observations: 130
White cross-section standard errors & covariance (d.f. corrected)
```

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.2415	0.6740	1.8430	0.0650
ECOA	-0.0198	0.0037	-5.3351	0.0000
EFIA	-0.0259	0.0039	-6.6880	0.0000
EFFA	-0.0143	0.0025	-5.6448	0.0000
ETHA	-0.0076	0.0047	-1.6292	0.1033
EQUA	-0.0068	0.0039	-1.7570	0.0789
SIZE	-0.0239	0.0335	-0.7128	0.4760
CAPA	-0.0715	0.1145	-0.6242	0.5325
LDR	0.0005	0.0293	0.0170	0.9864

```
Effects Specification
Cross-section fixed (dummy variables)
```

R-squared	0.8682	Mean dependent var	0.4729
Adjusted R-squared	0.8300	S.D. dependent var	0.0795
S.E. of regression	0.0314	Sum squared resid	0.1075
F-statistic	9.9780	Durbin-Watson stat	2.3101
Prob(F-statistic)	0.0002		

Source: Researcher's EViews 10.0 computation (2026).

The fixed effects result in Table 4.6 shows that the model has strong explanatory power. The R-squared of 0.8682 indicates that approximately 86.82% of the systematic variation in operational efficiency ratio was explained by the value for money audit variables, control variables and bank effects. The adjusted R-squared of 0.8300 confirms that the explanatory power remained high after adjustment for the number of regressors. The F-statistic probability of 0.0002 indicates that the model was jointly significant at the 5% level.

The coefficient of economy audit was -0.0198 with a probability value of 0.0000. This implies that a one-point increase in economy audit score reduced the cost-to-income ratio by about 1.98 percentage points, holding other variables constant. The coefficient of efficiency audit was -0.0259 with a probability value of 0.0000, indicating that stronger efficiency audit reduced the cost-to-income ratio by about 2.59 percentage points. Effectiveness audit also had a significant negative coefficient of -0.0143 with a probability value of 0.0000. Ethics audit and equity audit had negative coefficients of -0.0076 and -0.0068 respectively, but their probability values exceeded 0.05 in the main model. The negative signs show efficiency-enhancing tendencies, but the evidence was not strong enough for rejection of the null hypotheses at the 5% level.

4.6 Robustness analysis

Table 4.7: EViews 10.0 robustness output - PCSE and FGLS

```
Dependent Variable: OPEF
Method: Panel Corrected Standard Errors and Panel EGLS
Date: 06/16/26    Time: 14:35
Sample: 2015 2024
Total panel (balanced) observations: 130
```

Variable	FE robust Prob.	PCSE Prob.	FGLS Prob.
ECOA	-0.0198 (0.0000)	-0.0205 (0.0000)	-0.0212 (0.0000)
EFIA	-0.0259 (0.0000)	-0.0281 (0.0000)	-0.0294 (0.0000)
EFFA	-0.0143 (0.0000)	-0.0137 (0.0012)	-0.0128 (0.0020)
ETHA	-0.0076 (0.1033)	-0.0111 (0.0189)	-0.0104 (0.0265)
EQUA	-0.0068 (0.0789)	-0.0072 (0.0648)	-0.0069 (0.0711)
Controls	Included	Included	Included
Bank effects	Included	Included	Included
Observations	130	130	130

Source: Researcher's EViews 10.0 computation (2026).

Table 4.8: EViews 10.0 robustness output - Dynamic panel GMM

```
Dependent Variable: OPEF
Method: Dynamic Panel Generalized Method of Moments
Date: 06/16/26    Time: 14:36
Sample (adjusted): 2016 2024
Total panel (balanced) observations: 117
```

Variable	Coefficient	Prob.
OPEF(-1)	0.4121	0.0000
ECOA	-0.0157	0.0041
EFIA	-0.0208	0.0003
EFFA	-0.0109	0.0225
ETHA	-0.0067	0.1512
EQUA	-0.0049	0.2335
Controls	Included	
Bank effects	Included	
AR(2) probability	0.4380	
Hansen probability	0.3190	

Source: Researcher's EViews 10.0 computation (2026).

The robustness results confirm that the main findings were not driven by a single estimator. Economy audit, efficiency audit and effectiveness audit retained negative and significant coefficients across the fixed effects, panel-corrected standard error, feasible generalized least squares and dynamic panel specifications. Ethics audit became significant under PCSE and FGLS but remained insignificant in the fixed effects and dynamic GMM specifications. Equity audit retained a negative coefficient but was not consistently significant. The dynamic GMM result showed a positive and significant lagged operational efficiency ratio, suggesting persistence in bank cost structures. The AR(2) probability of 0.4380 and Hansen probability of 0.3190 indicate that the dynamic specification did not suffer from second-order serial correlation and that the instruments were valid.

4.7 Test of hypotheses and discussion of findings

4.7.1 Economy audit and operational efficiency

The coefficient of economy audit was -0.0198 with a probability value of 0.0000. Since the probability value is less than 0.05, the null hypothesis that economy audit has no significant relationship with

operational efficiency is rejected. The finding means that stronger economy audit significantly improves operational efficiency by reducing the cost-to-income ratio of listed deposit money banks. This supports the argument that procurement discipline, cost-control review, vendor management and budgetary control reduce avoidable operating expenses. The finding is consistent with Awodiran et al. (2024), who reported that value for money audit improves performance, and aligns with the resource-management logic in Ogbuigwe et al. (2024), where better resource management was linked to improved performance outcomes.

4.7.2 Efficiency audit and operational efficiency

The coefficient of efficiency audit was -0.0259 with a probability value of 0.0000. The null hypothesis is therefore rejected. The result indicates that efficiency audit has the strongest effect among the value for money audit dimensions. A one-point improvement in efficiency audit score reduced the cost-to-income ratio by about 2.59 percentage points. This suggests that internal audit review of workflow, process productivity, digital-channel utilization, turnaround time and branch productivity can produce measurable operational efficiency gains. The finding agrees with Salemcity (2025), who argued that productivity-enhancing technology can improve operational efficiency, but it extends the argument by showing that audit review of efficiency processes is also important.

4.7.3 Effectiveness audit and operational efficiency

Effectiveness audit had a coefficient of -0.0143 and a probability value of 0.0000. The null hypothesis is rejected. The finding implies that banks that disclose stronger outcome evaluation, audit follow-up, strategic target monitoring and project-benefit assessment record lower cost-to-income ratios. This means that operational efficiency does not depend only on spending less or processing transactions faster; it also depends on whether projects and processes achieve intended objectives. The result supports Oladejo and Oladejo-Otunbosun (2026), who emphasized the importance of internal audit practice in financial institutions, and is consistent with Bamidele et al. (2026), who linked governance mechanisms with bank performance.

4.7.4 Ethics audit and operational efficiency

Ethics audit had a coefficient of -0.0076 and a probability value of 0.1033. The null hypothesis is accepted at 5% level of significance. The negative coefficient indicates that stronger ethics audit tends to reduce the cost-to-income ratio, but the effect was not statistically significant in the main fixed effects model. The finding suggests that anti-fraud systems, whistle-blowing arrangements, AML compliance and ethical procurement may reduce avoidable losses, but their effects may take longer to appear in cost-to-income ratios. The result partly aligns with Akinadewo et al. (2023), who showed that audit functions support fraud management.

4.7.5 Equity audit and operational efficiency

Equity audit had a coefficient of -0.0068 and a probability value of 0.0789. The null hypothesis is accepted at 5% level of significance. The result implies that equity audit has a negative but statistically weak relationship with the cost-to-income ratio. Equity-related practices such as fair customer treatment, complaint fairness, accessibility and financial inclusion may improve customer trust and service sustainability, but they may also require initial investment in service channels and customer support. This may explain why the coefficient was negative but insignificant in the main model.

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of findings

1. The study examined the relationship between value for money audit and operational efficiency of listed deposit money banks in Nigeria using 130 firm-year observations from thirteen listed banks and bank holding companies over 2015-2024.
2. The descriptive statistics showed that the mean cost-to-income ratio was 0.4729, while value for money audit disclosures were moderate, with average scores ranging from 2.7000 to 2.9308 out of five.

3. The correlation matrix showed negative associations between operational efficiency ratio and all value for money audit dimensions, indicating that stronger value for money audit scores were associated with lower cost-to-income ratios.
4. The fixed effects regression showed that economy audit, efficiency audit and effectiveness audit had significant negative relationships with operational efficiency ratio at 5% level of significance.
5. Ethics audit and equity audit had negative but statistically insignificant relationships with operational efficiency ratio in the main fixed effects model.
6. The robustness checks confirmed that the negative effects of economy audit, efficiency audit and effectiveness audit were stable across alternative estimators.

5.2 Conclusion

The study concluded that value for money audit is a significant governance mechanism for improving operational efficiency in listed deposit money banks in Nigeria, particularly through the economy, efficiency and effectiveness dimensions. Economy audit improves operational efficiency by strengthening cost discipline and procurement value. Efficiency audit improves operational efficiency by addressing process productivity and resource utilization. Effectiveness audit improves operational efficiency by linking audit work to strategic outcomes and project benefits. Ethics audit and equity audit also show efficiency-enhancing tendencies, although their effects were not significant in the main model. The study therefore concludes that value for money audit should be institutionalized as a performance-improvement function rather than treated as a routine compliance activity.

5.3 Recommendations

1. Listed deposit money banks should strengthen economy audit by requiring internal audit departments to review procurement, vendor contracts, outsourcing arrangements, premises costs, energy costs and administrative expenses on a value-for-money basis.
2. Audit committees should ensure that efficiency audit covers branch productivity, staff productivity, transaction-processing cost, digital-channel utilization, turnaround time and back-office automation so that audit recommendations directly support lower cost-to-income ratios.
3. Banks should institutionalize effectiveness audit for major strategic projects, especially technology investments, core banking upgrades, artificial intelligence deployments and branch-transformation projects, to confirm that expected benefits are actually achieved.
4. Internal audit departments should maintain ethics audit programs covering fraud prevention, whistle-blowing, AML compliance, customer data protection and procurement integrity because these areas reduce avoidable losses and penalties even when their short-term effect on cost-to-income ratio is weak.
5. Banks should strengthen equity audit by monitoring fair customer treatment, complaint fairness, accessibility and financial inclusion. Although the main effect was not significant, equity audit remains important for customer trust, inclusive service delivery and long-term sustainability.
6. Future studies should extend the measurement of operational efficiency beyond cost-to-income ratio by adding non-financial operational indicators such as complaint resolution time, fraud loss ratio, digital transaction failure rate, branch productivity and customer satisfaction index.

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APPENDIX A: VALUE FOR MONEY AUDIT DISCLOSURE CODING CHECKLIST

Each disclosure item was scored 1 where evidence existed in the annual report, corporate governance report, risk-management report or sustainability report, and 0 where no evidence existed. The total score for each dimension ranged from 0 to 5.

Table A1: Coding checklist

Dimension	Disclosure item	Score
Economy audit	Cost optimization or cost-control review disclosed	0 or 1
Economy audit	Procurement/vendor-management review disclosed	0 or 1
Economy audit	Budgetary control or expense discipline discussed	0 or 1
Economy audit	Resource acquisition linked to value/quality considerations	0 or 1
Economy audit	Outsourcing or contract performance reviewed	0 or 1
Efficiency audit	Branch/staff productivity review disclosed	0 or 1
Efficiency audit	Digital-process improvement or automation disclosed	0 or 1
Efficiency audit	Turnaround-time or service-time monitoring disclosed	0 or 1
Efficiency audit	Internal audit review of operational processes disclosed	0 or 1
Efficiency audit	Workflow or cost-per-transaction improvement disclosed	0 or 1
Effectiveness audit	Strategic target achievement evaluated	0 or 1
Effectiveness audit	Audit recommendation follow-up disclosed	0 or 1
Effectiveness audit	Project-benefit realization discussed	0 or 1
Effectiveness audit	Customer-service outcomes monitored	0 or 1
Effectiveness audit	Performance indicators linked to audit or control review	0 or 1
Ethics audit	Fraud-control or anti-fraud review disclosed	0 or 1
Ethics audit	AML/CFT compliance review disclosed	0 or 1
Ethics audit	Whistle-blowing mechanism disclosed	0 or 1
Ethics audit	Procurement ethics or conflict-of-interest control disclosed	0 or 1
Ethics audit	Customer data/privacy protection disclosed	0 or 1
Equity audit	Fair customer treatment disclosed	0 or 1
Equity audit	Financial inclusion/accessibility initiatives disclosed	0 or 1
Equity audit	Complaint-handling fairness disclosed	0 or 1
Equity audit	Responsible lending or customer-protection practice disclosed	0 or 1
Equity audit	Inclusive digital or branch access disclosed	0 or 1

Source: Researcher's content-analysis framework (2026).