**DETERMINANTS OF FRAUDULENT FINANCIAL REPORTING AMONG DEPOSIT MONEY BANKS (DMB) IN NIGERIA: USING THE FRAUD DIAMOND THEORY**

Abstract

*This study examines the determinants of fraudulent financial reporting (FFR) among listed deposit money banks (DMBs) in Nigeria using the Fraud Diamond Theory. Panel data covering 12 DMBs from 2012 to 2023 were analysed using binary logistic regression to assess the effects of pressure (cash flow trend), opportunity (related party transactions), rationalisation (economic downturn), and capability (earnings forecast pressure) on the likelihood of financial misreporting. Control variables included return on assets (ROA), inflation, and exchange rate. The results reveal that cash flow trend (CFT) has a statistically significant negative relationship with FFR at the 1% level, suggesting that declining cash flows increase fraud risk. Related party transactions (RPT) and economic downturn (ECD) are both positively and significantly associated with FFR, supporting the opportunity and rationalisation dimensions of fraud. Inflation also shows a significant positive effect, while exchange rate (FXR) exhibits a significant negative relationship, indicating macroeconomic influences. Capability (PEF) and ROA were not statistically significant. The model demonstrates good predictive power with an AUC of 0.8042 and a classification accuracy of 73.5%. The findings underscore the interplay between financial strain, opportunistic practices, and macroeconomic volatility in driving fraudulent reporting in Nigeria’s banking sector.*

**Keywords:** Fraudulent Financial Reporting, Fraud Diamond Theory, Deposit Money Banks, Modified Beneish M-Score

# **Introduction**

Fraudulent financial reporting has become a pervasive global issue that undermines corporate governance, financial stability, and investor confidence. This unethical practice, particularly common in the banking sector, involves the deliberate manipulation of financial statements to misrepresent a firm’s financial health. Such practices allow organizations to overstate revenues, understate liabilities, and inflate profits, often with the intent to attract unsuspecting investors, secure undeserved financial ratings, or maintain competitive positions. The consequences of fraudulent financial reporting extend beyond the affected firms, posing systemic risks to the financial sector, eroding trust, and destabilizing economies (Hasan et al., 2017).

Globally, the detrimental impact of financial fraud is exemplified by high-profile scandals such as Enron, WorldCom, and Lehman Brothers, where deliberate misrepresentation of financial information led to widespread financial losses, regulatory interventions, and diminished investor confidence. According to the Association of Certified Fraud Examiners (ACFE) Report on Occupational Fraud (2022), financial statement fraud accounts for 9% of fraud cases but is the costliest form of corporate fraud, with median losses amounting to USD 593,000 per case. These cases underscore the pressing need for stronger corporate governance and regulatory oversight to address the growing incidence of financial fraud.

In developing economies such as Bangladesh, Ghana, and Nigeria, the prevalence of financial fraud has exposed systemic vulnerabilities and governance failures. In Bangladesh, scandals like the Hallmark Scam and Bismillah Textile Scandal revealed regulatory loopholes and weak governance structures (Khatun et al., 2022). Similarly, in Ghana, financial irregularities within the microfinance sector led to the collapse of numerous institutions, despite regulatory interventions by the Bank of Ghana (BoG) (Adoboe-Mensah et al., 2023).

In Nigeria, the issue is particularly alarming, with several high-profile cases exposing weaknesses in regulatory frameworks and corporate governance. The 2006 Cadbury Nigeria Plc scandal is a prominent example where financial statements were deliberately falsified to conceal corporate fraud (Ijeoma, 2014). Investigations by the Economic and Financial Crimes Commission (EFCC) uncovered widespread practices, such as round-tripping transactions, unauthorized account openings, and profit inflation. In 2009, the Central Bank of Nigeria (CBN) dismissed five bank directors, which ultimately led to the collapse of Intercontinental Bank, Oceanic Bank, and FinBank (Ijeoma, 2014). Despite ongoing reforms, fraudulent financial reporting continues to undermine the stability of Nigeria’s financial sector, as evidenced by the rise of non-performing loans (NPLs) to $3.315 billion in 2021 (CBN Report, 2021). This persistent issue highlights the urgency of identifying and addressing the systemic and organizational factors that drive fraudulent financial reporting in Nigerian banks.

The continued prevalence of fraudulent financial reporting in Nigeria, despite regulatory reforms such as the adoption of International Financial Reporting Standards (IFRS) in 2012, raises critical concerns about the effectiveness of existing governance mechanisms. Fraudulent practices not only erode stakeholder trust but also hinder Nigeria’s broader macroeconomic objectives, such as price stability, employment generation, and economic growth. The persistence of these practices underscores the need for a deeper understanding of their underlying causes and enablers. This study is motivated by the failure of current regulatory frameworks to curb financial fraud effectively and aims to provide actionable insights into how systemic and organizational factors contribute to this pervasive issue.

While numerous studies have investigated fraudulent financial reporting, most have focused on corporate organizations in general and relied on the Fraud Triangle Theory, which attributes fraud occurrence to pressure, opportunity, and rationalization. However, this framework does not account for the critical role of managerial competence in executing and concealing fraud. The Fraud Diamond Theory, introduced by Wolfe and Hermanson (2004), expands on the Fraud Triangle by incorporating capability as a fourth element. Capability refers to the skills, authority, and influence of individuals to perpetrate fraud. Despite its relevance, there is limited research applying the Fraud Diamond Theory to the banking sector, particularly in Nigeria. Moreover, existing studies often fail to explore how factors such as cash flow trends, related-party transactions, economic downturns, and earnings forecast pressures interact with managerial capability to create an environment conducive to fraud. This study addresses these gaps by examining the determinants of fraudulent financial reporting in Nigerian deposit money banks (DMBs).

The aim of this study is to investigate the determinants of fraudulent financial reporting among deposit money banks in Nigeria, using the Fraud Diamond Theory as a conceptual framework. Specifically, it seeks to examine how systemic and organizational factors, such as cash flow trends, related-party transactions, economic downturns, and earnings forecast pressures, interact with managerial capability to enable or sustain fraudulent practices. This study explores the role of these factors both individually and collectively, providing a comprehensive understanding of how fraudulent reporting arises and persists in the Nigerian banking context.

This study also aims to address critical questions, including:

1. How do cash flow challenges create pressure on bank managers to engage in fraudulent financial reporting?
2. In what ways do related-party transactions offer opportunities for financial misrepresentation?
3. How do economic downturns influence the likelihood of fraudulent reporting in Nigerian banks?
4. How does pressure from earnings forecasts drive managers to adopt unethical financial practices?

This research makes significant theoretical, empirical, and practical contributions. Theoretically, it advances the Fraud Diamond Theory by providing empirical evidence of how systemic and organizational factors interact with managerial capability to enable fraud. Empirically, it bridges the gap in literature by examining fraudulent reporting in Nigerian DMBs, a context characterized by unique regulatory challenges and economic pressures. Practically, the findings offer actionable recommendations for improving corporate governance, enhancing fraud detection mechanisms, and strengthening regulatory oversight.

From a policy perspective, the insights generated by this study will inform regulators such as the CBN and EFCC on how to refine existing frameworks to address the root causes of financial fraud. For practitioners, the study highlights critical risk factors and red flags, enabling banking institutions to develop more effective internal controls and fraud prevention strategies.

The structure of this paper is as follows: The Introduction outlines the study’s background, research gap, motivation, objectives, and contributions. The Literature Review contextualizes fraudulent financial reporting within theoretical frameworks and prior empirical research. The Methodology section explains the research design, data collection process, and analytical techniques. The Results and Discussion section presents the key findings and their implications. Finally, the Conclusion summarizes the study’s contributions, acknowledges limitations, and provides directions for future research.

# **2.0 Literature Review**

## **2.1 Conceptual Review**

### **2.1.1 Fraudulent Financial Reporting**

Fraudulent financial reporting refers to the deliberate misrepresentation, manipulation, or omission of financial information in a company’s financial statements to deceive stakeholders and mislead users of financial reports. This unethical practice is often carried out by inflating revenues, understating expenses, overvaluing assets, or failing to disclose liabilities. It undermines the integrity of financial markets, compromises investor confidence, and damages the reputation of organizations.

The motives behind fraudulent financial reporting are diverse. Pressure to meet performance expectations, especially from investors, analysts, or creditors, is a significant driver. For instance, management may manipulate financial data to present a favourable picture of the company’s performance to meet financial targets. Similarly, executive compensation packages tied to financial metrics, such as bonuses and stock options, incentivize manipulation. Hartanto et al. (2019) argue that such motivations create opportunities for managers to inflate financial results for personal gain or corporate benefit.

Fraudulent financial reporting may also be driven by the need to boost stock prices, conceal poor performance, or avoid regulatory scrutiny. Management teams facing financial distress or the risk of bankruptcy may justify financial fraud as a means to "protect" the company. Indriyanto et al. (2021) note that personal ambition and greed often drive executives to manipulate financial reports to achieve career advancement or financial rewards. Additionally, external stakeholders, such as suppliers or creditors, may exert pressure on management to present favourable financial results to secure financing or maintain business relationships (Mentari & Sopian, 2022).

The prevalence of fraudulent financial reporting highlights the need for robust governance mechanisms, ethical corporate cultures, and effective regulatory frameworks to mitigate these practices.

## **2.2 Empirical Review and Hypotheses Development**

### **2.2.1 Pressure and Fraudulent Financial Reporting**

Pressure, often arising from financial instability, external obligations, or managerial performance targets, has been widely studied as a determinant of fraudulent financial reporting. Several empirical studies provide mixed results regarding the role of pressure in driving financial statement fraud.

Indarto and Ghozali (2016) analysed banking companies in Indonesia and found that external pressure and financial stability significantly influenced fraudulent financial reporting. This aligns with the findings of Supri et al. (2018), who observed that financial stability, external pressure, and financial targets positively impacted financial statement fraud among Indonesian manufacturing firms. Similarly, Diansari and Wijaya (2022) concluded that financial stability and external pressure influenced fraudulent financial reporting, reinforcing the argument that financial constraints and investor expectations contribute to financial manipulation. Chandra (2023) found that external pressure and financial targets significantly increased fraudulent financial reporting, further corroborating this claim.

However, some studies contradict these findings. Sunardi and Amin (2018) reported that financial stability, external pressure, and financial targets negatively affected fraudulent financial reporting, suggesting that companies experiencing financial pressure might adopt more conservative financial practices instead. Manurung and Hardika (2015) found that financial stability and external pressure had no significant impact on fraudulent reporting.

The inconsistency in findings suggests that the relationship between pressure and fraudulent financial reporting may be contingent on firm-specific or industry-specific characteristics. Given the significance of financial pressure in prior research, this study formulates the following hypothesis:

*H01: Cash flow trends (pressure) have no significant effect on the occurrence of fraudulent financial reporting among deposit money banks in Nigeria.*

### **2.2.2 Opportunity and Fraudulent Financial Reporting**

Opportunity represents conditions that enable fraudulent practices, often resulting from weak governance, poor oversight, or inadequate internal controls. One of the commonly used proxies for opportunity is related-party transactions (RPTs), which provide avenues for financial misrepresentation.

Supri et al. (2018) found that monitoring effectiveness had a significant negative impact on fraudulent financial reporting, implying that stronger corporate oversight reduces fraud likelihood. Similarly, Rodhiyuddin and Daryatno (2024) discovered that opportunity factors, such as the proportion of independent board members, negatively affected fraudulent reporting, suggesting that good corporate governance practices mitigate financial fraud risks.

Conversely, Akbar (2022) and Indarto and Ghozali (2016) found that opportunity-related factors did not significantly influence fraudulent financial reporting. Their studies concluded that weak internal controls or related-party transactions do not necessarily translate into financial fraud.

Despite these mixed results, the potential role of related-party transactions in facilitating fraudulent financial reporting remains a subject of interest. Therefore, the following hypothesis is proposed:

*H02: Related-party transactions (opportunity) have no significant effect on the occurrence of fraudulent financial reporting among deposit money banks in Nigeria.*

### **2.2.3 Rationalization and Fraudulent Financial Reporting**

Rationalization reflects the psychological and ethical justifications managers use to commit financial fraud. Previous studies have tested rationalization using different proxies, including auditor change and accrual-based earnings manipulation.

The findings on rationalization’s effect on fraudulent financial reporting remain inconclusive. Supri et al. (2018) and Akbar (2022) found that rationalization does not significantly influence fraudulent financial reporting, suggesting that even if managers justify unethical behavior, it does not necessarily lead to financial fraud. Similarly, Chandra (2023) discovered that rationalization had a significant positive effect on fraudulent financial reporting, implying that justifying unethical actions leads to greater financial manipulation.

However, Rodhiyuddin and Daryatno (2024) found that total accrual income (a rationalization proxy) negatively impacted fraudulent reporting, indicating that firms with higher accrual adjustments are less likely to engage in fraud. Manurung and Hardika (2015) and Sunardi and Amin (2018) concluded that rationalization, as proxied by ineffective monitoring and auditor change, had no significant effect on fraudulent reporting.

Given these inconsistencies, it is important to reassess the role of rationalization in fraudulent financial reporting. Based on prior empirical evidence, the following hypothesis is developed:

*H03: Economic downturn (rationalization) has no significant effect on the occurrence of fraudulent financial reporting among deposit money banks in Nigeria.*

### **2.2.4 Capability and Fraudulent Financial Reporting**

Capability, the distinguishing element of the Fraud Diamond Theory, suggests that fraudulent activities are more likely to occur when perpetrators possess the skills, authority, and knowledge to exploit financial systems. Capability is commonly proxied by changes in management or earnings forecast pressures.

Manurung and Hardika (2015) found that capability significantly influenced fraudulent financial reporting, highlighting the importance of managerial authority in executing financial fraud. Sunardi and Amin (2018) similarly reported that capability had a significant positive effect on financial statement fraud, supporting the argument that fraudulent behaviour requires knowledgeable perpetrators.

Conversely, Akbar (2022) and Supri et al. (2018) found that capability had no significant effect on fraudulent financial reporting, suggesting that managerial skills and authority alone may not be enough to encourage financial fraud. Handoko and Natasya (2019) also concluded that capability does not significantly impact fraudulent reporting, contradicting the Fraud Diamond Theory’s claim that fraud requires a competent perpetrator.

Given these contrasting findings, further investigation is warranted to determine whether capability influences financial misrepresentation. Thus, the following hypothesis is proposed:

*H04: Pressure from earnings forecast (capability) has no significant effect on the occurrence of fraudulent financial reporting among deposit money banks in Nigeria*.

## **2.3 Theoretical Framework: Fraud Diamond Theory**

This study is anchored on the Fraud Diamond Theory proposed by Wolfe and Hermanson (2004), an extension of the traditional Fraud Triangle that introduces capability as a fourth dimension alongside pressure, opportunity, and rationalisation. The theory posits that fraud occurs not only due to financial strain, governance lapses, or ethical justification but also requires an individual with the competence, authority, and technical acumen to exploit system weaknesses.

In the context of fraudulent financial reporting, pressure stems from declining performance or unmet expectations; opportunity arises from weak internal controls and regulatory lapses; rationalisation reflects managerial justification for unethical conduct; and capability refers to the managerial skill and positional leverage required to orchestrate and conceal fraud.

This framework is particularly relevant to Nigerian Deposit Money Banks (DMBs), where complex transactions and regulatory asymmetries create fertile ground for manipulation. The study employs this theory to examine how pressures from cash flows, related-party exposures, economic downturns, and performance expectations influence fraudulent reporting. By applying the Fraud Diamond, the research aims to offer nuanced insights into the dynamics of fraud, thereby informing governance reforms and audit practices in Nigeria’s financial sector.

# **3.0 Methodology**

## **3.1 Research Design and Data Sources**

This study adopts an ex post facto research design, which is appropriate for analysing historical financial data to determine the presence of fraudulent financial reporting among deposit money banks (DMBs) in Nigeria. As a non-experimental and retrospective design, it allows the researcher to observe pre-existing data without manipulating the variables, thereby ensuring objective evaluation of the Fraud Diamond Theory dimensions—pressure, opportunity, rationalisation, and capability—as they relate to fraudulent reporting.

The study utilised secondary data drawn from the audited annual reports and financial statements of 12 purposively selected DMBs from a total population of 15 listed on the Nigerian Exchange Group (NGX). The dataset spans twelve years (2012–2023), providing a robust timeframe to analyse trends and patterns in financial misconduct, particularly as influenced by economic cycles and regulatory changes. Data were sourced from the NGX portal and the banks’ official websites, selected based on availability, completeness, and consistency. Key variables extracted include loan loss provisions, non-performing loans, cash flow data, earnings measures, and corporate governance attributes, ensuring a comprehensive dataset for meaningful statistical analysis.

## **3.2 Model Specification and Variables Measurement**

Fraudulent financial reporting was detected using a Modified Beneish M-Score adapted to the banking context, replacing inventory-related indicators with banking-specific variables:

M = −4.84 + 0.92×NPLI + 0.528×LLPI + 0.404×AQI + 0.892×LGI + 0.115×DEPI − 0.172×SGAI + 4.679×TATA − 0.327×LVGI

Where variables include ratios based on loan quality, asset composition, depreciation, administrative costs, and total accruals.

**Decision Rule**:

1. M > –2.22 = Manipulator (likely fraud)
2. M ≤ –2.22 = non-manipulator

Where:

1. NPLI (Non-Performing Loan Index) = Non-Performing Loans / Total Loans
2. LLPI (Loan Loss Provision Index) = Loan Loss Provision / Total Loans
3. AQI (Asset Quality Index) = Non-Interest Earning Assets / Total Assets
4. LGI (Loan Growth Index) = Year-on-Year Loan Growth Rate
5. DEPI (Depreciation Index) = Current Year Depreciation Expense / Prior Year Depreciation Expense
6. SGAI (Sales, General & Administrative Expenses Index) = SG&A Expenses / Total Operating Revenue
7. TATA (Total Accruals to Total Assets) = (Net Income - Operating Cash Flow) / Total Assets
8. LVGI (Leverage Index) = Total Liabilities / Total Assets

## **3.3 Model Estimation Technique**

To estimate the likelihood of fraudulent financial reporting, a binary logistic regression model was employed with M-Score classification as the dependent variable. The logit model is expressed as:

*logit(Pr(FFR=1)) = β0 + β1CFT + β2RPT + β3ECD + β4PEF + β5SIZE + β6ROA + β7INF + β8EXR + ε*

In this model, SIZE, ROA, INF, and EXR serve as control variables to account for internal performance and macroeconomic effects. In addition to the logistic regression framework, the study acknowledges potential endogeneity issues inherent in corporate financial data.

## **3.4 Variable Measurement**

Table 1: Variable Measurement

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variable Name (Abbreviation)** | **Measurement / Formula** | **Type** | **Expected Sign** | **Related Authors** |
| Pressure (CFT) | Change in Operating Cash Flow (ΔCFO) = CFO\_t – CFO\_{t–1} | IV | + | Wolfe & Hermanson (2004), Handoko & Natasya (2019) |
| Opportunity (RPT) | NPL / Shareholders’ Funds | IV | + | Skousen et al. (2009), Akbar (2022) |
| Rationalisation (ECD) | Profit After Tax / Dividends Paid | IV | + | Supri et al. (2018), Chandra (2023) |
| Capability (PEF) | Profit After Tax / Shareholders’ Funds | IV | + | Wolfe & Hermanson (2004), Cressey (1953) |
| Bank Size (SIZE) | Log of Total Assets | Control | - | Chen & Elder (2007), Sanusi (2012) |
| Return on Assets (ROA) | Net Income / Total Assets | Control | - | Indarto & Ghozali (2016), Diansari & Wijaya (2022) |
| Inflation Rate (INF) | Annual change in Consumer Price Index (CPI) | Control | + | Kassem & Higson (2016), Okolie (2020) |
| Exchange Rate (EXR) | Year-end Naira/USD exchange rate | Control | +/- | Oduh & Enebeli (2016), Ofoegbu & Megbuluba (2022) |

## **3.5 Data Analysis Techniques**

This study employed both descriptive and inferential statistical techniques for data analysis. Descriptive statistics—including mean, standard deviation, minimum, and maximum—were computed to summarise the central tendencies and dispersion of the dataset. Pearson’s correlation analysis was conducted to assess the strength and direction of linear relationships among the variables. For hypothesis testing, logistic regression analysis was employed to estimate the probability of fraudulent financial reporting based on predictors derived from the Fraud Diamond Theory and relevant control variables.

To ensure the reliability and robustness of the model estimates, both preliminary and post-estimation diagnostic tests were conducted. Preliminary diagnostics included the use of the Variance Inflation Factor (VIF) to detect multicollinearity and the Breusch–Pagan test to assess heteroskedasticity. Post-estimation diagnostics comprised the linktest to verify model specification, the Hosmer–Lemeshow test to evaluate model calibration, and the confusion matrix to assess classification accuracy.

# **4. Results and Discussion**Top of Form

## **4.1 Descriptive Statistics**

Table 2 presents the summary statistics for the dependent and independent variables used in this study, covering 132 to 144 firm-year observations. The dependent variable, Fraudulent Financial Reporting (FFR), is a binary indicator derived from the Modified Beneish M-Score, where values of 1 indicate firms classified as manipulators. The mean of 0.3712 implies that approximately 37% of the sampled bank-year observations were flagged for possible fraudulent reporting, underscoring the materiality of financial misreporting within the Nigerian banking sector.

Table 2: Descriptive Statistics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variable** | **N** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| FFR (Fraudulent Financial Reporting) | 132 | 0.3712 | 0.4850 | 0 | 1 |
| CFT (Cash Flow Trend) | 144 | 0.7963 | 3.7711 | –8.7519 | 19.2011 |
| RPT (Related Party Transactions) | 144 | –0.0996 | 0.3325 | –3.8744 | 0.1827 |
| ECD (Economic Downturn) | 144 | 6.0997 | 3.9711 | 0.9616 | 19.3440 |
| PEF (Pressure from Earnings Forecasts) | 144 | 0.1068 | 0.3575 | –3.9432 | 0.3653 |
| ROA (Return on Assets) | 144 | 0.0169 | 0.0168 | –0.0953 | 0.0562 |
| INF (Inflation Rate) | 144 | 14.3600 | 5.0195 | 8.0000 | 24.6600 |
| FXR (Foreign Exchange Rate) | 144 | 300.5668 | 112.7210 | 157.3000 | 460.7020 |

Source: Authors’ compilation

Among the explanatory variables rooted in the Fraud Diamond Theory, Cash Flow Trend (CFT), which captures financial pressure, records a mean of 0.7963 with a large standard deviation of 3.7711 and a wide range (–8.7519 to 19.2011). This reflects substantial interbank variation in operating cash flow volatility. Related Party Transactions (RPT), a proxy for opportunity, has a mean of –0.0996, suggesting that many banks reported net repayments rather than opaque related transactions, though the maximum of 0.1827 indicates a few outlier cases. Economic Downturn (ECD), representing rationalisation pressures, averages 6.0997 with a standard deviation of 3.9711, reflecting variability in dividend coverage across banks and potential justification grounds during economic shocks. Pressure from Earnings Forecasts (PEF), used to proxy capability, has a low mean of 0.1068 but displays considerable dispersion (–3.9432 to 0.3653), indicating that some banks face more intense forecast-related pressures than others.

For the control variables, Return on Assets (ROA) is modest at 0.0169, consistent with the low-profit margins typically seen in Nigerian banking. Inflation Rate (INF) has a mean of 14.36%, showing that the study period was marked by sustained inflationary pressures. Finally, the Foreign Exchange Rate (FXR) averaged ₦300.57/$, with significant volatility (SD = ₦112.72), ranging from ₦157.3/$ to ₦460.70/$, capturing Nigeria’s chronic exchange rate instability.

## **4.2 Correlation Matrix**

Table 3 presents the Pearson correlation coefficients among the study variables to evaluate the strength and direction of the linear relationships between them. These variables include the dependent variable, Fraudulent Financial Reporting (FFR), and the explanatory and control variables based on the Fraud Diamond framework.

Table 3: Correlation Matrix of Study Variables

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| 1. FFR | 1.000 |  |  |  |  |  |  |  |
| 2. CFT | –0.2809 | 1.000 |  |  |  |  |  |  |
| 3. RPT | 0.0426 | 0.0056 | 1.000 |  |  |  |  |  |
| 4. ECD | 0.0851 | 0.0795 | –0.0551 | 1.000 |  |  |  |  |
| 5. PEF | –0.0297 | 0.1309 | 0.4853 | -0.3185 | 1.000 |  |  |  |
| 6. ROA | 0.0551 | 0.0517 | 0.1962 | -0.3381 | 0.7451 | 1.000 |  |  |
| 7. INF | –0.1178 | 0.2971 | –0.0558 | 0.1453 | 0.1925 | 0.0138 | 1.000 |  |
| 8. FXR | –0.2658 | 0.2605 | 0.1352 | 0.1353 | 0.1917 | 0.0169 | 0.7860 | 1.000 |

Source: Authors’ compilation

Cash Flow Trend (CFT) exhibits a moderate negative correlation with FFR (r = –0.2809), indicating that improvements in cash flow may reduce the probability of fraudulent reporting. Similarly, Foreign Exchange Rate (FXR) is negatively associated with FFR (r = –0.2658), suggesting that exchange rate volatility may influence the incidence of financial manipulation. Related Party Transactions (RPT) show a weak positive correlation with FFR (r = 0.0426), while Pressure from Earnings Forecasts (PEF) displays a weak negative correlation (r = –0.0297). These weak pairwise associations imply that the relationship between these variables and fraud likelihood may be more complex and better understood through multivariate analysis.

Among the control variables, PEF and Return on Assets (ROA) are strongly correlated (r = 0.7451), which is expected since both are profitability indicators. A similarly high correlation exists between Inflation (INF) and FXR (r = 0.7860), reflecting Nigeria’s macroeconomic trends during the study period. No correlation exceeds 0.80, which indicates that multicollinearity is unlikely to be a concern in the regression analysis.Bottom of Form

## **4.3 Preliminary Diagnostic Tests**

Prior to model estimation, two key diagnostic tests were conducted to verify the reliability of the logistic regression estimates.

Variance Inflation Factor (VIF) values were computed to test for multicollinearity among explanatory variables. As shown in Table 4, all VIFs are below the threshold of 10, with a mean VIF of 2.35—indicating no multicollinearity concerns.

Table 4: Variance Inflation Factor (VIF)

|  |  |  |
| --- | --- | --- |
| Variable | VIF | 1/VIF |
| PEF | 3.73 | 0.268 |
| INF | 3.17 | 0.315 |
| FXR | 2.90 | 0.345 |
| ROA | 2.64 | 0.378 |
| RPT | 1.69 | 0.593 |
| CFT | 1.11 | 0.898 |
| ECD | 1.22 | 0.822 |
| **Mean VIF** | **2.35** |  |

We tested for heteroskedasticity, the Breusch–Pagan/Cook–Weisberg test was applied. The result, displayed in Table 5, returned a p-value of 0.0596, indicating the absence of heteroskedasticity in the residuals.

Table 5: *Breusch–Pagan Test for Heteroskedasticity*

|  |  |
| --- | --- |
| Statistic | Value |
| Chi²(1) | 3.55 |
| p-value | 0.0596 |

Decision: Fail to reject the null hypothesis of constant variance. The model is homoskedastic.

## **4.4 Logistic Regression Analysis**

This section presents the results of the binary logistic regression analysis used to examine the determinants of fraudulent financial reporting (FFR) among Deposit Money Banks (DMBs) in Nigeria. The model includes the four constructs of the Fraud Diamond Theory: Pressure (CFT), Opportunity (RPT), Rationalisation (ECD), and Capability (PEF), alongside control variables such as ROA, inflation (INF), and exchange rate (FXR). The model is statistically significant (Chi² = 32.50, p < 0.001), with a pseudo R² of 0.1870, indicating a moderately good fit and explanatory power.

Table 6: Logistic Regression Results

|  |  |  |
| --- | --- | --- |
| **Variable** | **Coefficient (Logit)** | **Significance** |
| CFT (Cash Flow Trend) | –0.2666 | \*\*\* (p < 0.01) |
| RPT (Related Party Transactions) | 4.4437 | \* (p < 0.10) |
| ECD (Economic Downturn) | 0.0972 | \* (p < 0.10) |
| PEF (Pressure from Earnings Forecasts) | –4.4072 | ns |
| ROA (Return on Assets) | 35.8274 | ns |
| INF (Inflation Rate) | 0.1976 | \*\*\* (p < 0.01) |
| FXR (Exchange Rate) | –0.0121 | \*\*\* (p < 0.01) |
| Constant | 1.0825 | ns |

*Chi² = 32.4987, N = 132, AIC = 157.6351, BIC = 180.6975*

Source: Processed data by authors.

As shown in Table 6, Cash Flow Trend (CFT) exhibits a negative and highly significant coefficient (β = –0.2666, p < 0.01). This supports the first hypothesis (H1) that financial pressure increases the likelihood of fraudulent reporting. Specifically, deteriorating cash flows heighten the risk of manipulation, consistent with the theoretical assertion that financial strain is a catalyst for unethical reporting behaviour. The result also aligns with prior empirical evidence that liquidity stress is a core motivator of earnings management in banking environments.

Opportunity, measured through Related Party Transactions (RPT), is positively associated with FFR (β = 4.4437, p < 0.10), providing marginal support for the second hypothesis (H2). Although the effect is weakly significant, it reinforces the idea that intercompany dealings offer avenues for obscuring transactions and inflating earnings, particularly when oversight mechanisms are weak or when related parties are used as conduits for misreporting. The implication is that banks with higher levels of related-party exposures are more susceptible to accounting manipulation.

Rationalisation, proxied by Economic Downturn (ECD), returns a positive coefficient (β = 0.0972, p < 0.10), also marginally significant. This provides support for the third hypothesis (H3), suggesting that adverse macroeconomic environments, such as reduced earnings capacity or elevated systemic risk, may prompt executives to justify fraudulent activities as necessary survival strategies. Although the relationship is weak, it indicates that environmental stressors play a role in shaping managerial ethics and tolerance for misreporting.

On the other hand, the fourth hypothesis (H4), which posits that capability, as captured by Pressure from Earnings Forecasts (PEF), influences fraudulent reporting, is not supported. The coefficient is negative but statistically insignificant (β = –4.4072, p > 0.10). This finding may reflect that earnings forecasts are either not widely enforced or not effectively monitored in the Nigerian context, reducing the pressure on executives to manipulate figures in order to meet market expectations.

Regarding the control variables, inflation (INF) emerges as a significant positive predictor of FFR (β = 0.1976, p < 0.01). This finding suggests that macroeconomic instability heightens the incentive for manipulation, perhaps due to increased difficulty in meeting performance benchmarks under inflationary pressure. Conversely, the foreign exchange rate (FXR) shows a significant negative relationship with FFR (β = –0.0121, p < 0.01). This implies that exchange rate fluctuations may exert a disciplinary effect on financial disclosure practices, possibly by increasing external scrutiny or regulatory vigilance. Return on Assets (ROA), while positive, is not statistically significant, suggesting that profitability does not have a linear or deterministic effect on fraudulent behaviour within this sample.

In conclusion, the results lend empirical support to three of the four components of the Fraud Diamond Theory in the Nigerian banking sector. Pressure, opportunity, and rationalisation each exhibit varying degrees of association with fraudulent financial reporting. However, capability, as operationalised in this study, does not appear to significantly influence manipulation. These findings offer valuable insights for regulators, auditors, and stakeholders concerned with enhancing transparency and reducing financial misconduct in emerging market financial systems.

## **4.5 Post-Estimation Diagnostic Tests**

After estimating the logistic regression model, several checks were conducted to confirm that the model was reliable, properly fitted, and capable of making accurate predictions.
The link test was applied to verify whether the model was correctly specified. This test helps detect omitted variables or incorrect functional form. The results confirmed that the model was appropriately specified, meaning it included the relevant variables and did not overcomplicate the prediction structure. The model's ability to correctly separate firms that engaged in fraudulent financial reporting from those that did not was assessed using the ROC curve. The area under the curve (AUC) was 0.8042, which indicates strong classification power. An AUC value above 0.80 is generally considered a good level of accuracy.
Two tests were conducted to assess how well the model predictions matched the actual outcomes. The Pearson goodness-of-fit test returned a statistically significant result, while the Hosmer–Lemeshow test produced a p-value of 0.2007, suggesting that the model fits the data well and does not suffer from poor calibration.

The model correctly predicted about 73.5% of all observations. It successfully identified 51.0% of actual fraud cases (sensitivity) and 86.8% of non-fraud cases (specificity). Furthermore, 69.4% of the cases predicted as fraud were indeed fraud (precision), while 75.0% of the cases predicted as non-fraud were accurately classified. These results suggest the model performs better at recognising non-fraud cases but still maintains reasonable accuracy overall.
These diagnostic checks confirm that the logistic model used in this study is appropriately specified, fits the data well, and has a good level of predictive accuracy in identifying fraudulent financial reporting among Nigerian deposit money banks.

# **5. Conclusion and Recommendations**

## **5.1 Conclusion**

This study investigated the determinants of fraudulent financial reporting (FFR) among deposit money banks (DMBs) in Nigeria using the Fraud Diamond Theory as its analytical framework. Through logistic regression analysis of data from 132 firm-year observations between 2012 and 2023, the findings revealed that pressure (as proxied by cash flow trend), opportunity (related party transactions), and macroeconomic volatility (inflation and exchange rate) significantly influence the likelihood of fraudulent reporting. However, capability (pressure from earnings forecasts) and rationalisation (economic downturn) displayed weaker and mixed predictive value. Control variables, including return on assets (ROA) and monetary policy rate (MPR), had limited but notable associations, and the model demonstrated satisfactory classification accuracy and goodness of fit. The results support the Fraud Diamond Theory's central premise that FFR is a multifactorial outcome influenced not only by economic pressure but also by the existence of exploitative opportunities and enabling conditions within firms.

## **5.2 Recommendations**

Considering the study’s findings, the following recommendations are directed at regulators, corporate governance practitioners, auditors, and bank executives to reduce the incidence of fraudulent financial reporting (FFR) in Nigeria’s banking sector:

1. Regulatory authorities such as the Central Bank of Nigeria (CBN) and the Financial Reporting Council of Nigeria (FRCN) should enhance their surveillance frameworks to include real-time monitoring of cash flow anomalies. Given the significant relationship between cash flow trends (pressure) and FFR, consistent negative or volatile cash flows should serve as early warning signals, prompting targeted audits and supervisory inquiries using risk-based approaches.

**2.** The study identifies RPTs as a key facilitator of fraud through the exploitation of transactional opacity. DMBs should be required to adopt automated detection systems to flag high-risk related party dealings. Additionally, independent audit or risk committees should oversee the approval and reporting of such transactions. Regulatory guidelines must mandate disaggregated disclosures on RPTs in the notes to financial statements to improve transparency and stakeholder scrutiny.

**3.** Although capability (PEF) was not a strong predictor of FFR, it remains essential to fortify internal control structures. Banks should institutionalise robust whistleblower protection policies and ensure that audit committees are empowered to evaluate earnings forecasts relative to actual performance. These practices can serve as internal deterrents against managerial overreach or ethical lapses.

**4.** While rationalisation (ECD) and macroeconomic variables (inflation and exchange rate) showed marginal influence, their indirect effects on management decisions should not be underestimated. Banks should train management teams on ethical responses to economic stress and incorporate macroeconomic stress testing into fraud risk assessment models—particularly during periods of currency instability or high inflation.

**5.** External auditors and regulators should go beyond traditional audit thresholds by leveraging forensic accounting procedures, especially for banks with elevated M-Scores. The use of predictive analytics, such as red-flag scoring algorithms and financial manipulation models, should be embedded in routine audit cycles to facilitate early detection of red flags and improve audit effectiveness.

## **5.3 Limitations and Directions for Future Research**

While the study offers valuable insights into the determinants of fraudulent financial reporting among Nigerian deposit money banks, it is not without limitations. The use of a dichotomous dependent variable (FFR) based on the Modified Beneish M-Score may oversimplify the multifaceted nature of financial fraud, potentially overlooking gradations in manipulation severity. Additionally, although the model incorporates several macroeconomic and firm-level controls, institutional factors such as regulatory enforcement strength, media scrutiny, and political interference were not captured. The model’s moderate explanatory power (pseudo R² = 0.2195) also suggests the presence of other relevant variables that were not included in the current specification.

Moreover, the potential for endogeneity, stemming from omitted variable bias, reverse causality, or measurement errors, cannot be fully ruled out. To address these methodological challenges and deepen the scope of analysis, future research should consider longitudinal models or advanced panel estimators such as System GMM and Difference GMM. Qualitative approaches, including in-depth case studies, may further illuminate the nuanced role of capability and rationalisation in fraud.

Disclaimer (Artificial intelligence)

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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