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FRAUD HEPTAGON FACTORS AND FINANCIAL STATEMENT FRAUD: EMPIRICAL EVIDENCE FROM CONSUMER CYCLICALS FIRMS

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Abstract
This study examines the effect of the Fraud Heptagon elements on Financial Statement Fraud in Consumer Cyclicals sector companies listed on the Indonesia Stock Exchange during 2021–2024. Using the purposive sampling method, 29 companies were selected, resulting in 116 panel data observations analyzed through panel data regression. The result show that Financial Target (ROA) negatively affects financial statement fraud, while External Pressure (LEVERAGE) and Change in Director (CID) have positive effects. In contrast, Financial Stability (ACHANGE), Personal Financial Need (OSHIP), Greed, Ideal Conditions of the Company (NOI), and Frequent Number of CEO Pictures (CEOPIC) show no significant effect. Ignorance and Effective Monitoring (BDOUT) negatively affect fraud, indicating that awareness and good supervision reduce manipulations risks. Meanwhile, Change in Auditor (CHAUD) positively influence fraud, suggesting that auditor changes may create opportunities for misconduct. Overall, the findings highlight that not all Fraud Heptagon elements significantly affect financial statement fraud. However, governance quality, leadership stability, and external oversight remain crucial in preventing fraudulent financial reporting.

Keywords: Fraud Heptagon, Financial Statement Fraud, Corporate Governance, External Pressure, Auditor Change

1. Introductions

Financial statement fraud is the intentional misrepresentations or omission of important data in financial reports to deceive users (Permatasari & Laila, 2021). Although it occurs less often than asset misappropriations or corruptions, it causes significantly higher financial losses, often in the hundreds of thousands of dollars (ACFE, 2022).

Financial statement fraud often arises when management face strong pressure to satisfy the expatiations of shareholders, creditors, and the capital market (Jao et al., 2020). In response, managers may manipulate earnings or engage in window-dressing practice to improve the appearance of financial result (Anggraini et al., 2023). With substantial authority, top executives also have the ability to alter reported assets, revenues, or liabilities, potentially misleading users of financial information's (Hudaya et al., 2021). The table below illustrates values fluctuations among selected Consumer Cyclicals companies listed on the Indonesia Stock Exchange from 2021 - 2024:

Table 1. Fraud Heptagon Fluctuations in the Consumer Cyclicals Sector

Sector	2021	2022	2023	2024
INDS	0.76	0.72	1.18	0.54
SMSM	0.42	0.62	0.36	0.66

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Sector	2021	2022	2023	2024
WOOD	2.38	0.20	0.84	0.29
TFCO	0.56	1.13	1.07	1.43
IDEA	2.34	0.28	1.78	0.32

Table 1 shows that the fraud heptagon values of five consumer cyclicals companies INDS, SMSM, WOOD, TFCO, and IDEA fluctuated from 2021 to 2024. The fraud heptagon measures potential fraud risk based on seven factors: pressure, opportunity, rationalizations, competence, arrogance, collusion, and capability (Marks, 2012). INDS exhibited a declining trend, peaking at 1.18 in 2023 and dropping to 0.54 in 2024, indicating stronger internal controls or lower financial pressure.

SMSM stayed stable at 0.36 and 0.66, indicating moderate fraud risk. WOOD and IDEA showed strong volatility high in 2021, dropping in 2022, and rising again in 2023 reflecting sensitivity to operational and external pressures. TFCO rose steadily from 0.56 to 1.43, suggesting increasing fraud risk tied to financial pressure or weaker controls. Overall, fraud risk in the consumer cyclicals sector appears dynamic and influenced by operational and environmental factors.

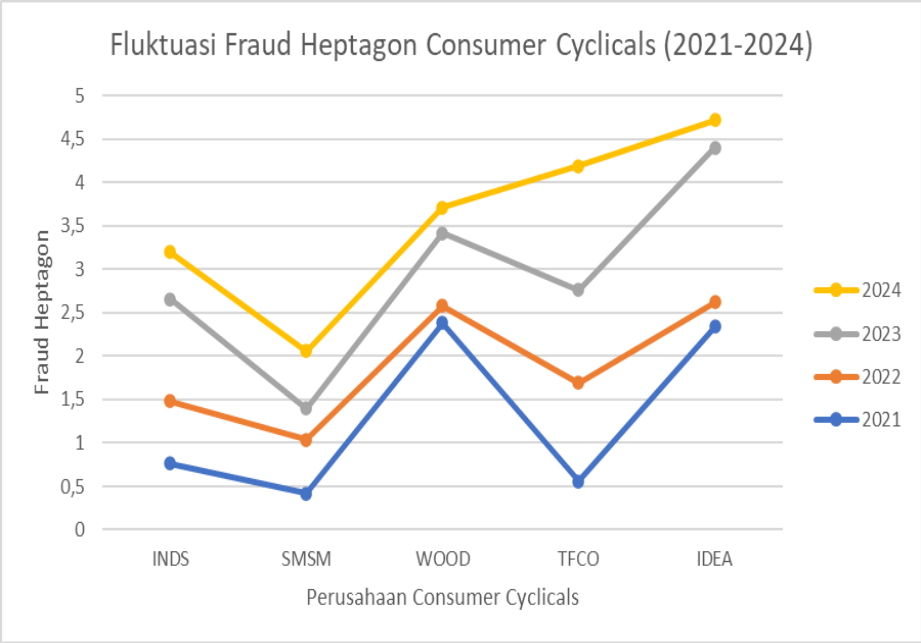

Figure 1. Graph of Fraud Heptagon Fluctuations in the Consumer Cyclicals Sector (2021–2024)

Source: Data processed from the annual financial reports of companies in the Consumer Cyclicals sector (2021–2024).

Figure 1 shows the fraud heptagon trend over four years in consumer cyclicals Companies in the consumer cyclicals sector exhibited notable fluctuations in fraud risk. WOOD and IDEA initially recorded high fraud levels, which dropped sharply in 2022. This decline is likely attributable to internal restructuring or enhanced governance, which reduced opportunities for fraud (Tessa & Harto, 2016).

In contrast, TFCO shows a consistent rise in fraud risk over the period, indicating growing financial pressure or weakening internal controls. This trend aligns with the Fraud Heptagon's emphasis on pressure, opportunity, and rationalization as key drivers of misconduct (Marks, 2012). Conversely, INDS and SMSM demonstrated relative stability, suggesting effective and consistent risk management practices that mitigated external market or macroeconomic influences (Albrecht et al., 2011).

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Figure 1 reinforces the insights from Table 1, illustrating that fraud risk varies significantly across firms and years within the sector. This variability underscores the necessity for adaptable internal controls and stronger ethical governance (Dorminey et al., 2012). Continuous monitoring of all seven heptagon factors pressure, opportunity, rationalization, competence, arrogance, ignorance, and greed is essential to maintain transparent and reliable financial reporting.

Compared to Cressey's Fraud Triangle, which focuses on three core elements, the Fraud Heptagon offers a broader and more nuanced explanation of complex fraudulent behavior in this dynamic sector (Sutrisno & Anwari, 2023). The literature on financial stability and fraud presents mixed findings. Some studies link instability to increased fraud pressure (Listianto & Muniroh, 2024), while others find that stability itself reduces fraud incentives (Septiani et al., 2025). Several reports indicate no significant relationship, highlighting that governance quality and integrity may be stronger determinants (Wardani & Ratnasari, 2023).

External pressures, such as high financial leverage, are theoretically expected to elevate fraud risk (Aulia et al., 2024). However, empirical evidence is inconsistent, as robust internal controls and effective audits can offset this pressure (Huang et al., 2025). Similarly, while personal financial need may motivate manipulation (Fadrul et al., 2021), many studies show no significant impact, particularly in contexts where insider ownership aligns managerial interests with those of shareholders (Jurnal Machung, 2023).

Director turnover can elevate fraud risk by creating transitional challenges and oversight gaps (Sihombing & Panggulu, 2022). Conversely, some findings suggest that leadership changes may strengthen governance through fresh perspectives and renewed oversight (Jurnal Stekom, 2022). Ignorance, or a lack of understanding of reporting rules, can influence fraud (Smith, 2021), though several studies indicate it is less influential than direct pressure or rationalization (Lubis & Wulandari, 2022). Greed is often linked to higher fraud risk (Jurnal Akuntansi, 2025); however, ambitious leaders may also act to protect long-term corporate reputation, thereby reducing fraudulent tendencies (IBIK Journals, 2025; Dinasti International Journals, 2025).

Monitoring by independent commissioners and audit committees is expected to reduce fraud (UMP Journals, 2024), but its effectiveness varies. In some cases, monitoring mechanisms are merely procedural (Masharif Al-Syariah, 2025), and fraud can persist when internal pressures or rationalizations dominate (Rayyan Journals, 2025). Changes in receivables or inventory relative to sales can indicate fraud opportunities within the Fraud Heptagon framework. Although the nature of an industry can raise fraud risk due to factors like uncollectible receivables (Jurnal UPY, 2023), some industries exhibit lower risk because stronger internal controls offset these inherent issues (APKE, 2025).

Auditor changes may increase fraud risk, as new auditors might miss earlier irregularities (UMA Journals, 2024). Yet, a change in auditor can also reduce fraud when it improves governance through mandatory rotation or enhances audit quality (Jurnal Akuntansi, 2025). Finally, frequent CEO appearances in media or reports may signal arrogance and higher fraud potential (UAJY, 2025). Conversely, a highly visible CEO may act more cautiously under public and stakeholder scrutiny, potentially lowering fraud risk (UNDIP, 2023).

2. Theoretical Background

2.1 Agency Theory (Grand Theory)

Agency theory, as proposed by Jensen and Meckling (1976), describes the inherent conflict of interest that arises when managers (agents) act on behalf of shareholders

(principals). This separation of ownership and control creates a situation where managers may prioritize personal benefits over shareholder wealth maximization, especially when monitoring mechanisms are weak (Ujiyantho & Pramuka, 2007). In such contexts, the self-interest of agents can manifest in financial statement manipulation to portray superior performance, thereby creating opportunities for fraud.

2.2 Fraud Heptagon

Building upon foundational models like Cressey's (1953) Fraud Triangle and Wolfe and Hermanson's (2004) Fraud Diamond, the Fraud Heptagon (Lou & Wang, 2011) offers a more comprehensive framework for understanding fraudulent behavior. It expands the analysis to seven interconnected drivers: pressure, opportunity, rationalization, capability, collusion, ego, and arrogance. This model provides a broader perspective by integrating financial, psychological, and behavioral factors that collectively influence the propensity for fraud.

2.3 Financial Target

Financial targets impose performance pressure on management to achieve goals set by leadership or stakeholders. Return on Assets (ROA) calculated as Net Income divided by Total Assets is a key metric for assessing how efficiently a company utilizes its assets to generate profit (Skousen et al., 2009). It is frequently used to evaluate managerial performance and determine incentive structures such as bonuses (Daromes & Jao, 2020). Consequently, companies with high ROA expectations may be more inclined to engage in earnings management to meet forecasts or sustain prior performance levels.

2.4 Financial Stability

Financial stability refers to a company's ability to operate smoothly and meet its financial obligations consistently (Permatasari, 2019). A stable firm can cover routine expenses, unexpected costs, and future investments, thereby bolstering its reputation among investors and creditors. However, companies experiencing financial distress may resort to presenting an artificially robust financial position to conceal underlying weaknesses (Sasongko & Wijayantika, 2019).

2.5 External Pressure

External pressure is a critical antecedent of fraud, arising from excessive demands by third parties such as creditors, investors, or regulators. This pressure compels management to meet specific expectations, which can trigger fraudulent financial reporting. As outlined in Statement on Auditing Standards (SAS) No. 99, excessive external pressure constitutes a significant fraud risk factor, often proxied by financial ratios like the debt-to-asset ratio (LEVERAGE) (Nuryuliza & Triyanto, 2019).

2.6 Personal Financial Need

Personal Financial Need reflects the influence of executives' personal financial interests on corporate decision-making (Kurniawati Laurensia, 2014). It is commonly measured by the proportion of shares owned by management relative to total outstanding shares (OSHIP) (Purnama & Astika, 2022). When executives hold substantial ownership, their personal wealth becomes directly tied to the company's stock performance, potentially aligning or conflicting with shareholder interests (Skousen et al., 2009).

2.7 Change in Directors

A change in directors represents a shift in leadership authority and strategic direction, often initiated to enhance organizational performance. However, such transitions can create temporary governance voids and increase pressure, thereby elevating fraud risk (Wolfe & Hermanson, 2004). Since directors oversee critical policies, their replacement might be exploited to remove individuals aware of existing irregularities. Empirical studies by Jannah and Rasuli (2021) and Alfarago and Mabrur (2022) associate director changes with a higher likelihood of financial statement fraud.

2.8 Ignorance

Organizational ignorance refers to a condition where relevant knowledge is disregarded or underdeveloped, either intentionally or unintentionally. Jalonen (2023) categorizes ignorance as limited or widespread and intentional or unintentional. Furthermore, Schwarzkopf (2019) notes that information overload can paradoxically foster ignorance, as critical signals may be obscured by excessive data.

2.9 Greed

Greed characterizes executive behavior driven by the pursuit of short-term personal gain, often at the expense of long-term shareholder value. Jebran, Chen, and Cai (2022) found that greedy CEOs tend to adopt aggressive corporate policies, while Rehman and Hamdan (2023) observed that CEO greed negatively impacts corporate social responsibility (CSR) performance.

2.10 Effective Monitoring

Effective monitoring entails the vigilant oversight performed by internal supervisory units, such as the board of commissioners and audit committee. Statement on Auditing Standards (SAS) No. 70 highlights that fraud risk increases when management is dominated by a single individual or a small group without adequate counterbalancing controls (Wicaksana, 2019). Thus, robust and independent monitoring is essential to mitigate such risks.

2.11 Ideal Conditions of the Company

The ideal condition of a company encompasses sound governance, transparency, competent leadership, and a strong internal control system. Kossek et al. (2017) discuss the evolution of the "ideal worker" concept towards "ideal working conditions" that balance organizational and employee interests. In the Indonesian context, research emphasizes that implementing Good Corporate Governance (GCG) practices is crucial for achieving and sustaining sound financial performance.

2.12 Change in Auditor

An auditor change occurs when a company appoints a new external audit firm, influenced by factors such as audit quality, cost, audit opinion, or management changes. Beattie and Fearnley (1995) established a positive relationship between changes in financial managers and auditor turnover. Similarly, Ningtiyas and Hariyanto (2024) demonstrated that management changes significantly affect auditor changes in Indonesia.

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2.13 Frequent Number of CEO Pictures

Frequent CEO turnover, characterized by repeated changes in a short period, often results from poor performance or internal conflicts. Jenter and Lewellen (2020) found that 38%–55% of CEO replacements are performance-driven. In Indonesia, Setiawan, Phua, and Trinugroho (2019) observed that company performance typically declines in the year of CEO replacement.

2.14 Research Hypotheses

1) H_1: The Effect of Financial Targets (X_1) on Financial Statement Fraud (Y) Within the Fraud Triangle framework, financial targets represent a primary source of pressure. Unrealistic targets may incentivize management to distort financial disclosures (Laili & Suwandi, 2021). However, strong internal oversight and a focus on long-term sustainability can mitigate this effect (Utami & Wardhani, 2019). H_1: Financial Targets positively affect Financial Statement Fraud.
2) H_2: The Effect of Financial Stability (X_2) on Financial Statement Fraud (Y) While rapid asset growth can create complexity that masks manipulation (Wardani & Ratnasari, 2023), stability alone may not be a decisive factor. Firms with robust internal controls can maintain integrity despite instability (Putri, 2020). H_2: Financial Stability has no significant effect on Financial Statement Fraud.
3) H_3: The Effect of External Pressure (X_3) on Financial Statement Fraud (Y) Excessive stakeholder expectations, often proxied by high leverage, increase the risk of covenant breaches and may drive management to inflate performance (Rahmawati & Hapsari, 2021; SAS No. 99). H_3: External Pressure positively affects Financial Statement Fraud.
4) H_4: The Effect of Personal Financial Need (X_4) on Financial Statement Fraud (Y) Significant managerial ownership (OSHIP) can create motives for profit manipulation (Lubis & Nurhayati, 2022). However, high personal integrity and strong governance can counteract this pressure (Sari & Nugraheni, 2020). H_4: Personal Financial Need does not significantly affect Financial Statement Fraud.
5) H_5: The Effect of Change in Directors (X_5) on Financial Statement Fraud (Y) Leadership transitions can create oversight gaps and increase fraud risk. While some view such changes as routine (Wulandari & Prasetyo, 2020), they can be exploited to conceal irregularities. H_5: Change in Directors positively affects Financial Statement Fraud.
6) H_6: The Effect of Ignorance (X_6) on Financial Statement Fraud (Y) Ignorance, or a weak compliance culture, theoretically creates opportunities for manipulation (Wardani & Ratnasari, 2023). Yet, resilient internal controls can prevent fraud even in neglectful environments (Sari & Wicaksono, 2020). H_6: Ignorance positively affects Financial Statement Fraud.
7) H_7: The Effect of Greed (X_7) on Financial Statement Fraud (Y) Unchecked greed can motivate data manipulation for personal gain (Fauzan & Dwiastuti, 2022). However, stringent controls and transparent audits can suppress this behavior (Hidayah & Pratomo, 2020). H_7: Greed positively affects Financial Statement Fraud.
8) H_8: The Effect of Effective Monitoring (X_8) on Financial Statement Fraud (Y) Independent monitoring (e.g., via BDOUT) is a governance pillar meant to deter fraud. However, factors like committee ineffectiveness can undermine its impact

(Pratiwi & Syafitri, 2020; Lestari & Fitri, 2022). H_8: Effective Monitoring negatively affects Financial Statement Fraud.

9) H_9: The Effect of Ideal Conditions of the Company (X_9) on Financial Statement Fraud (Y) Favorable conditions (NOI) should reduce pressure to deceive, especially under robust governance (Lestari & Fitri, 2022; Pratiwi & Syafitri, 2020). H_9: Ideal Conditions of the Company negatively affect Financial Statement Fraud.
10) H_{10}: The Effect of Change in Auditor (X_{10}) on Financial Statement Fraud (Y) Auditor changes, often linked to "opinion shopping," can increase fraud opportunities as new auditors may lack familiarity with historical reporting (Sari & Sukrisno, 2022; Rahmawati & Hapsari, 2021). H_{10}: Change in Auditor positively affects Financial Statement Fraud.
11) H_{11}: The Effect of Frequent Number of CEO Pictures (X_{11}) on Financial Statement Fraud (Y) Frequent CEO imagery may signal arrogance or narcissism, traits theoretically linked to a higher propensity for manipulation (Wardani & Ratnasari, 2023). However, a strong ethical culture can mitigate this risk (Pratiwi & Syafitri, 2020). H_{11}: Frequent Number of CEO Pictures positively affects Financial Statement Fraud.

3. Method

This study uses a quantitative approach with secondary data from the annual reports of consumer cyclicals companies listed on the Indonesia Stock Exchange (IDX) during the period 2021-2024.

Table 2. Sampling Criteria

No	Information	Amount
1	Consumer Cyclicals companies listed on the IDX (2021-2024)	154
2	Less: Companies that did not publish complete annual reports (2021-2024)	(13)
3	Less: Companies that did not generate profits (incurred losses) during the period	(78)
4	Less: Companies that did not have accounts receivable during the period	(0)
	Final number of companies (firms) used	29
	Year of observations (period)	4
	Total number of observations (samples)	116
Note: The table outlines the purposive sampling process applied to determine the final research sample of firms in the consumer cyclicals sector on the Indonesia Stock Exchange (IDX) from 2021 to 2024.		

Source: Processed data from IDX and company annual reports (2025)

Table 3. Operational Definitions of Research Variables

No	Variable	Definition	Operational Indicator	Measurement Scale
1	F-Score (Y)	A composite measure of financial statement fraud risk, derived from accrual quality and financial performance metrics	F-Score = Accrual Quality + Financial Performance Accrual Quality = (ΔWC + ΔNCO + ΔFIN) / Average Total Assets Financial Performance =	Ratio

		(Dechow et al., 2011).	ΔReceivables + ΔInventory + ΔCash Sales + ΔEarnings	
2	Financial Target (X_1)	The profit objective set by management, representing the pressure element in fraud theory.	ROA = Net Income / Total Assets	Ratio
3	Financial Stability (X_2)	A condition describing the stability of a company's financial position from one period to the next.	ACHANGE = [Total Assets (t) – Total Assets (t-1)] / Total Assets (t-1)	Ratio
4	External Pressure (X_3)	Excessive pressure from external parties (e.g., creditors, investors) on management to meet specific targets.	LEVERAGE = Total Liabilities / Total Assets	Ratio
5	Personal Financial Need (X_4)	A condition where executives' personal financial situations may influence corporate financial decisions.	OSHIP = Number of Shares Held by Management / Total Outstanding Shares	Ratio
6	Change in Directors (X_5)	A change in board leadership, representing the capability or rati onalization factor for fraud.	Dummy variable: 1 if there is a director change in year t, 0 otherwise.	Nominal
7	Ignorance (X_6)	A condition where management shows disregard for ethical standards, internal controls, and governance.	IGNORANCE = Number of Governance Training Sessions Attended by BoD / Total Number of BoD Members	Ratio
8	Greed (X_7)	An excessive drive by management for personal gain or wealth, which may incentivize manipulation.	GREED = Total Director Remuneration / Net Profit After Tax	Ratio
9	Effective Monitorin g (X_8)	The effectiveness of oversight by the board and audit committee. A lower	BDOUT = Number of Independent Commissioners / Total Number of Commissioners	Ratio

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		ratio suggests weaker monitoring.		
10	Nature of Industry (X_9)	An industry-specific condition related to receivables turnover, indicating potential opportunity for fraud.	NOI = [Receivables(t)/Sales(t)] – [Receivables(t-1)/Sales(t-1)]	Ratio
11	Change in Auditor (X_{10})	Auditor turnover, which may be used to conceal fraud or, conversely, improve audit quality.	Dummy variable: 1 if the company changed its auditor in year t, 0 otherwise.	Nominal
12	Frequent CEO Pictures (X_{11})	The frequency of CEO imagery in annual reports, proxying for managerial arroganc e or overconfidence.	Count of CEO photographs featured in the annual report.	Ratio
Note: WC = Working Capital; NCO = Net Non-Current Operating Assets; FIN = Net Financial Assets.				

Source: Adapted from Dechow et al. (2011); Vousinas (2019); and prior literature.

The data analysis techniques used in this study involve panel data regression with the assistance of the EViewss 12 program. The analysis begins with descriptive statistics to examine the distributions, mean, and variations of the data, followed by panel data regression estimations using the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). The best model was selected through Chow tests, Hausman tests, and Lagrange Multiplier (LM) tests. Before regression testing, classical assumptions tests were conducted in the form of multicollinearity and heteroscedasticity to ensure that there were no significant dilatations of regression assumptions. After the appropriate model was determined, the coefficient of determinations (R^2) was tested to assess the ability of the independents variables to explain the dependents variables, and hypothesis testing was performed using the t-test for individual effects and the F-test for the simultaneous effects of all independent's variables on the dependent's variables.

4. Result and Discussion

4.1 Descriptive Statistical Analysis

Table 4. Descriptive Statistics of Research Variables

Variable	Min	Max	Mean	Std. Dev.
F-Score (Y)	-4.7000	4.6800	0.320345	1.549055
ROA	0.0000	0.8000	0.077931	0.118520
ACHANGE	0.010276	0.049940	0.030478	0.011415
LEVERAGE	0.0700	1.0600	0.406742	0.210683
OSHIP	0.005941	0.219602	0.107514	0.062059
CID	0.0000	5.0000	2.465517	1.741718
IGNORANCE	0.0000	87.5000	36.39172	26.95676
GREED	0.0000	12.0000	0.349310	1.570050

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Variable	Min	Max	Mean	Std. Dev.
BDOUT	0.3300	2.0000	0.495259	0.223114
NOI	-1.0500	0.9300	-0.006034	0.178091
CHAUD	0.0000	5.0000	2.517241	1.633789
CEOPIC	0.0200	8.0000	2.845000	1.634129

Source: Processed data, EViews 12 (2025)

The descriptive statistics of all research variables are summarized in Table 1. The F-Score, serving as the dependent variable proxy for financial statement fraud (Y), exhibits a wide range from –4.7000 to 4.6800, with a mean of 0.320345 and a standard deviation of 1.549055. Among the independent variables, Financial Target (ROA) has a mean of 0.077931, while External Pressure (LEV) averages 0.406742. The governance and behavioral variables show considerable variation; for instance, Change in Directors (CID) ranges from 0 to 5, and the Ignorance Index has a high maximum value of 87.5000. The skewness and kurtosis values, coupled with Jarque-Bera probabilities close to 0.0000, indicate that the distributions of most variables deviate from normality, justifying the use of robust estimation techniques in subsequent analysis.

4.2 Selection of Panel Data Regression Model

A sequence of statistical tests was conducted to determine the most appropriate estimation model. The Chow test (Cross-section F test) yielded a probability value of 0.0000 (Table 2), leading to the rejection of the null hypothesis (H_0) and indicating that the Fixed Effects Model (FEM) is superior to the Common Effects Model (CEM).

Table 5. Chow Test (Cross-section F Test) Results

Effects Test	Statistic	d.f.	Prob.
Cross-section F	11.351850	(28, 41)	0.0000
Cross-section Chi-square	174.852263	28	0.0000
Note: H_0: Common Effect Model is appropriate. Prob. < 0.05 → Reject H_0, select Fixed Effect Model.			

Source: Processed data, EViews 12 (2025)

Subsequently, the Hausman test was performed to choose between FEM and Random Effects Model (REM). As shown in Table 3, the test result (Prob. = 0.8837 > 0.05) fails to reject H_0, suggesting that REM is more efficient and appropriate.

Table 6. Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.636252	11	0.8837
Note: H_0: Random Effect Model is appropriate. Prob. > 0.05 → Fail to Reject H_0, select Random Effect Model.			

Source: Processed data, EViews 12 (2025)

Finally, the Breusch-Pagan Lagrange Multiplier (LM) test was conducted to compare REM with CEM. Table 4 shows a significant LM statistic (Prob. = 0.0000), confirming that REM is preferred over CEM.

Table 7. Breusch-Pagan Lagrange Multiplier (LM) Test Results

Test Hypothesis	Breusch-Pagan Statistic	Prob.
H_0: Variances across entities are zero (CEM).	93.91462	0.0000
H_1: Variances across entities are not zero (REM).		

Source: Processed data, EViews 12 (2025)

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4.3 Classical Assumption Tests

Prior to regression analysis, the model was tested for key classical assumptions to ensure the validity and reliability of the estimation results. Two primary tests were conducted: the multicollinearity test and the heteroscedasticity test.

The multicollinearity test aims to detect high correlations among independent variables, which can inflate standard errors and make coefficient estimates unstable. Table 8 presents the correlation matrix for the independent variables. The results show that all pairwise correlation coefficients are below the common threshold of 0.80. The highest correlation observed is 0.194143 between GREED (Greed Index) and BDOUT (Effective Monitoring). This confirms the absence of severe multicollinearity, indicating that each independent variable provides unique information to the model.

Table 8. Results of Classical Assumption Tests

Test	Key Metric/Result	Threshold	Conclusion	Implication for Model
Multicollinearity Test (Correlation Matrix)	Highest correlation: 0.194143 (GREED & BDOUT). All other correlations <	0.80	No multicollinearity detected.	Independent variables are distinct; coefficient estimates are reliable and interpretable.
Heteroscedasticity Test (Glejser Approach)	All independent variables have Prob. > 0.05 (e.g., ROA: 0.2794, LEVERAGE: 0.0929, CHAUD: 0.1128).	0.05	Homoscedasticity is confirmed (no heteroscedasticity).	Residual variance is constant; OLS estimators are efficient and unbiased.

Source: Processed data, EViews 12 (2025)

Concurrently, the heteroscedasticity test was performed using the Glejser approach, which regresses the absolute residuals on the independent variables. The results, also summarized in Table 2, show that the probability values for all independent variables exceed the 0.05 significance level. For instance, LEVERAGE has a probability of 0.0929, and CHAUD has a probability of 0.1128. Since no variable significantly explains the variation in the absolute residuals, the null hypothesis of constant variance (homoscedasticity) is accepted.

The combined results from Table 2 affirm that the regression model satisfies the critical assumptions of no multicollinearity and homoscedasticity. This provides a solid foundation for proceeding with the interpretation of the regression coefficients in the subsequent hypothesis testing, as the estimates are deemed Best Linear Unbiased Estimators (BLUE).

4.4 Hypothesis Testing Results

The Random Effects Model (REM) was employed to test the research hypotheses. The overall model fit and the significance of individual predictors are summarized in Table 3. The F-statistic of 11.35185 with a probability of 0.000000 confirms that the set of independent variables, collectively derived from the fraud triangle and pentagon frameworks, has a statistically significant effect on the financial statement fraud proxy (F-Score) at the 5% significance level.

The model demonstrates strong explanatory power, with an R-squared value of 0.853486. This indicates that approximately 85.35% of the variation in the likelihood of financial statement fraud is explained by the eleven independent variables in the model.

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The Adjusted R-squared of 0.778301, which accounts for the number of predictors, remains high and suggests a robust model fit.

Table 9. Random Effects Model Regression and Hypothesis Testing Results

Aspect	Result	Statistical Value	Interpretation & Conclusion
Overall Model Fit (F-Test)	F-Statistic (Prob.)	11.35185 (0.000000)	The regression model is statistically significant (Prob. < 0.05). All independent variables jointly influence the dependent variable.
Explanatory Power	R-squared / Adj. R-squared	0.853486 / 0.778301	The model has very high explanatory power, accounting for ~85.35% of the variance in the F-Score.
Individual Variable Significance (t-Test at α=0.05)			
Constant	Coef. (Prob.)	-0.760344 (0.2595)	Not statistically significant.
ROA (Financial Target)	-0.497398 (0.6071)	H1 Not Supported. Financial targets do not significantly affect fraud.	
ACHANGE (Financial Stability)	0.970327 (0.9027)	H2 Not Supported. Financial stability does not significantly affect fraud.	
LEVERAGE (External Pressure)	1.873685 (0.0190)	H3 Supported. External pressure (leverage) has a positive and significant effect on fraud.	
OSHIP (Personal Financial Need)	0.595575 (0.6494)	H4 Not Supported. Personal financial need does not significantly affect fraud.	

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Aspect	Result	Statistical Value	Interpretation & Conclusion
CID (Change in Directors)	0.117267 (0.0163)	H5 Supported. Changes in directors have a positive and significant effect on fraud.	
IGNORANCE (Ignorance Index)	-0.000647 (0.8542)	H6 Not Supported. Ignorance does not significantly affect fraud.	
GREED (Greed Index)	0.076990 (0.2554)	H7 Not Supported. Greed does not significantly affect fraud.	
BDOUT (Effective Monitoring)	-0.960446 (0.1175)	H8 Not Supported. Effective monitoring does not have a significant deterrent effect.	
NOI (Nature of Industry)	-0.688988 (0.1346)	H9 Not Supported. Industry conditions do not significantly affect fraud.	
CHAUD (Change in Auditor)	0.102383 (0.0448)	H10 Supported. A change in auditor has a positive and significant effect on fraud.	
CEOPIC (Frequent CEO Pictures)	0.065512 (0.4898)	H11 Not Supported. CEO picture frequency does not significantly affect fraud.	
Dependent Variable: F-Score (Y). Estimation Method: Panel EGLS (Cross-section random effects).			

Source: Processed data, EViews 12 (2025)

Based on the t-test results for individual coefficients ($\alpha = 0.05$), three hypotheses are supported:

1) H3: External Pressure (LEVERAGE) has a positive and significant effect ($\beta = 1.8737$, $p = 0.0190$).
2) H5: Change in Directors (CID) has a positive and significant effect ($\beta = 0.1173$, $p = 0.0163$).

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3) H10: Change in Auditor (CHAUD) has a positive and significant effect (β = 0.1024, p = 0.0448).
4) Conversely, eight hypotheses (H1, H2, H4, H6, H7, H8, H9, H11) are not supported, as their probability values exceed 0.05. The final regression equation is as follows: F-Score = -0.760344 - 0.497398ROA + 0.970327ACHANGE + 1.873685LEVERAGE + 0.595575OSHIP + 0.117267CID - 0.000647IGNORANCE + 0.076990GREED - 0.960446BDOUT - 0.688988NOI + 0.102383CHAUD + 0.065512CEOPIC

5. Conclusion

This study aimed to analyze the determinants of financial statement fraud in the context of Indonesia's banking sector, specifically testing the integrated framework of the fraud triangle and fraud pentagon theories. Based on the analysis of panel data using the Random Effects Model, the research yielded the following conclusive answers to its objectives.

First, the overall model confirms that the confluence of factors from both theoretical frameworks provides a strong explanatory basis for fraudulent financial reporting, as evidenced by a highly significant F-statistic and a substantial R-squared of 0.8535. However, not all elements exert a direct, significant influence. Second, regarding individual determinants, the findings indicate a nuanced landscape. External pressure, proxied by high financial leverage (LEVERAGE), emerges as the most potent and significant driver of fraud, underscoring the critical role of intense financial and covenant-related stress in motivating misconduct. Furthermore, structural instability in governance and oversight also plays a crucial role. Both changes in directors (CID) and changes in auditors (CHAUD) were found to have a positive and significant effect, highlighting that periods of transition in key monitoring functions can create windows of opportunity for fraud.

Conversely, several hypothesized factors were found to be statistically insignificant in this specific sample. These include traditional fraud triangle elements like financial targets (ROA), financial stability (ACHANGE), and personal financial need (OSHIP), as well as fraud pentagon components such as ignorance, greed, the nature of the industry, the frequency of CEO pictures, and the measured level of effective monitoring (BDOUT). This suggests that in the studied environment, the pressures from external debt and the opportunities arising from governance flux are more immediate and salient triggers than internal performance pressures or certain behavioral traits, which may be mitigated by broader institutional or sector-wide controls.

Therefore, the primary theoretical implication is that while comprehensive, the fraud pentagon model's predictive power can be contingent. For stakeholders like regulators, auditors, and bank management, the practical implication is clear: enhanced, continuous, and transitional oversight is paramount. Supervisory focus should be intensively directed towards highly leveraged institutions and rigorously maintained during periods of board or auditor turnover to effectively mitigate fraud risk. Future research could explore these dynamics with alternative fraud proxies, a broader sample across sectors, or qualitative methods to deepen the understanding of the insignificance of the other factors.

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