THE EFFECT OF THE FRAUD HEXAGON ON FRAUDULENT FINANCIAL STATEMENTS: INSTITUTIONAL OWNERSHIP AS A MODERATING VARIABLE

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Abstract:
Purpose - This study examines the effects of six Fraud Hexagon dimensions on financial statement fraud (FSF) and the moderating role of institutional ownership in Indonesian healthcare companies.
Method - Using a quantitative causal-comparative approach and purposive sampling, the study analyzed secondary data from 23 healthcare companies listed on the Indonesia Stock Exchange during 2022–2024 (69 firm-year observations). FSF was classified as a binary variable using the F-Score, and hypotheses were tested using binary logistic regression with interaction terms.
Findings - Stimulus, proxied by return on assets (ROA), collusion, and opportunity, proxied by board of directors' outside membership (BDOUT), showed significant negative effects on FSF. Ego, auditor change, and director change were insignificant at the 5% level. Institutional ownership significantly moderated the relationships involving ROA, collusion, and BDOUT, but not those involving ego, auditor change, or director change.
Implications - Fraud Hexagon indicators do not uniformly increase fraud risk. Institutional ownership acts selectively rather than universally in mitigating fraud-related risks.
Originality - By integrating the Fraud Hexagon and institutional ownership in Indonesia's healthcare sector, this study highlights the context-dependent relevance of ownership structures when assessing financial reporting fraud.

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INTRODUCTION

Financial statements provide structured information about a company's financial position and performance during an accounting period and are fundamental to stakeholder decision-making. Ideally, they should provide useful information about the company's condition and be prepared transparently in accordance with the applicable accounting basis (Beemamol, 2024).

Investors commonly use profitability and other financial indicators to assess corporate performance. However, when reporting is not transparent, management

may manipulate financial statements to influence incentives or present an overly favorable picture of corporate performance (Andriani et al., 2022). Such manipulation can distort the economic substance of the firm, impair stakeholder decision-making, and generate substantial financial losses (Siska et al., 2024).

Financial statement fraud (FSF) refers to the intentional misstatement, manipulation, or omission of financial information to mislead users of financial statements. According to the Association of Certified Fraud Examiners (ACFE, 2024), financial statement fraud represents a smaller proportion of occupational fraud cases than asset misappropriation and corruption, yet it produces substantially higher financial losses. Figure 1 presents the distribution of fraud categories reported by ACFE.

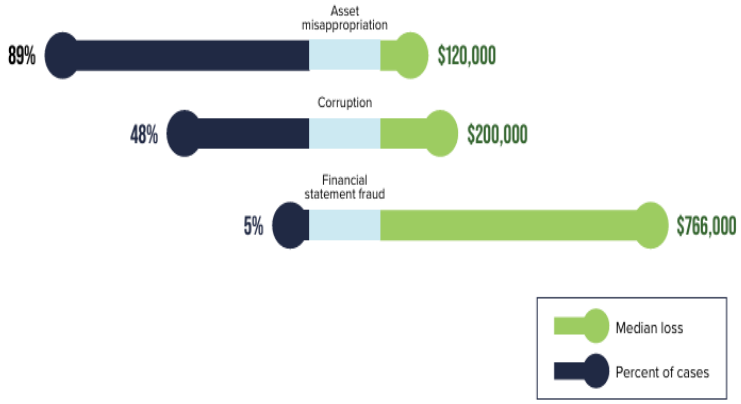


Figure 1. Fraud Categories
Source: ACFE (2024), Report to the Nations

In Indonesia, FSF remains a serious concern because of its potential financial consequences. The 2025 ACFE Indonesia Fraud Survey reports that 16.55% of fraud cases caused losses of IDR 100 million–500 million, 17.51% caused losses of IDR 500 million–1 billion, and 23.74% caused losses of IDR 1 billion–50 billion. Government, construction, banking and financial services, healthcare, and insurance are among the industries reporting the highest fraud-related losses. Healthcare accounts for 12%, placing the sector among the industries with substantial fraud exposure (Survei Fraud Indonesia, 2025).

A fraud case disclosed in 2024 in the healthcare sector illustrates the relevance of this issue. Puspadini (2024) reported that the former President Director of PT Indofarma Tbk allegedly falsified the company's 2020 financial statements by manipulating receivables, payables, and advance payments related to fictitious medical-equipment transactions so that reported performance appeared to meet targets. The report also described improper recording of discount claims and the use of fabricated transactions to obtain external funding. This case demonstrates how accounting manipulation can affect both reported financial condition and the use of corporate funds.

The Indonesian healthcare industry has faced significant operational and financial pressures in the period following the COVID-19 pandemic (Windyaswari et al., 2020). These conditions provide a relevant setting for examining the mechanisms associated with fraudulent financial reporting. This study adopts the Fraud Hexagon framework developed by Vousinas (2019), which extends earlier fraud models.

Cressey (1953) identified pressure, opportunity, and rationalization in the fraud triangle; Wolfe and Hermanson (2004) added capability in the fraud diamond; and Crowe (2011) incorporated arrogance/ego in the fraud pentagon. The Fraud Hexagon further adds collusion, yielding six dimensions: stimulus, opportunity, rationalization, capability, ego, and collusion.

Post-pandemic recovery also required healthcare organizations to normalize services while responding to operational adjustments in the sector (Rokom, n.d.; Windyaswari et al., 2020). This context does not by itself establish that healthcare firms are more fraudulent than firms in other sectors. Rather, it supports the selection of healthcare as a relevant empirical setting because financial reporting, service continuity, procurement, and governance operate simultaneously in an industry with specialized transactions. The present study therefore treats sectoral conditions as contextual factors and does not use them as direct evidence of fraud. This distinction is important because the dependent variable is an accounting-based fraud indication, not a legal determination that a company committed fraud.

Empirical studies of the Fraud Hexagon have produced inconsistent results. Rinaldy and Saputra (2024) reported that stimulus was not significant, whereas opportunity, rationalization, capability, arrogance, and collusion were significant. Alfarago et al. (2023) found significant effects for stimulus, opportunity, and collusion but not for rationalization, capability, and ego. Nugroho and Diyanty (2022) reported significant effects for stimulus, opportunity, and capability, while rationalization, arrogance, and collusion were not significant. These mixed findings indicate that the explanatory relevance of individual Fraud Hexagon elements may depend on organizational and governance conditions.

Institutional ownership is examined as one such governance condition. Supriatiningsih et al. (2024) argue that institutional ownership can function as a monitoring mechanism that may reduce fraud risk because institutional investors generally possess both the resources and incentives to monitor management. Effective governance can strengthen accountability, transparency, and stakeholder confidence (Laura, 2024).

The potential monitoring role of institutional ownership is particularly relevant in industries with specialized and complex transactions, where fraudulent activities may be difficult to detect at an early stage (Zarlis, 2019). Weak internal control can create room for opportunistic reporting, while collusive relationships can further reduce the effectiveness of oversight (Andhika et al., 2024). Accordingly, the effect of Fraud Hexagon factors on FSF may vary according to the strength and form of institutional monitoring.

This study therefore addresses two related gaps: the inconsistent evidence regarding the direct effects of Fraud Hexagon elements and the limited evidence on whether institutional ownership conditions those relationships in Indonesian healthcare companies. The study tests six Fraud Hexagon proxies: stimulus, ego, collusion, opportunity, rationalization, and capability: and evaluates institutional ownership as a moderator. By focusing on the healthcare sector during 2022–2024, the study aims to provide sector-specific evidence on fraudulent financial reporting and corporate governance.

THEORETICAL REVIEW

Agency Theory provides a governance-based explanation for fraudulent financial reporting. When ownership and control are separated, managers may possess information and incentives that differ from those of shareholders, creating agency conflicts and opportunities for opportunistic reporting (Jensen & Meckling, 2014; Muuna et al., 2023). In this study, Agency Theory is used primarily to frame stimulus, ego, and collusion as conditions that may influence managerial reporting behavior and the effectiveness of monitoring.

From an Agency Theory perspective, governance mechanisms become relevant because they can reduce information asymmetry and strengthen the accountability of managerial reporting. The separation between ownership and control creates a monitoring problem when managers possess more information about operating conditions and reporting choices than external shareholders (Jensen & Meckling, 2014). Accounting theory also places agency relationships among the central explanations for differences between managerial incentives and owners' interests (Subroto & Endaryati, 2024). In this setting, institutional shareholders may contribute monitoring capacity because they can evaluate financial information and governance practices over repeated periods. Research on corporate governance and fraud has therefore examined board characteristics, ownership structures, transparency, accountability, and financial-report integrity as mechanisms related to the risk or prevention of corporate misconduct (Girau et al., 2022; Ali & Saputra, 2023; Rosidah et al., 2023; Wardhani & Samrotun, 2020). Corporate governance is also associated with broader firm performance considerations, which reinforces the need to distinguish monitoring effects from the operating outcomes used as fraud proxies (Zulhelmy & Sukma, 2022).

Situational Action Theory (SAT) emphasizes that misconduct emerges from the interaction between individual propensities and the situations in which actions are taken (Wikström, 2010; Lokanan & Aujla, 2020). Applied to financial reporting, the theory directs attention to organizational opportunities, rationalizations, and capabilities that may shape whether a manager can perceive and carry out fraudulent behavior. SAT therefore complements Agency Theory by linking organizational context with the behavioral mechanisms represented in the Fraud Hexagon.

SAT is useful in this study because the Fraud Hexagon combines conditions that are not identical in nature. Some proxies represent organizational circumstances, such as board monitoring, while others represent changes in leadership or audit relationships. SAT directs attention to the interaction between a person's propensity and the setting in which an action becomes possible or acceptable (Wikström, 2010; Lokanan & Aujla, 2020). This perspective is consistent with earlier fraud research that emphasizes pressure, opportunity, rationalization, and internal-control conditions as distinct but potentially connected factors (Nurlia & Hermanto, 2021; Sidauruk & Abimanyu, 2022). Accordingly, the present study does not assume that one observable proxy fully represents fraudulent intent. Instead, each variable is treated as an empirical indicator that may be associated with the likelihood of the F-Score classification under the organizational conditions observed in the sample.

The Fraud Hexagon framework integrates six dimensions: stimulus, opportunity, rationalization, capability, ego, and collusion (Vousinas, 2019). In this study, these dimensions are operationalized through observable company-level proxies: ROA for stimulus, CEO duality for ego, concurrent positions held by independent commissioners for collusion, the proportion of independent commissioners (BDOUT) for opportunity, auditor change for rationalization, and director change for capability. Because each proxy represents only one empirical manifestation of a broader theoretical construct, interpretation must distinguish the measured indicator from the latent concept.

The development of fraud theory shows a progressive broadening of the conditions considered relevant to misconduct. Cressey (1953) introduced pressure, opportunity, and rationalization through the fraud triangle. Wolfe and Hermanson (2004) added capability, while Crowe (2011) introduced arrogance or ego into the expanded model. Vousinas (2019) subsequently advanced the S.C.O.R.E. model and the literature commonly applying the Fraud Hexagon uses collusion as an additional dimension. Recent applications demonstrate that the framework has been examined in different organizational settings, including Indonesian state-owned enterprises, ASEAN infrastructure companies, manufacturing companies, rural banks, and Jordanian industrial firms (Achmad et al., 2024; Naldo & Widuri, 2023; Andhika et al., 2024; Suryandari et al., 2023; Bader et al., 2024). Other studies have also combined Fraud Hexagon variables with governance moderators such as audit committees (Oktaviany & Reskino, 2023). These applications support the relevance of the framework, but they also show why proxy selection and sector context should be stated explicitly rather than assuming that the same indicator has an identical meaning across studies.

The proxy design used here requires particular caution. ROA is an observed profitability measure and is used as the proxy for stimulus, but a higher ROA is not itself evidence of pressure or fraud. CEO duality is used to capture ego through concentration of executive roles, while concurrent positions held by independent commissioners are used as the collusion proxy. BDOUT captures the proportion of independent commissioners and is therefore more directly connected to monitoring structure than to an abstract opportunity concept. Auditor change and director change are binary indicators for rationalization and capability, respectively. The gap between each theoretical construct and its observable indicator affects interpretation. A statistically significant coefficient indicates an association between the proxy and the study's FSF classification, not direct proof that the underlying psychological or behavioral Fraud Hexagon dimension caused fraudulent conduct. This measurement distinction is consistent with the mixed empirical evidence reported across Fraud Hexagon studies (Alfarago et al., 2023; Nugroho & Diyanty, 2022; Rinaldy & Saputra, 2024).

Institutional ownership is positioned as a moderating governance mechanism. Institutional investors may have stronger incentives and resources to monitor management, but their effect need not be identical across all fraud mechanisms (Supriatiningsih et al., 2024). The moderation tests therefore examine whether the relationship between each Fraud Hexagon proxy and FSF changes as institutional

ownership increases, rather than assuming that institutional ownership automatically reduces every form of fraud risk.

Institutional ownership is therefore modeled as a conditioning variable rather than assumed to have a universally protective effect. Prior research has examined institutional ownership in relation to financial-report integrity and as a moderator in governance-oriented models (Wardhani & Samrotun, 2020; Almas & Novita, 2024; Supriatiningsih et al., 2024). This monitoring logic is compatible with evidence that corporate governance can be relevant to the likelihood of corporate fraud (Girau et al., 2022), but it does not imply that institutional investors can neutralize every fraud mechanism. Monitoring may be more effective for observable reporting and board processes than for behavioral elements that are only indirectly captured by binary proxies. The hypotheses therefore test whether the slope of each Fraud Hexagon proxy changes with institutional ownership. This formulation is more precise than treating institutional ownership as a separate fraud-prevention variable because the empirical question concerns conditional relationships between the six proxies and FSF.

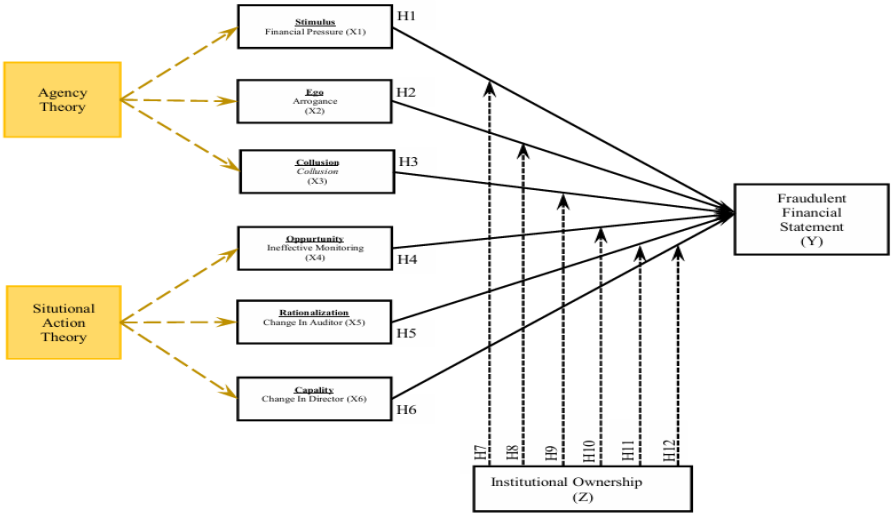


Figure 2. Research Framework
Source: Authors' research model based on the theoretical framework used in this study.

Hypothesis:

H1: Stimulus, proxied by ROA, has a positive effect on the likelihood of financial statement fraud.

H2: Ego, proxied by CEO duality, has a positive effect on the likelihood of financial statement fraud.

H3: Collusion, proxied by concurrent positions held by independent commissioners, has a positive effect on the likelihood of financial statement fraud.

H4: Opportunity, proxied by BDOUT, has a positive effect on the likelihood of financial statement fraud.

H5: Rationalization, proxied by auditor change, has a positive effect on the likelihood of financial statement fraud.

H6: Capability, proxied by director change, has a positive effect on the likelihood of financial statement fraud.

H7: Institutional ownership weakens the positive effect of stimulus (ROA) on financial statement fraud.
H8: Institutional ownership weakens the positive effect of ego (CEO duality) on financial statement fraud.
H9: Institutional ownership weakens the positive effect of collusion on financial statement fraud.
H10: Institutional ownership weakens the positive effect of opportunity (BDOUT) on financial statement fraud.
H11: Institutional ownership weakens the positive effect of rationalization (auditor change) on financial statement fraud.
H12: Institutional ownership weakens the positive effect of capability (director change) on financial statement fraud.

RESEARCH METHODS

This study employs a quantitative causal-comparative design to examine the effects of Fraud Hexagon variables on fraudulent financial statements and the moderating role of institutional ownership. The population comprises healthcare-sector companies listed on the Indonesia Stock Exchange (IDX) during 2022–2024. Using purposive sampling, 23 firms were selected and observed for three years, producing 69 firm-year observations. Secondary data were obtained from publicly available annual reports and financial statements through documentation from the official IDX website (www.idx.co.id). Because the dependent variable is dichotomous (0 = non-fraud indication; 1 = fraud indication based on the study's F-Score classification), binary logistic regression was used. EViews 12 was employed to estimate the main effects and the interaction terms between each Fraud Hexagon proxy and institutional ownership.

The unit of analysis is the firm-year. Each of the 23 selected companies contributes observations for up to three reporting years, generating the 69 observations used in estimation. The purposive-sampling approach limits the analysis to healthcare companies for which the required annual-report and financial-statement information was available for the 2022–2024 observation period. Consequently, the results are intended to explain patterns within the selected sample and should not be interpreted as population-wide estimates for all Indonesian companies. The use of secondary documents also means that the analysis evaluates information disclosed in corporate reporting rather than unobserved managerial motives.

The dependent variable is the study's F-Score-based FSF classification. Observations with an F-Score greater than 1 are coded 1 and the remaining observations are coded 0, as specified in Table 1. The independent variables represent the six Fraud Hexagon dimensions through ROA, CEO duality, concurrent positions held by independent commissioners, BDOUT, auditor change, and director change. Institutional ownership is measured as the proportion of shares held by institutions relative to total outstanding shares. The dummy variables retain their original binary interpretation, whereas ROA, BDOUT, collusion, and institutional ownership remain quantitative measures according to the operational definitions presented in the table.

Binary logistic regression is appropriate to the model specification because the dependent variable has two categories. The estimated model includes the six Fraud

Hexagon proxies, institutional ownership, and six interaction terms between institutional ownership and each Fraud Hexagon proxy. In general form, the model estimates the log-odds of FSF as a function of X1 through X6, Z, and X1Z through X6Z. The 5% significance level is used to evaluate the reported p-values. For interaction models, the coefficient of a Fraud Hexagon proxy represents its conditional association when institutional ownership equals zero, while each interaction coefficient indicates how that association changes as institutional ownership increases. This interpretation is applied in the Results and Discussion section to avoid treating a main-effect coefficient as constant across all levels of the moderator.

Table 1. Variables and Indicators

Variable	Indicator
Fraudulent Financial Statement (Y)	F-Score = Accrual Quality + Financial Performance The F-Score results are measured using a dummy variable, coded as 1 if the score is greater than 1, and coded as 0 otherwise.
Stimulus (X1)	$ROA = \frac{Net\ Income}{Total\ Asset}$
Ego (X2)	The variable is operationalized as a dummy, where a value of 1 indicates the presence of a dual CEO position, and 0 indicates its absence. This allows for a binary classification of executive structure in the analysis.
Collusion (X3)	The total number of independent commissioners holding multiple positions concurrently.
Opportunity (X4)	$\text{BDOUT} = \frac{\text{Number of independent commissioners}}{\text{Total number of commissioners}}$
Rationalization (X5)	This is a dummy variable, coded as 1 if there was an auditor change during the 2022–2024 period, and coded as 0 if no auditor change occurred.
Capability (X6)	This is a dummy variable, coded as 1 if there was a director change and coded as 0 if no director change occurred.
Institutional Ownership (Z)	$\text{INS} = \frac{\text{Total shares owned by other institutions}}{\text{Total outstanding shares}}$

Table 1 summarizes the operational definitions used in the empirical model. It distinguishes the theoretical Fraud Hexagon dimensions from the observable company-level indicators used for estimation and specifies the coding of the FSF, ego, auditor-change, and director-change variables.

RESULTS AND DISCUSSION

Table 2 shows 69 observations for every variable, indicating a balanced set of firm-year data for the reported descriptive statistics. The mean of FCORE is 0.43, while the institutional-ownership variable has a mean of 0.62 and a median of 0.74. ROA ranges from -0.20 to 1.25, CLSN ranges from 0 to 3, and BDOUT ranges from 0.33 to 0.75. The dummy variables also show variation across the sample, which permits comparison between observations with and without the specified governance or reporting changes.

Table 2. Descriptive Analysis

Statistic	FCORE	ROA	EGO	CLSN	BDOUT	ACHANGE	DCHANGE	INST
Mean	0.43	0.12	0.61	1.35	0.45	0.14	0.43	0.62
Median	0	0.05	1	1	0.4	0	0	0.74
Maximum	1	1.25	1	3	0.75	1	1	1
Minimum	0	-0.20	0	0	0.33	0	0	0
Observations	69	69	69	69	69	69	69	69

Table 3 reports an R-squared statistic of 0.334183. Because the dependent variable is dichotomous and the model is estimated using binary logistic regression, this statistic should be treated as an R-squared-type model-fit measure rather than interpreted mechanically as the percentage of variance explained in the same sense as ordinary least squares regression. The substantive interpretation should therefore focus primarily on coefficient signs, statistical significance, and the interaction terms.

Table 3. Hypothesis Testing and Model Fit

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	34.8472	16.5109	2.1105	0.0348
ROA	-10.9905	4.9892	-2.2029	0.0276
EGO	6.8359	3.6319	1.8821	0.0598
CLSN	-8.9765	3.1317	-2.8663	0.0042
BDOUT	-63.4992	32.3986	-1.9599	0.0500
ACHANGE	0.3217	7.0014	0.0459	0.9633
DCHANGE	3.0900	3.5235	0.8769	0.3805
INST	-44.7678	20.9810	-2.1337	0.0329
ROA*INST	12.1603	6.1327	1.9828	0.0474
EGO*INST	-6.4947	4.2439	-1.530	0.1259
CLSN*INST	8.9907	3.4528	2.6038	0.0092
BDOUT*INST	83.7504	42.4227	1.9741	0.0484
ACHANGE*INST	2.4159	8.3914	0.2879	0.7734
DCHANGE*INST	-3.3815	4.5053	-0.7506	0.4529
R-Squared	0.334183			

Hypothesis 1 predicts a positive effect of stimulus, proxied by ROA, on FSF. The estimated coefficient for ROA is negative and statistically significant (β = -10.9905; p = 0.0276). Thus, the data indicate a significant association in the direction opposite to H1, and the directional hypothesis is not supported. The result also shows that interpreting higher ROA straightforwardly as greater fraud pressure is problematic; within this specification, higher ROA is associated with lower log-odds of the study's FSF classification.

Hypothesis 2 predicts a positive effect of ego (EGO) on FSF. The coefficient is positive (β = 6.8359) but not statistically significant at the 5% level (p = 0.0598). Accordingly, H2 is not supported. The result suggests that CEO duality, as operationalized in this study, does not provide sufficient statistical evidence of an association with FSF in the sample.

Hypothesis 3 predicts a positive effect of collusion (CLSN) on FSF. The coefficient is negative and statistically significant (β = -8.9765; p = 0.0042). Therefore, although CLSN is statistically associated with FSF, the observed direction is opposite

to the positive relationship proposed in H3, so the directional hypothesis is not supported. This finding requires cautious interpretation because the CLSN proxy measures concurrent positions held by independent commissioners and may capture governance structure differently from the underlying theoretical concept of collusion.

Hypothesis 4 predicts a positive effect of opportunity (BDOUT) on FSF. The coefficient is negative (β = -63.4992) and is significant at the 5% threshold as reported (p = 0.0500). The negative sign is opposite to the hypothesized positive direction, and H4 is therefore not supported as stated. Because BDOUT represents the proportion of independent commissioners, the negative coefficient is more consistent with a monitoring interpretation: a higher proportion of independent commissioners is associated with lower log-odds of the FSF classification.

Hypothesis 5 predicts a positive effect of rationalization, proxied by auditor change (ACHANGE), on FSF. The coefficient is positive but statistically non-significant (β = 0.3217; p = 0.9633). H5 is therefore not supported. Auditor change alone does not provide evidence of a systematic relationship with FSF in this sample.

Hypothesis 6 predicts a positive effect of capability, proxied by director change (DCHANGE), on FSF. The coefficient is positive but not statistically significant (β = 3.0900; p = 0.3805). Consequently, H6 is not supported. A change in directors, as operationalized here, is insufficient to demonstrate that managerial capability increases the likelihood of FSF.

Taken together, the first six tests do not support the proposed positive directions. The three statistically significant coefficients, ROA, CLSN, and BDOUT, are negative, while the remaining coefficients are not significant at the 5% level. This pattern reinforces the need to separate statistical significance from theoretical direction. A significant coefficient with the opposite sign does not support a directional hypothesis merely because the p-value is below 0.05. The result is also consistent with the broader literature showing that Fraud Hexagon findings vary across proxies and research settings. Rinaldy and Saputra (2024), Alfarago et al. (2023), and Nugroho and Diyanty (2022) reported different combinations of significant and non-significant Fraud Hexagon dimensions, indicating that the empirical performance of individual proxies is not uniform across samples.

The negative ROA coefficient should therefore be interpreted as an association within this specification rather than evidence that profitability prevents fraud. ROA is used as a stimulus proxy, yet it directly measures accounting performance. The negative result may indicate that the proxy captures operating performance differently from the theoretical pressure construct in this healthcare sample. A similar measurement issue applies to CLSN. Concurrent positions held by independent commissioners can describe a governance characteristic, but they are not equivalent to direct evidence of a secret agreement. BDOUT provides a clearer governance interpretation because a larger proportion of independent commissioners is commonly associated with stronger monitoring. Its negative coefficient is therefore compatible with the monitoring logic discussed in Agency Theory, although the study design does not establish causality (Jensen & Meckling, 2014; Girau et al., 2022).

For the moderating effects (H7–H12), the interaction terms ROA×INST (β = 12.1603; p = 0.0474), CLSN×INST (β = 8.9907; p = 0.0092), and BDOUT×INST (β =

83.7504; p = 0.0484) are statistically significant, whereas EGO×INST (p = 0.1259), ACHANGE×INST (p = 0.7734), and DCHANGE×INST (p = 0.4529) are not. The positive interaction coefficients for ROA, CLSN, and BDOUT indicate that the negative conditional main-effect associations become less negative as institutional ownership increases on the log-odds scale. Therefore, institutional ownership significantly moderates these three relationships, but the results do not support the original wording that it weakens a positive main effect because the estimated main-effect coefficients are negative. H8, H11, and H12 are not supported because their interaction terms are not significant.

Because the model contains interaction terms, the main-effect coefficients and the moderation coefficients must be read jointly. The positive ROA×INST, CLSN×INST, and BDOUT×INST coefficients indicate that the negative conditional associations reported for these three proxies move toward zero as institutional ownership increases. The findings therefore establish statistically significant moderation for those relationships, but they do not show that institutional ownership simply strengthens a fraud-deterrence effect. The sign of the interaction means that the negative slope becomes less negative at higher levels of institutional ownership. For EGO, ACHANGE, and DCHANGE, the interaction terms are not statistically significant, so the data do not provide evidence that institutional ownership changes those relationships within the estimated model.

The selective moderation result is consistent with treating institutional ownership as a governance mechanism whose influence depends on what is being monitored. Institutional investors can possess resources and incentives to evaluate financial reporting and governance practices, but their presence does not guarantee control over every behavioral pathway represented in the Fraud Hexagon (Supriatiningsih et al., 2024). Research on institutional ownership, financial-report integrity, and governance moderation similarly supports examining ownership as a conditional mechanism rather than an automatic safeguard (Wardhani & Samrotun, 2020; Almas & Novita, 2024). From a practical perspective, the evidence suggests that governance assessment should focus on specific reporting and board mechanisms rather than relying on the ownership percentage alone.

The results also have implications for the use of fraud-detection frameworks in applied research. Fraud Hexagon theory is valuable for organizing possible drivers of misconduct, but empirical tests depend on how each dimension is operationalized. Studies in state-owned enterprises, infrastructure, manufacturing, banking, and industrial-company settings use different indicators and therefore do not necessarily estimate the same underlying mechanism (Achmad et al., 2024; Naldo & Widuri, 2023; Andhika et al., 2024; Suryandari et al., 2023; Bader et al., 2024). The present findings should thus be read as evidence about the selected proxies in Indonesian healthcare firms, not as a definitive rejection of the broader theoretical dimensions. This interpretation also explains why the study emphasizes coefficient direction, interaction structure, and measurement limitations alongside p-values.

CONCLUSION

The empirical results require a more cautious conclusion than a simple statement that the Fraud Hexagon variables increase financial statement fraud. In the binary logistic interaction model, the conditional main-effect coefficients for ROA (β = -10.9905; p = 0.0276), collusion (CLSN; β = -8.9765; p = 0.0042), and opportunity (BDOUT; β = -63.4992; p = 0.0500) are statistically significant, but all three coefficients are negative. Ego (EGO), auditor change (ACHANGE), and director change (DCHANGE) are not statistically significant at the 5% level. Accordingly, the reported coefficients do not support the positive directional hypotheses H1–H6 as stated.

Institutional ownership has a negative and statistically significant main-effect coefficient (β = -44.7678; p = 0.0329). In addition, institutional ownership significantly moderates the relationships between ROA, CLSN, and BDOUT and FSF through positive interaction terms. These positive interactions indicate that the negative conditional main-effect associations become less negative as institutional ownership increases. The interaction terms involving EGO, ACHANGE, and DCHANGE are not significant. The moderating role of institutional ownership is therefore selective rather than uniform across all Fraud Hexagon proxies.

The reported R-squared statistic is 0.334183; however, because the analysis uses binary logistic regression, this value should be interpreted as a model-fit statistic rather than as an ordinary least squares percentage of variance explained. The results emphasize the importance of matching theoretical constructs with their empirical proxies and interpreting both statistical significance and coefficient direction when evaluating hypotheses.

These findings also identify a measurement issue that should be acknowledged. ROA, the proportion of independent commissioners (BDOUT), concurrent commissioner positions (CLSN), auditor change, and director change are proxies for broader Fraud Hexagon constructs and may not fully capture the underlying behavioral mechanisms. The results should therefore be generalized cautiously beyond the 23 healthcare firms and 69 firm-year observations included in the 2022–2024 sample.

Future studies can strengthen inference by testing alternative proxies for the same Fraud Hexagon dimensions, estimating marginal effects of the interaction model at substantively meaningful levels of institutional ownership, and extending the observation period or sector coverage. Such extensions would help determine whether the negative coefficients observed here are specific to the selected healthcare sample, the measurement choices, or the period studied.

Overall, the study contributes sector-specific evidence that institutional ownership can condition several relationships associated with financial statement fraud, but it should not be treated as a uniformly protective governance mechanism. Future interpretation and replication should preserve the distinction between the theoretical Fraud Hexagon constructs and the accounting or governance proxies used to operationalize them.

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