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Internal Audit Techniques and Fraud Rate in Tertiary Institutions: A Study of University of Calabar

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ABSTRACT

This study examined internal audit techniques and the fraud rate at the University of Calabar. The specific objectives were to: evaluate the effect of risk-based auditing on the fraud rate in the University of Calabar; examine the role of forensic auditing in reducing the fraud rate in the University of Calabar; assess the effectiveness of continuous auditing techniques in fraud rate in the University of Calabar; and determine the influence of data analytics on the fraud rate in the University of Calabar. The study adopted a survey research design. The population of this study comprised Bursary staff, totaling eight hundred and thirty (830). The study used simple random sampling and primary sources. The study presented the collected data in tables and percentages. This study used multiple regression analysis. The results revealed thus: there was a negative and significant effect of risk-based auditing on the fraud rate; there was a significant effect of forensic auditing in reducing the fraud rate; there was a positive significant effect of continuous auditing techniques in fraud rate; and there was a significant effect of data analytics on the fraud rate in University of Calabar. The study recommended that organizations should adopt advanced audit techniques such as data analytics and continuous auditing. Regulatory bodies should also enforce compliance with audit standards. Organizations should invest in technology to support modern audit practices.

Keywords

Internal audit techniques, fraud rate, risk-based auditing, forensic auditing, fraud rate, continuous auditing techniques data analytics.

1. Introduction

Fraud has emerged as one of the most persistent challenges confronting organizations across both developed and developing economies. It undermines financial integrity, erodes stakeholder confidence, and organizational sustainability. In Nigeria and other emerging economies, fraud has become particularly alarming because of weak internal controls, regulatory gaps, and increasingly sophisticated fraudulent schemes ([Association of Certified Fraud Examiners, 2024](#)). Organizations, especially in the financial sector, are continuously exposed to risks such as asset misappropriation, financial statement fraud, and cyber-related fraud. Internal auditing plays a critical role in mitigating fraud risks by providing independent assurance on the internal control systems. Internal audit techniques include systematic procedures and tools designed to evaluate organizational processes, ensure compliance, detect irregularities, and prevent fraud ([Institute of Internal Auditors, 2023](#)). These techniques include risk-based auditing, forensic auditing, continuous auditing, data analytics, and control testing. The relationship between internal audit techniques and fraud rate is therefore of significant academic and practical importance ([Figure 1](#)). Effective application of internal audit techniques is expected to reduce the occurrence and impact of fraud, while weak or outdated audit practices may allow fraud to thrive. This study examines how internal audit techniques influence fraud rates, with particular emphasis on their effectiveness in detecting, preventing, and deterring fraudulent activities.

Despite the growing emphasis on corporate governance and internal control systems, fraud remains pervasive across organizations. Reports indicate that organizations lose approximately 5% of their annual revenue to fraud globally (ACFE, 2024). In Nigeria, recurring cases of financial misappropriation, embezzlement, and insider fraud raise concerns about the effectiveness of internal audit mechanisms. One major issue is that many organizations still rely on traditional audit techniques that may not be sufficient to address modern, technology-driven fraud schemes. Additionally, internal auditors may lack the independence, technical expertise, or tools required to detect sophisticated fraud. Weak enforcement of audit recommendations further exacerbates the problem. Moreover, empirical findings remain inconsistent on whether internal audit techniques reduce fraud rates. While some studies suggest that advanced techniques such as forensic auditing and data analytics significantly reduce fraud, others argue that organizational culture and management override play a more dominant role. This gap necessitates a comprehensive examination of how specific internal audit techniques influence fraud rates, particularly in developing economies where institutional frameworks may be weaker.

2. Review of literature and hypothesis development

Internal auditing has evolved significantly from its traditional watchdog role into a strategic function that adds value to organizational governance, risk management, and control processes. According to the Institute of Internal Auditors (IIA, 2023), internal auditing is defined as an independent, objective assurance and consulting activity designed to add value and improve an organization’s operations. It helps organizations accomplish their objectives by bringing a systematic, disciplined approach to evaluating and improving the effectiveness of risk management, control, and governance processes. Modern internal auditing goes beyond mere compliance checking to encompass risk-based evaluation, performance auditing, and advisory services. This shift reflects the increasing complexity of business environments and the need for proactive fraud prevention mechanisms (Eulerich et al., 2023). In this regard, internal auditors are expected to anticipate risks, identify vulnerabilities, and recommend corrective actions before fraud occurs.

Conceptual framework

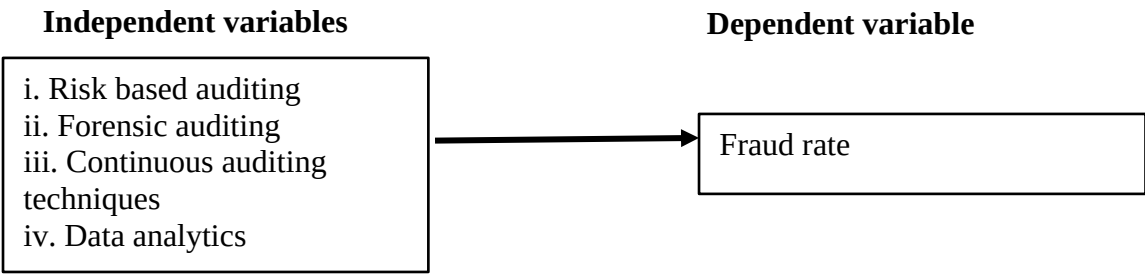


Fig. 1 Conceptual framework
Source: Researchers’ compilation 2026.

Risk-based auditing

Forensic auditing

Internal audit techniques refer to the tools, procedures, and methodologies internal auditors use to assess organizational operations and detect irregularities. Traditional techniques include transaction testing, vouching, compliance auditing, and physical verification. While these methods remain relevant, critics often describe them as reactive rather than proactive because they typically detect fraud after it occurs (Arens et al., 2020).

Risk-Based Auditing (RBA)

Risk-based auditing is a proactive approach that focuses audit efforts on areas with the highest risk exposure. It involves identifying, assessing, and prioritizing risks, followed by allocating audit resources accordingly (IIA, 2023). RBA enhances efficiency and effectiveness by ensuring that critical risk areas receive adequate attention. Scholars argue that RBA significantly reduces fraud opportunities by strengthening controls in vulnerable areas (Beck, 2023). However, its effectiveness depends on accurate risk assessment and organizational transparency.

Forensic Auditing

Forensic auditing is a specialized field that combines accounting, auditing, and investigative skills to examine financial information for use in legal proceedings. It focuses on detecting, investigating, and preventing fraud through detailed examination and evidence gathering (Singleton & Singleton, 2010). Forensic auditing techniques include data mining, digital forensics, lifestyle analysis, and fraud risk assessment. These techniques are

particularly effective in uncovering complex fraud schemes that may not be detected through conventional auditing.

Continuous Auditing

Continuous auditing uses automated tools to perform audit activities in real time or near real time. It allows for ongoing monitoring of transactions and controls, thereby reducing the time lag between fraud occurrence and detection (Vasarhelyi et al., 2012). Continuous auditing is increasingly relevant in digital environments where transactions occur rapidly and in large volumes. It enhances fraud detection by identifying anomalies as they occur.

Data Analytics in Auditing

Data analytics has emerged as a transformative tool in internal auditing. It involves the use of statistical techniques, algorithms, and software to analyze large datasets and identify patterns, trends, and anomalies (Vasarhelyi, et al., 2012). Audit data analytics improves fraud detection by enabling auditors to examine entire transaction populations rather than relying on sampling. This increases the likelihood of identifying irregularities and reduces audit risk.

Fraud rate

Fraud is defined as any intentional act of deception designed to secure unfair or unlawful gain (ACFE, 2024). It encompasses various forms, including asset misappropriation, corruption, and financial statement fraud. Fraud rate refers to the frequency or incidence of fraud within an organization over a specified period. Researchers often measure it using indicators such as the number of reported fraud cases, financial losses incurred, or the frequency of control breaches. The increasing prevalence of fraud in organizations has been attributed to factors such as weak internal controls, poor corporate governance, economic pressures, and technological advancements (Dorminey et al., 2012).

Internal Audit and fraud prevention

Internal auditing plays a central role in fraud prevention by establishing and maintaining effective internal control systems. According to COSO (Committee of Sponsoring Organizations, 2013), internal control consists of five components: control environment, risk assessment, control activities, information and communication, and monitoring. Internal auditors contribute to fraud prevention by: Evaluating the effectiveness of internal controls, identifying weaknesses and recommending improvements, conducting fraud risk assessments, and promoting ethical behavior and compliance. Research suggests that organizations with strong internal audit functions experience lower fraud rates due to improved oversight and accountability (Bonrath & Eulerich, 2024). Fraud detection involves identifying fraudulent activities after they have occurred. Internal audit techniques such as forensic auditing, data analytics, and surprise audits are particularly effective in detecting fraud. Detection is enhanced by advanced technologies, Continuous monitoring systems, and Whistleblowing mechanisms. However, detection alone is not sufficient; organizations must also focus on prevention to minimize losses. The effectiveness of internal audit in reducing fraud depends largely on its independence and objectivity. Internal auditors must be free from management interference to perform their duties effectively (IIA, 2023). Lack of independence can compromise audit findings and allow fraud to persist. Therefore, organizational structures should ensure that internal auditors report to audit committees rather than management (The Institute of Internal Auditors, 2024).

Internal Audit Techniques and Fraud Rate

The relationship between internal audit techniques and fraud rate is generally inverse. Olowokudejo et al. (2023), in their study of deposit money banks in Nigeria, employed a survey research design and regression analysis to examine the effectiveness of risk-based auditing. Their findings revealed a statistically significant inverse relationship between risk-based auditing and fraud rate. Specifically, banks that prioritized high-risk areas through structured risk assessment frameworks experienced fewer fraud incidents. The study also highlighted that risk-based auditing improves resource allocation efficiency within audit departments, thereby strengthening fraud detection capabilities.

Similarly, Adeyemi and Adeniyi (2024) empirically investigated the role of forensic auditing in mitigating fraud within Nigerian public sector institutions. Using a mixed-method approach combining questionnaire data and case analysis, the study found that forensic auditing techniques – such as digital forensics, financial profiling, and

investigative interviewing – significantly reduced fraud occurrence. The authors concluded that forensic auditing not only detects fraud but also deters it by increasing employees' perceived likelihood of detection.

In a related study, [Okafor et al. \(2022\)](#) examined the impact of continuous auditing on fraud prevention in selected manufacturing firms. Using panel data analysis, the study showed that organizations adopting continuous auditing systems experienced a notable decline in fraud rates. The real-time nature of continuous auditing enables prompt identification of anomalies, thereby reducing the window of opportunity for fraudulent activities. However, the study also noted that the effectiveness of continuous auditing depends on the availability of technological infrastructure and skilled personnel.

[Kumar and Gupta \(2024\)](#) explored the role of data analytics in fraud detection within financial institutions in India. Their study employed a quantitative approach using structural equation modeling (SEM) to analyze data collected from audit professionals. The findings indicated that data analytics significantly improves fraud detection accuracy by identifying unusual transaction patterns and outliers. The study emphasized that data-driven audit techniques outperform traditional audit methods in detecting complex and concealed fraud schemes.

[Eze \(2023\)](#) focused on internal control evaluation as a core internal audit technique in Nigerian manufacturing firms. Using correlation and regression analysis, the study found that effective internal control systems are negatively correlated with fraud occurrence. Organizations with strong control environments, regular control testing, and compliance monitoring reported lower fraud rates. The study reinforced the importance of control-based auditing as a foundational tool in fraud prevention.

Expanding beyond Nigeria, [Hazaee et al. \(2023\)](#) investigated the effectiveness of internal audit practices in reducing fraud in Middle Eastern financial institutions. Their findings showed that internal audit independence and the use of advanced audit tools significantly reduce fraud risk. The study also highlighted that organizational support and management commitment are critical factors influencing the effectiveness of internal audit functions.

In South Africa, [Mbetha and Moosa \(2024\)](#) examined the relationship between internal audit quality and fraud detection in public enterprises. The study found that audit quality—measured by auditor competence, independence, and adherence to standards—significantly reduces fraud rates. High-quality internal audit functions were associated with improved fraud detection and reduced financial irregularities.

A study by [Chen and Wu \(2023\)](#). in China investigated the role of technology-enabled auditing in fraud prevention. Using a large dataset from listed companies, the study found that firms utilizing artificial intelligence (AI) and machine learning tools in auditing reported significantly lower fraud incidences. The authors argued that technological integration enhances the predictive and preventive capabilities of internal audit systems.

Furthermore, [Musa and Ibrahim \(2023\)](#) examined the constraints affecting internal audit effectiveness in Nigeria. Their findings revealed that despite the adoption of modern audit techniques, factors such as lack of independence, inadequate funding, and management interference limit internal audit effectiveness in fraud control. This suggests that the mere presence of audit techniques is insufficient; institutional support and governance structures are equally important.

A recent study by [Shehu \(2025\)](#) analyzed the combined effect of multiple internal audit techniques on fraud rate in Nigerian SMEs. Using multiple regression analysis, the study found that combining risk-based auditing, forensic auditing, and data analytics produced a greater reduction in fraud rate than using a single technique. This supports the contingency theory perspective that a multi-faceted approach is more effective in addressing fraud.

In addition, [Mbetha and Moosa \(2024\)](#). investigated the impact of internal audit reporting mechanisms on fraud control. Their findings indicated that timely, transparent reporting improves management response to audit findings, thereby reducing fraud risk. Delays in implementing audit recommendations were found to increase the likelihood of repeated fraudulent activities. From a global perspective, the Association of Certified Fraud Examiners ([ACFE, 2024](#)) reported that organizations with proactive internal audit functions detected fraud faster and incurred lower losses compared to those without such systems. The report emphasized that internal audit techniques such as data monitoring, surprise audits, and whistleblowing mechanisms significantly contribute to fraud reduction. Despite these positive findings, some studies present contrasting evidence.

For instance, [Olaoye and Adekola \(2017\)](#), found that internal audit techniques had a limited impact on fraud reduction in organizations with weak corporate governance structures. The study argued that management override of controls often neutralizes the effectiveness of audit procedures. Similarly, [Tagang et al. \(2024\)](#) reported that while data analytics improves fraud detection, its effectiveness is limited by data quality issues and lack of technical expertise among auditors. This highlights the need for capacity building and data governance frameworks. Overall, the empirical literature suggests a strong inverse relationship between internal audit techniques and fraud rate. However, contextual factors such as organizational culture, technological capability, the regulatory environment, and auditor independence influence the effectiveness of these techniques. The literature also indicates a shift from traditional audit methods to more proactive and technology-driven approaches. Based on the review of the literature, the following hypotheses were formulated:

H01: There is no significant effect of risk-based auditing on the fraud rate in the University of Calabar;

H02: There is no significant effect of forensic auditing on reducing the fraud rate in the University of Calabar;

H03: There is no significant effect of continuous auditing techniques on the fraud rate in the University of Calabar;

H04: There is no significant effect of data analytics on fraud rate in the University of Calabar.

Theoretical framework

This study is anchored on several relevant theories that explain fraud occurrence and the role of internal audit.

The Fraud Triangle Theory, developed by [Cressey \(1953\)](#), posits that fraud occurs when three elements are present: pressure, opportunity, and rationalization. Internal audit techniques primarily target the “opportunity” element by strengthening controls and reducing loopholes. The fraud triangle model emerged from observation. [Cressey \(1953\)](#) studied the behavior of 250 criminals serving jail sentences in a United States Cell. [Cressey \(1953\)](#) observed a common characteristic among the inmates and concluded that they engaged in payroll fraud because of unshareable financial problems, opportunities to defraud due to internal control weaknesses, and the ability to defend their criminal actions after committing the crime. Based on these observations, [Cressey \(1953\)](#) hypothesized that three factors must be present for individuals to commit fraud. These factors are pressure, opportunity, and rationalization. According to this theory, “whether the fraud benefited the perpetrator directly or one that benefited a perpetrator’s organization, the three conditions for fraud were always present for fraud to occur”. Consequently, these three factors became the pillars of the fraud triangle theory.

3. Methodology

The study adopted a survey research design. The study focused on internal audit techniques and the fraud rate at the University of Calabar. The study population consisted of University of Calabar staff. The study population comprised University staff. The population of this study comprised staff of the Bursary unit (450), Internal Audit (55), Stores (20), Procurement (15), Works (250), Budget (25), and Payroll (15). A total of eight hundred and thirty (830). The study used simple random sampling and primary sources. Taro Yamane formula was used to determine the sample size. The formular is stated thus:

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

Where

N = Population

1 = Constant

E = tolerable error (0.05)

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

$$= \frac{830}{1+830(0.05)^2}$$

$$= \frac{830}{1+830(0.0025)}$$

$$= \frac{830}{1+2.075}$$

$$= \frac{830}{1.075} = 269 \cong 270$$

The sample size is two hundred and seventy (270). Of the 270 copies distributed, 265 were correctly filled and returned. The collected data were presented in tables and percentages. This study used multiple regression analysis. For the purpose of this study, the empirical model for this study is specified thus;

The econometric model is stated thus:

$$FR = b_0 + b_1RBA + b_2FA + b_3CAT + b_4DA + Ut \dots\dots\dots_1$$

Where

FR = Fraud rate (measured as the proportion of fraudulent activities)

Internal audit techniques (measured with Risk-based Auditing, Forensic Auditing, Continuous Auditing Techniques, Data analytics)

RBA = Risk-based Auditing

FA = Forensic Auditing

CAT = Continuous Auditing Techniques

DA = Data analytics

bo = Regression constant

b₁.b₄ = Regression parameters or coefficients

Ut = Stochastic error term

4. Results

TABLE 1: Descriptive Statistics

	Mean	Std. Deviation	N
RBA	17.8585	1.56553	265
FA	17.2219	1.37921	265
CAT	18.0514	1.69551	265
DA	18.5305	1.49565	265
FR	17.0965	1.49095	265

Source: SPSS output (2026)

From [Table 1](#), the mean values of RBA analysis (17.8585), FA (17.2219), CAT (18.0514), DA (18.5305), and FR (17.0965). The standard deviations of RBA (1.56553), FA (1.37921), CAT (1.69551), DA (1.49565), and FR (1.49095). To assess the relationships among the variables used in this study, the researcher used the Pearson Product-Moment Correlation. The correlations among the variables are presented in [Table 2](#). The results indicated that selected variables were significant at the 1% level, while others were significant at the 5% level. A normality test was conducted to determine whether the dataset followed a normal distribution. Regression analysis requires normally distributed data, with skewness and kurtosis values close to zero. [Table 3](#) presents the normality test results, including computed skewness and kurtosis values for all variables in the study. The results indicated that all variables met the normality condition, as their skewness and kurtosis values fell between -2 and +2 for skewness and -7 and +7 for kurtosis, which are considered acceptable ranges.

TABLE 2: Correlations

		RBA	FA	CAT	DA	FR
RBA	Pearson Correlation	1	.186**	.218**	.235**	.292**
	Sig. (2-tailed)		.001	.000	.000	.000
	Sum of Squares and Cross-products	759.775	124.762	179.264	170.344	211.244
	Covariance	2.451	.402	.578	.549	.681
	N	265	265	265	265	265
FA	Pearson Correlation	.186**	1	.090	.113*	.206**
	Sig. (2-tailed)	.001		.112	.046	.000
	Sum of Squares and Cross-products	124.762	589.691	65.450	72.392	131.344
	Covariance	.402	1.902	.211	.234	.424
	N	265	265	265	265	265
CAT	Pearson Correlation	.218**	.090	1	.034	.312**
	Sig. (2-tailed)	.000	.112		.554	.000
	Sum of Squares and Cross-products	179.264	65.450	891.177	26.511	244.457
	Covariance	.578	.211	2.875	.086	.789
	N	265	265	265	265	265
DA	Pearson Correlation	.235**	.113*	.034	1	.302**
	Sig. (2-tailed)	.000	.046	.554		.000
	Sum of Squares and Cross-products	170.344	72.392	26.511	693.460	209.084
	Covariance	.549	.234	.086	2.237	.674
	N	265	265	265	265	265
FR	Pearson Correlation	.292**	.206**	.312**	.302**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	Sum of Squares and Cross-products	211.244	131.344	244.457	209.084	689.106
	Covariance	.681	.424	.789	.674	2.223
	N	265	265	265	265	265

** . Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: SPSS output (2026)

TABLE 3: Normality test of main variables

TABLE 8. Normality test of main variables												
	N	Range	Minimu m	Maximu m	Mean	Std. Deviation	Variance	Skewness	Kurtosis			
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
RBA	265	10.00	13.00	23.00	17.8585	.08877	1.56553	2.451	-.124	.138	.153	.276
FA	265	8.00	13.00	21.00	17.2219	.07821	1.37921	1.902	-.174	.138	.082	.276
CAT	265	9.00	13.00	22.00	18.0514	.09614	1.69551	2.875	.403	.138	.399	.276
DA	265	9.00	14.00	23.00	18.5305	.08481	1.49565	2.237	-.647	.138	.539	.276
FR	265	8.00	13.00	21.00	17.0965	.08454	1.49095	2.223	-.419	.138	.303	.276
Valid N (listwise)	265											

Source: SPSS output (2026)

TABLE 4: Regression results of the effect of internal audit techniques on fraud rate

Variable	Unstandardized coefficients (β)	Std. Error	Standardized coefficient (β)	t-statistic	prob.
Constant	2.797	.875		3.195	.001
RBA	-.172	.088	-.135	-1.956	.002
FA	.181	.087	.161	2.094	.005
CAT	.119	.051	.117	2.318	.001
DA	.741	.073	.689	10.101	.000
R	.811				
R-squared	.658				
Adj R-squared	.654				
std. Error	.393				
D/W	2.052				

a. Predictors: (Constant), RBA, FA, CAT, DA

b. b. Dependent Variable: FR

Test of hypothesis one

H01: There is no significant effect of risk-based auditing on fraud rate in the University of Calabar;

The study tested the hypotheses based on the coefficients of the constructs in the specified model and the significance of the values, as shown in Table 4. The estimated result validated this hypothesis. The test of hypothesis one was based on the coefficient of risk-based auditing. From the result shown in Table 4, the coefficient of risk-based auditing is 0.172 with a probability of 0.02. The t-calculated value of (-1.956) was less than the t-critical value and significant at the 0.05 level, indicating that the coefficient passes the significance test. Based on this result, the null hypothesis was accepted in favour of the alternative. This result implies that risk-based auditing has a negative and significant effect on the fraud rate at the University of Calabar.

Test of hypothesis two

H02: There is no significant effect of forensic auditing in reducing fraud rate in University of Calabar

The study tested the hypotheses based on the coefficients of the constructs in the specified model and the significance of the values, as shown in Table 4. The estimated result validated this hypothesis. The test of hypothesis was based on the coefficient of forensic auditing. From the result shown in Table 4, the coefficient of forensic auditing is 0.181 with a probability of 0.005. The t-calculated value of 2.094 exceeded the t-critical value and was significant at the 0.01 level, indicating that the coefficient passed the significance test. Based on this result, the null hypothesis was accepted in favour of the alternative. This result implies that forensic auditing has a positive significant effect on fraud rate at the University of Calabar.

Test of hypothesis three

H03: There is no significant effect of continuous auditing techniques on fraud rate in University of Calabar

The study tested the hypotheses based on the coefficients of the constructs in the specified model and the significance of the values, as shown in Table 4. The estimated result validated this hypothesis. The test of hypothesis one was based on the coefficient of continuous auditing techniques. From the result shown in Table 4, the coefficient of continuous auditing techniques is .119 with a probability of 0.001. The t-calculated value of 2.318 exceeded the t-critical value and was significant at the 0.01 level, indicating that the coefficient passed the significance test. Based on this result, the null hypothesis was rejected in favour of the alternative. This result implies that continuous auditing techniques have positive significant effect on fraud rate in the University of Calabar.

Test of hypothesis four

H04: There is no significant effect of data analytics on fraud detection in the University of Calabar

The study tested the hypotheses based on the coefficients of the constructs in the specified model and the significance of the values, as shown in Table 4. The estimated result validated this hypothesis. The test of hypothesis one was based on the coefficient of data analytics. From the result shown in Table 4, the coefficient of data analytics is .741 with a probability of 0.000. The t-calculated value of 10.101 exceeded the t-critical value and was significant at the 0.01 level, indicating that the coefficient passed the significance test. Based on this result,

the null hypothesis was rejected in favor of the alternative. This result implies that data analytics has a significant effect on fraud rate. This result implies that risk-based auditing has positive significant effect on fraud rate at the University of Calabar.

Discussion of findings

In hypothesis one, it was found that risk-based auditing has a negative and significant effect on fraud rate at the University of Calabar (Table 4). The study tested the hypotheses based on the coefficients of the constructs in the specified model and the significance of the values. The estimated result validated this hypothesis. The test of hypothesis one was based on the coefficient of risk-based auditing. Based on this result, the null hypothesis was rejected in favour of the alternative. This finding is in line with the work of [Abdullahi and Mansor \(2023\)](#), who argued that risk-based auditing is a proactive approach that focuses audit efforts on areas with the highest risk exposure. It involves identifying, assessing, and prioritizing risks, followed by allocating audit resources accordingly. RBA enhances efficiency and effectiveness by ensuring that critical risk areas receive adequate attention. Scholars argue that RBA significantly reduces fraud opportunities by strengthening controls in vulnerable areas. However, its effectiveness depends on accurate risk assessment and organizational transparency.

In hypothesis two, it was found that forensic auditing has a significant effect on reducing the fraud rate at the University of Calabar (Table 4). The study tested the hypotheses based on the coefficients of the constructs in the specified model and the significance of the values. The estimated result validated this hypothesis. The test of hypothesis was based on the coefficient of forensic auditing. Based on this result, the null hypothesis was accepted in favour of the alternative. This result implies that forensic auditing has a positive significant effect on fraud rate at the University of Calabar. This finding aligns with [Singleton and Singleton \(2010\)](#), who argued that forensic auditing is a specialized field that combines accounting, auditing, and investigative skills to examine financial information for use in legal proceedings. It focuses on detecting, investigating, and preventing fraud through detailed examination and evidence gathering. Forensic auditing techniques include data mining, digital forensics, lifestyle analysis, and fraud risk assessment. These techniques are particularly effective at uncovering complex fraud schemes that conventional auditing may miss.

Hypothesis three found a positive, significant effect of continuous auditing techniques on the fraud rate at the University of Calabar (Table 4). The study tested the hypotheses based on the coefficients of the constructs in the specified model and the significance of the values. The test of hypothesis one was based on the coefficient of continuous auditing techniques. Based on this result, the null hypothesis was rejected in favour of the alternative. This result implies that continuous auditing techniques have positive significant effect on fraud rate in the University of Calabar. This finding aligns with [Vasarhelyi et al. \(2012\)](#), who argued that continuous auditing uses automated tools to perform audit activities in real time or near real time. This allows ongoing monitoring of transactions and controls, reducing the time lag between fraud occurrence and detection. Continuous auditing is increasingly relevant in digital environments where transactions occur rapidly and in large volumes. It enhances fraud detection by identifying anomalies as they occur.

Hypothesis four found a positive significant effect of risk-based auditing on the fraud rate at the University of Calabar (Table 4). The study tested the hypotheses based on the coefficients of the constructs in the specified model and the significance of the values. The estimated result validated this hypothesis. The test of hypothesis one was based on the coefficient of data analytics. Based on this result, the null hypothesis was rejected in favor of the alternative. This result implies that data analytics has a significant effect on fraud rate. This result implies that risk-based auditing has positive significant effect on fraud rate at the University of Calabar. This finding aligns with [Appelbaum et al. \(2023\)](#), who argued that data analytics has emerged as a transformative tool in internal auditing. It uses statistical techniques, algorithms, and software to analyze large datasets and identify patterns, trends, and anomalies. Audit data analytics improves fraud detection by enabling auditors to examine entire populations of transactions rather than relying on sampling. This increases the likelihood of identifying irregularities and reduces audit risk.

5. Conclusion

This study portrays the effect of internal audit techniques on fraud rate. The study revealed that risk-based auditing has a negative significant effect on fraud rate at the University of Calabar. Forensic auditing has a significant effect on reducing the fraud rate at the University of Calabar. Continuous auditing techniques have positive significant effect on fraud rate at the University of Calabar. Risk-based auditing has positive significant

effect on the fraud rate at the University of Calabar. Internal auditing has evolved significantly from its traditional watchdog role into a strategic function that adds value to organizational governance, risk management, and control processes. It helps organizations accomplish their objectives by bringing a systematic, disciplined approach to evaluating and improving the effectiveness of risk management, control, and governance processes. However, effectiveness of internal audit techniques depends on factors such as auditor independence, organizational support, and technological capability. Internal audit techniques play a critical role in reducing fraud rates within organizations.

References

- Abdullahi, R., & Mansor, N. (2023). Fraud prevention initiatives in the Nigerian public sector: Understanding the power of fraud triangle theory. *Journal of Financial Crime*, 30(4), 981-999. [\[Link\]](#)
- Adeyemi, S. B., & Adeniyi, A. A. (2024). Forensic auditing and fraud detection in public sector organizations. *Journal of Accounting and Financial Management*, 10(2), 45-62.
- Appelbaum, D., Kogan, A., & Vasarhelyi, M. A. (2023). *Data analytics for internal auditors: A practical guide*. Wiley.
- Arens, A. A., Elder, R. J., Beasley, M. S., & Hogan, C. E. (2020). *Auditing and assurance services* (17th ed.). Pearson.
- Association of Certified Fraud Examiners. (2024). *Report to the nations on occupational fraud and abuse*. ACFE.
- Beck, F. (2023). *Integrated risk-based internal auditing*. Institute of Internal Auditors Australia.
- Bonrath, A., & Eulerich, M. (2024). Internal auditing's role in preventing and detecting fraud: An empirical analysis. *International Journal of Auditing*, 28(2), 173-190. [\[Crossref\]](#)
- Chen, Y., & Wu, Z. (2023). Financial fraud detection of listed companies in China: A machine learning approach. *Sustainability*, 15(1), 105. [\[Crossref\]](#)
- Committee of Sponsoring Organizations of the Treadway Commission. (2013). *Internal control - Integrated framework*. COSO.
- Cressey, D. R. (1953). *Other people's money: A study in the social psychology of embezzlement*. Free Press.
- Dorminey, J. W., Fleming, A. S., Kranacher, M.-J., & Riley, R. A., Jr. (2012). The evolution of fraud theory. *Issues in Accounting Education*, 27(2), 555-579. [\[Crossref\]](#)
- Eulerich, M., Masli, A., Pickerd, J., & Wood, D. A. (2023). The impact of audit technology on audit task outcomes: Evidence for technology-based audit techniques. *Contemporary Accounting Research*, 40(2), 981-1012. [\[Crossref\]](#)
- Eze, J. C. (2023). Internal control systems and fraud prevention in manufacturing firms. *International Journal of Business Research*, 15(1), 78-92.
- Hazaea, S. A., Al-Matari, E. M., Khatib, S. F. A., Albitar, K., & Zhu, J. (2023). Internal auditing in the Arab World: A systematic literature review and directions for future research. *SAGE Open*, 13(3). [\[Crossref\]](#)
- Institute of Internal Auditors. (2023). *International professional practices framework*. IIA.
- Kumar, R., & Gupta, S. (2024). Data analytics and fraud detection in financial institutions. *Journal of Financial Crime*, 31(1), 120-135.
- Mbetha, S. K. M., & Moosa, R. (2024). The role of the internal audit function in detecting and preventing fraud at a South African municipality. *AFEBI Management and Business Review*, 9(1), 36-47.
- Musa, A., & Ibrahim, L. (2023). Internal audit independence and fraud control. *African Journal of Accounting*, 9(3), 66-81.
- Okafor, C. N., et al. (2022). Continuous auditing and fraud prevention. *Journal of Accounting Systems*, 14(2), 55-70.
- Olaoye, C. O., & Adekola, R. D. (2017). The roles of auditors in fraud detection and prevention in Nigeria deposit money banks: Evidence from Southwest. *European Scientific Journal*, 13(31), 290. [\[Crossref\]](#)
- Olowokudejo, F. F., et al. (2023). Risk-based auditing and fraud control in Nigerian banks. *Nigerian Journal of Accounting Research*, 12(1), 34-50.
- Ramadhan, M. G., Janssen, M., & van der Voort, H. (2023). Driving and inhibiting factors for implementing audit analytics in an internal audit function. *Journal of Emerging Technologies in Accounting*, 20(2), 135-163. [\[Crossref\]](#)
- Shehu, T. S. (2025). Internal control system and fraud mitigation: A case of selected SMEs in Nigeria. *Asian Journal of Advanced Research and Reports*, 19(4), 301-315. [\[Crossref\]](#)
- Singleton, T. W., & Singleton, A. J. (2010). *Fraud auditing and forensic accounting* (4th ed.). John Wiley & Sons. [\[Crossref\]](#)
- Tagang, J. D., Ahmed, A., Ningi, S. I., & Shittu, I. O. (2024). An assessment of information management practices and the containment of financial crimes in Nigeria. *FUDMA Journal of Accounting and Finance Research*, 2(4), 82-90. [\[Crossref\]](#)
- The Institute of Internal Auditors. (2024). *Global internal audit standards*. The Institute of Internal Auditors.

Vasarhelyi, M. A., Alles, M. G., Kuenkaikaew, S., & Littlely, J. (2012). The acceptance and adoption of continuous auditing by internal auditors: A micro analysis. *International Journal of Accounting Information Systems*, 13(3), 267-281. [[Crossref](#)]