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Financial Instability Red Flag and Fraud Risk Detection: The Moderating Role of Board Independence in Listed Financial Institutions in Nigeria

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ABSTRACT

The persistence of fraudulent financial reporting among Nigerian financial institutions, despite regulatory reforms and corporate governance codes, motivates this study, which examines the effect of the Financial Instability Red Flag on fraud risk detection, the direct effect of board independence on fraud risk detection, and the moderating role of board independence on the financial instability-fraud risk detection relationship. Financial instability, an accounting red flag recognised under ISA 240 Paragraph A35, reflects deteriorating financial condition arising from excessive debt obligations and is proxied by total liabilities divided by total assets. The study adopted a quantitative approach and an ex post facto research design, anchored on positivist philosophy, using panel data drawn from the audited annual reports of 42 listed Nigerian financial institutions from 2014 to 2024 (462 firm-year observations). Fraud risk detection was measured with the Dechow F-Score model, while board independence was measured as the proportion of independent directors to total board size. Data were analysed using descriptive statistics, correlation analysis, and panel regression, with firm size as a control variable. Findings show that Financial Instability Red Flag had a negative and statistically insignificant effect on fraud risk detection under the direct-effect model, but became positive and statistically significant once board independence and interaction terms were introduced. Board independence had a negative and statistically significant direct effect on fraud risk detection when first introduced as a moderator, but this effect became negative and statistically insignificant once the interaction terms were added; board independence also did not significantly moderate the financial instability-fraud risk detection relationship. The study concludes that financial instability is a context-dependent red flag whose fraud-signalling strength is sensitive to governance-model specification, while board independence, though theoretically expected to strengthen monitoring, has not translated into a consistent, statistically significant direct or moderating safeguard within Nigerian financial institutions. Regulators and boards should therefore strengthen financial stability monitoring and empower independent directors with stronger risk oversight mandates.

KEYWORDS: Financial instability, accounting red flags, board independence, fraud risk detection, F-Score model, panel regression, Nigeria

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1. Introduction

Given the growing prevalence of fraudulent financial practices in financial systems around the world, fraud risk detection has emerged as one of the most important issues in current financial reporting

and corporate governance. In the United States, accounting fraud resulted in $74 billion in losses to shareholders who ended up damaging the reputation of these businesses and even leading to their bankruptcy (Beasley et al., 2010). The collapse of major corporations highlighted the dangers of weak governance structures, earnings manipulation and aggressive accounting methods to investor confidence and financial market stability. The role of accounting red flags as indicators of financial statement fraud has also been recently emphasized in the literature, highlighting the significance of such red flags in identifying fraud practices to be abnormal accruals, revenue manipulation and financial distress signals (Dechow et al., 2011; Jannah et al., 2022; Inayah & Chariri, 2024). Likewise, the study by Achmad et al. (2023) found that board independence contributes to the independence of financial reporting, with the ability to curb managerial opportunism through financial reporting, thereby enhancing the effectiveness of financial reporting oversight.

Financial Instability Red Flag refers to situations that suggest a weakening in the financial health of an organisation due to the absence of a balance in paying off debt, poor performance, and/or heightened solvency pressures. Financial instability is also a fraud risk indicator that has been given significant weight in paragraphs A35 of ISA 240, which refers to financial instability as a key fraud risk factor as a result of the pressures to manipulate financial statements for financial stability and regulatory requirements. The present study uses total liabilities/total assets as an indicator for Financial Instability Red Flag since the ratio directly reflects the level of financial pressure and the degree of debt dependence of listed financial institutions. The institutions in which the financial instability exists may resort to reporting aggressively and manipulate earnings, especially in a sector like Nigeria, which has stringent capital adequacy and solvency requirements by the Central Bank of Nigeria.

Financial irregularities, regulatory sanctions and governance failures have been a recurring occurrence in the financial sector in Nigeria involving listed financial institutions. The Nigeria Deposit Insurance Corporation (NDIC) reported that Nigerian banks suffered fraud and forgery worth more than ₦9.4 billion in 2023 while attempted fraud cases totalled over ₦21 billion in the banking sector. The Central Bank of Nigeria (CBN) has been intervening in troubled banks on several occasions because of governance failures and financial reporting irregularities that pose threats to depositor confidence and financial system stability. The financial instability caused by excessive liabilities persists as a source of fraudulent financial reporting by listed financial institutions, causing financial statements to lose in credibility and giving shareholders, depositors and regulators huge risks to take.

While it is hoped that corporate governance mechanisms that are tasked with oversight within organisations will help to identify fraud risk, the effectiveness of these red flags will vary greatly based on the quality of the corporate governance mechanism in question. The enhancement of the independence of board members is even more significant as independent directors are believed to contribute to the effectiveness of monitoring and improve the capacity of financial institutions to detect suspicious financial reporting practices. But, the question remains whether board independence can help in some degree to moderate the accounting red flag-fraud risk detection relationship in listed financial institutions in Nigeria. There has been no shortage of fraudulent financial reporting or any financial governance-related sanctions in the sector, which also indicates that there are some financial governance warning signals not being translated into effective financial fraud detection in the absence of strong financial governance.

Teachers of financial education face a number of conceptual, contextual, and methodological challenges that are noted in existing literature based on financial instability as a fraud indicator. Some previous studies conceptualized leverage, liquidity, and financial pressure as components of financial distress and, growth in revenue or shareholder wealth rather than as warning signals of financial reporting fraud (Arief et al., 2024; Adepoju & Ibrahim, 2025; Olawale & Akinyemi, 2021; Al-Yahyaee et al., 2024; Zhang et al., 2023; Munyua & Kamau, 2022; Napitupulu et al., 2025). There is also a geographical limitation as most previous empirical studies on financial pressure indicators and fraud have been carried out on countries other than Nigeria and outside the financial sector (Chen & Wang, 2024; Al-Rizky et al., 2024; Puspaningrum et al., 2024). In terms of methodology, several studies only used a perception-based survey instrument, Beneish M-Score or logistic regression without a composite panel-based fraud risk detection framework that includes governance moderation (Ramadhanty & Septiani, 2024; Simanjuntak et al., 2024). The identified gaps warrant a focused empirical study of financial instability as a fraud risk indicator in the listed Nigerian financial institutions taking into account the influence of board independence.

The work therefore has three specific objectives set; first, to study the effect of Financial Instability Red Flag on fraud risk detection among listed financial institutions in Nigeria; second, to study the effect of Board Independence on fraud risk detection among listed financial institutions in Nigeria; and third, to determine the moderating effect of Board Independence on the relationship between Financial Instability Red Flag and fraud risk detection among listed financial institutions in Nigeria. The following hypotheses, formulated in the null form, were used in the study:
The rest of the paper is organized as follows: Section 2 briefly summarizes the relevant conceptual, theoretical and empirical literature and formulates the hypotheses; Section 3 describes the methodology; Section 4 reports and discusses the results; and Section 5 concludes with recommendations.

2. Literature Review and Hypotheses Development

2.1 Conceptual Review

Fraud Risk Detection

Fraud Risk Detection is the process of determining the risk of financial reporting being fraudulent, including the evaluation of unusual financial transactions and financial reporting differences. ISA 240 states that fraud risk detection requires the identification and the evaluation of fraud risk factors using analytical procedures as well as the evaluation of fraud risk factors. The Fraud Score (F-Score) model is widely used in fraud detection research due to its proven ability to discriminate between fraudulent and non-fraudulent companies on the basis of accrual-based measures (RSST Accruals) and financial performance indicators (Jannah et al., 2022; Dechow et al., 2011; Inayah & Chariri, 2024). The current study uses the F-Score model since it incorporates both accrual manipulation and abnormal financial performance, the two primary signals of fraudulent financial reporting in financial institutions and suitable for a panel analysis.

Economic Uncertainty Warning Sign

Financial instability means that the situation that the financial condition of an organisation is unstable, with the potential to put pressure on management to distort its financial statements or hide operational problems. The idea comes from the ISA 240 Paragraph A35 which states that financial instability, high debt levels and economic pressure are important fraud risk factors. Total liabilities/total assets is used in the current study because it directly, simply and reliably reflects debt dependence and financial pressure, as do the leverage ratios and distress-prediction scores used in other studies (e.g., Altman, Z-score) and in other studies of accounting frauds that consider financial pressure as a fraud incentive.

Board Independence

Board independence is the proportion of members who are independent directors on the board who can exercise independent and unbiased judgment and undertake effective oversight of management actions and financial reporting. According to Agency Theory, independent directors enhance the monitoring process and therefore mitigate agency problems and agency conflicts. The present study follows Achmad et al. (2023) approach to measuring the level of independence of the board by dividing the number of independent directors by the total number of directors. The natural logarithm of the total assets of the firm is treated as a control variable because the bigger the firm the more sophisticated are their internal control systems and the more scrutiny the firm is subjected to by regulators, which could impact the relationship between financial instability and fraud risk detection.

2.2 Theoretical Review

According to Cressey (1953) fraud follows the theory of the triangle, which states that pressure, opportunity and rationalisation must be present to commit fraud. For this reason, the three elements of pressure, opportunity and rationalisation are financial incentives for committing fraud, weaknesses in the internal control and governance systems that enable fraud to occur, and the justification that perpetrators give for their unethical actions in their minds, respectively. The theory is directly applicable to financial instability, which is a classic pressure situation that can drive management to fiddle with financial statements to maintain investor confidence, and the board independence is applicable in the opportunity dimension as a good board can limit the exploitation of weak controls.
Fraud Diamond Theory is an adaptation of the Fraud Triangle that incorporates ‘capability' as a new factor; that fraud will not occur unless the perpetrator has the capacity, authority and position to perform and cover up the fraud. In financially vulnerable institutions, competent management could

use lack of oversight on the board to massage reported results and camouflage financial strains, and thus make this theory applicable to the study of how governance weakness interacts with financial pressure to facilitate fraud.

Fraud Deterrence Theory is based on the deterrence principles of Beccaria (1764) and later in compliance and governance literature, this theory assumes that an individual rationally evaluates the costs and benefits of committing fraud and that fraud is less likely to be committed if there is high monitoring, sanctions, and detection probability (Paternoster, 2010). The theory also suggests that board independence, which makes it more likely that it is detected, should deter management from using the financial instability to alter financial reports, supporting a theory test of board of independence as a moderator.

The Agency Theory, which was first articulated by Jensen and Meckling (1976), is a theory that comes from the separation of ownership and control of the firm. Due to information asymmetry, managers (agents) may have an interest in acting in their own self-interest at the shareholder's (principals') expense. In the Agency Theory context, financial instability raises the level of information asymmetry, which will give an incentive to managers to manipulate financial statements in order to maintain the control they have over the firm and its market position, and independent directors will be expected to decrease information asymmetry and limit the opportunity for managers to manipulate financial statements. Together these four theories offer complementary lenses through which to understand how financial instability conveys a fraud signal and how board independence is theorized to dampen the fraud signal, namely: pressure and motive (Fraud Triangle), capability (Fraud Diamond), detection and deterrence (Fraud Deterrence Theory), and governance oversight of agency conflict (Agency Theory).

2.3 Empirical Review and Hypotheses Development

Reports of a strong financial-pressure/instability effect. A substantial body of evidence links financial-stability or pressure-type indicators to significantly higher fraudulent-reporting tendencies. Burlacu et al. (2025) and Fahira et al. (2021) using the Dechow F-Score and Fraud Pentagon/Hexagon frameworks, respectively, concluded that the financial performance, financial stability and the pressure variables are all significant positive factors that increase the likelihood of fraudulent financial reporting by listed non-financial companies. Similarly, Pramesti and Kusumawati (2023) using the same framework concluded that financial performance, financial stability and pressure variables are significant positive factors that increase the likelihood of fraudulent financial reporting by listed non-financial companies. Likewise, Septiana and Harjanto (2026), Rahmatullah and Rusmanto (2026) and Fitriyanto and Triyono (2025) reported that Financial stability significantly affected Fraudulent Reporting in energy companies, Harjanto and Rahmatullah (2026) in banking sector companies, and Achmad et al. (2024) found that Financial pressure was the only Fraud Hexagon dimension that significantly explained fraudulent statements in Indonesian state owned enterprises. Most of these studies suggest that under such circumstances, because of the need to keep investors happy, to avoid sanctions from the regulators, and to please creditors, management faces incentives to manipulate financial statements.

Studies reporting an insignificant effect. Other research, however, did not show any significant correlation between financial-pressure indicators and false claims. Various other studies by Apriliza et al. (2026), Hardila et al. (2026), Hakim et al. (2023) and Fadhilah et al. (2024) revealed that financial stability or pressure variables did not have a significant impact on financial statements at all, and similarly the governance-and pressure-related variables were statistically insignificant in explaining fraud. The contradictory results are usually explained by differences in sector (manufacturing, non-cyclical or state-owned enterprises, versus regulated financial institutions), in the approach used to measure fraud (Beneish M-Score or logistic regression, versus the F-Score panel framework), or in the institutional context. All these mixed pieces of evidence highlight the need for rethinking financial instability, particularly in the more heavily regulated financial sector of Nigeria.

Research on board independence and studies on governance-moderation. The direct effect of governance mechanisms, such as board independence, on fraud detection, is also mixed. Fitriyanto and Triyono (2025) as well as Raihan et al. (2024), Arum and Wahyudi (2024), and Rachmawati and Raharja (2023) conclude that governance mechanisms like whistleblowing, corporate governance quality, and monitoring effectiveness have a significant negative effect on financial reporting fraud. Conversely, Apriliza et al (2026), Hardila et al (2026), Achmad et al (2024), Hakim

et al (2023), and Ramadhanty and Septiani (2024) reported that audit committees, board oversight, and monitoring activities were not found to significantly reduce or moderate the nature of fraud, meaning that their presence does not provide adequate protection against fraud without adequate authority, competence, and enforcement power. Similarly, other studies that have investigated the governance variables and their relationship with accounting red flags and fraud detection, such as Puspaningrum et al. (2024), Kuncara and Pamungkas (2024), Nurkholik et al. (2024), Khairani et al. (2024), Susanto et al. (2024), Wicaksono and Suryandari (2021), Riyanti and Trisanti (2021), and Yadiati et al. (2023), also yielded mixed results as to whether the governance variables have any meaningful association with fraud detection outcomes, and do not explicitly include board independence as an independent variable, nor as a moderator of the association between the other governance variables and accounting red flags in listed Nigerian financial institutions. The above issues further drive the present study to directly test the board independence-fraud risk detection relationship, and also to moderate the financial instability-fraud risk detection relationship, in Nigeria. For the purpose of empirical testing, the following hypotheses are restated as follows:

H1: Financial Instability Red Flag has no significant effect on fraud risk detection among listed financial institutions in Nigeria.

H2: Board Independence has no significant effect on fraud risk detection among listed financial institutions in Nigeria.

H3: Board Independence has no significant moderating effect on the relationship between Financial Instability Red Flag and fraud risk detection among listed financial institutions in Nigeria.

3. Methodology

The study used a quantitative research approach and ex post facto research design due to the nature of the study where secondary historical data which were not manipulated were used in the study. It was guided by the positivist philosophical paradigm, which assumes that the phenomena of organizations and finances have an independent existence and can be objectively measured (Saunders et al., 2019; Creswell & Creswell, 2018). Since the study uses financial statement and corporate governance disclosures that have been audited, it is proper to use this paradigm because it allows indicators that can be measured of financial instability, board independence, fraud risk detection, and firm size, then to test these indicators using panel regression to create empirical relationships among them.

All the financial institutions listed on the Nigerian Exchange Group (NXG), that is, deposit money banks, insurance companies, mortgage institutions and other financial service companies were included in the population for the period 2014 – 2024. Only firms that reported full and consistent financial statement and governance information for the entire period were included, using a purposive sampling technique. Table 1 summarises the population and sample.

Table 1: Population and Sample of the Study

Sector	Population	Sample	Justification for Selection
Banking (Deposit Money Banks)	18	18	No firm was excluded
Non-Banking (Insurance and Other Financial Services)	25	24	One firm excluded due to incomplete reporting between 2014 and 2024
Total	**43**	**42**	Final sample for analysis

The final sample of 42 listed financial institutions generated 462 firm-year observations. Data were obtained from audited annual reports and financial statements published by the sampled firms and the Nigerian Exchange Group, extracted using a structured data extraction sheet designed to ensure consistency and accuracy across firms and years.

Fraud Risk Detection was measured using the Dechow F-Score model, which combines RSST Accruals and Financial Performance:

F-Score = RSST Accrual + Financial Performance

where RSST Accrual = (WC + NCO + FIN) / ATA; Working Capital (WC) = (Current Assets − Cash) − (Current Liabilities − Debt in Current Liabilities); Non-Current Operating Assets and Liabilities (NCO) = (Total Assets − Current Assets − Investments) − (Total Liabilities − Current Liabilities − Long-term Debt); Financial Assets and Liabilities (FIN) = (Short-term Investments + Long-term Investments) − (Long-term Debt + Debt in Current Liabilities); and Average Total Assets (ATA) = (Total Assets$_t$ + Total Assets$_{t-1}$)/2. Financial Performance = Change in receivables + Change in inventories + Change in sales + Change in earnings, with each change component scaled by

average total assets or by the corresponding prior-period value, consistent with the Dechow et al. (2011) specification. Table 2 presents the measurement of the variables retained for this paper.

Table 2: Variable Measurement

Variable	Type	Measurement	Source
Fraud Risk Detection (FRD)	Dependent	F-Score = RSST Accrual + Financial Performance	Dechow et al. (2011); Jannah et al. (2022); Inayah and Chariri (2024)
Financial Instability Red Flag (FINRFL)	Independent	Total Liabilities ÷ Total Assets	ISA 240, Paragraph A35
Board Independence (BIND)	Moderator	Number of Independent Directors ÷ Total Number of Directors	Achmad et al. (2023)
Firm Size (FSIZE)	Control	Natural logarithm of Total Assets	—

Data were analysed using descriptive statistics, correlation analysis, and panel regression analysis. Diagnostic procedures included the Variance Inflation Factor (VIF) for multicollinearity, the Breusch-Pagan/Cook-Weisberg and Modified Wald tests for heteroskedasticity, the Wooldridge test for autocorrelation, the Pesaran cross-sectional dependence test, the Levin-Lin-Chu unit root test, and the Hausman specification test and Breusch-Pagan Lagrangian Multiplier test to determine the appropriate estimator between Fixed Effects, Random Effects, and pooled Ordinary Least Squares (OLS). Robust standard errors were applied where heteroskedasticity was detected.

Three regression models, each estimated as a single combined multivariate equation incorporating all four accounting red flags of the parent thesis (Financial Instability, Liquidity Pressure, Aggressive Revenue Recognition, and Unusual Accruals Red Flags) together with Board Independence and Firm Size, were specified. Liquidity Pressure Red Flag (LIQRFL), Aggressive Revenue Recognition Red Flag (REVRFL), and Unusual Accruals Red Flag (ACCRFL) were measured, respectively, as current liabilities divided by current assets, revenue growth rate divided by cash flow growth rate, and total accruals divided by total assets, consistent with ISA 240 Paragraphs A30-A35; these three red flags and their interactions with board independence are reported alongside Financial Instability Red Flag in the full regression tables (Section 4) because they were estimated jointly in the same models, but the hypotheses and discussion of this paper concern only Financial Instability Red Flag and Board Independence. The first (direct-effect) model examines the joint effect of the four accounting red flags on Fraud Risk Detection:

Model 1: $FRD_it = \beta_0 + \beta_1 FINRFL_it + \beta_5 FSIZE_it + \varepsilon_it$

The second model introduces Board Independence as an additional direct predictor to test its own effect on Fraud Risk Detection:

Model 2: $FRD_it = \beta_0 + \beta_1 FINRFL_it + \beta_5 BIND_it + \beta_6 FSIZE_it + \varepsilon_it$

The third (moderating-effect) model introduces the interaction terms between Board Independence and each accounting red flag:

Model 3: $FRD_it = \beta_0 + \beta_1 FINRFL_it + \beta_5 BIND_it + \beta_6 (FINRFL \times BIND)_it + \varepsilon_it$

where β_0 is the constant term, β_1-β_{10} are regression coefficients, i denotes the cross-sectional firm unit, t denotes the time period, and ε is the error term. Hypothesis H1 is tested using the FINRFL coefficient in Models 1 and 3, H2 is tested using the BIND coefficient in Models 2 and 3, and H3 is tested using the FINRFL × BIND interaction coefficient in Model 3.

4. Results and Discussion

4.1 Descriptive Statistics

Table 3 presents the descriptive statistics for the variables central to this paper's scope: Fraud Risk Detection, Financial Instability Red Flag, Board Independence, and Firm Size.

Table 3: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
FRD	462	18.34614	51.68304	-0.146	512.812
FINRFL	462	20.36615	53.71698	0.005	490.627
BIND	462	0.7061442	0.1445039	0.16667	0.92857
FSIZE	462	16.99349	2.16874	10.8198	24.7836

Fraud Risk Detection recorded a mean of 18.35 with a large standard deviation of 51.68, indicating substantial variation in fraud risk detection scores across the sampled institutions. Financial

Instability Red Flag had a mean of 20.37 and a standard deviation of 53.72, suggesting that listed financial institutions experienced considerable and highly variable levels of debt-related pressure over the period. Board Independence averaged 0.706 (approximately 70.6% independent directors), with a moderate standard deviation of 0.145, reflecting the growing emphasis on governance compliance within the sector. Firm Size averaged 16.99 (log of total assets) with moderate dispersion (SD = 2.169).

4.2 Correlation Analysis

Table 4 presents the correlation matrix for the variables central to this paper's scope.

Table 4: Correlation Matrix

Variables	FRD	FINRFL	BIND	FSIZE
FRD	1.0000			
FINRFL	-0.0723	1.0000		
BIND	-0.0250	-0.0638	1.0000	
FSIZE	-0.0681	0.0871	-0.1019	1.0000

Financial Instability Red Flag had a weak negative bivariate relationship with Fraud Risk Detection (r = -0.0723), while Board Independence also showed a weak negative correlation with Fraud Risk Detection (r = -0.0250); Financial Instability Red Flag and Board Independence correlated weakly with each other (r = -0.0638). None of these pairwise correlations approached the conventional 0.80 threshold for serious multicollinearity. Overall, the correlation matrix suggested that the explanatory variables were sufficiently independent for reliable panel regression estimation.

4.3 Diagnostic Tests

Separate diagnostic batteries were run for each of the three models. Table 5 reports the diagnostics for Model 1 (direct effect), Table 7 for Model 2 (direct effect with Board Independence added), and Table 9 for Model 3 (moderating effect with interaction terms). As detailed below, each model was originally estimated with all four accounting red flags of the parent thesis (Financial Instability, Liquidity Pressure, Aggressive Revenue Recognition, and Unusual Accruals Red Flags) entered simultaneously; the regression tables that follow report only the rows relevant to this paper's scope: Financial Instability Red Flag, Board Independence, their interaction (Model 3), and Firm Size.

Table 5: Diagnostic Tests for Model 1 (Direct Effect)

Diagnostic Test	Test Statistic	P-value	Remark
Variance Inflation Factor (VIF)	Mean VIF = 1.02	—	No Multicollinearity
Modified Wald Test for Groupwise Heteroskedasticity	$Chi^2(42)$ = 3046708.46	0.0000	Heteroskedasticity Present
Wooldridge Test for Autocorrelation	F(1,41) = 0.404	0.5287	No Autocorrelation
Pesaran Cross-sectional Dependence Test	Z = -0.591	0.5547	No Cross-sectional Dependence
Levin-Lin-Chu Unit Root Test	Adjusted t* = -1.8e+02	0.0000	Stationary Series
Hausman Specification Test	$Chi^2(5)$ = 3.93	0.5595	Random Effect Preferred
Breusch and Pagan LM Test for Random Effects	$Chibar^2(01)$ = 7.35	0.0034	Random Effect Appropriate

For Model 1, the low Mean VIF (1.02) indicated the absence of multicollinearity, while the Modified Wald test confirmed heteroskedasticity (p = 0.000), for which robust standard errors were applied. No autocorrelation or cross-sectional dependence was detected, and the panel series were stationary. The Hausman test favoured Random Effects over Fixed Effects (p = 0.5595), and the Breusch-Pagan LM test confirmed Random Effects was preferable to pooled OLS (p = 0.0034); Model 1 was therefore estimated using robust Random-Effects Generalised Least Squares (GLS).

4.4 Regression Results

Table 6: Regression Results for Model 1 (Direct Effect, Robust Random-Effects GLS)

Variable	Coef.	Std. Err.	z-value	P-value	Remark
FINRFL	-0.0172	0.0708	-0.24	0.808	Negative and Not Significant
FSIZE	-0.1438	0.6269	-0.23	0.819	Negative and Not

					Significant
Constant	-10.2872	12.8407	-0.80	0.423	Negative and Not Significant

Model statistics: Observations = 462; Wald χ^2 = 1553.23 (p = 0.0000); Within R^2 = 0.7653; Between R^2 = 0.8320; Overall R^2 = 0.7779.

Under Model 1, Financial Instability Red Flag (FINRFL) had a negative and statistically insignificant coefficient of -0.0172 (p = 0.808), and Firm Size was negative and insignificant. The other three accounting red flags entered as covariates in the same model but fall outside this paper's scope.

Table 7: Diagnostic Tests for Model 2 (Effect of the Moderator)

Diagnostic Test	**Test Statistic**	**P-Value**	**Decision**
Variance Inflation Factor (VIF)	Mean VIF = 1.64	—	No Multicollinearity
Modified Wald Test for Groupwise Heteroskedasticity	$Chi^2(42)$ = 415969603.78	0.0000	Heteroskedasticity Present
Wooldridge Test for Autocorrelation	F(1,41) = 0.486	0.4894	No Autocorrelation
Pesaran Cross-sectional Dependence Test	Z = -0.922	0.3564	No Cross-sectional Dependence
Levin-Lin-Chu Unit Root Test	Adjusted t* = -1.8e+02	0.0000	Stationary Series
Hausman Specification Test	$Chi^2(6)$ = 1.73	0.9429	Random Effect Preferred
Breusch and Pagan LM Test for Random Effects	$Chibar^2(01)$ = 1.57	0.1054	Pooled OLS Preferred

For Model 2, multicollinearity remained absent (Mean VIF = 1.64) and heteroskedasticity was again present and corrected with robust standard errors. Although the Hausman test nominally favoured Random Effects (p = 0.9429), the Breusch-Pagan LM test indicated that pooled OLS was preferable to Random Effects (p = 0.1054); Model 2 was therefore estimated using pooled OLS with robust standard errors.

Table 8: Regression Results for Model 2 (Effect of the Moderator, Pooled OLS)

Variable	**Coef.**	**Std. Err.**	**t-value**	**P-value**	**Remark**
FINRFL	-0.0029	0.0667	-0.04	0.965	Negative and Not Significant
BIND	-89.648	13.4932	-6.64	0.000	Negative and Significant
FSIZE	-0.3160	0.5422	-0.58	0.560	Negative and Not Significant
Constant	8.2662	11.5251	0.72	0.474	Positive and Not Significant

Model statistics: Observations = 462; F-statistic = 298.97 (p = 0.0000); R^2 = 0.7977.

Under Model 2, Board Independence (BIND) entered with a negative and statistically significant coefficient of -89.648 (p = 0.000), while Financial Instability Red Flag remained negative and insignificant. The other three accounting red flags entered as covariates in the same model but fall outside this paper's scope.

Table 9: Diagnostic Tests for Model 3 (Moderating Effect)

Diagnostic Test	**Test Statistic**	**P-Value**	**Decision**
Modified Wald Test for Groupwise Heteroskedasticity	$Chi^2(42)$ = 1921394.07	0.0000	Heteroskedasticity Present
Wooldridge Test for Autocorrelation	F(1,41) = 0.030	0.8641	No Autocorrelation
Pesaran Cross-sectional Dependence Test	Z = -1.315	0.1886	No Cross-sectional Dependence
Levin-Lin-Chu Unit Root Test	Adjusted t* = -1.8e+02	0.0000	Stationary Series
Hausman Specification Test	$Chi^2(10)$ = 2.25	0.9941	Random Effect Preferred

Breusch and Pagan LM Test for Random Effects	Chibar²(01) = 2.47	0.0581	Pooled OLS Preferred

For Model 3, heteroskedasticity was again present and corrected with robust standard errors, while autocorrelation and cross-sectional dependence were absent, and the series were stationary. As in Model 2, the Hausman test nominally favoured Random Effects (p = 0.9941), but the Breusch-Pagan LM test favoured pooled OLS (p = 0.0581); Model 3 was accordingly estimated using pooled OLS with robust standard errors.

Table 10: Regression Results for Model 3 (Moderating Effect, Pooled OLS)

Variable	Coef.	Std. Err.	z-stat	P-value	Remark
FINRFL	0.6176	0.2989	2.07	0.039	Positive and Significant
BIND	-28.3445	30.2842	-0.94	0.349	Negative and Insignificant
FINRFL × BIND	-0.7576	0.4226	-1.79	0.073	Negative and Insignificant
FSIZE	-0.2917	0.5451	-0.54	0.593	Negative and Insignificant
Constant	-4.1755	21.7766	-0.19	0.848	Negative and Insignificant

Model statistics: Observations = 462; F(10, 451) = 232.61 (p = 0.0000); R^2 = 0.8376.

Financial Instability Red Flag yielded a different and new positive and statistically significant coefficient (0.6176, p = 0.039) in Model 3, having negative non-significant coefficients of -0.0172 (Model 1) and -0.0029 (Model 2). Board Independence was no longer significant (p = 0.349) with its coefficient being slightly negative (-28.3445) as compared to its highly significant coefficient in Model 2 (-89.648). The central concept of H3, the interaction term FINRFL × BIND, was negative but not statistically significant at the 5% level (-0.7576, p = 0.073). The measure of Firm Size had a negative and insignificant trend in all three models. The other three accounting related red flags and their interaction terms with Board Independence entered as covariates in the same model but are not part of this paper.

4.5 Discussion of Findings

4.5.1 Financial Instability Red Flag and Fraud Risk Detection.

This negative and insignificant coefficient in Model 1 and 2, but positive and significant effect in Model 3 (Financial Instability Red Flag: -0.0172 to 0.6176 (p = 0.039)) is quite an iota shift in direction and significance. This change suggests that the relationship between board independence and financial instability changed after introducing the moderating framework, so that financial instability now became a more important predictor of fraud risk detection. The results were in line with the findings of Septiana and Harjanto (2026), Rahmatullah and Rusmanto (2026), Burlacu et al. (2025), Falasifah et al. (2025), Fitriyanto and Triyono (2025), Pramesti and Kusumawati (2023), Fahira et al. (2021), and Achmad et al. (2024) who found that those indicators of financial pressure or financial stability significantly influenced the tendency of companies to report fraud. Those companies with unstable financial condition are more likely to distort financial statements to maintain investor confidence. However, the finding contradicts Apriliza et al. (2026), Hardila et al. (2026), Hakim et al. (2023), Fadhilah et al. (2024), and Maulida et al. (2024), who reported insignificant pressure effects, a divergence plausibly attributable to differences in sector (manufacturing and state-owned enterprises versus regulated financial institutions), fraud-measurement approach (Beneish M-Score/logistic regression versus the panel F-Score framework), and institutional context. Under the moderating model, the significant positive effect is consistent with the Fraud Triangle and Fraud Diamond theories, which state that financial pressure is still a large incentive for fraudulent reporting, and with Agency Theory because of the instability, it increases information asymmetry between the managers and the shareholders and thus increases the chance of opportunistic behaviour. The increase in significance when governance interaction is added also contributes to Fraud Deterrence Theory as it demonstrates the impact of governance mechanisms on the relationship between financial pressure and the detectable risk of fraud. The findings of the study do not support the moderating specification, as it rejected H1 at the p = 0.039 significance level, but it did not reject the moderating specification that had been hypothesized in any of the simpler direct-effect

specifications.

4.5.2 Board Independence and Fraud Risk Detection

Under the full specification (Model 3), the Board Independence coefficient was negative but no longer statistically significant, a specification under which H2 could not be rejected (coefficient = -28.3445, p = 0.349). In the Nigerian listed financial institutions, the direct effect of board independence on the fraud risk detection was found to be negative but insignificant in the study as the headline model, moderating effect was considered.The moderating effect was considered in the study, and the board independence had a negative but insignificant direct effect on the fraud risk detection among the listed financial institutions in Nigeria. This is in line with the study of Apriliza et al. (2026); Hardila et al. (2026); Achmad et al. (2024); Hakim et al. (2023); and Ramadhanty and Septiani (2024) which stated that even though the governance mechanisms exist, they did not significantly reduce or moderate fraudulent reporting practices, because the quality of governance, the technical competence, the effectiveness of monitoring and the effectiveness of institutional enforcement were still low. However, the finding contradicts previous studies by Fitriyanto and Triyono (2025), Raihan et al. (2024), Arum and Wahyudi (2024), and Rachmawati and Raharja (2023) who found that there were significant negative effects of governance mechanisms on fraudulent financial reporting and the effectiveness of fraud monitoring among listed financial institutions in Indonesia. The differences in the findings might stem from the variations in the quality of governance among the firms analysed and the differences in institutional environment among the firms, as well as the variations in the measurement approaches used by the studies, since, in the earlier studies, measured some of the other components of governance system such as whistleblowing mechanisms, audit committee effectiveness, and internal controls, which was not done in the current study and the earlier studies were conducted in firms with different institutional environment; the current study was conducted on financial institutions listed on the Nigerian stock exchange. This finding supports a part of Fraud Deterrence Theory and Agency Theory where it is hypothesized that governance mechanisms like board independence will help minimize tendencies to commit fraud through monitoring and oversight roles; however, the insignificant effect in the final model suggests that simply having a board independent of management is not enough to meaningfully reduce the propensity to fraudulent reporting without proper enforcement, technical expertise, and active engagement in governance processes. It also helps support the Fraud Triangle and Fraud Diamond theories in that governance structures may not be able to completely negate pressure, opportunity and capability factors of fraudulent financial reporting and indicates that the capacity of listed financial institutions to detect the fraud risk in Nigeria can be low in absence of effective governance, expertise, institutional independence and active monitoring capacity.

4.5.3 Moderating Effect of Board Independence on the Financial Instability and Fraud Risk Detection

Thus, the interaction of Financial Instability Red Flag with Board Independence in the model was negative but not significant at 5% level, and thus H3 is not rejected (-0.7576, p = 0.073), showing a tendency towards weakening relationship between Financial Instability Red Flag and the fraud risk detection but not significantly so. This finding is in line with Apriliza et al. (2026), Hardila et al. (2026), Hakim et al. (2023), and Ramadhanty and Septiani (2024) who also found that the pressure related fraud dimension and the fraud related implications of financial instability were not significantly moderated by governance mechanisms, suggesting that the independence of the board of directors was not able to significantly reduce the fraud related implications of financial instability in the context of high financial pressure that firms faced. This is because it challenges the findings of Arum and Wahyudi (2024); Raihan et al. (2024); Achmad et al. (2024) and Fitriyanto and Triyono (2025) who found that governance mechanisms have a significant moderating effect on the pressure-fraud relationship, which may be attributed to the fact that the studies examined wider governance mechanisms with potential to be stronger than board independence alone and that there are differences between the institutional and regulatory environment in Indonesia and that of the other countries. Theoretically, this insignificant moderating effect partially supports the Fraud Deterrence Theory and Agency Theory which predict that board independence should provide greater monitoring ability to mitigate the adverse effects of financial instability on fraud-related outcomes and that board independence of Nigerian financial institutions may not yet be strong enough to appreciably influence the outcome of the board's monitoring function in the context of severe

financial instability. It also corroborates the Fraud Triangle and Fraud Diamond theories in that it demonstrates that pressures to commit fraudulent reporting remain strong even when structures are in place to prevent it.

5. Conclusion and Recommendations

This study investigated the effect of Financial Instability Red Flag on Fraud risk detection within the listed financial institutions in Nigeria, direct effect of board independence on fraud risk detection, and the moderating effect of board independence on the financial instability-fraud risk detection relationship. The study found that financial instability directly did not have a significant relationship with the fraud risk detection in the direct-effect models (Models 1 and 2), but became positive and significant with the addition of board independence and the interaction between financial instability and board independence in the moderating-effect model (Model 3). This means that while the fraud-signalling power of financial instability is sensitive to the way the financial instability is modelled, governance-inclusive specifications also provide information about financial pressure relevant to fraud, which isn't captured by simpler direct-effect specifications. The study also finds that board independence has a statistically significant negative direct effect on fraud risk detection, though it becomes statistically insignificant after the inclusion of the interaction terms in Model 3 and that there is no significant moderating effect of board independence on the association between financial instability and fraud risk detection (although the negative sign of the interaction term indicates a weakening tendency). Overall, financial instability is a relevant, but context-dependent, red flag, whereas at present, board independence (as defined in listed financial institutions in Nigeria) has demonstrated only a model-dependent direct effect and has not emerged as a statistically significant safeguard against instability-driven fraud risk.

From this, the study recommends that the management of listed financial institutions in Nigeria should strengthen their internal financial-stability monitoring systems which involve the conduct of periodic financial stress assessments, solvency checks and early-warning mechanisms; that the Boards of Directors, Audit Committees and Risk Management Departments of the listed financial institutions have primary responsibility in implementing the above recommendations, while the Central Bank of Nigeria and the Financial Reporting Council of Nigeria as regulators watch over the implementation. Second, there should be greater board independence structures in listed financial institutions, with a higher percentage of independent directors with adequate accounting, auditing and risk-management skills, as achieved by implementation of board composition policies and governance training in the institutions by the Nomination Committees, Boards of Directors and Shareholders in the companies, under the watch of the Securities and Exchange Commission and the Central Bank of Nigeria. Third, boards should set up committees for governance and risk-oversight that can keep a close watch on the link between financial crisis and reporting of fraud in banks, especially in distressed banks, under the Central Bank of Nigeria and Nigeria Deposit Insurance Corporation (NDIC).

The study is limited by the use of secondary data obtained from financial institutions' annual reports, which may not be able to detect any fraudulent activity that was not recorded, and because it only covers financial institutions listed between 2014 and 2024, it may not be generalisable to other sectors, unlisted financial institutions, or other time periods. Financial instability and independence of the board are the only factors that are considered and others such as audit quality and ownership structure are omitted. Future research should broaden the moderating framework to other forms of governance, add other control variables relevant to fraud, and see if the importance of financial instability under governance-inclusive models seen here holds true with other methods of estimation and longer panels.

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