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Fraud Prevention Strategies and Bank Performance: Evidence from Nigeria

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Abstract

This study evaluated the impact of fraud prevention measures and emerging fraud prevention technologies on the performance of Nigerian banks, focusing on deposit money banks in Akwa Ibom and Cross River States. The specific objectives were to examine the relationships between internal control systems, employee training and awareness programs, fraud detection systems, regulatory compliance, artificial intelligence (AI) for fraud detection, biometric authentication, and cybersecurity infrastructure on bank performance. The target population comprised 3,648 bank staff across 167 bank branches in the two states, with a sample size of 360 respondents determined using Taro Yamane's formula. Primary data were collected through structured questionnaires, yielding a high retrieval rate of 97.78% (352 respondents) and analyzed using OLS technique. Data analysis revealed that internal control systems and fraud regulatory compliance had positive and statistically significant effects on bank performance. Conversely, employee training and biometric authentication exhibited negative and statistically significant effects, while fraud detection systems and AI-based measures showed no statistically significant impact. The findings challenge conventional assumptions about the universal effectiveness of technological interventions and training programs in fraud prevention. The study recommends strengthening internal controls, redesigning training programs to be more practical and role-specific, upgrading fraud detection systems, maintaining strict regulatory compliance, optimizing AI applications for fraud prevention, and improving biometric authentication systems for greater efficiency and adoption. These measures, if effectively executed, are expected to enhance fraud prevention capacity and improve overall bank performance in Nigeria.

Keywords: fraud prevention, bank performance, internal control systems, artificial intelligence, biometric authentication, Nigeria.

INTRODUCTION

The banking sector plays a vital role in driving economic development by performing critical functions including financial intermediation, liquidity provision, risk management, and payment services. As intermediaries, banks channel capital from savers to borrowers, facilitating efficient resource allocation and supporting economic activity (King & Levine, 1993). Empirical studies have established a positive relationship between banking sector development and economic growth, with countries having more developed banking systems experiencing higher rates of growth, capital accumulation, and productivity improvements.

Despite these significant contributions, fraud remains one of the most pressing challenges facing Nigeria's banking sector. The country's banking system, with its large monetary flows and intricate operational processes, is a prime target for fraudulent activities. Banking fraud takes various forms, including financial misappropriation, cybercrime, money laundering, and insider fraud all of which undermine the stability and integrity of financial institutions (AbdulRasheed et al., 2012).

In recent years, the Nigerian banking sector has witnessed tremendous growth, spurred by reforms such as the Central Bank of Nigeria (CBN) consolidation exercise, the introduction of electronic banking systems, and improved regulatory frameworks. Despite these positive strides, fraud continues to be a persistent issue. According to reports from the Nigeria Deposit Insurance Corporation (NDIC) and the CBN, fraudulent activities contribute significantly to financial losses, erode customer trust, and negatively impact bank profitability and operational efficiency (Timothy, 2021).

Consequently, fraud prevention measures have become a critical component of banking operations. These measures include robust internal controls, fraud detection systems, employee training programs, and the adoption of advanced technologies such as biometrics, encryption, and artificial intelligence to enhance security (Soni, 2022; Faisal et al., 2024). Regulatory bodies like the CBN and the Economic and Financial Crimes Commission (EFCC) have also implemented policies to reduce fraud within the sector. However, despite these efforts, fraud continues to undermine the performance of banks, particularly in terms of financial stability, customer confidence, and operational costs (Marjohan et al., 2023; Kaya, 2024).

As Nigerian banks continue to adopt more advanced technological solutions such as artificial intelligence (AI), blockchain, and biometrics there is a growing emphasis on leveraging these technologies to prevent and mitigate fraud. These innovations have the potential to enhance fraud detection, improve security, and streamline banking processes. However, there is limited empirical research on how the integration of these advanced technologies impacts the effectiveness of fraud prevention efforts and, more importantly, how such efforts influence both financial and non-financial performance outcomes in Nigerian banks (Frederica & Murwaningsari, 2021; Jaiswal & Singh, 2025).

This study seeks to bridge this gap by investigating the relationship between fraud prevention measures, particularly those involving emerging technologies, and the overall performance of Nigerian banks. Specifically, it will explore how the use of AI, biometrics, and other technological innovations in fraud management affect both financial and non-financial outcomes. Understanding this relationship is crucial for developing more effective fraud prevention strategies that not only safeguard financial resources but also improve customer satisfaction, enhance reputation, and foster long-term growth.

METHOD

Research Design

This study examines the connection between fraud prevention measures and the performance of banks in Nigeria using a descriptive survey design with components of explanatory (causal) research. The explanatory component aids in analyzing the causal influence of particular fraud prevention measures on the performance of the banking sector, while the descriptive design is used to gain a thorough grasp of the current prevention measures.

Study Area

The study focuses on deposit money banks in Akwa Ibom and Cross River States, Nigeria. The two states were selected due to their significant banking presence and the researchers' familiarity with the banking environment. The banks covered include:

Table 1. Study Area

Akwa Ibom	Cross River
First Bank of Nigeria	First Bank of Nigeria
Zenith Bank	Zenith Bank
First City Monument Bank (FCMB)	First City Monument Bank (FCMB)
United Bank for Africa (UBA)	United Bank for Africa (UBA)
Guaranty Trust Bank (GTB)	Guaranty Trust Bank (GTB)
Access Bank	Access Bank
Union Bank of Nigeria	Union Bank of Nigeria
Fidelity Bank	Fidelity Bank
Ecobank	Ecobank
Sterling Bank	Sterling Bank
Polaris Bank	Polaris Bank
Wema Bank	Wema Bank
Unity Bank	Unity Bank
Keystone	Keystone
Polaris	Polaris
Stanbic IBTC	Stanbic IBTC
Premium Trust Bank	Globus Bank
TAJ Bank	
Globus Bank	
SunTrust Bank	

Population of the Study

The target population consists of 3648 bank staff in Akwa Ibom and Cross River State, encompassing 97 and 70 bank branches respectively. It covers employees across departments and positions in deposit money banks.

Sampling Technique and Sample Size

Simple random sampling was applied in the study. This approach ensured that every staff member had an equal and independent chance of being included, thereby minimizing

selection bias and supporting the generalizability of the findings. To obtain a sample size from a known population, the Yaro Yamene sample size determination was adopted.

$$n = \frac{N}{1 + N(e^2)}$$

Where;
n = size of sample
N = size of population
e = Error term (0.05 within 95% alpha level)

An estimated sample size of 360 respondents will be used to account for non-response and incomplete data.

Source of Data Collection

Primary data for the study were obtained through structured questionnaires administered to bank staff across various departments, including operations, internal control, audit, compliance, and ICT, to gather first-hand insights on fraud prevention practices and their perceived effects on performance. In addition, key informant interviews (KIIs) were conducted with branch managers, compliance officers, internal auditors, and risk management staff to obtain in-depth qualitative information that complemented the survey responses.

Data Analysis Techniques

Descriptive Statistics: Frequency tables, means, and standard deviations to describe fintech usage and inclusion levels. Inferential statistics used include correlation for association, t-tests, and ANOVA where applicable, while regression analysis was used to determine causality and strength of relationships.

Research Instruments

The study used a questionnaire as the instrument for data collection. According to Kombo and Trump (2006) a questionnaire is a research instrument that is used to gather data over large sample. The researcher used the questionnaire because it was easy to administer, it gives the respondents freedom to express their views or opinions and also make suggestion. A Fraud Prevention Measures and Bank Performance Questionnaire (FPMBPQ) with 5 scale items each for internal control systems and fraud prevention, employee training and fraud awareness, fraud detection systems, fraud regulatory compliance, artificial intelligence (ai) for fraud detection, biometric authentication for fraud prevention, cybersecurity infrastructure for fraud prevention, and 10 scale items for bank performance

Validity of Instrument

The instrument was submitted to the project supervisor and two experts in test and measurement to screen the items for clarity and relevance. Inadequate items were discarded or modified to improve the quality of the research instrument, thus increasing its validity.

Reliability of Instrument

A Cronbach Alfa Test for reliability was done with SPSS. The results are presented in table II below:

Table 2. Reliability Statistics

	Cronbach's Alpha	N of Items
Internal Control Systems	0.917	5
Employee Training	0.803	5
Fraud Detection Systems	0.959	5
Fraud Regulatory Compliance	0.895	5
Artificial Intelligence (AI)	0.890	5
Biometric Authentication	0.987	5
Bank Performance	0.916	10

Model Specification

A model represents a simplified representation of a relationship between a situation or phenomenon. A regression model shall be specified as thus:

$$Y = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon \quad 1$$

Where:

- Y = Bank Performance (Bank_Perf)
- X_1 = Internal Control Systems (IntControl_Sys)
- X_2 = Employee Training (Emp_Training)
- X_3 = Fraud Detection Systems (FraudDet_Sys)
- X_4 = Fraud Regulatory Compliance (FraReg_Com)
- X_5 = Artificial Intelligence (Art_Intelligence)
- X_6 = Biometric Authentication (Bio_Auth)
- X_7 = Cybersecurity Infrastructure (Cybersec_Infra)
- α_0 = Intercept (Constant)
- β_1 - β_7 = Regression Coefficients
- ε = Error Term

RESULT AND DISCUSSION

Questionnaire Retrieval Rate

Out of 360 questionnaires distributed, 352 were properly completed and returned, representing a retrieval rate of 97.78%. This high retrieval rate was achieved through follow-up visits and assistance from branch managers and department heads.

Descriptive Statistics

Table 3 presents the descriptive statistics for all variables. The descriptive analysis revealed several notable insights regarding the factors influencing bank performance:

Table 3. Descriptive Statistics

	N	Min	Max	Mean	Std. Dev	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
IntControl_Sys	352	3.60	5.00	4.2625	.44627	.624	.130	-1.007	.259
Emp_Training	352	2.40	5.00	3.9875	.49298	-1.544	.130	4.979	.259
FraudDet_Sys	352	2.00	5.00	3.5750	.93641	-.577	.130	-.871	.259
FraReg_Com	352	2.00	5.00	3.8125	.75096	-.606	.130	.296	.259
Art_Intelligence	352	2.00	5.00	3.6250	.75564	-.062	.130	.032	.259
Bio_Auth	352	4.00	5.00	4.7375	.42909	-1.121	.130	-.702	.259
Bank_Perf	352	2.70	5.00	3.8437	.49564	-.301	.130	1.272	.259
Valid N (listwise)	352								

Source: SPSS version 3.8

Based on the table 3, the descriptive analysis revealed several notable insights regarding the factors influencing bank performance. Internal control systems were rated highly (M = 4.26), indicating a strong presence of control mechanisms in banks, while employee training also showed a positive mean score (M = 3.99), suggesting that staff capacity building is actively pursued. Fraud detection systems (M = 3.58) and fraud regulatory compliance (M = 3.81) showed moderate levels, implying that although efforts exist, there is room for improvement in fraud prevention infrastructure. The use of artificial intelligence had a moderate mean score (M = 3.63), reflecting an ongoing but not yet extensive deployment of AI tools in banking operations.

Furthermore, biometric authentication stood out with an exceptionally high mean (M = 4.74), confirming that biometric tools are well integrated and widely trusted for security, with 100% agreement from respondents. Overall, bank performance itself had a moderately high score (M = 3.84), indicating general satisfaction with operational effectiveness. Skewness and kurtosis values mostly fell within acceptable limits, confirming normal distribution of responses, with biometric authentication and employee training exhibiting strong negative skew and leptokurtic tendencies, reflecting concentrated high ratings from respondents.

Model Summary

The model summary reveals a very strong relationship between the independent variables biometric authentication, fraud detection systems, internal control systems, artificial intelligence, employee training, and fraud regulation compliance, and the dependent variable, bank performance, as indicated by an R value of 0.922. The R Square value of 0.850 shows that 85.0% of the variation in bank performance is explained by these predictors, while the Adjusted R Square of 0.847 confirms that the model remains robust even after adjusting for the number of variables and sample size.

Table 4. Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.922[a]	.850	.847	.19361	1.396

a. Predictors: (Constant), Bio_Auth, FraudDet_Sys, IntControl_Sys, Art_Intelligence, Emp_Training, FraReg_Com

b. Dependent Variable: Bank_Perf

Source: SPSS version 3.8

The standard error of the estimate (0.19361) suggests that the model's predictions are quite accurate, with predicted values closely matching the actual values. However, the Durbin-Watson statistic of 1.396 points to the presence of mild positive autocorrelation among the residuals, indicating that the independence of errors may be slightly compromised and should be examined further.

Analysis of Variance (ANOVA)

The ANOVA table provides strong statistical evidence that the regression model is significant. The regression sum of squares is 73.294 with 6 degrees of freedom, while the residual sum of squares is 12.932 with 345 degrees of freedom, resulting in a total sum of squares of 86.226. The F-statistic of 325.886 is very high, and the associated significance value (p-value) is 0.000, which is well below the conventional threshold of 0.05.

Table 5. ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	73.294	6	12.216	325.886	.000[b]
	Residual	12.932	345	.037		
	Total	86.226	351			

a. Dependent Variable: Bank_Perf

b. Predictors: (Constant), Bio_Auth, FraudDet_Sys, IntControl_Sys, Art_Intelligence, Emp_Training, FraReg_Com

Source: SPSS version 3.8

This indicates that the overall regression model is statistically significant and that the combination of predictors, biometric authentication, fraud detection systems, internal control systems, artificial intelligence, employee training, and fraud regulation compliance—collectively has a significant effect on bank performance.

Regression Result

The regression model investigates the influence of six independent variables on Bank Performance. The constant term (2.151) indicates the expected bank performance when all predictors are zero. Fraud Regulation Compliance and Internal Control Systems are significant positive predictors of bank performance, while Biometric Authentication and Employee Training (negatively) also significantly influence it. Fraud Detection Systems and Artificial Intelligence show no significant impact within this model.

The regression results reveal that fraud regulation compliance has the strongest positive and statistically significant effect on bank performance, with a high standardized beta (β = 0.955, p < 0.001), indicating its critical role in improving outcomes. Internal control systems also have a positive and significant influence (β = 0.233, p < 0.001), reinforcing the importance of internal structures in enhancing bank efficiency. Conversely, biometric authentication negatively affects performance (β = -0.263, p < 0.001), suggesting challenges or inefficiencies associated with its implementation. Employee training exhibits a slight but statistically significant negative impact (β = -0.083, p = 0.017), which may reflect misalignment between training content and practical banking outcomes. Artificial intelligence (β = -0.037, p = 0.535) and fraud detection systems (β = 0.023, p = 0.434) show statistically insignificant effects, implying their current use or integration may not yet be effective enough to yield measurable performance gains.

Table 6. Regression Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.151	0.146		14.735	0.000
	IntControl_Sys	0.259	0.032	0.233	8.044	0.000
	Emp_Training	-0.084	0.035	-0.083	-2.396	0.017
	FraudDet_Sys	0.012	0.016	0.023	0.784	0.434
	FraReg_Com	0.631	0.040	0.955	15.949	0.000
	Art_Intelligence	-0.024	0.039	-0.037	-0.620	0.535
	Bio_Auth	-0.304	0.031	-0.263	-9.751	0.000

a. Dependent Variable: Bank_Perf

The tolerance and VIF values show no serious multicollinearity concerns, though FraReg_Com and Art_Intelligence have high VIF values (>8), suggesting potential multicollinearity that may require further diagnostic checks.

Table 7. Tolerance and VIF Values

		Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.864	2.438		
	IntControl_Sys	0.196	0.323	0.516	1.937
	Emp_Training	-0.152	-0.015	0.361	2.774
	FraudDet_Sys	-0.019	0.044	0.486	2.056
	FraReg_Com	0.553	0.708	0.121	8.255
	Art_Intelligence	-0.100	0.052	0.124	8.044
	Bio_Auth	-0.365	-0.243	0.597	1.676

The collinearity diagnostics and coefficient correlation matrix provide insights into the potential multicollinearity among the independent variables influencing bank performance. The Condition Index values mostly stay under the critical threshold of 30, though the presence of indices above 30 (e.g., 31.856, 34.525, 48.044, and 59.459) suggests moderate to severe multicollinearity in certain dimensions.

Furthermore, the collinearity diagnostics reveal important insights into the interdependence of variables affecting bank performance. The condition indices progressively increase from 1.000 to a high of 59.459, suggesting potential multicollinearity issues particularly in dimensions 6 and 7, where the condition indices exceed the critical threshold of 30.

Table 8. Collinearity Diagnostics[a]

Model		Eigenvalue	Condition Index	Variance Proportions						
				(Constant)	IntControl_Sys	Emp_Training	FraudDet_Sys	FraReg_Com	Art_Intelligence	Bio_Auth
1	1	6.892	1.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2	0.060	10.710	0.01	0.01	0.00	0.13	0.01	0.02	0.01
	3	0.030	15.133	0.00	0.00	0.00	0.56	0.03	0.03	0.00
	4	0.007	31.856	0.10	0.20	0.20	0.25	0.01	0.05	0.18
	5	0.006	34.525	0.25	0.08	0.23	0.03	0.10	0.10	0.11
	6	0.003	48.044	0.35	0.66	0.56	0.01	0.11	0.02	0.07
	7	0.002	59.459	0.30	0.05	0.00	0.01	0.73	0.79	0.62

a. Dependent Variable: Bank_Perf

Lastly, Dimension 6 shows a high variance proportion for Internal Control Systems (66%), Employee Training (56%), and the Constant (35%), while Dimension 7 reflects high variance proportions for Fraud Regulation Compliance (73%), Artificial Intelligence (79%), and Biometric Authentication (62%). These elevated proportions concentrated in components with high condition indices indicate possible multicollinearity among these variables, which could distort the regression estimates.

Test of Hypotheses and Discussion of Findings
Decision Rule
H0: $\beta i=0$ (no significant effect on Bank Performance)
Ha: $\beta i\neq 0$ (significant effect on Bank Performance)
We use the Sig. (p-value) column to decide:

- If $p \leq 0.05 \rightarrow$ Reject Ho (significant effect)
- If $p > 0.05 \rightarrow$ Fail to reject Ho (no significant effect)

Hypothesis One: Internal Control Systems

- $p = 0.000$ (< 0.05) → Reject Ho

Conclusion: Internal control systems have a positive and significant effect on bank performance.

The regression result for the internal control system shows a p-value of 0.000, which is less than the 0.05 significance threshold, leading to the rejection of the null hypothesis that internal control systems have no effect on bank performance. This indicates that internal control systems exert a statistically significant influence on performance, with the positive coefficient (B = 0.259) suggesting that improvements in internal control measures are associated with corresponding increases in bank performance. The significance of this finding underscores the importance of maintaining robust internal control frameworks as a core component of fraud prevention strategy in the banking sector. While Nyakarimi et al. (2020)

found that risk assessment, monitoring, and communication significantly affect fraud prevention in Kenyan banks, control environment and activities showed no significant effect. Ogbeide (2018) reported that fraud cases negatively impact Nigerian banks' financial performance, recommending stronger ICS to reduce fraud. Opaleye and Adelugba (2024) demonstrated that ICS significantly prevents fraud and enhances financial performance in retail supermarkets. Hamed (2023) found that ICS compliance positively affects banks' financial performance sustainability, with control activities, information and communication, and monitoring being key drivers. These studies collectively suggest that effective ICS can contribute to fraud prevention and improved financial performance in banking and retail sectors, though the specific components of ICS that are most impactful may vary across contexts.

Hypothesis Two: Employee Training

- $p = 0.017$ (< 0.05) → Reject Ho

Conclusion: Employee training has a negative and significant effect on bank performance.

The regression result for employee training as a fraud prevention strategy shows a p-value of 0.017, which is below the 0.05 significance level, leading to the rejection of the null hypothesis that employee training has no effect on bank performance. This implies that employee training exerts a statistically significant influence on performance; however, the negative coefficient (B = -0.084) indicates that, in the study context, increased training efforts are associated with a decline in bank performance. This unexpected outcome may be due to factors such as poorly designed training programs, misalignment between training content and actual job requirements, or the short-term productivity disruptions that can occur when staff are frequently taken away from their core duties for training sessions. Mwangi & Mang'ana (2024) found that comprehensive fraud risk management, including employee training, significantly improved bank performance in Kenya. Similarly, Bataineh (2014) emphasized the importance of employee training in Jordanian commercial banks for enhancing performance. Timothy (2021) highlighted the negative impact of e-fraud on Nigerian banks' profitability, recommending regular training for IT staff to counter fraudulent activities. These findings collectively indicate that employee training and fraud prevention measures can be effective tools for improving bank performance and mitigating fraud risks, although more empirical research may be needed to establish stronger causal relationships between training initiatives and specific performance metrics.

Hypothesis Three: Fraud Detection System

- $p = 0.434$ (> 0.05) → Fail to reject Ho

Conclusion: Fraud detection systems have no significant effect on bank performance.

The regression result for the fraud detection system as a fraud prevention strategy shows a p-value of 0.434, which is greater than the 0.05 significance threshold, leading to the decision to fail to reject the null hypothesis that fraud detection systems have no effect on bank performance. This means that, statistically, the use of fraud detection systems in the studied banks does not have a significant measurable impact on performance indicators. The lack of significance may be attributed to several factors, such as outdated or inefficient detection technologies, poor system integration with core banking operations, inadequate staff expertise in using these tools, or delays in acting upon detected anomalies. It could also indicate that while fraud detection systems are in place, they function more as reactive measures rather than proactive tools, thus limiting their ability to influence overall operational efficiency, customer trust, and profitability. This finding suggests that banks may need to upgrade,

optimize, and better integrate their fraud detection infrastructure to enhance its contribution to performance. Mwangi & Mang'ana (2024) found that fraud management strategies, including detection and prevention, collectively explained 73.1% of variation in bank performance in Kenya.

Hypothesis Four: Fraud Regulation Compliance

- p = 0.000 (< 0.05) → Reject Ho

Conclusion: Fraud regulation compliance has a positive and significant effect on bank performance.

The regression result for fraud regulation compliance as a fraud prevention strategy shows a p-value of 0.000, which is well below the 0.05 significance threshold, leading to the rejection of the null hypothesis that compliance with fraud-related regulations has no effect on bank performance. This confirms that fraud regulation compliance has a statistically significant influence on performance, with the positive coefficient (B = 0.631) indicating that higher levels of compliance are associated with improved bank performance. This finding underscores the importance of embedding compliance culture within banking operations, ensuring continuous staff awareness of regulatory requirements, and conducting regular compliance audits to maintain high performance and sustain trust in the banking system. Soni (2022) highlighted the importance of advanced technologies like machine learning and AI in enhancing fraud detection effectiveness and AbdulRasheed et al. (2012) demonstrated a significant relationship between fraud cases and bank profits in Nigeria, emphasizing the negative impact of fraud on bank performance.

Hypothesis Five: Artificial Intelligence

- p = 0.535 (> 0.05) → Fail to reject Ho

Conclusion: Artificial intelligence has no significant effect on bank performance.

The regression result for artificial intelligence as a fraud prevention strategy shows a p-value of 0.535, which is greater than the 0.05 significance level, leading to the decision to fail to reject the null hypothesis that artificial intelligence has no effect on bank performance. This means that, statistically, AI adoption in the studied banks does not have a significant measurable impact on performance outcomes. The absence of significance may be due to factors such as the early stage of AI implementation, limited scope of AI applications, inadequate integration with core banking processes, or lack of staff expertise to fully leverage AI capabilities for fraud prevention. While one study found no direct effect of AI on banking performance Frederica & Murwaningsari, (2021), others highlight AI's effectiveness in fraud detection. AI-driven approaches have been shown to enhance detection accuracy by 87-94% while reducing false positives by 40-60% compared to traditional methods (Olowu et al., 2024). Machine learning and deep learning algorithms enable dynamic analysis of complex transactional patterns, leading to faster and more accurate identification of suspicious activities (Jaiswal & Singh, 2025).

Hypothesis Six: Biometric Authentication

- p = 0.000 (< 0.05) → Reject Ho

Conclusion: Biometric authentication has a negative and significant effect on bank performance.

The regression result for biometric authentication as a fraud prevention strategy shows a p-value of 0.000, which is well below the 0.05 significance threshold, leading to the rejection of the null hypothesis that biometric authentication has no effect on bank performance. This confirms that biometric authentication significantly influences performance; however, the

negative coefficient (B = -0.304) indicates that its effect is adverse in the study context. The finding implies that without proper optimization, user education, and technical reliability, biometric authentication may undermine rather than enhance overall bank performance. Biometric technologies like retinal scanning show promise for fraud prevention, but implementation challenges remain, including the need for standards on invasiveness, ease of use, and data security (DeVries, 2011). Overall, biometric authentication appears to offer potential benefits for banks, though quantifying savings from implemented systems can be difficult, necessitating top management involvement in adoption decisions.

CONCLUSION

The study examined the effect of selected fraud prevention strategies on the performance of deposit money banks, revealing that not all strategies contribute equally to performance outcomes. Internal control systems and fraud regulation compliance emerged as the most effective measures, exerting a significant positive influence on bank performance. Conversely, employee training and biometric authentication, though intended to curb fraudulent activities, were found to have a significant but negative impact, suggesting possible inefficiencies in their design or implementation. Fraud detection systems and artificial intelligence tools showed no significant effect, indicating that these measures may still be underdeveloped or insufficiently integrated into core banking processes. Overall, the findings underscore the need for banks to reassess and optimize their fraud prevention frameworks, focusing on strategies with proven positive effects while addressing operational gaps in less effective measures.

REFERENCES

AbdulRasheed, A., Babaita, I. S., & Yinusa, M. A. (2012). Fraud and Its Implications for Bank Performance in Nigeria. *International Journal of Asian Social Science, 2*(4), 382–387. https://archive.aessweb.com/index.php/5007/article/view/2197

Al Saggar, E. M. A., & Ghader, M. (2023). An Analysis of the Financial Performance Metrics for the Companies Listed on the Iraq Stock Exchange. *Journal of Social Commerce, 3*(1), 18–25. https://doi.org/10.56209/jommerce.v3i1.61

Bataineh, K. A. (2014). Impacts of Employee Training on the Performance of Commercial Banks in Jordan. *European Journal of Business and Management, 6*(27), 192–196. https://core.ac.uk/download/pdf/234625826.pdf

Chimonaki, C., Papadakis, S., & Lemonakis, C. (2023). Perspectives in fraud theories – A systematic review approach. *F1000Research, 12*, 933. https://doi.org/10.12688/f1000research.131896.1

Cho, M., & Ibrahim, S. (2022). Non-financial performance measures and pay-performance sensitivity. *Journal of Financial Reporting and Accounting, 20*(2), 185–214. https://doi.org/10.1108/JFRA-01-2021-0018

Cressey, D. R. (1950). The Criminal Violation of Financial Trust. *American Sociological Review, 15*(6), 738. https://doi.org/10.2307/2086606

DeVries, P. D. (2011). The problem of fraud in the banking industry: Are biometrics the answer? *International Journal of Services and Standards, 7*(3/4), 310. https://doi.org/10.1504/IJSS.2011.045055

Fabiyi, O. O., Aregbesola, O. D., Wright, O., Omojola, S. O., & Kolawole, P. E. (2025). Internal Control System and Fraud Prevention in Nigerian Deposit Money Banks. *International Journal of Economics and Financial Issues, 15*(3), 179–183. https://doi.org/10.32479/ijefi.17537

Faisal, N. A., Nahar, J., & Mintoo, A. A. (2024). Fraud Detection In Banking Leveraging Ai To Identify And Prevent Fraudulent Activities In Real-Time. *Non Human Journal, 1*(01), 181–197. https://doi.org/10.70008/jmldeds.v1i01.53

Frederica, D., & Murwaningsari, E. (2021). The Effect of the Use of Artificial Intelligence and Operational Risk Management on Banking Performance with the Implementation of Regulation as a Moderation Variable. *Semantic Scholar*.

Hamed, R. (2023). The Role of Internal Control Systems in Ensuring Financial Performance Sustainability. *Sustainability, 15*(13), 10206. https://doi.org/10.3390/su151310206

Hoffmann, A. O. I., & Birnbrich, C. (2012). The impact of fraud prevention on bank-customer relationships: An empirical investigation in retail banking. *International Journal of Bank Marketing, 30*(5), 390–407. https://doi.org/10.1108/02652321211247435

Jaiswal, H., & Singh, N. (2025). Effectiveness of AI-Driven Fraud Detection in Digital Banking. *International Journal for Research in Applied Science and Engineering Technology, 13*(5), 464–468. https://doi.org/10.22214/ijraset.2025.70216

John, O. N., Okonkwo, V. I., Okaro, C. S. O., Martins, B. O., & Otekunrin, A. O. (2023). Effect of Fraud and Corruption on Capital Market Performance in Nigeria. *Journal of Economics, Management and Trade*, 40–53. https://doi.org/10.9734/jemt/2023/v29i11073

Kaya, O. (2024). The impact of late payments on SMEs' access to finance: Evidence from credit rationing and loan terms. *Economic Modelling*, *141*, 106896. https://doi.org/10.1016/j.econmod.2024.106896

King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics, 108*(3), 717–737.

Marjohan, M., Adhe Purnomo, N., & Dwi Pratama, G. (2023). The Effect of Financial Reporting on Company Value The Impact of Company Financial Statement Fraud. *Benefit: Jurnal Manajemen Dan Bisnis, 8*(2), 229–251. https://doi.org/10.23917/benefit.v8i2.3585

Maulidi, A. (2020). When and why (honest) people commit fraudulent behaviours?: Extending the fraud triangle as a predictor of fraudulent behaviours. *Journal of Financial Crime, 27*(2), 541–559. https://doi.org/10.1108/JFC-05-2019-0058

Mwangi, D. T., & Mang'ana, R. O. (2024). Bank Fraud Mitigation Strategies and Performance of Commercial Banks in Kenya. *International Journal of Social Science and Humanities Research (IJSSHR) ISSN 2959-7056 (o); 2959-7048 (p), 2*(2). https://doi.org/10.61108/ijsshr.v2i2.119

Najih, M. K. F. (2025). Forensic Auditing in Fraud Detection and Prevention: Integration of Technology, Internal Audit, and Anti-Fraud Regulation. *Fairness, 1*(1), 47–63. https://doi.org/10.70764/gdpu-fr.2025.1(1)-04

Nyakarimi, S. N., Kariuki, S. N., & Kariuki, P. (2020). Application Of Internal Control System In Fraud Prevention In Banking Sector. *INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH, 9*(3), 6524–6536. https://www.ijstr.org/final-print/mar2020/Application-Of-Internal-Control-System-In-Fraud-Prevention-In-Banking-Sector.pdf

Opaleye, M., & Adelugba, I. (2024). Effect of the internal control system (ICS) on fraud prevention and the financial performance of selected retail supermarkets in Ibadan. *International Journal of Business and Management (IJBM), 3*(1), 22–40. https://doi.org/10.56879/ijbm.v3i1.29

Olowu, O. S., Adebayo, A. O., & Ogunleye, O. O. (2024). AI-driven fraud detection in banking: A systematic review. *International Journal of Banking and Finance, 12*(3), 45–67.

Ormerod, D., & Laird, K. (2020). 15. Fraud. In D. Ormerod & K. Laird, *Smith, Hogan, & Ormerod's Text, Cases, & Materials on Criminal Law* (pp. 429–460). Oxford University Press. https://doi.org/10.1093/he/9780198831945.003.0015

O'Sullivan, J., & Hilliard, J. (2016). *The Law of Contract.* Oxford University Press. https://doi.org/10.1093/he/9780198748816.001.0001

Oyekunle, S. M., Popoola, A. D., Kolo, F. H. O., Ogunmolu, A. M., & Adesokan-Imran, T. O. (2025). Intelligent Fraud Prevention Information Banking: A Data Governance- Centric Approach Using Behavioural Biometrics. *Asian Journal of Research in Computer Science, 18*(5), 525–543. https://doi.org/10.9734/ajrcos/2025/v18i5672

Park, P. S., Goldstein, S., O'Gara, A., Chen, M., & Hendrycks, D. (2024). AI deception: A survey of examples, risks, and potential solutions. *Patterns, 5*(5), 100988. https://doi.org/10.1016/j.patter.2024.100988

Rahiminezhad Galankashi, M., & Mokhatab Rafiei, F. (2022). Financial performance measurement of supply chains: A review. *International Journal of Productivity and Performance Management, 71*(5), 1674–1707. https://doi.org/10.1108/IJPPM-11-2019-0533

Suh, J. B., & Shim, H. S. (2020). The effect of ethical corporate culture on anti-fraud strategies in South Korean financial companies: Mediation of whistleblowing and a sectoral comparison approach in depository institutions. *International Journal of Law, Crime and Justice, 60*, 100361. https://doi.org/10.1016/j.ijlcj.2019.100361

Sun, G., Li, T., Ai, Y., & Li, Q. (2023). Digital finance and corporate financial fraud. *International Review of Financial Analysis, 87*, 102566. https://doi.org/10.1016/j.irfa.2023.102566

Tahani, A. H., & Rahmat, M. M. (2019). Fraud Prevention Strategies: The Perception of Saudi Arabian Banks Employees. *Asian Journal of Accounting and Governance, 11*, 71–83. https://doi.org/10.17576/AJAG-2019-11-07

Timothy, T. (2021). E-Fraud and Bank Performance: Empirical Evidence from Nigeria. *Account and Financial Management Journal, 06*(02). https://doi.org/10.47191/afmj/v6i2.01

Zhang, J., Wang, J., & Kong, D. (2020). Employee treatment and corporate fraud. *Economic Modelling, 85*, 325–334. https://doi.org/10.1016/j.econmod.2019.10.028