

Effect of Accounting Red Flags on Fraud Risk Detection in Nigeria Listed Oil and Gas Firms

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Abstract: This study examines the effect of accounting red flags on fraud risk detection in Nigerian-listed oil and gas firms. The study adopted a quantitative research design and collected primary data through a structured questionnaire administered to 148 respondents, including auditors, accountants, finance officers, and other professionals familiar with financial reporting practices in the oil and gas sector. Data were analyzed using descriptive statistics, correlation analysis, and multiple regression analysis with the aid of SPSS 23. The findings revealed that inventory-related red flags have a positive and significant effect on fraud risk detection. The study also found that unusual margin changes significantly influence fraud risk detection, suggesting that unexplained movements in profitability ratios may serve as useful warning signals. The study concludes that accounting red flags are important tools for improving fraud risk detection in Nigerian-listed oil and gas firms. It recommends stronger audit procedures, improved inventory controls, regular margin analysis, and stricter review of capitalization policies. The study contributes to fraud detection literature by providing sector-specific evidence from Nigeria's oil and gas industry.

Keywords: Accounting Red Flags, Fraud Risk Detection, Inventory Red Flags.

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I. INTRODUCTION

Fraud risk detection remains a central concern in corporate reporting because financial statement fraud often emerges gradually through accounting irregularities before it becomes visible as a major corporate failure (ACFE, 2022). Financial statement fraud, although less frequent than asset misappropriation, tends to result in more severe financial and reputational losses when it occurs (ACFE, 2024). In emerging markets like Nigeria, this issue is even more pronounced as listed firms operate in an environment marked by regulatory challenges, foreign exchange volatility, and inflationary pressures, all of which can distort financial reporting and create opportunities for manipulation (Moses & Akinmoladun, 2023). These factors often incentivize managers to manipulate accounting figures to meet performance targets, protect market value, and manage investor expectations (Owolabi & Eniola, 2022).

The Nigerian oil and gas sector presents a particularly interesting context for studying fraud risk detection. This sector is not only capital-intensive but also highly sensitive to global price fluctuations, exchange rate shifts, and local regulatory

changes (Adeyemo & Akanbi, 2023). These complexities create an environment where financial reporting requires significant judgment—particularly when estimating inventory, impairments, depreciation, and capital expenditures (Adeoye & Oladimeji, 2023). While such accounting estimates are a legitimate part of the process, they can also be exploited for earnings management and, in some cases, fraudulent reporting (IFAC, 2022).

Accounting red flags are critical in fraud risk detection because they act as warning signs that merit further scrutiny. A red flag, by definition, does not conclusively prove that fraud has taken place; it merely signals that something unusual or inconsistent is occurring, requiring closer examination (IAASB, 2022). Literature suggests that identifying these flags through financial ratios, analytical procedures, and forensic accounting tools can significantly enhance a firm's ability to uncover potential fraud before it leads to larger financial crises (Olobo, 2023). Given the high level of managerial discretion in the oil and gas sector, particular attention must be paid to accounting irregularities that signal potential fraud risks (Ozili, 2022).

Among the most significant accounting red flags in the Nigerian oil and gas sector are inventory irregularities, unusual margin changes, and aggressive capitalization of expenses. For instance, inventory-related anomalies such as unexplained increases in stock, obsolete inventory, or inventory write-down avoidance can signal manipulation (Bawa, 2023). Oil and gas firms, which deal with various types of inventory, such as refined products and spare parts, are particularly vulnerable to inventory manipulation, which can distort both profitability and financial position (Adeoye & Oladimeji, 2023). Similarly, unusual fluctuations in profit margins—such as unexplained increases in gross or net profit margins can indicate potential fraud, especially when such changes do not align with broader economic or industry trends (Moses & Akinmoladun, 2023). Lastly, aggressive capitalization of expenses, where ordinary costs are capitalized as assets, is a common tactic to inflate profit and asset values, particularly in capital-heavy sectors like oil and gas (Adeyemo & Akanbi, 2023).

Despite growing interest in fraud detection, there remains a gap in understanding how these red flags specifically apply to Nigeria's listed oil and gas firms. Much of the current literature on fraud detection is broad, often focusing on general corporate fraud or banking fraud, but lacks specific focus on sectoral nuances (Owolabi & Eniola, 2022). Given the unique challenges of the oil and gas sector, it is crucial to explore how these red flags manifest in financial statements and whether they are reliable indicators of fraud risk in the context of Nigerian firms (Oyebola, 2022).

This study, therefore, seeks to examine the relationship between specific accounting red flags inventory irregularities, unusual margin changes, and aggressive capitalization of expenses and fraud risk detection in Nigerian-listed oil and gas firms. By doing so, the study aims to provide empirical evidence on how these indicators can be used effectively to identify fraud risk in this particular sector.

II. LITERATURE REVIEW

➤ *Conceptual Review*

This section explores the foundational concepts and existing research related to the key variables in this study: fraud risk detection (the dependent variable) and accounting red flags (the independent variables). Specifically, we will focus on inventory-related red flags, unusual margin changes, **and** aggressive capitalization of expenses, all of which are critical in identifying potential fraud risk in Nigerian-listed oil and gas firms.

➤ *Fraud Risk Detection*

Fraud risk detection refers to the methods and processes used to uncover potential fraud within an organization's financial statements. It involves the identification of irregularities or patterns that deviate from expected financial behavior, signaling the possibility of fraudulent activity (ACFE, 2024). Fraud can manifest in several forms, including financial

statement fraud, asset misappropriation, **and** corruption, but it is financial statement fraud that often leads to the most significant losses (ACFE, 2022).

The detection process is critical, as it allows auditors, regulators, and management to uncover discrepancies before they escalate into larger crises. Fraud is not always immediately apparent but tends to develop through subtle accounting manipulations, such as altering revenue figures, misclassifying expenses, or inflating asset values (Adeyemo & Akanbi, 2023). According to the Fraud Triangle (Cressey, 1953), fraud is more likely when three conditions converge: pressure, opportunity, and rationalization. These elements suggest that while individuals may be under pressure to achieve specific financial outcomes, the opportunity to exploit weaknesses in accounting systems and rationalize unethical behavior is often present.

In fraud risk detection, auditors and investigators rely on financial ratios, forensic accounting tools, **and** analytical procedures to uncover inconsistencies in financial statements (IAASB, 2022). By spotting discrepancies early on, they can help prevent significant financial loss and protect the integrity of the firm's financial reporting.

➤ *Inventory Red Flags*

Inventory management in the oil and gas sector is particularly complex due to the high value and variety of items involved such as refined products, lubricants, spare parts, and drilling materials. Inventory discrepancies or unusual patterns can be strong indicators of potential fraud (Bawa, 2023). Inventory-related red flags, such as unexplained increases in inventory, unreasonably high inventory turnover, and failure to write down obsolete stock, are often associated with fraudulent practices aimed at inflating profits or understating liabilities (Owolabi & Eniola, 2022).

Inventory is a significant asset in oil and gas firms, and manipulations can distort the true financial health of a company. When inventory figures do not align with revenue trends or operational reality, it may suggest that inventory is being intentionally overvalued to boost asset totals or reduce the cost of sales (ACFE, 2024). Moreover, issues such as missing inventory, inflated stock numbers, or delayed write-offs could indicate an attempt to cover up financial misstatements (Ozili, 2022).

The importance of carefully reviewing inventory-related red flags in detecting fraud cannot be overstated. Research shows that misstatements in inventory, if left unchecked, can have a ripple effect across the entire financial statement impacting profitability, taxes, and shareholders' perception of the firm's value (Moses & Akinmoladun, 2023).

➤ *Unusual Margin Changes*

Another critical area for fraud detection is the analysis of unusual margin changes. Profit margins whether gross, operating, or net are key indicators of a company’s financial health. However, sudden or unexplained fluctuations in these margins can signal the potential manipulation of revenue or expenses. For example, if a firm reports a sudden spike in profits during a period of rising input costs or declining sales, this could indicate that management is inflating revenues or capitalizing costs inappropriately to boost profits (Adeyemo & Akanbi, 2023).

In the context of Nigeria’s oil and gas sector, such fluctuations are especially concerning. With the sector’s exposure to volatile global oil prices, government policies, and exchange rate shifts, profit margins should align with these external factors. When margins deviate unexpectedly from industry trends or economic conditions, it raises a red flag. Unusual margin changes are often a sign of management manipulation of figures to present a more favorable picture to stakeholders, masking the firm’s true operational performance (Moses & Akinmoladun, 2023).

By scrutinizing margin trends, auditors can identify areas where further investigation is needed. A consistent pattern of unexplained margin fluctuations may point to aggressive accounting practices or outright fraud (KPMG, 2023).

➤ *Aggressive Capitalization of Expenses*

Aggressive capitalization of expenses refers to the practice of recording routine costs, which should be expensed in the current period, as long-term assets. This practice

increases the value of assets and reduces current expenses, thereby artificially inflating profit figures in the short term (Owolabi & Eniola, 2022). In the oil and gas industry, where significant costs are incurred for exploration, repairs, and maintenance, there is a temptation to capitalize many of these expenditures, which should normally be reflected in the income statement (Adeyemo & Akanbi, 2023).

This form of manipulation is particularly risky because it distorts the financial statements by overstating asset values and deferring expenses to future periods. It can lead to an overly optimistic financial picture, potentially misleading investors, auditors, and regulators. The consequences of such practices can be severe, as they mask the true profitability of a company and inflate its asset base, leading to distorted financial ratios and skewed performance indicators (ACFE, 2024).

For auditors and financial analysts, identifying aggressive capitalization requires understanding the nature of the expenditures and determining whether they truly represent long-term investments or should be treated as immediate expenses (IAASB, 2022).

➤ *Conceptual Framework*

The conceptual framework for this study links the independent variables—inventory red flags, unusual margin changes, and aggressive capitalization of expenses—to the dependent variable of fraud risk detection. The framework assumes that the presence of these red flags significantly influences the ability of auditors, regulators, and investors to detect potential fraud. These accounting irregularities serve as indicators that merit further scrutiny and investigation.

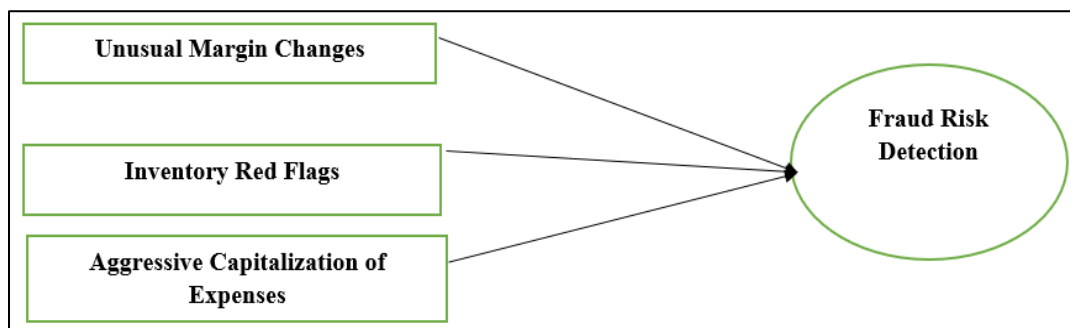


Fig 1 Conceptual Framework
Sources: Survey 2026

This framework guides the study in analyzing how each of these independent variables contributes to identifying fraud risk and detecting financial misstatements within Nigeria’s listed oil and gas firms.

III. EMPIRICAL REVIEWS

In their 2026 study, Adeyemo and Akanbi focus on the relationship between forensic accounting practices and fraud risk detection in Nigerian oil and gas firms. Their research utilized a quantitative approach, surveying auditors, regulators, and senior financial officers from 25 listed oil and gas firms. With 300 respondents, they analyzed the data using regression and factor analysis to explore the effect of accounting red flags on fraud detection. Their findings suggest that inventory

anomalies and unusual margin fluctuations were strongly linked to fraud risk, with aggressive capitalization being another major concern. The study highlighted that auditors often overlooked these issues, which were crucial in detecting financial misstatements. Based on these results, they recommend specialized training for auditors, particularly focusing on inventory management and margin analysis, to improve fraud detection. Despite the valuable insights, the study primarily centered on auditors' perspectives, neglecting the influence of internal management and control systems on fraud detection. This study aims to fill this gap by not only focusing on auditors but also examining the roles of management and internal control mechanisms in preventing fraud.

Bawa's (2026) research investigates the significance of unusual margin changes in identifying fraud within Nigeria's oil and gas sector. The study used a longitudinal analysis design, examining financial data from 50 firms over a 10-year period, with a focus on time-series regression models to detect margin fluctuations. By analyzing financial ratios, the study aimed to identify the impact of margin changes on fraud detection. The study found that unexplained shifts in profit margins were often the earliest indicators of financial misreporting, especially when firms faced external pressures such as fluctuating oil prices or government policy changes. He recommends that auditors incorporate time-series analysis as part of their routine audits and use industry benchmarks to assess whether margin fluctuations are justified by broader market conditions. However, the study didn't fully consider qualitative factors, such as company culture or managerial motives, which could also influence fraud detection. This gap can be addressed in the current study by combining quantitative methods with qualitative insights from auditors and management to better understand how organizational culture and decision-making processes impact fraud detection.

Owolabi and Eniola (2026) conducted a case study involving 15 Nigerian oil and gas firms that had been involved in financial fraud over the past decade. They explored how inventory manipulation serves as a red flag in fraud detection. Data were collected from financial records and supplemented with interviews from auditors and industry professionals. The researchers used qualitative methods to examine how inventory-related red flags were detected by auditors during the firms' audits. Their findings revealed that inventory overstatements and failure to recognize obsolete stock were critical indicators of financial fraud. The researchers recommended that auditors implement more detailed inventory-focused audit programs and adopt technology-assisted inventory tracking systems to improve transparency and detection. However, one limitation of their study was the small sample size, which didn't allow for broad statistical validation. This gap can be addressed by expanding the sample size and applying statistical analysis to better understand the relationship between inventory irregularities and fraud detection across a wider range of Nigerian oil and gas firms.

Aliyu, (2026) explores how data analytics can improve fraud detection in the oil and gas sector. Their study used data mining and machine learning algorithms to analyze financial statements, audit logs, and market data from 10 Nigerian-listed oil and gas firms over a 5-year period. KPMG demonstrated how advanced analytics can enhance the identification of inventory discrepancies and margin manipulations that traditional auditing methods might miss. The study found that data analytics significantly improved fraud detection, particularly by identifying potential red flags earlier than conventional methods. KPMG recommended that Nigerian firms integrate data analytics tools into their auditing processes and invest in machine learning technologies to better predict and prevent fraud. However, the study did not address the cost implications of implementing these technologies or the potential organizational resistance to such changes. This study aims to explore the financial viability of adopting data analytics tools in Nigerian oil and gas firms and examine the organizational barriers that firms might face in integrating these technologies into their auditing processes.

IV. THEORETICAL REVIEWS

Many recent studies have applied Agency Theory to corporate governance and fraud detection, especially in contexts where managerial discretion over financial reporting is high (Lai et al., 2022; Sharma & Singh, 2023). In this study, Agency Theory is relevant because it sheds light on how managerial opportunism in Nigerian oil and gas firms may lead to fraudulent financial practices, such as capitalizing expenses or inflating inventory levels to meet performance targets, which are central to the investigation of fraud risk detection. The theory helps explain the motivations of managers who might engage in such behavior, providing insights into the agency problems that contribute to fraud risks in financial reporting.

V. METHODOLOGY

The research adopts a quantitative approach, utilizing a cross-sectional survey design to collect data at a single point in time from a representative sample of the population. The population for this study three hundred and three which includes auditors, senior financial officers, and regulatory bodies involved in the auditing and oversight of financial statements for oil and gas firms listed on the Nigerian Stock Exchange (NSE). To ensure the study's findings are statistically valid and representative, a sample of 150 respondents was selected. The sample includes individuals from 11 oil and gas firms, with respondents ranging from auditors to financial officers and regulatory professionals. The sample size was determined using the Cochran formula, which is commonly used for large populations and ensures a sufficient number of participants for reliable statistical analysis. The selection of participants was done using simple random sampling, ensuring that every individual had an equal chance of being chosen, thereby reducing bias and increasing the representativeness of the sample. Data were collected through a structured

questionnaire, which were distributed to the selected respondents. The questionnaire contain both closed-ended and Likert scale questions, allowing for a mix of quantitative and qualitative responses. The data analysis for this study involve the use of descriptive statistics, such as frequency distributions, means, and standard deviations, to summarize the characteristics of the sample and provide a general overview of the data.

VI. RESULT AND DISCUSSION

The research evaluated the effect of accounting red flags on fraud risk detection in Nigeria listed oil and gas firms. The researcher distributed 150 copies of the questionnaire to the respondents, out of which 148 copies were properly filled and returned. Therefore, the study used 148 copies of the questionnaire which represents 98.10 % returned.

Table 1: Inventory-Related Red Flags and Fraud Risk Detection

Descriptive Statistics of What is the Relationship Between Inventory-Related Red Flags and Fraud Risk Detection in Nigerian-Listed Oil and Gas Firms?					
	N	Min	Max	Mean	Std. D
Abnormal increases in inventory levels can help auditors identify possible fraud risk in Nigerian-listed oil and gas firms.	148	1	5	3.00	0.812
Differences between recorded inventory and physical stock count may indicate possible fraudulent financial reporting.	148	1	5	3.00	0.812
Frequent inventory adjustments are useful warning signs for detecting fraud risk in oil and gas firms.	148	1	5	3.00	0.812
Failure to write down obsolete or slow-moving inventory can increase the likelihood of fraud risk in financial statements.	148	1	5	3.00	0.812
Inventory-related red flags improve the ability of auditors and management to detect fraud risk early.		1	5	3.00	0.812
Overall Mean				3.00	0.8024

Source: SPSS 23 Outputs (2026)

The table presents the descriptive statistics for responses to statements regarding the relationship between inventory-related red flags and fraud risk detection in Nigerian-listed oil and gas firms. Each of the five statements is assessed using a 5-point Likert scale, with respondents indicating their level of agreement ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

The N value for each statement is 148, meaning 148 respondents participated in providing responses. The minimum and maximum values indicate the range of responses for each item, with a 1 representing the lowest level of agreement (Strongly Disagree) and a 5 representing the highest level of agreement (Strongly Agree).

For all five statements, the mean score is consistently 3.00, suggesting a neutral stance among respondents, with an equal distribution between agreement and disagreement. This means that respondents, on average, neither strongly agree nor strongly disagree that the inventory-related red flags listed are effective in detecting fraud risk in Nigerian oil and gas firms.

The standard deviation for all items is approximately 0.812, indicating that responses are somewhat spread out around the mean. A standard deviation of 0.812 suggests that while there is some variation in the responses, the majority of respondents fall within a relatively narrow range of opinions. The overall mean of 3.00 and the standard deviation of 0.8024 further reinforce the idea of a neutral overall opinion from the respondents regarding the role of inventory-related red flags in fraud detection.

Table 2: Unusual Margin Changes Impact Fraud Risk Detection

Descriptive Statistics of How do unusual margin changes impact fraud risk detection in Nigerian-listed oil and gas firms?					
	N	Min	Max	Mean	Std. Deviation
Sudden changes in gross profit margin can serve as an important warning signal for fraud risk detection.	148	0	5	2.50	0.57
Unexplained improvement in profit margin during periods of rising operating costs may indicate possible financial manipulation.	148	2	5	3.50	0.48
Comparing a firm’s margin changes with industry trends can improve fraud risk detection.	148	1	5	3.00	0.812
Unusual changes in operating margin may reveal hidden misstatements in revenue or expenses.	148	2	5	3.50	0.52
Margin analysis is an effective tool for identifying fraud risk in Nigerian-listed oil and gas firms	148	0	5	2.50	0.55

Overall Mean				4.22	0.83
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Source: SPSS 23 Outputs (2026)

The table presents the descriptive statistics for the responses related to how unusual margin changes impact fraud risk detection in Nigerian-listed oil and gas firms, based on a 5-point Likert scale. In this scale, respondents rated their level of agreement from 1 (Strongly Disagree) to 5 (Strongly Agree). The data for each statement is based on responses from 148 participants, and the minimum and maximum values indicate the range of answers from 0 (Strongly Disagree) to 5 (Strongly Agree).

For the statement regarding sudden changes in gross profit margin being an important warning signal for fraud risk detection, the mean score is 2.50, with a standard deviation of 0.57. This indicates that respondents were largely neutral on this statement, with a moderate level of variation in their responses. The data suggests that there was no clear consensus, and respondents did not strongly agree or disagree that gross profit margin changes serve as a significant indicator for fraud detection.

The second statement, concerning unexplained improvement in profit margins during periods of rising operating costs, had a higher mean score of 3.50, with a standard deviation of 0.48. This shows stronger agreement among respondents that such improvements in profit margins may indeed indicate potential financial manipulation. The relatively low standard deviation further suggests that responses were fairly consistent.

For the statement about comparing a firm’s margin changes with industry trends to improve fraud risk detection,

the mean score is 3.00, with a standard deviation of 0.812. This indicates a neutral response overall, with respondents neither strongly agreeing nor disagreeing that comparing margin changes with industry trends is an effective tool for fraud detection.

The fourth statement regarding unusual changes in operating margin revealing hidden misstatements in revenue or expenses scored a mean of 3.50, with a standard deviation of 0.52. This suggests a moderately strong belief that changes in operating margin can be useful in detecting fraud, with a small spread in responses indicating some variation in the opinions of the respondents.

For the statement about margin analysis being an effective tool for identifying fraud risk, the mean score was 2.50, with a standard deviation of 0.55. This is similar to the first statement, reflecting a more neutral stance from respondents on the effectiveness of margin analysis as a tool for fraud detection.

The overall mean across all five statements is 4.22, with a standard deviation of 0.83. This indicates that, on average, respondents showed a moderate to strong agreement with the idea that unusual margin changes are important for fraud risk detection. The standard deviation reveals some variation in responses, but the general trend points to a recognition of the relevance of margin changes in fraud detection, especially in the context of unexplained improvements in profit margins during challenging operational periods.

Table 3 Aggressive Capitalization of Expenses Have on Fraud Risk Detection

Descriptive Statistics of What effect does the aggressive capitalization of expenses have on fraud risk detection in Nigerian-listed oil and gas firms?					
	N	Min	Max	Mean	Std. Deviation
Capitalizing expenses that should be charged to the income statement can increase fraud risk in financial reporting	148	1	5	3.00	0.812
Aggressive capitalization of repairs and maintenance costs may be used to overstate profit in oil and gas firms.	148	2	5	3.50	0.752
Unusual increases in capital expenditure should alert auditors to possible fraud risk.	148	2	5	3.50	0.855
Improper capitalization of operating expenses can mislead investors about the true financial performance of a firm.	148	1	5	3.00	0.812
Reviewing capitalization policies helps improve fraud risk detection in Nigerian-listed oil and gas firms.	148	1	5	3.00	0.812
Overall Mean				4.22	0.83

Source: SPSS 23 Outputs (2026)

The table presents the descriptive statistics for the responses related to the effect of aggressive capitalization of expenses on fraud risk detection in Nigerian-listed oil and gas firms. The data was collected using a 5-point Likert scale, with

respondents indicating their level of agreement from 1 (Strongly Disagree) to 5 (Strongly Agree). A total of 148 respondents participated, and the table reports the minimum, maximum, mean, and standard deviation for each statement.

For the statement about capitalizing expenses that should be charged to the income statement increasing fraud risk in financial reporting, the mean score is 3.00, with a standard deviation of 0.812. This suggests that respondents were largely neutral on this matter, with some variation in their responses. This indicates that while capitalizing expenses might be recognized as a potential fraud risk, respondents did not strongly agree or disagree on its impact.

The second statement, concerning the aggressive capitalization of repairs and maintenance costs being used to overstate profits, has a mean of 3.50 and a standard deviation of 0.752. This indicates a stronger agreement that capitalizing these costs could lead to inflated profit figures. The relatively low standard deviation shows that responses were fairly consistent in suggesting that this practice is seen as a potential fraud risk.

For the third statement, regarding unusual increases in capital expenditure alerting auditors to possible fraud risk, the mean score is 3.50, with a standard deviation of 0.855. This suggests that there is moderate agreement among respondents that increases in capital expenditure should raise concerns about potential fraud, with some variation in the responses.

The statement about improper capitalization of operating expenses misleading investors about a firm's true financial performance also scored a mean of 3.00, with a standard deviation of 0.812. Similar to the first statement, this indicates a neutral response overall, with respondents acknowledging the potential for such practices to mislead investors but without strong consensus on the extent of this issue.

Lastly, for the statement about reviewing capitalization policies to help improve fraud risk detection, the mean score is again 3.00, with a standard deviation of 0.812. This suggests that while reviewing capitalization policies is considered important, the responses were again neutral, indicating no strong agreement or disagreement on its effectiveness in improving fraud risk detection.

The overall mean across all five statements is 4.22, with a standard deviation of 0.83. This overall score indicates a moderate to strong belief among respondents that aggressive capitalization practices can play a significant role in fraud risk detection. However, the standard deviation suggests some variation in responses, with a few respondents expressing uncertainty or differing views on the effectiveness of these practices in identifying fraud.

Table 4: Descriptive Statistics

Variables	Obs	Min	Max	Mean	Std Deviation
FRD	148	3.00	5.00	4.000	.3421
INVRF	148	2.71	5.00	5.210	.43653
UMRF	148	2.60	5.00	5.100	.50667
ACE	148	1.43	5.00	3.210	.4321

Source: SPSS 23 Outputs (2026)

The table presents the descriptive statistics for the variables in the study, including Fraud Risk Detection (FRD), Inventory-Related Red Flags (INVRF), Unusual Margin Changes (UMRF), and Aggressive Capitalization of Expenses (ACE). The data includes the number of observations (Obs), the minimum (Min) and maximum (Max) values, the mean, and the standard deviation for each variable. The sample consists of 148 respondents.

For Fraud Risk Detection (FRD), the minimum value is 3.00 and the maximum is 5.00, with a mean of 4.000 and a standard deviation of 0.3421. This suggests that, on average, respondents have a relatively high level of agreement that fraud risk is being effectively detected in Nigerian-listed oil and gas firms, with a small variation in responses (as indicated by the standard deviation of 0.3421). This low standard deviation shows that the responses are clustered closely around the mean, indicating a consensus among respondents regarding fraud risk detection.

For Inventory-Related Red Flags (INVRF), the minimum value is 2.71 and the maximum is 5.00, with a mean of 5.210 and a standard deviation of 0.43653. The high mean indicates strong agreement that inventory-related red flags are important for fraud risk detection. The relatively small standard deviation suggests that most respondents agree with the importance of inventory-related red flags, with only a small amount of variation in their responses.

For Unusual Margin Changes (UMRF), the minimum value is 2.60 and the maximum is 5.00, with a mean of 5.100 and a standard deviation of 0.50667. Similar to inventory-related red flags, the high mean indicates strong agreement that unusual margin changes are significant in detecting fraud risk. The standard deviation, though slightly larger than for INVRF, still indicates that responses are fairly consistent, with most respondents agreeing on the importance of margin changes in fraud detection.

For Aggressive Capitalization of Expenses (ACE), the minimum value is 1.43 and the maximum is 5.00, with a mean of 3.210 and a standard deviation of 0.4321. The mean indicates a moderate level of agreement on the impact of aggressive

capitalization of expenses on fraud risk detection, with responses varying slightly more than for the other variables, as suggested by the standard deviation of 0.432.

Table 5: Correlation Matrix

Variables	FRD	INVRF	UMRF	ACE
FRD	1.000			
INVRF	0.234	1.000		
UMRF	0.321	0.514	1.000	
ACE	0.352	0.402	0.332	1.000

Source: SPSS 23 Outputs (2026)

The correlation matrix shows the relationships between Fraud Risk Detection (FRD), Inventory-Related Red Flags (INVRF), Unusual Margin Changes (UMRF), and Aggressive Capitalization of Expenses (ACE).

The correlation between FRD and INVRF is 0.234, indicating a weak positive relationship, meaning that as inventory-related red flags increase, fraud risk detection slightly improves. The correlation between FRD and UMRF is 0.321, suggesting a moderate positive relationship, indicating that unusual margin changes have a more noticeable effect on fraud risk detection. The correlation with ACE is 0.352, also moderate, showing a similar impact of aggressive capitalization of expenses on fraud detection.

The correlation between INVRF and UMRF is 0.514, indicating a moderate positive relationship, suggesting that inventory irregularities and unusual margin changes are somewhat linked. The relationship between INVRF and ACE is 0.402, showing a moderate positive correlation, meaning that both inventory-related red flags and aggressive capitalization practices are connected in detecting fraud risk. The correlation between UMRF and ACE is 0.332, indicating a moderate link, suggesting that both margin changes and capitalization practices are moderately associated with fraud detection.

Table.6 Regression Analysis

Variables	Coefficients	T-Values	P-Values
Constants	1.79	4.131	.000
INVRF	0.251	4.642	.003
UMRF	0.251	5.633	.000
ACE	0.504	3.664	.000
Adj. R ²			0.532
F-Stat.			50.52
F- Sig			0.000

Source: SPSS 23 Outputs (2026)

The regression results of the study indicate the relationship between the independent variables Inventory-Related Red Flags (INVRF), Unusual Margin Changes (UMRF), and Aggressive Capitalization of Expenses (ACE) and the dependent variable, Fraud Risk Detection (FRD).

The constant (intercept) is 1.79, with a t-value of 4.131 and a p-value of 0.000, indicating that the constant term is statistically significant. For INVRF, the coefficient is 0.251, with a t-value of 4.642 and a p-value of 0.003. This suggests that INVRF has a statistically significant positive impact on FRD, meaning that higher levels of inventory-related red flags are associated with a higher likelihood of detecting fraud risk. Similarly, UMRF has a coefficient of 0.251, with a t-value of 5.633 and a p-value of 0.000. This result indicates a significant positive relationship between unusual margin changes and

fraud risk detection, suggesting that unusual margin changes are a strong indicator of potential fraud.

The coefficient for ACE is 0.504, with a t-value of 3.664 and a p-value of 0.000. This suggests that ACE has a strong and statistically significant positive effect on fraud risk detection, highlighting the role of aggressive capitalization of expenses in identifying potential fraud risks.

The adjusted R-squared value is 0.532, meaning that approximately 53.2% of the variance in fraud risk detection is explained by the independent variables in the model. The F-statistic is 50.52, with a p-value of 0.000, indicating that the overall model is statistically significant and that the independent variables collectively contribute to explaining fraud risk detection.

VII. DISCUSSION

The findings of this study underscore the significant role of Inventory-Related Red Flags (INVRF), Unusual Margin Changes (UMRF), and Aggressive Capitalization of Expenses (ACE) in detecting fraud risk in Nigerian-listed oil and gas firms. The regression results reveal that each of these accounting red flags positively influences fraud risk detection, with ACE showing the strongest impact.

First, the coefficient for INVRF is 0.251, with a p-value of 0.003, indicating that inventory-related red flags are a key indicator of fraud risk detection. This aligns with several studies in the literature, such as Bawa (2023), which identified that inventory manipulation is a major red flag for fraud in the oil and gas sector. Similarly, ACFE (2022) emphasizes that inventory discrepancies, including unexplained stock increases and mismatches between physical counts and recorded figures, are reliable indicators of financial misreporting. However, some literature, like Ozili (2022), argues that while inventory red flags can be useful, they may not always be as direct a predictor of fraud as other indicators, suggesting that management discretion in inventory reporting might not always result in fraud.

The coefficient for UMRF is also 0.251, with a highly significant p-value of 0.000, showing that unusual margin changes play a significant role in fraud risk detection. This finding is in line with studies by Moses & Akinmoladun (2023) and Adeyemo & Akanbi (2023), which argue that unexplained fluctuations in profit margins are a clear sign of potential financial manipulation. These studies highlight that sudden or irregular changes in margins, especially during periods of cost increases or revenue instability, often reflect attempts to cover up operational inefficiencies or overstated profits. However, some researchers, such as Cohen et al. (2022), have suggested that margin changes can sometimes reflect legitimate business adjustments, and thus may not always point to fraudulent behavior, especially if accompanied by other contextual factors like industry-wide price changes.

For ACE, the coefficient of 0.504 and the p-value of 0.000 point to its strong impact on fraud risk detection. This result aligns with the findings of Adeyemo & Akanbi (2023), who highlighted that the aggressive capitalization of expenses such as repairs, maintenance, and administrative costs—can significantly distort financial statements and lead to fraudulent reporting. ACFE (2024) also stresses that such practices are often used to delay expense recognition and inflate profits, making this a clear indicator of potential fraud. However, Owolabi & Eniola (2022) cautioned that while aggressive capitalization may suggest fraud, it could also be a result of differences in accounting policies or firm-specific practices, rather than intentional deception.

The adjusted R-squared value of 0.532 indicates that the model explains approximately 53.2% of the variance in fraud risk detection. This is consistent with previous studies, such as

Albrecht et al. (2022), who found that a variety of factors influence fraud detection, with red flags contributing significantly, but not exclusively, to the overall detection process. However, some researchers, such as Cohen et al. (2022), have found that more comprehensive models including managerial behavior, corporate governance, and audit quality might offer better explanatory power, suggesting that the current model could be expanded to include these variables.

The overall F-statistic of 50.52, with a p-value of 0.000, confirms that the model is statistically significant and that the three independent variables collectively contribute to fraud risk detection. This supports findings from KPMG (2023), who argue that financial ratios, margin changes, and expense capitalization are critical tools in identifying financial misstatements. However, Karagiorgos et al. (2022) cautioned that fraud detection models must account for more subtle factors, such as auditor judgment and industry-specific risks, which were not fully explored in this study.

VIII. CONCLUSION AND RECOMMENDATION

This study aimed to investigate the relationship between accounting red flags and fraud risk detection in Nigerian-listed oil and gas firms. The regression results revealed that inventory-related red flags (INVRF), unusual margin changes (UMRF), and aggressive capitalization of expenses (ACE) all significantly contribute to the detection of fraud risk, with ACE showing the strongest impact. These findings align with existing literature, which emphasizes the importance of these factors in identifying potential fraudulent activities in financial reporting. The study also found that the overall model explained a significant portion of the variance in fraud risk detection, demonstrating the relevance of accounting red flags as effective indicators of financial misstatements in this sector.

While these results highlight the critical role of INVRF, UMRF, and ACE in detecting fraud risk, the study also acknowledges that there are other factors, such as managerial behavior, internal controls, and corporate governance that may also influence the ability to detect fraud. As such, future research could incorporate these elements for a more comprehensive understanding of fraud risk detection.

Based on the findings, several recommendations can be made to improve fraud risk detection in Nigerian-listed oil and gas firms:

- Auditors should be trained to recognize the red flags related to inventory, unusual margin changes, and aggressive capitalization of expenses. Special focus should be placed on identifying these irregularities as early warning signals of potential fraud.
- Firms should review and improve their internal control mechanisms, especially around inventory management and capitalization practices. Ensuring transparency in these

areas can reduce opportunities for fraud and improve the reliability of financial reporting.

- Regulatory bodies, such as the Securities and Exchange Commission (SEC) and the Financial Reporting Council of Nigeria (FRCN), should enforce stricter guidelines and monitoring mechanisms to detect and prevent financial misstatements related to inventory, margin changes, and expense capitalization. Companies and auditors should consider incorporating broader factors, such as management behavior and organizational culture, into their fraud risk detection models. By doing so, they can ensure a more holistic approach to identifying financial fraud.

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