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Fraud Heptagon Analysis in Detecting Fraudulent Financial Statements with the Whistleblowing System as a Moderating Variable (An Empirical Study on Consumer Cyclicals Sector Companies Listed on the Indonesia Stock Exchange, 2020–2024)

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ABSTRACT

This study examines the influence of the seven elements of the fraud heptagon pressure, opportunity, rationalization, capability, arrogance, ignorance, and greed on fraudulent financial statements, and tests whether the whistleblowing system (WBS) moderates these relationships. Using a quantitative associative design, the research analyzes panel data from 76 consumer cyclicals firms listed on the Indonesia Stock Exchange during 2020-2024 (380 firm-year observations) obtained through purposive sampling. Fraudulent financial statements were proxied by the Dechow F-Score, and the data were analyzed using panel-data regression and Moderated Regression Analysis with EViews 13. The results indicate that pressure, opportunity, rationalization, capability, and greed have a significant positive effect on fraudulent financial statements, whereas arrogance and ignorance do not. The whistleblowing system significantly moderates and weakens the effect of all seven heptagon elements, functioning as a quasi-moderator and confirming its role as a comprehensive internal-control mechanism.

INTRODUCTION

Organizations and companies are established with a vision and mission to enhance firm value and stakeholder trust, in part by issuing performance-accountability reports among them the financial statements that every entity is required to prepare for a given period. Financial statements also help a company strengthen its competitiveness in the business arena (Larum et al., 2021). However, the dynamic nature of business competition can give rise to criminal behavior in the form of fraud, one manifestation of which is fraud in financial statements (Gunawan & Tjandrawan, 2025).

Financial statements are prepared according to each country's standards, with reference to the International Financial Reporting Standards (IFRS). In Indonesia, the Statement of Financial Accounting Standards (PSAK), issued by the Indonesian Institute of Accountants (IAI), governs their preparation. High-quality financial statements are intended to add value, signaling to readers that the company is in good condition. Paradoxically, this very objective can motivate management to manipulate the statements so that the firm always appears to be performing well an act that constitutes fraud (Larum et al., 2021).

Fraud is a systemic threat to the integrity of financial reporting worldwide. According to the Occupational Fraud 2024: A Report to the Nations published by the Association of Certified Fraud Examiners (ACFE) the largest and most comprehensive study of its kind a total of 1,921 cases from 138 countries were analyzed, with aggregate losses exceeding USD 3.1 billion, or an average of USD 1.66 million per case. More alarmingly, the ACFE estimates that the typical organization loses roughly 5% of its annual revenue to fraud, and that the median time to detection reaches twelve months (ACFE, 2024). Within the ACFE fraud tree, financial-statement fraud occurs in only about 5% of cases yet carries the highest median loss (USD 766,000) nearly six times that of asset misappropriation underscoring that, although relatively rare, it is the most financially damaging category for firms, investors, creditors, and the capital market as a whole.

At the national level, the (ACFE Indonesia, 2025) survey records that corruption still dominates (47.6%), followed by financial-statement fraud (40.2%) and asset misappropriation (12.2%). The proportion of financial-statement fraud in Indonesia almost four times the global figure signals that the problem carries a far more serious dimension in the Indonesian capital-market context and demands urgent academic and policy attention. In 2023 alone, Indonesia recorded 791 fraud cases with potential losses of IDR 28.4 trillion, and scored only 34 out of 100 on Transparency International's Corruption Perceptions Index, ranking 115th of 180 countries (Anandya & Ramadhana, 2024).

Among the sectors exposed to such risk, the consumer cyclicals sector has characteristics that make it a particularly relevant object of study. The sector covers businesses producing and distributing non-primary consumer goods automotive and components, textiles and apparel, durable household goods, and tourism, entertainment, and retail. Demand for these products and services is cyclical: it rises sharply when the economy expands and falls drastically during recessions (Susilowati & Saseka, 2025). This volatility generates substantial financial pressure on management, especially in downturns. The 2020-2024 period was critical for the sector in Indonesia: the COVID-19 pandemic triggered extreme demand uncertainty, global supply-chain disruptions, and fundamental shifts in consumer behavior. The high cash-flow volatility characteristic of the sector further complicated the prediction of financial performance and heightened reporting uncertainty (Hakim & others, 2024). The case of PT Sri Rejeki Isman Tbk (Sritex) which operates in the consumer cyclicals sector is concrete evidence of how financial pressure in this sector can culminate in the manipulation of financial data (Anam et al., 2025).

Table 1. Selected Fraud Cases in Companies Listed on the Indonesia Stock Exchange

No	Company (Sector, Year)	Description of the Fraud Case
1	PT Sri Rejeki Isman Tbk – Sritex (Consumer Cyclical, 2025)	Banking-credit corruption: trillions of rupiah in syndicated credit became non-performing, allegedly through abuse of power, collusion, and manipulation of financial data to meet credit requirements; estimated state loss of IDR 1.08 trillion (Anam et al., 2025).
2	PT Indofarma Tbk (Healthcare, 2024)	A 2024 BPK audit indicated fraud throughout 2023 operations; long-term losses of IDR 278.44 billion (Tempo.co, 2024).
3	PT Timah Tbk (Mining, 2023)	Alleged reclassification of profit into loss amid an investigation into abuse of power in tin-commodity trading; recorded a loss of IDR 499.67 billion at end-2023 versus a 2022 profit (CNBC Indonesia, 2024).
4	PT Waskita Karya Tbk (Infrastructure, 2023)	Alleged recording of fictitious profits while cash flows were negative; BPKP found that statements did not reflect actual conditions (CNBC Indonesia, 2023).
5	PT Kimia Farma Tbk (Healthcare, 2024)	Management acknowledged irregularities in the financial reporting of its subsidiary; consolidated loss of IDR 1.82 trillion in 2023, reversing prior-year gains (Tempo.co, 2025).
6	PT Garuda Indonesia Tbk (Transportation, 2020)	Aircraft-procurement irregularities inconsistent with BUMN procurement principles; state loss equivalent to about IDR 8.8 trillion (CNBC Indonesia, 2022).
7	PT Asuransi Jiwasraya Tbk (Finance, 2020)	Liquidity shortfall of IDR 23.92 trillion; financial-reporting fraud officially uncovered by the Attorney General's Office (CNN Indonesia, 2021).

Source: compiled by the authors (2025).

These cases demonstrate that fraud can still be perpetrated with relative ease at large institutions for the benefit of the perpetrators or third parties, heightening stakeholders' need for assurance over the fairness of the information presented in corporate financial statements (Raminda, 2025).

The detection of financial-statement fraud has evolved through a series of theoretical models. It began with (Cressey, 1953) fraud triangle (pressure, opportunity, and rationalization); (Wolfe & Hermanson, 2004) added capability to form the fraud diamond; (Crowe, 2011) extended this into the fraud pentagon by adding arrogance; and (Vousinas, 2019) proposed the fraud hexagon by introducing collusion. The fraud heptagon then emerged as the most recent evolution. (Yusof, 2016), in a dissertation on Malaysian public listed companies, added two further factors ignorance and greed. Ignorance reflects a lack of knowledge or awareness of fraud risk, whereby an individual relies on a position of not-knowing and indirectly rejects valid information; greed denotes the psychological drive to obtain excessive personal gain. (Reskino, 2022) further developed the heptagon by incorporating religiosity and culture, arguing that fraud arises from weak faith and weak organizational culture.

Empirical findings on the fraud heptagon remain markedly inconsistent. (Satata et al., 2024) found pressure, opportunity, and arrogance to be significant, while rationalization,

capability, ignorance, and greed were not. (Djami & Murtanto, 2024) reported significant effects only for pressure and ignorance. (Handoko et al., 2023) found only opportunity and rationalization significant, whereas (Larum et al., 2021a) found pressure, capability, and arrogance significant but opportunity and rationalization insignificant. These recurring inconsistencies indicate a clear need for replication and extension under different contexts, periods, and methods.

Beyond the drivers of fraud, the dimension of fraud prevention and control is equally important. The whistleblowing system (WBS) is a violation-reporting mechanism that enables employees or related parties to report suspected irregularities safely, anonymously, and with protection (Prayogi & Kurniawan, 2025). Since 2008, Indonesia's National Committee on Governance Policy (KNKG) has issued guidelines for WBS implementation as an integral part of good corporate governance. Theoretically, an effective WBS reduces opportunistic management behavior by increasing the risk that fraud will be exposed through internal channels(Ghozali et al., 2019). (Masdiantini et al., 2021) found that WBS significantly reduces the potential for financial-statement fraud, whereas (Maisaroh & Nurhidayati, 2021) found no significant effect. This inconsistency motivates further testing of the role of WBS, particularly as a moderating variable in the relationship between the heptagon elements and financial-statement fraud.

Studies that combine all seven heptagon elements with WBS as a moderating variable in the consumer cyclicals sector remain very limited. The most relevant study, (Raihan et al., 2024), uses only the six hexagon elements (excluding ignorance and greed) with WBS as a moderator, employs the Beneish M-Score, and focuses on the banking and finance sector. (Hakim & others, 2024) examine the hexagon in consumer cyclicals firms for 2020-2022 but neither use the full heptagon nor test WBS as a moderator. (Prayogi & Kurniawan, 2025) test the heptagon with WBS moderation but focus exclusively on state-owned enterprises. Table 2 summarizes the principal research gaps that motivate the present study.

Table 2. Summary of the Research Gap

Dimension of the Gap	Condition in Prior Studies	Contribution of This Study
Completeness of the theoretical model	Most studies use the hexagon (Raihan et al., 2024; Hakim et al., 2024) or the heptagon without WBS moderation (Satata et al., 2024; Djami & Murtanto, 2024; Handoko et al., 2023).	Tests the full seven-element heptagon with WBS as a moderator simultaneously.
Sector and research object	Focus on banking, mining, SOEs, general manufacturing, and property; the full heptagon has not been applied to consumer cyclicals.	Focuses exclusively on consumer cyclicals firms on the IDX.
Period and pandemic–recovery context	Existing heptagon studies rarely cover the full 2020–2024 span (e.g., Hakim et al., 2024 cover only 2020–2022).	Uses 2020–2024, capturing both the acute crisis and the recovery phase.
Dependent-variable proxy	Many studies use the Beneish M-Score (≈ 86% accuracy).	Uses the Dechow F-Score (≈ 95% accuracy) integrating accrual quality and financial performance (Reskino & Puteri, 2023).

Source: developed by the authors (2025).

Based on the foregoing, this study is motivated by three considerations. Phenomenologically, financial-statement fraud remains high in Indonesia and the pandemic's impact on reporting integrity in the consumer cyclicals sector during 2020-2024 has not been fully mapped. Theoretically, the fraud heptagon needs validation and development in a sector not previously examined with the full seven elements together with WBS moderation. Methodologically, the use of the F-Score and panel data for consumer cyclicals firms offers a more precise and underexploited approach. Accordingly, this study aims to obtain empirical evidence on the effect of the seven heptagon elements on fraudulent financial statements and on the moderating role of the whistleblowing system in these relationships.

RESEARCH METHOD

This study employs a quantitative associative design, which seeks to establish relationships between the dependent and independent variables using numerical data and statistical procedures to test pre-specified hypotheses (Sugiyono, 2019). The data are panel data observations of more than one company over more than one period. The independent variables are the seven elements of the fraud heptagon; the dependent variable is fraudulent financial statements; and the whistleblowing system serves as the moderating variable. The scope is restricted to consumer cyclicals companies listed on the Indonesia Stock Exchange (IDX). Data processing was conducted with EViews version 13.

2.1 Population, Sample, and Data

The population comprises consumer cyclicals firms listed on the IDX, totaling 163 companies as of 2025. The sample was drawn using purposive sampling based on the following criteria: (1) consumer cyclicals firms listed on the IDX; (2) firms that published annual reports or financial statements consecutively throughout 2020-2024; and (3) firms with complete data for all required variables over 2020-2024. Applying these criteria yielded 76 firms and, over a five-year observation window, 380 firm-year observations. The study uses secondary data financial statements and annual reports obtained from the official IDX website (www.idx.co.id) and the companies official websites collected through documentation and library study.

Table 3. Sample-Selection Procedure

No	Criterion	Reduction	Total
1	Population of consumer cyclicals firms listed on the IDX		163
2	Firms not publishing annual reports/financial statements consecutively during 2020–2024	(68)	95
3	Firms without complete data for the required variables during 2020–2024	(19)	76
	Number of firms		76
	Observation years (2020–2024)		5
	Total observations over the research period		380

Source: company data as of 9 November 2025.

2.2 Operational Definition and Measurement of Variables

Dependent variable

Fraudulent financial statements denote intentional manipulation by management that misleads users through information inconsistent with actual conditions (Oktaviany & Reskino, 2023). The variable is proxied by the F-Score developed by Dechow et al. (2011), measured as the sum of accrual quality and financial performance. Accrual quality is captured by the RSST accrual, computed by dividing accruals derived from changes in non-cash working capital (ΔWC), non-current operating assets (ΔNCO), and net financial assets (ΔFIN) by average total assets. An F-Score above 1 indicates an above-normal risk of misstatement.

F-Score = Accrual Quality + Financial Performance

Independent variables

The seven heptagon elements were each operationalized through a proxy. Pressure was proxied by financial stability (the change in total assets scaled by total assets). Opportunity was proxied by ineffective monitoring (the proportion of independent commissioners, BDOUT). Rationalization was proxied by change in auditor (a dummy: 1 if the firm changed auditor, 0 otherwise). Capability was proxied by change in director (a dummy: 1 if a change of directors occurred, 0 otherwise). Arrogance was proxied by the frequency of the CEO's picture in the annual report. Ignorance was proxied by corporate-governance training (a dummy: 1 if governance training was provided to employees or directors, 0 otherwise). Greed was proxied by remuneration (a dummy: 1 if remuneration exceeded the period average, 0 otherwise).

Moderating variable

The whistleblowing system was measured by the firm's compliance with KNKG WBS indicators, expressed as the ratio of WBS items applied to the total WBS items recommended by the KNKG (Raihan et al., 2024).

Table 4. Variable Measurement

No	Variable	Proxy	Scale
1	Fraudulent Financial Statement (Y)	F-Score (Dechow et al., 2011)	Ratio
2	Pressure (X1)	Financial Stability = (Total Assets□ − Total Assets□₋₁) / Total Assets□	Ratio
3	Opportunity (X2)	Ineffective Monitoring = ratio of independent commissioners (BDOUT)	Ratio
4	Rationalization (X3)	Change in Auditor (dummy: 1 = change, 0 = no change)	Nominal
5	Capability (X4)	Change in Director (dummy: 1 = change, 0 = no change)	Nominal
6	Arrogance (X5)	Frequency of the CEO's picture in the annual report	Nominal
7	Ignorance (X6)	Governance Training (dummy: 1 = training provided, 0 = none)	Nominal
8	Greed (X7)	Remuneration (dummy: 1 = above average, 0 = otherwise)	Nominal
9	Whistleblowing System (Z)	WBS = (WBS items applied / WBS items per KNKG) × 100%	Ratio

Source: developed by the authors (2025).

2.3 Data-Analysis Technique

Data were analyzed using panel-data regression in EViews 13. The analysis comprised descriptive statistics, panel-model selection, classical-assumption testing, multiple linear regression, hypothesis testing, and Moderated Regression Analysis (MRA). Three estimators were considered the Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model (REM) with the most appropriate model selected through the Chow test, the Hausman test, and the Lagrange Multiplier test. Classical-assumption testing covered normality (Jarque Bera), multicollinearity (variance inflation factor), heteroscedasticity (White test), and autocorrelation (Durbin Watson). Hypotheses were evaluated through the coefficient of determination (adjusted R^2), the partial t-test, and the simultaneous F-test, while the moderating role of WBS was tested through MRA. The regression models are specified as follows.

Direct-effect model:

$$FFS = \alpha + \beta1ACHANGE + \beta2BDOUT + \beta3AUDCHANGE + \beta4DCHANGE + \beta5CEOPIC + \beta6IGN + \beta7GRD + \varepsilon$$

Moderated (MRA) model:

$$FFS = \alpha + \beta1ACHANGE + \beta2BDOUT + \beta3AUDCHANGE + \beta4DCHANGE + \beta5CEOPIC + \beta6IGN + \beta7GRD + \beta8WBS + \beta9(ACHANGE \times WBS) + \beta10(BDOUT \times WBS) + \beta11(AUDCHANGE \times WBS) + \beta12(DCHANGE \times WBS) + \beta13(CEOPIC \times WBS) + \beta14(IGN \times WBS) + \beta15(GRD \times WBS) + \varepsilon$$

Where FFS = fraudulent financial statement; ACHANGE = financial stability (pressure); BDOUT = ineffective monitoring (opportunity); AUDCHANGE = change in auditor (rationalization); DCHANGE = change in director (capability); CEOPIC = frequency of the CEO's picture (arrogance); IGN = governance training (ignorance); GRD = remuneration (greed); WBS = whistleblowing system; α = constant; β1–β15 = regression coefficients; and ε = error term.

2.4 Research Hypotheses

Drawing on agency theory and prior evidence, the study advances fourteen hypotheses. The first seven concern the direct effects of the heptagon elements, and the remaining seven concern the moderating role of the whistleblowing system:

H1: Pressure has an effect on fraudulent financial statements.

H2: Opportunity has an effect on fraudulent financial statements.

H3: Rationalization has an effect on fraudulent financial statements.

H4: Capability has an effect on fraudulent financial statements.

H5: Arrogance has an effect on fraudulent financial statements.

H6: Ignorance has an effect on fraudulent financial statements.

H7: Greed has an effect on fraudulent financial statements.

H8: The whistleblowing system moderates the effect of pressure on fraudulent financial statements.

H9: The whistleblowing system moderates the effect of opportunity on fraudulent financial statements.

H10: The whistleblowing system moderates the effect of rationalization on fraudulent financial statements.

H11: The whistleblowing system moderates the effect of capability on fraudulent financial statements.

H12: The whistleblowing system moderates the effect of arrogance on fraudulent financial statements.

H13: The whistleblowing system moderates the effect of ignorance on fraudulent financial statements.

H14: The whistleblowing system moderates the effect of greed on fraudulent financial statements.

The conceptual framework linking these variables is presented in Figure 1.

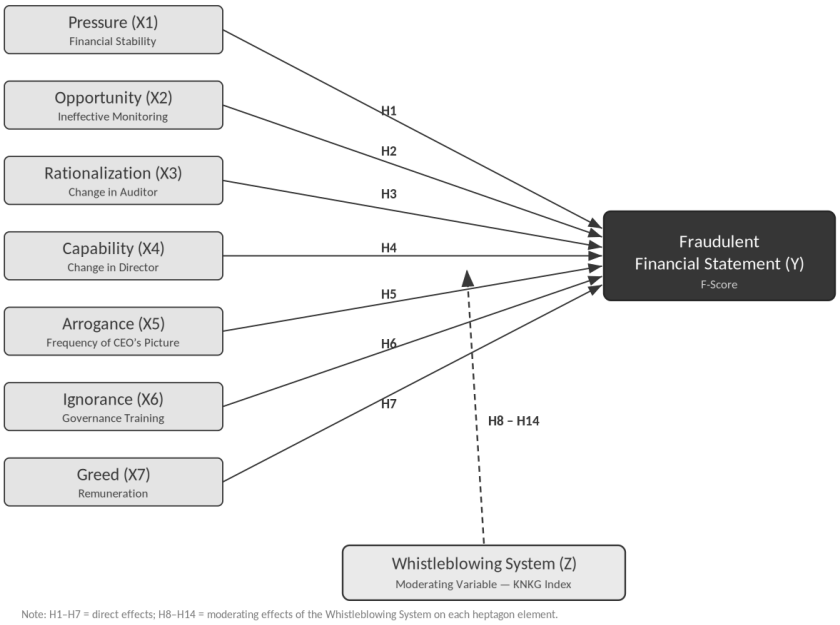

Figure 1. Conceptual Framework of the Research
Source: developed by the authors (2025).

RESULT AND DISCUSSION

3.1 Descriptive Statistics

Descriptive statistics summarize the characteristics of the data for the dependent variable (fraudulent financial statements), the seven heptagon elements, and the moderating variable. The results for the 380 firm-year observations are presented in Table 5.

Table 5. Descriptive Statistics

Statistic	FFS (Y)	Pressure (X1)	Opp. (X2)	Ration. (X3)	Cap. (X4)	Arrog. (X5)	Ign. (X6)	Greed (X7)	WBS (Z)
Mean	174.0312	0.6601	0.4357	0.3815	0.3105	2.4894	0.9157	0.5078	0.5037
Median	-1.3369	0.0021	0.4000	0.0000	0.0000	2.0000	1.0000	1.0000	0.5000
Maximum	124725.9	228.0701	1.0000	1.0000	1.0000	9.0000	1.0000	1.0000	1.0000
Minimum	-55348.70	-0.9279	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Std. Dev.	7041.824	11.7212	0.1158	0.4864	0.4633	1.1813	0.2780	0.5005	0.2282
Obs.	380	380	380	380	380	380	380	380	380

Source: EViews 13 output (2026).

The F-Score has a mean of 174.03, indicating that, on average, sample firms exhibit a high risk of misstatement, although the median of −1.34 shows that half of the firms have a low fraud risk; the very wide range (from−55,348.70 to 124,725.9) and a standard deviation exceeding the mean reflect highly heterogeneous data. Pressure (financial stability) has a mean of 0.66, suggesting moderate asset growth on average. Opportunity (ineffective monitoring) averages 0.44, indicating a relatively low level of monitoring ineffectiveness. Rationalization (change in auditor) and capability (change in director) have means of 0.38 and 0.31, respectively, indicating that auditor and director turnover were relatively infrequent. Arrogance (CEO pictures) averages 2.49, with a maximum of nine. Ignorance (governance training) has a high mean of 0.92, showing that most firms reported governance training. Greed (remuneration) and WBS both average around 0.50, indicating moderate dispersion across firms.

3.2 Panel-Model Selection

The most appropriate estimator for the direct-effect model was determined through three specification tests. As reported in Table 6, the Chow test (Cross-section F probability = 0.6475 > 0.05) favored the Common Effect Model over the Fixed Effect Model; the Hausman test (Cross-section random probability = 0.8296 > 0.05) favored the Random Effect Model over the Fixed Effect Model; and the Lagrange Multiplier test (Breusch–Pagan probability = 0.5802 > 0.05) favored the Common Effect Model over the Random Effect Model. The Common Effect Model was therefore selected for the direct-effect model.

Table 6. Panel-Model Specification Tests (Direct-Effect Model)

Test	Statistic / Probability	Decision
Chow test	Cross-section F prob. = 0.6475 (> 0.05)	Common Effect Model
Hausman test	Cross-section random prob. = 0.8296 (> 0.05)	Random Effect Model
Lagrange Multiplier test	Breusch–Pagan prob. = 0.5802 (> 0.05)	Common Effect Model
Selected model		Common Effect Model

Source: EViews 13 output (2026).

3.3 Classical-Assumption Tests

The classical-assumption tests confirm that the model satisfies the requirements for valid estimation. The Jarque–Bera probability of 0.5823 (> 0.05) indicates that the residuals are normally distributed. The centered VIF values for all independent variables range from 1.0138 to 1.0751 well below 10 indicating no multicollinearity. The White test yields an Obs×R-squared Chi-square probability of 0.8667 (> 0.05), indicating no heteroscedasticity. Finally, the Durbin–Watson statistic of 1.9815 lies between dU (1.8693) and 4−dU (2.1308), indicating no autocorrelation.

Table 7. Summary of Classical-Assumption Tests

Test	Result	Criterion	Conclusion
Normality (Jarque–Bera)	prob. = 0.5823	> 0.05	Normally distributed
Multicollinearity (VIF)	1.0138–1.0751	< 10	No multicollinearity
Heteroscedasticity (White)	prob. = 0.8667	> 0.05	No heteroscedasticity
Autocorrelation (Durbin–Watson)	DW = 1.9815	dU < DW < 4−dU	No autocorrelation

Source: EViews 13 output (2026).

3.4 Direct-Effect Regression and Hypothesis Testing (H1–H7)

Based on the selected Common Effect Model, the estimated direct-effect equation is:

$$FFS = 10.2275 + 0.1252\ Pressure + 4.3353\ Opportunity + 1.4345\ Rationalization + 1.8020\ Capability + 0.2862\ Arrogance + 0.9143\ Ignorance + 1.5392\ Greed + \varepsilon$$

The simultaneous F-test yields an F-statistic of 5.5383 (> F-table 2.0342) with a probability of 0.0000 (< 0.05), confirming that the seven heptagon elements jointly affect fraudulent financial statements. The adjusted R^2 of 0.2456 indicates that the model explains 24.56% of the variation in fraudulent financial statements, with the remainder attributable to factors outside the model. The partial t-test results (t-table = 1.9664) are reported in Table 8.

Table 8. Partial t-Test Results (Direct-Effect Model)

Hypothesis	Variable	Coef.	t-stat.	Prob.	Result
H1	Pressure	0.1252	2.4005	0.0169	Significant (+) — accepted
H2	Opportunity	4.3353	3.0857	0.0022	Significant (+) — accepted
H3	Rationalization	1.4345	3.1022	0.0021	Significant (+) — accepted
H4	Capability	1.8020	3.1022	0.0021	Significant (+) — accepted
H5	Arrogance	0.2862	1.4279	0.1142	Not significant — rejected
H6	Ignorance	0.9143	1.0060	0.3150	Not significant — rejected
H7	Greed	1.5392	3.3899	0.0008	Significant (+) — accepted

Source: EViews 13 output (2026).

3.5 Discussion of the Direct Effects

Pressure, opportunity, rationalization, capability, and greed. Five of the seven heptagon elements significantly and positively affect fraudulent financial statements. The significance of pressure (proxied by financial stability) confirms that, in the volatile consumer cyclicals sector during the pandemic-affected 2020-2024 period, financial pressure is a tangible driver of misstatement, consistent with (Handoko, 2021; Larum et al., 2021b; Rachmawati & Raharja, 2024). The significance of opportunity (ineffective monitoring) indicates that weak oversight by independent commissioners creates room for manipulation,

in line with agency theory's prediction that information asymmetry and weak control mechanisms widen managerial discretion (Achmad et al., 2022). Rationalization (change in auditor) is significant, supporting the view that frequent auditor turnover can be used to obscure traces of fraud and to exploit the transition period (Imtikhani & Sukirman, 2021). Capability (change in director) is also significant, reflecting that leadership turnover may bring in actors whose authority and access can be misused, while temporarily weakening internal control (El Fath & Setiawan, 2024). Finally, greed (remuneration) is significant and positive, indicating that the drive to obtain or sustain high compensation can motivate the manipulation of reported performance (Pamungkas & Irwandi, 2025).

Arrogance and ignorance. Arrogance (frequency of the CEO's picture) and ignorance (governance training) do not significantly affect fraudulent financial statements. For arrogance, this suggests that the number of CEO photographs in annual reports is a weak signal of fraud risk in consumer cyclicals firms; the result is consistent with (Adhania et al., 2024; Rachmawati & Raharja, 2024). For ignorance, the non-significant result may indicate that the disclosure of governance-training programs in annual reports often reflects regulatory compliance and formality rather than the actual effectiveness of such training, so that it does not directly translate into a higher or lower probability of fraud (Djami & Murtanto, 2024). These findings reinforce that not all heptagon elements operate uniformly across sectors and periods, echoing the inconsistencies documented in prior literature.

3.6 Moderated Regression Analysis (H8-H14)

The moderating role of the whistleblowing system was tested through Moderated Regression Analysis. The specification tests for the MRA model again selected the Common Effect Model (Chow Cross-section F probability = 0.5496 > 0.05; Hausman Cross-section random probability = 0.0008; Lagrange Multiplier Breusch–Pagan probability = 0.1661 > 0.05), with the Lagrange Multiplier test confirming the Common Effect Model as the final choice. The estimated moderated equation is:

$$FFS = 34.9504 + 2.9239\ Pressure + 2.6456\ Opportunity + 6.0043\ Rationalization + 0.1587\ Capability + 1.2560\ Arrogance + 0.4070\ Ignorance + 5.2261\ Greed - 2.6594\ WBS - 14.4921\ (Pressure \times WBS) - 4.2387\ (Opportunity \times WBS) - 3.8459\ (Rationalization \times WBS) - 12.1480\ (Capability \times WBS) - 4.5752\ (Arrogance \times WBS) - 10.9668\ (Ignorance \times WBS) - 9.8047\ (Greed \times WBS) + \varepsilon$$

The simultaneous F-test for the moderated model yields an F-statistic of 5.9730 (> F-table 1.6939) with a probability of 0.0000 (< 0.05), confirming that the heptagon elements, the whistleblowing system, and their interactions jointly affect fraudulent financial statements. The adjusted R^2 of the moderated model is 0.1644 (16.44%); the decline relative to the direct model (24.56%) is consistent with the fact that all interaction coefficients are negative, reflecting the dampening effect of the whistleblowing system. The interaction t-test results (t-table = 1.9665) are reported in Table 9.

Table 9. Moderated Regression Analysis Results (H8–H14)

Hypothesis	Interaction	Coef.	t-stat.	Prob.	Moderating Role
H8	Pressure × WBS	-14.4921	-6.9892	0.0000	Quasi — weakening (accepted)
H9	Opportunity × WBS	-4.2387	-3.9720	0.0001	Quasi — weakening (accepted)
H10	Rationalization × WBS	-3.8459	-4.0764	0.0001	Quasi — weakening (accepted)
H11	Capability × WBS	-12.1480	-3.8319	0.0001	Quasi — weakening (accepted)
H12	Arrogance × WBS	-4.5752	-2.3523	0.0192	Quasi — weakening (accepted)
H13	Ignorance × WBS	-10.9668	-2.0350	0.0426	Quasi — weakening (accepted)
H14	Greed × WBS	-9.8047	-3.2900	0.0011	Quasi — weakening (accepted)

Source: EViews 13 output (2026).

All seven interaction terms are statistically significant with negative coefficients, and each independent variable is also significant in the direct regression. Following the moderation-classification criteria, this pattern identifies the whistleblowing system as a quasi-moderator: it both affects fraudulent financial statements directly (WBS coefficient = −2.6594, probability = 0.0001) and significantly moderates by weakening the positive effect of each heptagon element. For every element, the sign of the coefficient reverses after the interaction with WBS is introduced, confirming the attenuating role of the system.

3.7 Discussion of the Moderating Role of the Whistleblowing System

The findings demonstrate that an effective whistleblowing system functions as a meta-control mechanism that dampens the fraud-inducing effect of all seven heptagon elements. By providing a safe, anonymous, and protected reporting channel, the system raises the probability that opportunistic behavior will be detected, thereby altering the cost benefit calculus that underlies the agency conflict between managers and owners (Ghozali et al., 2019; Masdiantini et al., 2021).

For pressure, opportunity, rationalization, and capability, the whistleblowing system compensates for weaknesses in formal oversight especially during periods of financial strain, ineffective monitoring, auditor transition, and leadership change by enabling internal parties to surface indications of fraud that might otherwise escape detection (Wahyuningtiyas & Pramudyastuti, 2022). For arrogance, the system erodes the perceived invulnerability of dominant CEOs, since even the lowest-level employee can report unethical conduct, raising the probability of consequences for manipulative behavior (Raihan et al., 2024). For ignorance, the system creates a peer-to-peer monitoring mechanism that offsets gaps in individual managerial knowledge, complementing and partly substituting for formal governance training(Djami & Murtanto, 2024). For greed, the system narrows the “comfort zone” of managers seeking to inflate reported performance for additional compensation, since any opportunistic action oriented toward private gain is liable to be reported (Dhewi, 2023).

Taken together, all seven heptagon elements are significantly moderated by the whistleblowing system, each functioning as a quasi-moderator. This confirms that the whistleblowing system is a comprehensive and effective fraud-control instrument in consumer cyclicals firms listed on the Indonesia Stock Exchange during 2020-2024, and that its effectiveness extends even to fraud risks rooted in difficult-to-quantify leadership traits.

CONCLUSION AND SUGGESTIONS

This study examined the effect of the seven fraud-heptagon elements on fraudulent financial statements and the moderating role of the whistleblowing system in consumer cyclicals firms listed on the Indonesia Stock Exchange during 2020-2024. The results show that pressure, opportunity, rationalization, capability, and greed significantly and positively affect fraudulent financial statements, whereas arrogance and ignorance do not. Furthermore, the whistleblowing system significantly moderates and weakens the effect of all seven heptagon elements, functioning in every case as a quasi-moderator. These findings confirm that the whistleblowing system is not merely a reactive reporting tool but a meta-control instrument that strengthens the effectiveness of internal oversight in preventing financial-statement fraud.

Theoretically, the study extends the fraud heptagon by validating, for the first time in the consumer cyclicals sector, the moderating role of the whistleblowing system across the full set of seven elements. Practically, it underscores the need for firms in this volatile sector to build fraud-prevention systems responsive to the economic cycle restructuring director remuneration with clawback provisions, lengthening incentive horizons, tightening the justification for auditor and director changes, and establishing a comprehensive, trusted, and sustainable whistleblowing system. From a policy perspective, the findings suggest that the Financial Services Authority (OJK) and the Indonesia Stock Exchange (IDX) should move whistleblowing-system regulation from a requirement of existence toward a requirement of effectiveness, strengthen the forensic-accounting competence of independent commissioners, and integrate F-Score-based screening into the periodic monitoring of issuers' financial statements; the KNKG should also update its 2008 whistleblowing guidelines for the digital era.

This study has several limitations. Its scope is confined to consumer cyclicals firms on the IDX during 2020-2024, so the findings cannot be generalized to sectors with different financial and operational characteristics. The adjusted R^2 of 16.44% for the moderated model indicates that other factors outside the model also influence fraudulent financial statements. Finally, the quantitative panel-data approach cannot fully capture the dynamic, complex, and concealed nature of fraud; future research could adopt qualitative or mixed-methods designs and extend the analysis to other sectors and longer periods.

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