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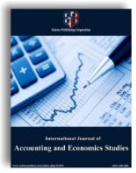

Hexagon Fraud Analysis in Detecting Fraudulent Financial Reporting

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Abstract

This study aims to analyze the influence of factors derived from the fraud hexagon theory pressure (financial stability, external pressure, financial targets), opportunity (audit committee, ineffective monitoring), rationalization (change of auditors), capability (change of directors), arrogance (CEO education, CEO duality), and collusion (related party transactions) on the likelihood of fraudulent financial reporting (FFR). Adopting a quantitative approach, this research utilizes numerical data and statistical analysis to test the proposed hypotheses, examining the relationships between these variables. The results of the logistic regression analysis reveal that several factors have a significant positive impact on the probability of FFR. Specifically, financial stability, financial targets, change of auditors, change of directors, and related party transactions were found to significantly increase the likelihood of fraudulent reporting. Conversely, external pressure, the presence of an audit committee, ineffective monitoring, CEO education, and CEO duality did not demonstrate a statistically significant influence on FFR in this study. The implications for companies are substantial. These findings underscore the critical need for robust corporate governance and vigilant board oversight. Companies should carefully monitor high-pressure environments driven by aggressive financial targets and scrutinize significant organizational changes, such as the turnover of directors or auditors, as these events may serve as red flags for potential fraud. Furthermore, establishing stricter controls and ensuring greater transparency in related party transactions are essential strategies to mitigate the risk of fraudulent financial reporting.

Keywords: *Fraudulent Financial Reporting; Pressure; Opportunity; Rationalization; Capability; Arrogance; Collusion.*

1. Introduction

Financial statements serve as the cornerstone of corporate communication, acting as the primary medium through which business entities convey their financial position, performance, and cash flows to both internal and external stakeholders. The information derived from these reports is strategically vital, supporting rational, data-driven economic decisions such as investments, credit extensions, and assessments of corporate performance and governance. Within the framework of financial accounting, statements prepared in accordance with the prevailing Financial Accounting Standards (SAK), effective as of January 1, 2022, must adhere to fundamental qualitative characteristics: relevance, reliability, comparability, and understandability. These characteristics are intended to produce information that is not only useful but also ethically and legally defensible.

However, the dynamics of contemporary business reveal a paradoxical tension between the idealistic presentation of financial statements and the empirical realities on the ground. The relentless demand for achieving aggressive financial performance targets often places management under significant pressure to project a positive corporate image, creating a fertile environment for misconduct. In this context, the phenomenon of fraudulent financial reporting emerges as a manipulative strategy employed to embellish a company's performance in the eyes of the public and investors.

Recent research indicates that such practices are not driven solely by economic motives but also involve complex psychological aspects, weaknesses in internal control systems, and deficiencies in external oversight functions (Lartey et al., 2023). Theoretically, the understanding of fraud causality has evolved significantly from the foundational Fraud Triangle model developed by Chimonaki et al. (2023), which identified three core elements: pressure, opportunity, and rationalization. This model has been expanded over time into more complex frameworks like the Fraud Diamond, Fraud Pentagon, and ultimately the Fraud Hexagon, which incorporates the additional elements of capability, arrogance, and collusion (Lan & Rao, 2025). Within the Fraud Hexagon framework, for instance, fraud is understood as the consequence of six interconnected and reinforcing conditions. This holistic approach offers a more comprehensive understanding by explaining the intricate social and psychological complexities behind management's decision to engage in fraudulent financial reporting.

Empirical evidence from both global and Indonesian contexts reveals that fraudulent financial reporting in the mining sector is not an incidental phenomenon but rather a serious, structural pattern. This industry possesses unique characteristics; it is capital-intensive, highly dependent on volatile commodity prices, and bound by stringent regulations and complex licensing procedures that inherently create openings for the manipulation of financial information. A stark example is Glencore, a commodity trading and mining giant, which in 2022 pleaded guilty to bribery and corruption practices in several countries, resulting in substantial fines. This development prompted further

scrutiny of the company's disclosure practices, transaction recording, and external audit processes (Chappidi et al., 2025). Subsequently, in 2025, the UK's audit regulator, the FRC, launched an investigation into Deloitte's audit of Glencore to assess whether material risks of non-compliance with laws and regulations were adequately addressed. This case demonstrates how non-financial issues like bribery can create material risks to the veracity of a mining company's financial statements, especially concerning the concealment of payments, such as the $1.5 billion disguised to settle past issues.

This case demonstrates how financial statement fraud can serve as a tool to gain an illegal competitive advantage and conceal material information that impacts risk assessment and investment decisions. Beyond eroding state revenues, this phenomenon undermines the integrity of the national financial reporting system and weakens investor confidence. The multidimensional perspective is further reinforced when such fraud is closely linked to principles of social and environmental responsibility issues inherently tied to the mining business, which are sometimes used as a facade to mask weak operational performance (Deng et al., 2025). A similar pattern emerged at PT Timah Tbk, involving inconsistencies and the purchase of illegal ore between 2022 and 2024 (Erkan et al., 2025). In 2024, the Indonesian government uncovered a scheme involving the purchase of tin ore from illegal mining activities, implicating several parties in PT Timah's supply chain. The investigation found the use of shell companies and falsified purchase documents to obscure the ore's origin, leading to massive financial losses (reported at over IDR 2.63 trillion) and damaging the transparency of the company's operational and cash flow reports. This case shows how a narrative of operational success can mask substantial balance sheet problems when significant transactions are disguised through third parties, deceiving analysts about the true corporate risks (Rahayu et al., 2025).

Conceptually, these fraudulent practices in the mining sector demand an approach that extends beyond mere regulatory strengthening and technical audits. The industry's characteristics, laden with external risks like commodity price fluctuations and dependency on public policy, suggest that oversight systems relying solely on formal structures are prone to failure. This is where the relevance of a theoretical model like the Fraud Hexagon becomes crucial. The model highlights not only economic pressures (stimulus) and control weaknesses (opportunity) but also the actors' capabilities, rationalizations, arrogance, and the potential for collusion factors often concealed within corporate and regulatory elite networks (Allen et al., 2023; Alwehaib, 2025).

Data from the Association of Certified Fraud Examiners (ACFE) in 2024 reveals that while fraud occurs across all sectors, the mining industry suffers the highest median loss, with a reported case in 2024 causing a loss of $550,000. Furthermore, the ACFE found that financial statement fraud is the most damaging type of fraud compared to asset misappropriation and corruption, with an average loss of $42,600 per month in 2024. At its core, fraud often arises from a conflict of interest between management (the agent) and owners or shareholders (the principal), a concept explained by agency theory (Al-Faryan, 2024). Managers may commit fraud to benefit themselves, often through performance-based incentives. This is facilitated by information asymmetry, where managers possess more complete information than shareholders, granting them the opportunity to manipulate financial reports.

Fraudulent financial reporting is a form of white-collar crime defined by the ACFE (2022) as the material misstatement of financial information with the intent to mislead users, either through deliberate misrepresentation or omission. This practice is typically executed through manipulative schemes such as overstating assets and revenues or understating liabilities and expenses, often driven by pressure to meet financial targets or secure performance-based bonuses (Hosseinkhani, 2025).

To comprehensively understand and detect such fraud, the Fraud Hexagon Theory, developed by Barry et al. (2022), provides a state-of-the-art framework by integrating six critical elements. The first, Pressure, reflects internal or external incentives driving fraudulent acts. This can be proxied by Financial Stability, the pressure to maintain a perception of health even when it is forced (Potthoff et al., 2022); External Pressure, the need to secure financing by attracting investors or creditors (Benzaken et al., 2024) and Financial Targets, the optimistic yet intense pressure to achieve high returns (Bouteska & Mili, 2022). The second element, Capability, represents the individual's technical ability and authority to execute fraud. It is often measured by the change of directors, as shifts in leadership can signal instability or an opportunity to install colluding parties (Achmad et al., 2022). Opportunity, the third element, refers to weaknesses in the internal control environment (Nasir et al., 2021). In summary, the Fraud Hexagon framework explains fraudulent financial reporting through multiple interrelated dimensions that capture both organizational and behavioral drivers of misconduct. Opportunity arises when weak governance mechanisms, such as ineffective audit committees and inadequate monitoring, fail to provide robust oversight, thereby creating gaps that can be exploited. Rationalization reflects the psychological process through which perpetrators justify unethical actions, often manifested in practices such as auditor changes aimed at opinion shopping. Arrogance represents an executive's belief that rules do not apply to them, commonly associated with overconfidence stemming from high educational attainment or the concentration of power through CEO duality. Finally, collusion involves covert cooperation among parties to circumvent internal controls, frequently facilitated through related-party transactions that obscure true firm performance. Together, these elements illustrate how structural weaknesses, psychological justifications, power concentration, and cooperative misconduct interact to increase the risk of fraudulent financial reporting. The Fraud Hexagon model is regarded as a more comprehensive framework for fraud detection because it incorporates not only economic incentives but also the psychological, organizational, and social dynamics that motivate perpetrators within specific institutional settings. Accordingly, this study, entitled "An Analysis of the Fraud Hexagon in Detecting Fraudulent Financial Reporting," seeks to systematically evaluate the effectiveness of the Fraud Hexagon theory in identifying indicators of fraudulent financial reporting within mining companies.

2. Method

2.1. Inferential statistical analysis

This study adopts a quantitative approach, as all indicators used are in the form of numerical figures and data. Quantitative research situates itself within the philosophy of positivism, which bases its analysis on objective observation and empirical measurement. As explained by Mahardini et al. (2025), this methodology prioritizes systematic measurement and statistical analysis to understand the relationships between variables. Within this model, data is collected through structured research instruments and is subsequently analyzed statistically to test the research hypotheses formulated within the established theoretical framework (Jelena & Maksimović, 2023). The analytical method employed is logistic regression, which is suitable for examining the relationship between several independent variables and a dichotomous dependent variable, in this case, the presence or absence of fraudulent financial reporting. This statistical technique allows for a robust assessment of how each factor contributes to the likelihood of fraud occurring, aligning perfectly with the study's objectives to test the formulated hypotheses.

2.2. Data collection and sample

The nature of this research is classified as applied, as its findings are intended to provide practical solutions to problems faced by organizations. This type of study is designed to address actual issues by offering data-driven recommendations that can be directly implemented into organizational policy or strategy (Junjie & Yingxin, 2022). Furthermore, a correlational approach is utilized, as the primary focus is to examine the relationships or associations between variables rather than to test for direct causal links (Mahardini et al., 2025). This research utilizes secondary data, specifically data obtained indirectly from published sources such as financial statements and annual reports available on the official website of the Indonesia Stock Exchange (IDX). The use of secondary data offers the advantages of time and cost efficiency while also enhancing objectivity, as the data has already been verified and made public. According to Jelena & Maksimović (2023), leveraging secondary data in quantitative research enables researchers to access broad and relevant information without the need for primary data collection, thereby increasing the external validity of the study.

2.3. Operationalization and measurement of variables

This study is explicitly designed as an empirical quantitative investigation, not as a review of prior literature. Its primary objective is to test hypotheses empirically regarding the determinants of fraudulent financial reporting using firm-level financial and corporate governance data. Previous studies are not reviewed for comparison purposes; instead, they are selectively employed to establish theoretical grounding, justify the selection of variables, and validate the appropriateness of measurement proxies used in the empirical model. Accordingly, this research contributes original empirical evidence rather than synthesizing existing findings.

The study employs two categories of variables: a dependent variable and a set of independent variables. The dependent variable represents fraudulent financial reporting, while the independent variables consist of empirically operationalized constructs derived from the Fraud Hexagon theory. Each construct is translated into observable financial ratios or governance indicators, enabling rigorous statistical testing and inference within an empirical framework.

Fraudulent financial reporting is inherently difficult to observe directly and is typically identified ex post. Prior empirical studies frequently use financial statement restatements as an indicator of fraud, as restatements reflect material misstatements arising from accounting errors, violations of standards, or intentional manipulation (Hasnan et al., 2021). Ding et al. (2025) further demonstrate that restatements related to accrual manipulation and accounting estimates remain a strong signal of fraud risk, even as overall restatement frequency declines. These findings support the validity of restatements as an empirical fraud proxy.

However, to ensure consistency across firm-year observations and to facilitate cross-sectional and longitudinal analysis, this study adopts the F-Score Model as a quantitative proxy for fraudulent financial reporting. The F-Score integrates accrual quality and financial performance into a composite measure reflecting the likelihood of financial misstatement (Nejad et al., 2024). Accordingly, fraudulent financial reporting is operationalized as:

FFR = Accrual Quality + Financial Performance

This approach strengthens the empirical nature of the study by enabling objective, replicable measurement of fraud risk.

The independent variables are grounded in the Fraud Hexagon framework, which posits that fraud arises from the interaction of six elements: Incentive/Pressure, Opportunity, Rationalization, Capability, Arrogance, and Collusion. Each element is operationalized using proxies that have been empirically validated in prior quantitative research.

The Incentive/Pressure element is represented by Financial Stability, External Pressure, and Financial Target. Financial Stability is measured using the percentage change in total assets (FS), capturing financial volatility and managerial pressure to maintain a stable financial image (Gustiana & Nasrudin, 2021). External Pressure is proxied by leverage (EP), reflecting creditor pressure and covenant constraints that may incentivize earnings manipulation (Huang et al., 2025). Financial Target is measured using return on assets (FT), capturing pressure to meet profitability benchmarks imposed by shareholders or boards (Singh et al., 2024).

The Opportunity element is operationalized through governance mechanisms. Audit Committee effectiveness is measured by the proportion of audit committee members with accounting or finance expertise (AC), while Ineffective Monitoring is proxied by the proportion of independent commissioners (IM). Although these mechanisms are designed to reduce fraud risk, prior empirical evidence suggests that their effectiveness may be limited under certain governance conditions (Broye & Johannes, 2021).

The Rationalization element is proxied by Change of Auditor (CA), measured as a dummy variable indicating a switch from a higher-quality auditor to a lower-quality auditor. Such changes may reflect management's attempt to justify aggressive accounting choices or reduce audit scrutiny (Baatwah & Wahab, 2025).

The Capability element is measured through Change of Directors (CD), captured by a dummy variable indicating director turnover during the observation period. Prior studies indicate that executive changes may coincide with periods of weakened oversight or provide capable individuals with the authority to execute fraudulent schemes (Alataw, 2025).

The Arrogance element is represented by CEO Education (CeD) and CEO Duality (CeDu). CEO Education is measured as a dummy variable indicating that a higher level of CEO Education, especially a PhD/Doctoral, may be involved in the fraudulent financial reporting (Aviantara R., 2021). CEO Duality (CeDu) is measured as a dummy variable indicating that the CEO holds the position of chairman of the board or multiple key leadership roles within the firm, which may involve fraudulent financial reporting (Thamlim & Reskino, 2023).

Finally, the Collusion element is proxied by Related Party Transactions (RPTs), measured as the ratio of sales to related parties relative to total consolidated sales. While not inherently fraudulent, extensive or poorly monitored RPTs may facilitate collusion and the circumvention of internal controls (Nugroho & Diyanti, 2022). A higher RPT ratio, therefore, reflects greater exposure to collusive practices that may increase the likelihood of fraudulent financial reporting.

3. Result and Discussion

3.1. Descriptive statistical analysis

Descriptive statistics represent the foundational phase of quantitative data analysis, providing the essential first look into the characteristics and structure of a dataset. This initial examination is crucial not only for summarizing the data but also for identifying patterns, anomalies,

and underlying distributions that will inform all subsequent inferential testing. The results of this initial analytical phase are systematically presented in the table below, which details the key statistical measures for each variable included in the research model.

Table 1: Descriptive Statistics

Variable	Object	Mean	Std. dev.	Min	Max
FFR	176	0,28	0,45	0	1
FS	176	0,14	0,35	-0,53	2,82
EP	176	0,48	0,30	0	1,88
FT	176	0,07	0,11	-0,12	0,57
AC	176	0,81	0,31	0	1
IM	176	0,44	0,13	0	0,67
CA	176	0,11	0,31	0	1
CeD	176	0,45	0,50	0	1
CeDu	176	0,74	0,44	0	1
RPT	176	0,06	0,15	0	0,8264
CD	176	0,11	0,31	0	1

Table 1 presents the descriptive statistics for 176 observations across all variables. The mean values indicate that FFR (0.28), FS (0.14), EP (0.48), and FT (0.07) have relatively low average levels, while AC shows a comparatively high mean of 0.81, suggesting a higher prevalence of this attribute in the sample. IM and CeD record moderate mean values of 0.44 and 0.45, respectively, whereas CeDU has a higher mean of 0.74, indicating it occurs more frequently. Variables such as CA, RPT, and CD have low mean values, all close to 0.10. The standard deviations reveal varying degrees of dispersion, with binary or dummy-type variables (e.g., FFR, AC, CA, CeD, CeDU, and CD) showing moderate variability, while FS and EP exhibit wider ranges, as reflected by their negative minimums and relatively high maximum values. Overall, the minimum and maximum values indicate substantial variation across observations, suggesting heterogeneity within the dataset.

3.2. Multicollinearity test

The process of building a robust and reliable statistical model, particularly in the context of regression analysis, is contingent upon a series of diagnostic checks known as the classical assumption tests. To diagnose this potential issue, researchers rely on specific statistical measures and established rules of thumb. According to the guideline articulated by Effilyadi et al. (2022), a clear indication of a multicollinearity problem exists among the independent variables if the correlation coefficient between any pair of them exceeds a specific threshold, which is often set at a high value such as 0.9. Conversely, if all pairwise correlation values fall below this threshold, it is a strong indication that multicollinearity is not a concern. Following this established methodological protocol, a multicollinearity test was conducted for this study, with the results comprehensively detailed in the correlation matrix presented below.

Table 2: Multicollinearity Test

	FS	EP	FT	AC	IM	CA	CeD	CeDu	RPT	CD
FS	1,00									
EP	-0,07	1,00								
FT	0,27	-0,29	1,00							
AC	0,07	0,30	-0,04	1,00						
IM	0,04	0,18	0,01	0,39	1,00					
CA	-0,06	0,03	0,01	0,11	0,04	1,00				
CeD	-0,03	-0,08	0,03	0,13	0,19	0,05	1,00			
CeDU	-0,02	0,27	-0,30	0,52	0,20	0,04	-0,03	1,00		
RPT	0,03	0,19	0,06	0,12	-0,02	0,06	0,03	-0,03	1,00	
CD	0,08	0,08	0,01	0,14	0,02	0,00	0,09	0,04	0,17	1,00

Table 2 reports the pairwise correlation coefficients among the independent variables to assess the presence of multicollinearity. Overall, the correlation values are relatively low, with most coefficients well below the commonly accepted threshold of 0.70, indicating that multicollinearity is not a serious concern in this model. The highest correlations are observed between AC and CeDU (0.52), AC and IM (0.39), and FT and CeDU (–0.30), which are still within acceptable limits. Other correlations, such as between FS and FT (0.27) or EP and AC (0.30), are moderate but not excessive. Many variable pairs exhibit very weak or near-zero correlations, suggesting that the variables capture distinct dimensions. Therefore, the results indicate that the regression model is unlikely to suffer from multicollinearity problems, and the independent variables can be included simultaneously without biasing the estimation results.

3.3. Logistic regression and Wald test

The analytical core of this study is anchored in the application of logistic regression, a sophisticated statistical technique specifically chosen for its suitability in modeling the complex relationships inherent in the research question. Based on the application of this model to the dataset, the following logistic regression equation was derived. This equation mathematically represents the relationships between the ten independent variables, each representing a facet of the Fraud Hexagon theory, and the log-odds of a company engaging in fraudulent financial reporting (FFR). The equation is as follows:

$$FFR = -0.83 + 2.06FS – 2.01EP + 8.89FT + 0.58AC – 1.79IM + 1.68CA + 0.62CeD – 0.50CeDU – 8.66RPT + 1.46CD + \varepsilon$$

An initial inspection of the regression output suggests a nuanced and complex picture. The p-values associated with each independent variable indicate that only five of the ten predictors have a statistically significant influence on the dependent variable. These significant variables are Financial Stability (FS), Financial Target (FT), Change of Auditor (CA), Related Party Transaction (RPT), and Change of Directors (CD). However, a closer look at the coefficients reveals a potential anomaly: among these five significant variables, one appears to have a coefficient whose direction is contrary to the hypothesized effect, an issue that warrants deeper investigation in the subsequent analysis. To formally test the significance of each of these variables and to move beyond a preliminary assessment, the study employs the

Wald test, a standard and rigorous procedure for hypothesis testing within the logistic regression framework. The comprehensive results of the logistic regression analysis, including the Wald test statistics for each variable, are presented in the following table.

Table 3: Logistic Regression Summary

FFR	Odds Ratio	Coefficient	Std. err.	z	P>z	[95% conf.	interval]
FS	7,83	2,06	0,62	3,3	0,001	0,84	3,28
EP	0,13	-2,01	104,57	-1,92	0,055	-4,05	0,04
FT	7,29	8,89	2,24	3,97	0,000	4,50	1,33
AC	1,79	0,58	0,91	0,64	0,523	-1,21	2,38
IM	0,17	-1,79	1,66	-1,08	0,282	-5,05	1,47
CA	5,36	1,68	0,68	2,48	0,013	0,35	3,00
CeD	1,86	0,62	0,43	1,44	0,151	-0,23	1,47
CeDu	0,61	-0,50	0,58	-0,86	0,391	-1,63	0,64
RPT	0,00	-8,66	293,02	-2,95	0,003	-1,44	-2,92
CD	4,29	1,46	0,66	2,19	0,028	0,15	2,76
cons	0,44	-0,83	0,70	-1,18	0,236	-2,19	0,54

Table 3 presents the results of the logistic regression analysis examining the determinants of FFR. The findings show that FS, FT, CA, RPT, and CD have statistically significant effects on the likelihood of FFR. Specifically, FS (OR = 7.83, p = 0.001), FT (OR = 7.29, p < 0.001), CA (OR = 5.36, p = 0.013), and CD (OR = 4.29, p = 0.028) positively and significantly increase the odds of FFR, indicating a strong association with the dependent variable. In contrast, RPT has a significant negative effect (OR ≈ 0.00, p = 0.003), suggesting that higher RPT substantially reduces the probability of FFR. EP shows a negative coefficient and is marginally significant at the 10% level (p = 0.055), while AC, IM, CeD, and CeDu are not statistically significant, implying no clear evidence of their influence on FFR. Overall, the results indicate that only selected variables play a meaningful role in explaining variations in FFR, while others do not exhibit significant explanatory power in the model.

3.4. Regression model fit test

After establishing the significance of the individual predictors through the Wald test, a final and critical step in the validation of the logistic regression model is to assess its overall goodness of fit. The decision rule for this test is centered on the probability of the chi-square statistic. As Huang et al. (2024) clarify, a model is considered valid and a good fit for the data if the probability chi-square value is greater than the alpha level of 0.05. A non-significant result (p > 0.05) is the desired outcome, as it indicates that the model's predictions do not significantly deviate from the observed data, thereby supporting the model's validity. Conversely, a significant result (p < 0.05) would suggest a poor fit, indicating that the model is not accurately capturing the underlying data-generating process. The results of the Hosmer-Lemeshow goodness-of-fit test for this study are presented below.

Table 4: Model Fit Test

Test Result	Score
Number of observations	176
Number of groups	10
Hosmer–Lemeshow chi2(8)	9,26
Prob > chi2	0,3209

Table 4 presents the results of the model fit test using the Hosmer–Lemeshow goodness-of-fit statistic. Based on 176 observations divided into 10 groups, the Hosmer–Lemeshow chi-square value is 9.26 with a corresponding probability value of 0.3209. Since this p-value is well above the conventional significance level of 0.05, the null hypothesis cannot be rejected, indicating no statistically significant difference between the predicted probabilities from the logistic regression model and the observed outcomes. This result confirms that the model fits the data adequately and provides a reliable representation of the underlying empirical relationships. Consequently, the significant effects identified for Financial Stability, Financial Target, Change of Auditor, Related Party Transactions, and Change of Directors on the likelihood of fraudulent financial reporting are supported by the overall goodness of fit, reinforcing the robustness and credibility of the model's conclusions.

3.5. Discussion

The results of this study provide nuanced empirical support for the Fraud Hexagon theory in explaining fraudulent financial reporting (FFR). Among the ten explanatory variables examined, only five, Financial Stability (FS), Financial Target (FT), Change of Auditor (CA), Related Party Transactions (RPT), and Change of Directors (CD), demonstrate statistically significant relationships with FFR. This finding underscores the idea that fraud is not driven by a single factor but rather by a selective interaction of pressure, opportunity, capability, and collusion elements, which may vary depending on institutional and regulatory contexts.

The strong positive effect of Financial Stability and Financial Target highlights the central role of financial pressure in motivating fraudulent behavior. Companies facing declining financial conditions or aggressive earnings targets may experience increased incentives to manipulate financial statements to maintain investor confidence or meet contractual obligations. This evidence is consistent with agency theory, which suggests that managers may act opportunistically when their personal interests conflict with those of shareholders. Prior empirical studies, including Hudayati et al. (2022), Putra (2022), and Snoussi et al. (2025), similarly document that financial pressure significantly increases the likelihood of financial statement fraud. These results reinforce the relevance of the pressure dimension of the Fraud Hexagon as a dominant driver of FFR.

The finding of a significant positive impact of the change of Auditor supports the argument that auditor switching can serve as a red flag for fraudulent behavior. Frequent changes in external auditors may indicate management's intention to reduce audit scrutiny or to avoid the continuation of audit procedures that could reveal irregularities. By changing auditors, management may seek a less rigorous examination or take advantage of the new auditor's limited familiarity with the company, thereby increasing opportunities for fraud. This result is consistent with prior studies by Pamungkas et a. (2025), Bader et al. (2024), and Khaminy et al. (2022), which suggest that auditor changes are often associated with higher fraud risk and weaker monitoring mechanisms. Within the Fraud Hexagon framework, this finding

strengthens the opportunity dimension, indicating that disruptions in external oversight due to auditor changes create conditions that facilitate fraudulent activities.

Change of Directors is also positively associated with FFR, highlighting the critical role of managerial capability and authority in facilitating fraudulent actions. Turnover at the director level may bring in individuals who possess the skills, experience, and power necessary to override internal controls and to rationalize fraudulent behavior. Such changes can weaken governance continuity and create an environment in which fraud becomes easier to initiate and conceal. This finding supports the capability element of the Fraud Hexagon framework proposed by Lin et al. (2022) and is consistent with prior studies by Mandal & Amilan (20024) and Serrano et al. (2025). These studies emphasize that fraud is more likely to occur when individuals in key managerial positions have both the competence and the authority to exploit opportunities for wrongdoing. Therefore, changes in directors should be viewed as an important risk factor in assessing the likelihood of financial statement fraud.

In contrast to much of the prior literature, Related Party Transactions (RPT) in this study exhibit a significant negative relationship with Financial Fraud Risk (FFR). This finding suggests that a higher level of RPT is associated with a lower likelihood of financial statement fraud. Such a result is noteworthy, as RPTs are commonly perceived as mechanisms that increase opacity and provide opportunities for managerial opportunism. Previous studies, including Zimon et al. (2021) and Khuong et al. (2024), argue that RPTs are frequently used as tools for earnings management and tunneling activities, particularly in environments characterized by weak monitoring and poor governance. In those contexts, RPTs enable the transfer of resources for the benefit of controlling parties, thereby increasing the risk of fraud. Consequently, the dominant view in the literature assumes a positive association between RPTs and fraudulent behavior.

However, the negative coefficient observed in this study may reflect the impact of stricter disclosure requirements and improvements in corporate governance practices. Enhanced regulatory oversight and mandatory transparency may have limited the opportunistic use of RPTs, making such transactions more visible and easier to scrutinize by regulators, auditors, and other stakeholders (Bello & Kabara, 2025). As a result, the potential for RPTs to be used as concealment mechanisms for fraud may have diminished. Under these conditions, RPTs may function primarily as efficiency-driven and transparent business transactions rather than as instruments of manipulation. This interpretation is consistent with the findings of Mishra et al. (2025), who report inverse or insignificant relationships between RPTs and fraud in settings with strong regulatory enforcement. Therefore, the role of RPTs in influencing fraud risk appears to be highly context-dependent, shaped by the strength of institutional and governance frameworks.

The insignificance of variables such as External Pressure (EP), Ineffective Monitoring (IM), Audit Committee (AC), CEO Education (CeD), and CEO Duality with Ultimate Ownership (CeDU) indicates that not all components of the Fraud Hexagon framework have equal explanatory power in detecting Financial Fraud Risk (FFR). This result suggests that the influence of certain fraud-related factors may not be universally observable across different organizational or institutional settings, highlighting the context-specific nature of fraud detection. These findings imply that the effectiveness of commonly used fraud proxies depends heavily on environmental, regulatory, and organizational contexts. In some settings, external pressure or governance structures such as board oversight, audit committee, CEO Education, and CEO duality may be formally present but functionally ineffective in influencing managerial behavior. As a result, their impact on fraud risk may not be adequately captured through quantitative proxies alone. Consistent with this interpretation, prior studies by Guptam (2024), Gajda (2024), and Kassem (2022) report mixed and inconclusive evidence regarding governance-related variables. Their findings suggest that while governance mechanisms are designed to mitigate fraud, their actual effectiveness varies widely depending on how they are implemented and enforced in practice.

Finally, the satisfactory results of the Hosmer–Lemeshow goodness-of-fit test confirm that the regression model adequately represents the observed data. The non-significant chi-square value indicates that the predicted probabilities are consistent with actual outcomes, lending credibility to the model's explanatory power. This aligns with Saqret al. (2025) and reinforces confidence that the significant relationships identified are not spurious but reflect meaningful patterns within the data. Overall, this study extends prior fraud literature by demonstrating that while the Fraud Hexagon provides a comprehensive theoretical framework, only selected elements are empirically dominant in explaining fraudulent financial reporting. The findings suggest that regulators, auditors, and investors should place greater emphasis on financial pressure indicators and structural changes in management and auditing when assessing fraud risk. Future research is encouraged to explore moderating variables such as regulatory quality, ownership structure, and cultural factors to further refine the predictive power of the Fraud Hexagon model.

4. Conclusion

The empirical findings of this study provide strong but selective support for the Fraud Hexagon theory as an explanatory framework for fraudulent financial reporting. The results demonstrate that elements related to Pressure, Rationalization, and Capability are the most powerful and consistent predictors of fraud within the observed context. Financial Stability and Financial Target emerge as the most dominant pressure-related factors, indicating that firms experiencing financial instability or facing aggressive performance targets are significantly more likely to engage in fraudulent reporting. The magnitude of these effects underscores how financial distress and target-driven corporate cultures create extreme managerial pressure, encouraging earnings manipulation as a means of preserving reputation, meeting contractual obligations, and securing personal incentives. These findings align closely with agency theory, suggesting that when monitoring is imperfect and incentives are misaligned, managers may prioritize self-interest over shareholder value. In addition, the significance of auditor changes as a proxy for Rationalization highlights how management strategically reduces external scrutiny by engaging in opinion shopping, thereby normalizing unethical behavior under the guise of legitimate business decisions. The Capability element, reflected through changes in directors, further confirms that organizational transitions represent periods of heightened vulnerability, during which individuals with sufficient authority and expertise can exploit weakened governance structures to initiate or conceal fraudulent schemes.

Conversely, several elements of the Fraud Hexagon—namely Opportunity, Arrogance, and External Pressure—do not exhibit a statistically significant relationship with fraudulent financial reporting, raising important governance and methodological implications. The insignificance of audit committees and independent commissioners suggests that formal governance mechanisms may function symbolically rather than substantively, lacking the practical authority to deter determined and capable management. Similarly, the absence of significance for CEO education and CEO duality implies that arrogance, as a psychological construct, may not be adequately captured through demographic or structural proxies alone. The most unexpected finding relates to Related Party Transactions, where higher RPT intensity is associated with a lower probability of fraud, contradicting theoretical expectations of collusion. This anomaly likely reflects contextual factors, such as heightened regulatory scrutiny or disclosure requirements, or limitations in the proxy's ability to distinguish opportunistic from legitimate transactions. Overall, this study contributes to the literature by empirically validating key components of the Fraud Hexagon in an emerging market setting while simultaneously challenging assumptions about governance effectiveness and proxy measurement. The

findings suggest that fraud prevention efforts must move beyond formal compliance and focus more deeply on financial pressures, managerial incentives, organizational change, and contextual governance dynamics to enhance the integrity of financial reporting.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/ or publication of this article.

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References

[1] Achmad, T., Ghozali, I., & Pamungkas, I. D. (2022). Hexagon fraud: Detection of fraudulent financial reporting in state-owned enterprises in Indonesia. Economies, 10(1), 13. https://doi.org/10.3390/economies10010013.
[2] Alatawi, O. D. (2025). Combating corruption and promoting economic resilience: Legal and institutional reform in Saudi Arabia. Humanities and Social Sciences Communications, 12, Article 1597. https://doi.org/10.1057/s41599-025-05873-x.
[3] Al-Faryan, M. A. S. (2024). Agency theory, corporate governance and corruption: an integrative literature review approach. Cogent Social Sciences, 10(1). https://doi.org/10.1080/23311886.2024.2337893.
[4] Allen, D., Lim, W., Frankel, E., Simons, J., Siddarth, D., & Weyl, G. (2023). Ethics of decentralized social technologies: Lessons from Web3, the fediverse, and beyond. Edmond and Lily Safra Center for Ethics.
[5] AlWehaib, A. (2025). Comprehensive layered embezzlement and fraud model in financial crime prevention. Management & Knowledge Studies. https://doi.org/10.1515/mks-2025-0006.
[6] Aviantara, R. (2021). The Association Between Fraud Hexagon and Government's Fraudulent Financial Report. Asia Pacific Fraud Journal, 6(1), 26–42. https://doi.org/10.21532/apfjournal.v6i1.192.
[7] Bader, A. A., Abu Hajar, Y. A., Weshah, S. R. S., & Almasri, B. K. (2024). Predicting risk of and motives behind fraud in financial statements of Jordanian industrial firms using hexagon theory. Journal of Risk and Financial Management, 17(3), 120. https://doi.org/10.3390/jrfm17030120.
[8] Barry, E. S., Merkebu, J., & Varpio, L. (2022). State-of-the-art literature review methodology: A six-step approach for knowledge synthesis. Perspectives on Medical Education, 11(5), 281–288. https://doi.org/10.1007/S40037-022-00725-9.
[9] Baatwah, S. R., & Abdul Wahab, E. A. (2025). Investigating the role of interchangeable auditor positions: Does swapping hats impact audit quality? Managerial Auditing Journal, 40(5), 520–550. https://doi.org/10.1108/MAJ-05-2024-4332.
[10] Bello, K., & Kabara, A. S. (2025). Impact of related party transactions and off-balance sheet items on earnings management of listed deposit money banks in Nigeria. Kebbi Journal of Accounting Research (KEJAR), 1(2). https://kejar.com.ng/index.php/kejar/article/view/13.
[11] Benzaken, D., Adam, J. P., Virdin, J., & Voyer, M. (2024). From concept to practice: Financing sustainable blue economy in small island developing states, lessons learnt from the Seychelles experience. Marine Policy, 163, 106072. https://doi.org/10.1016/j.marpol.2024.106072.
[12] Bouteska, A., & Mili, M. (2022). Does corporate governance affect financial analysts' stock recommendations, target prices accuracy and earnings forecast characteristics? An empirical investigation of US companies. Empirical Economics, 63(5), 2125–2171. https://doi.org/10.1007/s00181-022-02297-3.
[13] Broye, G., & Johannes, P. (2021). Determinants of audit committee effectiveness: Reviewing a decade of empirical research. Accounting Auditing Control, 27(1), 51–109. https://doi.org/10.3917/cca.271.0051.
[14] Chappidi, S., Cobbe, J., Norval, C., Mazumder, A., & Singh, J. (2025). Accountability Capture: How Record-Keeping to Support AI Transparency and Accountability (Re)shapes Algorithmic Oversight. Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society, 8(1), 554-566. https://doi.org/10.1609/aies.v8i1.36570.
[15] Deng, Y., Di Vaio, A., & Ong, T. S. (2025). Corporate social responsibility or strategic opportunism? Evidence from high and new technology firms. Corporate Social Responsibility and Environmental Management. https://doi.org/10.1002/csr.70252.
[16] Ding, W., Chen, K., & Tian, G. (2025). Litigation risk and key audit matter disclosures: Evidence from a quasi-natural experiment in China. Accounting & Finance. https://doi.org/10.1111/acfi.70131.
[17] Erkan, D., Warsilah, H., & Cahyarini, S. Y. (2025). Community responses in a contested mining landscape: Perceptions and power in Belitung, Indonesia. Resources Policy, 111, 105785. https://doi.org/10.1016/j.resourpol.2025.105785.
[18] Gajda, W. (2025). Legal foundations for developing anti-fraud policies in enterprises: Challenges and perspectives. Public Administration and Law Review, 2(22), 90–98. https://doi.org/10.36690/2674-5216-2025-2-90-98.
[19] Gupta, D. (2024). Corporate governance and the prevention of fraud: An analytical study. International Journal of Multidisciplinary Research and Education, 4(2). https://doi.org/10.70454/IJMRE.2024.40205.
[20] Gustiana, A., & Nasrudin. (2021). Evaluating financial system stability using heatmap from aggregate financial stability index with change point analysis approach. Asia-Pacific Financial Markets, 28, 367–396. https://doi.org/10.1007/s10690-020-09326-0.
[21] Hasnan, S., Mohd Razali, M. H., & Mohamed Hussain, A. R. (2021). The effect of corporate governance and firm-specific characteristics on the incidence of financial restatement. Journal of Financial Crime, 28(1), 244–267. https://doi.org/10.1108/JFC-06-2020-0103.
[22] Hosseinkhani, N. (2025, August 21). Green finance and the circular economy transition: Policy frameworks, financial instruments, and impact metrics. SSRN. https://doi.org/10.2139/ssrn.5448317.
[23] Huang, L., Yu, L., & Huang, W. (2025). The effect of leverage manipulation on real estate firms' financial risk: Based on the interest conflicts perspective. PLOS ONE. https://doi.org/10.1371/journal.pone.0330709.
[24] Hudayati, A., Nisa, T. K., & Sanusi, Z. M. (2022). Financial pressure and related party transactions on financial statement fraud: Fraud triangle perspective. International Journal of Business and Emerging Markets, 14(2), 213–230. https://doi.org/10.1504/IJBEM.2022.121903.
[25] Khamainy, A. H. ., Amalia, M. M. ., Cakranegara, P. A., & Indrawati, A. (2022). Financial Statement Fraud: The Predictive Relevance of Fraud Hexagon Theory. JASF: Journal of Accounting and Strategic Finance, 5(1), 110–133. https://doi.org/10.33005/jasf.v5i1.249.
[26] Kassem, R. (2022). Elucidating corporate governance's impact and role in countering fraud. Corporate Governance, 22(7), 1523–1546. https://doi.org/10.1108/CG-08-2021-0279.
[27] Khuong, V. N., Nguyen, T. L., Le, H. T. A., & Bui, T. N. D. (2024). Related party transactions, accrual-based earnings management and real activities earnings management in emerging market. Pacific Accounting Review, 36(1), 60–76. https://doi.org/10.1108/PAR-08-2022-0112.
[28] Lan, T., & Rao, Y. (2025). Financial fraud in Chinese accounting firms explained by fraud hexagon theory. Multidisciplinary Science Journal, 7(12), 2025579. https://doi.org/10.31893/multiscience.2025579.
[29] Lartey, P. Y., Akolgo, I. G., Jaladi, S. R., Ayeduvor, S., & Afriyie, S. O. (2023). Recent advances in internal control: Soft control overcoming the limits of hard control. Foundations of Management and Business, 4(1). https://doi.org/10.25082/FMB.2023.01.004.
[30] Lin, B., Huang, J., Liao, Y., Liu, S., & Zhou, H. (2022). Why do employees commit fraud? Theory, measurement, and validation. Frontiers in Psychology, 13, Article 1026519. https://doi.org/10.3389/fpsyg.2022.1026519.

[31] Mandal, A., & Amilan, S. (2024). Fathoming fraud: Unveiling theories, investigating pathways and combating fraud. Journal of Financial Crime, 31(5), 1106–1125. https://doi.org/10.1108/JFC-06-2023-0153.
[32] Mishra, R. K., Kwabi, F. O., & Chandra, A. (2025). Corporate social responsibility, related party transaction and earnings management: Evidence from India. Journal of Business Ethics, 201, 331–369. https://doi.org/10.1007/s10551-025-05932-y.
[33] Nasir, M., Simsek, S., Cornelsen, E., Ragothaman, S., & Dag, A. (2021). Developing a decision support system to detect material weaknesses in internal control. Decision Support Systems, 151, 113631. https://doi.org/10.1016/j.dss.2021.113631.
[34] Nejad, M., Khan, A. S., & Othman, J. (2024). A panel data analysis of the effect of audit quality on financial statement fraud. Asian Journal of Accounting Research, 9(4), 422–445. https://doi.org/10.1108/AJAR-04-2023-0112.
[35] Nugroho, D. S., & Diyanty, V. (2022). Hexagon fraud in fraudulent financial statements: The moderating role of audit committee. 19(1). https://doi.org/10.21002/jaki.2022.03.
[36] Pamungkas, I. D., Oktafiyani, M., Swatyayana, P. A., Kurniawati, R., Putri, A. A., & Alfared, M. A. A. (2025). Can corporate governance structures reduce fraudulent financial reporting in the banking sector? Insights from the fraud hexagon framework. Journal of Risk and Financial Management, 18(12), 698. https://doi.org/10.3390/jrfm18120698.
[37] Potthoff, S., Gather, J., Hempeler, C., Gieselmann, A., & Scholten, M. (2022). "Voluntary in quotation marks": A conceptual model of psychological pressure in mental healthcare based on a grounded theory analysis of interviews with service users. BMC Psychiatry, 22, 186. https://doi.org/10.1186/s12888-022-03810-9.
[38] Putra, W. M. (2022). The effect of corporate financial pressure on financial statement fraud during the COVID-19 pandemic. In Proceedings of the International Conference on Sustainable Innovation Track Accounting and Management Sciences (ICOSIAMS 2021) (Advances in Economics, Business and Management Research). https://doi.org/10.2991/aebmr.k.211225.018.
[39] Rahayu, D. P., Faisal, F., Yokotani, Y., et al. (2025). The semiotics of extractive legality: Symbolic law and tin mining governance in Indonesia. International Journal for the Semiotics of Law. https://doi.org/10.1007/s11196-025-10354-0.
[40] Saqr, M., López-Pernas, S., & Tikka, S. (2026). Mapping relational dynamics with transition network analysis: A primer and tutorial. Advanced learning analytics methods. Springer. https://doi.org/10.1007/978-3-031-95365-1_15.
[41] Serrano, J., Delgado Rodríguez, M. J., Rodríguez Iglesias, I., & López Pérez, R. M. (2025). Misappropriation of assets: A quantitative and qualitative analysis of occupational fraud management in organizations. Journal of Financial Crime, 32(5), 994–1013. https://doi.org/10.1108/JFC-01-2025-0016.
[42] Singh, R., Gupta, C. P., & Chaudhary, P. (2024). Defining return on assets (ROA) in empirical corporate finance research: A critical review. Empirical Economics Letters.
[43] Snoussi, S., Salem, F. N., & Taktak, N. B. (2025). Impact of pressures on the detection of financial statement fraud risk. Corporate Ownership & Control, 22(2), 34–40. https://doi.org/10.22495/cocv22i2art3.
[44] Thamlim, W., & Reskino. (2023). Fraudulent Financial Reporting with Fraud Pentagon Perspective: The Role of Corporate Governance as Moderator. American Journal of Humanities and Social Sciences Research (AJHSSR), 07(01), 18–38.
[45] Zimon, G., Appolloni, A., Tarighi, H., Shahmohammadi, S., & Daneshpou, E. (2021). Earnings management, related party transactions and corporate performance: The moderating role of internal control. Risks, 9(8), 146. https://doi.org/10.3390/risks9080146.