ANALYSIS OF THE USE OF THE FRAUD HEXAGON MODEL IN DETECTING FRAUD IN STATE-OWNED ENTERPRISES IN INDONESIA

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Abstract

Background: State-owned enterprises (SOEs) face unique fraud vulnerabilities due to institutional complexity and dual accountability. The 2019 ACFE Indonesia Survey revealed SOEs ranked second among institutions most harmed by fraud (31.8%). High-profile cases demonstrate the severity of this governance challenge. Existing fraud frameworks inadequately address the multi-layered risk environment characteristic of state ownership structures.

Objective: his study examines fraud hexagon model adequately captures fraud dynamics in Indonesian SOEs by testing how six elements—stimulus, capability, collusion, opportunity, rationalization, and ego—influence financial statement fraud while accounting for institutional peculiarities of state ownership.

Research Methods: Using purposive sampling, 16 SOEs listed on the Indonesia Stock Exchange (2017-2022) provided 96 firm-year observations. Financial statement fraud is measured using the F-score model (Dechow et al., 2011). Independent variables operationalize fraud hexagon elements: stimulus (ROA), capability (CEO education), collusion (price-to-book ratio), opportunity (receivables-to-sales changes), rationalization (auditor changes), and ego (managerial ownership). Multiple regression analysis using EViews 13 tests hypotheses at 5% significance.

Research Results: Three elements significantly influence fraud: financial targets, nature of industry, and managerial ownership. CEO education, market performance, and auditor changes show no significant effects, suggesting individual characteristics matter less in institutionally-determined fraud environments.

Originality/Novelty of Research: This study proposes an "Institutional Fraud Framework" recognizing that fraud hexagon elements operate differently in SOE contexts some amplified, some neutralized, and some reversed. It represents the first comprehensive test of all six elements in Indonesian SOEs, using F-score continuous measures for nuanced fraud detection. Findings demonstrate the need for context-specific fraud theories rather than universal private sector models.

Keywords: Fraud Hexagon; Financial Statement Fraud; F-Score Model, State-Owned Enterprises, Corporate Governance

Introduction

Financial statements are defined as an organized representation of the financial condition and financial performance results of an entity as stated in the Financial Accounting Standards Statement (PSAK) Number 201 (IAI, 2024). The data presented in a financial statement includes data related to

financial position, financial performance, and cash flow which are one of the basic considerations for parties who use financial statements, both internal and external parties, in making economic decisions. Creditors and investors are examples of external parties who use financial statements as a basis for policy making, while the policies taken include decisions to lend capital to the company or as a place to invest in the company. In the conceptual framework of financial reporting, it is stated that financial information must meet fundamental qualitative characteristics, namely relevance and faithful representation (Kieso et al., 2020). Financial statements must be free from material misstatements and errors in order to be able to show a perfect representation. There are risks in the company's financial reporting, one of which is the risk of financial statement fraud.

Fraud is categorized into 3 major parts or what is known as the "fraud tree" which consists of corruption, asset misappropriation, and financial statement fraud (ACFE, 2024). Intentional acts by an employee in creating misstatements or omitting important information in an entity's financial statements are the definition of financial statement fraud, for example by recording non-existent income, reducing reported expenses, or artificially exaggerating reported assets (ACFE, 2024).

In the research report published by the ACFE every two years entitled Occupational Fraud 2024: A Reports to the Nations which is the result of research based on 1,921 fraud cases investigated from January 2022 to September 2023, several important points are presented in the following figure:

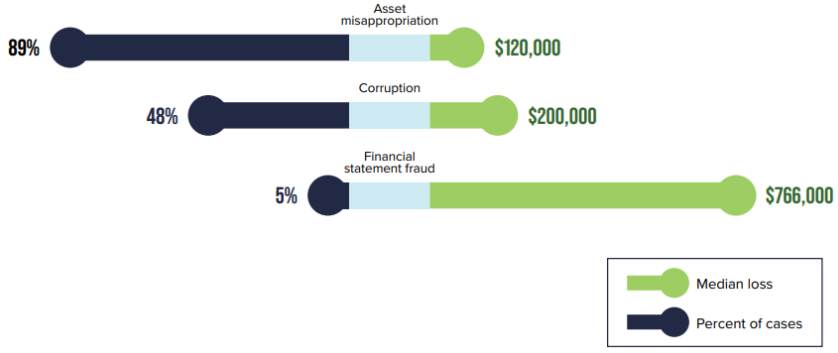

Figure 1
How Is Occupational Fraud Commited ?

Based on the figure in the study of 138 countries and 1,921 cases, it is explained that financial reporting fraud has the lowest percentage of cases, which is 5%, but has the largest median loss of 766,000 USD. Based on the data above, financial reporting fraud ranks first as the type of fraud that is most financially detrimental compared to the other two types of fraud, namely asset misuse and corruption.

Based on the Indonesian Fraud Survey conducted by ACFE Indonesia in 2019, State-Owned Enterprises (BUMN) ranked second among the institutions most harmed by fraud, accounting for 31.8% of cases. Several fraud cases have occurred in State-Owned Enterprises (BUMN). First, the Audit Result Report (LHP) and Semester Audit Result Summary (IHPS) published by BPK for the first semester of 2019 indicated that a state-owned aviation company had engaged in a suspicious collaboration with a technology partner. The cooperation contract worth $239.94 million was fully recognized as revenue in the first year of 2018, even though the contract period spanned 15 years, meaning the revenue should not have been fully recognized in that single year. Second, as reported in 2023, the Ministry of State-Owned Enterprises (BUMN) identified allegations of misrepresented financial reports in two state-owned construction companies. These financial reports presented the companies as having been profitable for years, despite their cash flows never being positive. Findings from the Audit Board of Indonesia (BPK) revealed indications of financial statement manipulation during the period 2018 to 2021. These fraudulent accounting practices were conducted to conceal the actual financial condition through recording fictitious revenues, delaying expense recognition, and accelerating asset recognition.

With the increasing cases of manipulation in financial reports, a tool is needed to prevent and detect fraudulent financial reports. One way to detect fraud in financial reports is by using the fraud hexagon theory. The fraud hexagon theory is a development of the fraud theory first proposed by Cressey (1953) in the fraud triangle concept, which states that there are 3 conditions that cause fraud, including pressure, opportunity, and rationalization. Furthermore, Wolfe and Hermanson (2004) added a new element, namely capability, to perfect the fraud triangle theory which is then known as the fraud diamond theory. Then, Crowe (2011) added an additional element in the form of arrogance to develop the fraud pentagon theory. Most recently, Vousinas (2019) added the element of collusion, so that the elements in the fraud hexagon theory consist of pressure (stimulus), capability, collusion, opportunity, rationalization, and ego which is known as the S.C.C.O.R.E. model.

This study addresses a fundamental theoretical and empirical gap by examining whether Vousinas's (2019) fraud hexagon model which adds collusion to the fraud pentagon framework adequately captures fraud dynamics in Indonesian SOEs. The novelty of this research lies in three dimensions: First, **theoretical extension**: We propose an "Institutional Fraud Framework" that contextualizes the fraud hexagon within state ownership theory, recognizing that SOEs serve multiple principals (government, citizens, shareholders) with inherently conflicting objectives. This institutional complexity creates fraud incentives absent in private firms, where agency relationships are more straightforward. Second, **empirical contribution**: While fraud hexagon research exists for private corporations, no comprehensive study has

systematically tested all six elements specifically within Indonesian SOE contexts over an extended period (2017-2022). Our analysis of 96 firm-year observations provides robust evidence on which fraud determinants are amplified or diminished in state ownership environments. Third, **methodological innovation**: We employ the F-score model (Dechow et al., 2011) to measure financial statement fraud more sophisticated approach than dichotomous fraud indicators used in prior SOE studies. This continuous measure captures varying fraud severity levels, providing nuanced insights into the mechanisms through which hexagon elements operate. The practical significance of this research is substantial. Understanding fraud determinants specific to SOEs enables regulators, auditors, and governance bodies to design targeted interventions rather than applying generic private sector frameworks. Given that Indonesian SOEs contribute significantly to national economic output and employment, enhancing their financial reporting integrity has broad socioeconomic implications. This study ultimately asks: How do the six elements of the fraud hexagon stimulus (financial targets), capability (CEO education), collusion (market performance), opportunity (industry nature), rationalization (auditor changes), and ego (managerial ownership) operate differently in SOE contexts compared to theoretical predictions and private sector findings? The answers carry important implications for fraud theory, corporate governance, and public policy in emerging markets

Literature Review

High targets, increase pressure on management, but provide bonuses when the target is achieved (Noble, 2019) in this situation can be an internal and external factor in influencing individuals to commit fraud. The pressure to commit fraud is financial and non-financial, for example reporting better results due to pressure to meet financial targets. In a study conducted by and stated that the stimulus associated with the financial target variable influences the occurrence of financial reporting fraud, but in the study and stated that the stimulus represented by the financial target variable does not affect the occurrence of financial reporting fraud.

Figure 2
Fraud Hexagon Model by Vousinas

High targets, increase pressure on management, but provide bonuses when the target is achieved (Noble, 2019) in (Pasaribu & Ekowati, 2023). This situation can be an internal and external factor in influencing individuals to commit fraud. The pressure to commit fraud is financial and non-financial, for example reporting better results due to pressure to meet financial targets (Vousinas, 2019). In a study conducted by (Pasaribu & Ekowati, 2023) and (Febriani et al., 2023) stated that the stimulus associated with the financial target variable influences the occurrence of financial reporting fraud, but in the study (Handoko & Tandean, 2021) and (Akbar et al., 2022) stated that the stimulus represented by the financial target variable does not affect the occurrence of financial reporting fraud.

Capability is a personal trait and ability that plays a major role in fraud can occur even with the presence of the other three elements (Wolfe and Hermanson, 2004) in (Rizqi & Purwanto, 2023). Many cases of fraud, especially those worth billions of dollars, would not have happened without the right people with the right abilities. Opportunity opens the door to fraud, opportunities and rationalizations can draw people in that direction, however, the person must have the ability to recognize the open door of fraud as an opportunity and take advantage of it by walking through it, not just once, but many times (Wolfe and Hermanson, 2004) in (Rizqi & Purwanto, 2023). Several important things that influence a person's competence in committing fraud, including position and intelligence. In a study conducted by (Sihombing & Panggulu, 2022) and (Sukmadilaga et al., 2022) stated that capability has an effect on financial statement fraud, but in a study conducted by (Wicaksono & Suryandari, 2021) and (Fouziah et al., 2022) stated that capability represented by the variable of CEO education has no effect on financial statement fraud.

The definition of collusion refers to a fraudulent agreement or pact between two or more parties, in which one party takes action against the other party for a malicious purpose, such as defrauding a third party of their rights (Vousinas, 2019). The parties involved in collusion can consist of employees in an organization, a group of individuals spanning several organizations and jurisdictions, or members of a particular organization or collective (Venter, 2007) in (Vousinas, 2019). When collusion occurs between employees, or between employees and outside parties, fraud is often more difficult to stop, and this is especially true as it becomes a growing problem. Political connections can also be an influence in committing fraud because by having close ties to the government, organizations can protect their position and reputation. Organizations with political connections have the potential to gain benefits from the government, including access to important resources, bank loans with favorable terms, favorable tax treatment, higher initial public offering (IPO) prices, and cash injections from the government if the company experiences financial difficulties (Wu et al, 2016) in (Rizqi & Purwanto, 2023). In a study conducted by (Jannah et al., 2021) and (Sumbari et al., 2023) it was stated that collusion associated with

market performance can influence the occurrence of financial reporting fraud, but in a study by (Febriani et al., 2022) it was stated that collusion does not influence the occurrence of financial reporting fraud.

The industrial environment of a company is one of the things that investors consider. When a company in an industry has ideal and good conditions, investors will be more interested in investing their capital in the company. To create these good conditions, not a few company managements commit financial reporting fraud (Kusumawati & Khoir, 2018) in (Febriani et al., 2023). The environment in a company, be it culture, organizational structure, internal control, or policies implemented, can create or reduce opportunities for companies to commit fraud. Nature of Industry refers to the ideal conditions of a company in an industry. In the financial statements, there are certain accounts whose balances are determined based on company estimates, such as bad debt accounts and obsolete inventory accounts. This gives the company the flexibility to change these balances without arousing suspicion because the balances of these accounts can be determined by the company (Sari & Nugroho, 2020). In the research conducted by (Khamainy et al., 2022) and (Nurardi & Wijayanti, 2021) stated that the opportunity variable represented by the nature of industry has an effect on financial reporting fraud, but in the research (Adhania et al., 2024) dan (Akbar et al., 2022) stated that the opportunity variable does not affect financial reporting fraud.

Rationalization is related to individual attitudes that justify wrong behavior (Skousen et al, 2009) in (Jannah et al., 2021). Replacement efforts are a form of organizational rationalization, because when the KAP or auditor transition process takes place, there is a transition period that makes the company rationalize the fraud that occurs (Setyono et al., 2023). In a study conducted by (Setyono et al., 2023) stated that rationalization proxied by auditor changes affects financial reporting fraud, but in the study by and stated that rationalization proxied by auditor changes does not affect the occurrence of financial reporting fraud.

Ego is a behavior that reflects that internal controls, policies, and company regulations do not apply to him, and feels free from the company's policies, regulations, and internal controls, so he feels innocent of the various frauds he has committed (Fouziah et al., 2022). Research conducted by (Fouziah et al., 2022) states that ego proxied by the variable of managerial ownership influences acts of financial reporting fraud, but in research by (Sihombing & Panggulu, 2022) states that ego associated with the variable of managerial ownership does not affect acts of financial reporting fraud. This study argues that the conventional fraud detection approaches are inadequate for SOE environments due to their failure to account for the institutional complexity and political economy factors inherent in state ownership structures. The research gap is not merely empirical but fundamentally theoretical existing models lack the sophistication to capture the multi layered fraud risk environment in Indonesian SOEs.

Financial Target Pressure and Fraud Stimulus

Agency theory posits that performance targets create incentives for earnings management when compensation or job security depends on target achievement (Jensen & Meckling, 1976). In SOEs, target-setting dynamics differ fundamentally from private firms. Government shareholders often impose politically-motivated performance targets that reflect social mandates (employment preservation, regional development) rather than economic efficiency. When these unrealistic targets conflict with market realities, management faces heightened pressure to manipulate financial statements.

Prospect theory (Kahneman & Tversky, 1979) suggests that individuals facing potential losses engage in riskier behavior than those anticipating gains. SOE executives falling short of government-mandated ROA targets face not only career consequences but also political scrutiny and potential reputational damage to the government itself. This creates asymmetric risk-reward profiles that amplify fraud stimulus beyond private sector levels. Pasaribu and Ekowati (2023) and Febriani et al. (2023) found positive relationships between financial targets and fraud in Indonesian contexts. However, Handoko and Tandean (2021) and Akbar et al. (2022) reported null findings, suggesting context-dependent effects. The inconsistency may reflect differential political pressures across SOE sectors.

H1: Financial targets (ROA pressure) positively influence financial statement fraud in Indonesian SOEs.

CEO Education and Fraud Capability

Upper echelon theory (Hambrick & Mason, 1984) posits that executive characteristics, including educational background, shape organizational outcomes through cognitive frameworks and decision-making styles. Higher education typically correlates with sophisticated understanding of accounting standards, financial instruments, and regulatory loopholes—capabilities necessary for complex fraud schemes (Wolfe & Hermanson, 2004).

However, the CEO education-fraud relationship in SOEs may operate paradoxically. In Indonesian SOEs, CEO appointments often involve political considerations alongside technical competence. Educational credentials may serve as legitimizing signals rather than true indicators of fraud capability. Moreover, politically-connected CEOs may possess institutional knowledge and network access that facilitates fraud regardless of formal education level.

Resource dependence theory suggests that organizations adapt to environmental constraints by developing specific capabilities (Pfeffer & Salancik, 1978). In SOE contexts, successful fraud may require more institutional and political navigation skills than technical accounting expertise, potentially weakening the education-fraud relationship. Research presents mixed findings. Sihombing and Panggulu (2022) and Sukmadilaga et al. (2022) found capability effects on fraud, while Wicaksono and Suryandari (2021) and

Fouziah et al. (2022) reported non-significant relationships. The inconsistency suggests that fraud capability in SOEs may be institutionally rather than individually determined.

H2: CEO education level (capability) positively influences financial statement fraud in Indonesian SOEs.

Market Performance and Collusive Behavior

Institutional isomorphism theory (DiMaggio & Powell, 1983) explains how organizations mimic others to gain legitimacy within their institutional field. When SOEs underperform market benchmarks, they face legitimacy threats that extend beyond shareholder dissatisfaction to questions about government ownership efficacy itself. This institutional legitimacy crisis creates pressures for collusive arrangements between management, board members, auditors, and political stakeholders to artificially inflate performance metrics.

The price-to-book value (PBV) ratio captures market perception versus accounting fundamentals, with significant deviations signaling potential information asymmetries. In SOE contexts, low PBV ratios may trigger coordinated efforts among multiple parties to manipulate valuations, as both government and management stakeholders share interests in demonstrating SOE viability. Jannah et al. (2021) and Sumbari et al. (2023) found collusion effects on fraud, while Febriani et al. (2022) reported null findings. The divergence may reflect variations in auditor independence and regulatory enforcement across SOE samples.

H3: Market performance (PBV ratio) negatively influences financial statement fraud in Indonesian SOEs

Industry Characteristics and Fraud Opportunity

Opportunity represents the structural conditions enabling fraud execution despite existing controls (Cressey, 1953). Industry characteristics create differential fraud opportunities through revenue recognition complexity, estimation uncertainty, and regulatory oversight intensity. The nature of industry proxy (receivables-to-sales ratio changes) captures revenue manipulation opportunities particularly relevant in SOE sectors.

Resource dependence theory suggests that organizations in certain industries face greater environmental uncertainty, necessitating flexibility in accounting choices (Pfeffer & Salancik, 1978). SOEs in infrastructure, utilities, and construction sectors often engage in long-term government contracts with complex revenue recognition standards, creating systematic opportunities for manipulation. Moreover, regulatory capture where SOEs influence their own oversight may weaken controls in certain industries. Khamainy et al. (2022) and Nurardi and Wijayanti (2021) found industry effects on fraud, while Adhania et al. (2024) and Akbar et al. (2022) found non-significant relationships. These inconsistencies may reflect heterogeneity in accounting flexibility across different SOE industries

H4: Nature of industry positively influences financial statement fraud in Indonesian SOEs.

Auditor Changes and Fraud Rationalization

Cognitive dissonance theory (Festinger, 1957) explains how individuals justify unethical behavior to maintain positive self-concepts. Rationalization represents the mental process whereby fraudsters convince themselves that their actions are acceptable or necessary. In private firms, frequent auditor changes signal "opinion shopping" seeking auditors willing to accommodate questionable practices.

However, SOE rationalization mechanisms may operate differently due to broader mission justifications. SOE executives may rationalize fraud as serving "national interest," "employment protection," or "economic stability" socio-political objectives transcending shareholder wealth maximization. This mission-based rationalization may be independent of auditor selection, as government oversight bodies (not management alone) often control SOE auditor appointments. Setyono et al. (2023) found auditor change effects on fraud, while Handoko and Tandean (2021) and Febriani et al. (2023) found null relationships. The divergence suggests that rationalization in SOEs operates through institutional rather than individual auditor-management dynamics.

H5: Auditor changes (rationalization) positively influence financial statement fraud in Indonesian SOEs.

Managerial Ownership and Ego-Driven Fraud

Psychological ownership theory (Pierce et al., 2001) posits that ownership stakes create psychological bonds influencing behavior. In private firms, higher managerial ownership typically reduces agency problems by aligning management-shareholder interests (Jensen & Meckling, 1976). However, this conventional wisdom may not hold in SOE contexts.

Power-distance cultural dimensions (Hofstede, 1980) suggest that in collectivist, high power-distance societies like Indonesia, concentrated ownership may foster ego-driven behaviors where executives view fraudulent activities as legitimate exercises of hierarchical authority. Moreover, SOE managers with ownership stakes may feel protected from consequences due to political connections, creating hubris and perceived invulnerability. Paradoxically, managerial ownership in SOEs may also reduce fraud through enhanced accountability. Managers with equity stakes face greater scrutiny from government oversight bodies and bear reputational costs if fraud is detected. The net effect remains theoretically ambiguous, requiring empirical resolution. Fouziah et al. (2022) found positive ego-fraud relationships, while Sihombing and Panggulu (2022) reported non-significant effects. The inconsistency highlights the complex, context-dependent nature of ownership-fraud dynamics in SOEs.

H6: Managerial ownership (ego) positively influences financial statement fraud in Indonesian SOEs.

Research Methods

This study employs quantitative methods using panel data regression analysis to examine relationships between fraud hexagon elements and financial statement fraud. The population comprises all SOEs listed on the Indonesia Stock Exchange (IDX) during 2017-2022. Using purposive sampling, we selected firms meeting three criteria: (1) continuous listing throughout the period, (2) financial reporting in Indonesian Rupiah, and (3) complete data availability for all variables. The final sample consists of 16 SOEs providing 96 firm-year observations over six years. Data analysis proceeded through multiple stages using EViews 13 software. First, descriptive statistics characterized variable distributions and identified outliers. Second, panel data diagnostic tests (Chow, Hausman, Lagrange Multiplier) determined the appropriate estimation model. Third, classical assumption tests (normality, multicollinearity, heteroscedasticity, autocorrelation) verified regression validity. Finally, multiple regression analysis tested hypotheses using the specification:

$$\mathbf{Y} = \boldsymbol{\alpha} + \boldsymbol{\beta_1 X_1} + \boldsymbol{\beta_2 X_2} + \boldsymbol{\beta_3 X_3} + \boldsymbol{\beta_4 X_4} + \boldsymbol{\beta_5 X_5} + \boldsymbol{\beta_6 X_6} + \mathbf{e}$$

Where Y represents F-score fraud probability, X_1-X_6 denote fraud hexagon elements, β_1-β_6 are coefficients, α is the constant term, and ε is the error term. Hypothesis testing employed t-statistics with 5% significance level and F-statistics for overall model significance.

Table 1

Operationalization for Independent Variables

No	Variable	Variable Concept	Measurement	Scale
1	Financial Target (Stimulus)-X1	ROA represents the fundamental performance metric that captures the efficiency of asset utilization a critical concern for SOEs managing public resources. The conceptual link between ROA pressure and fraud stimulus is theoretically grounded in target-setting theory, where unrealistic performance expectations create psychological pressure for earnings manipulation	ROA = $\frac{EAT}{Asset\ Total}$	Ratio
2	CEO Education (Capability)-X2	Educational attainment serves as a proxy for cognitive capability and sophisticated	Asc. Degree = 1 Bachelor Degree = 2 Master Degree = 3	Nominal

No	Variable	Variable Concept	Measurement	Scale
		understanding of financial systems. The ordinal scaling (Associate=1 to Doctoral=4) reflects increasing levels of technical knowledge and social capital necessary to execute complex fraud schemes	Doctoral Degree = 4	
3	Market Performance (Collusion)-X3	The PBV ratio captures market perception versus book value, indicating the degree of information asymmetry between management and stakeholders. In SOE contexts, significant deviations between market and book values may signal collusive activities between management, auditors, and regulatory bodies to manipulate investor perceptions. The conceptual logic is that collusion manifests through coordinated efforts to artificially inflate market valuations relative to fundamental book values	PBV = $\frac{Market\ Price\ Per\ Share}{Book\ Value\ Per\ Share}$	Ratio
4	Nature Of Industry (Opportunity)-X4	This ratio measures the quality of revenue recognition and collection efficiency. Changes in this ratio indicate potential revenue manipulation opportunities, particularly relevant in SOEs where revenue recognition standards may be more flexible due to government-related transactions and political considerations	NOI = $\frac{Receivable}{Sales} - \frac{Receivable\ (t-1)}{Sales\ (t-1)}$	Ratio
5	Auditor Change (Rationalization)-X5	Auditor changes represent management's attempt to find auditors who will accommodate questionable accounting practices. The rationalization occurs through the belief that "shopping for auditors" is legitimate business practice rather than fraud facilitation.	Code 1 = if there is a change in auditor Code 0 = if there is no change of auditor	Nominal

No	Variable	Variable Concept	Measurement	Scale
6	Managerial Ownership (Ego)-X6	Ownership concentration measures the degree of managerial entrenchment and perceived invulnerability. Higher ownership percentages in SOEs (though typically lower than private firms) may create ego-driven behaviors where managers believe their position protects them from fraud consequences.	MGR = $\frac{Managerial\ Shares}{Total\ Shares}$	Ratio

Results and Discussion

Based on data obtained from the official website at www.idx.co.id/id and the technology platform for the Indonesian Stock Exchange at www.idnfinancials.com/id/, there are 20 companies included in the BUMN company category in the period 2017 to 2022. However, not all companies meet the specified criteria. Therefore, the number of companies that met the criteria and were used as samples was 16 companies, with a total of 96 annual financial reports for the 2017-2022 research period.

In this research, data processing was carried out using the Eviews 13 application. The descriptive statistical analysis used was the minimum, maximum, average and standard deviation values. The variables that will be described using descriptive statistics are the factors that influence the occurrence of fraudulent financial statements, namely the independent variables in this research, namely: stimulus, capability, collusion, opportunity, rationalization and ego. The results of descriptive statistical testing can be seen in table 2 below:

Tabel 2
Statistik Deskriptif

	X_1	X_2	X_3	X_4	X_5	X_6	Y
Mean	0.0318	2.9688	3.1465	-0.0027	0.2083	0.0001	-0.0419
Median	0.0185	3.0000	1.2732	-0.0038	0.0000	0.0000	-0.0185
Maximum	0.2817	3.0000	41.2767	0.2217	1.0000	0.0035	1.9775
Minimum	-0.2793	2.0000	0.0645	-0.2645	0.0000	0.0000	-1.6124
Std. Dev.	0.0659	0.1749	7.6363	0.0894	0.4082	0.0004	0.5631
Skewness	0.3260	-5.3882	4.3500	-0.2830	1.4364	8.2346	0.1318
Kurtosis	10.0931	30.0323	20.6244	4.2370	3.0632	75.6112	5.5539
Jarque-Bera	202.9465	3387.4880	1545.2380	7.4029	33.0265	22174.4900	26.3678
Probability	0.0000	0.0000	0.0000	0.0247	0.0000	0.0000	0.0000
Sum	3.0554	285.0000	302.0597	-0.2544	20.0000	0.0112	-4.0260

Sum Sq. Dev.	0.4120	2.9063	5539.6840	0.7597	15.8333	0.0000	30.1258
Observations	96	96	96	96	96	96	96

Source : Data processed by author

Table 3

Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.085901	0.715398	0.120074	0.9047
X1	2.773977	0.837005	3.314171	0.0013
X2	-0.067403	0.238103	-0.283085	0.7778
X3	-0.004755	0.008105	-0.586628	0.5589
X4	-3.411955	0.379251	-8.996553	0.0000
X5	0.102460	0.086157	1.189234	0.2375
X6	-268.4363	99.30093	-2.703261	0.0082

Source : Data processed by author

Financial Targets and Fraud Stimulus

Based on table 3, Financial targets demonstrated a significant positive relationship with fraud probability, **providing strong support for H1**. This finding indicates that higher ROA pressure substantially increases financial statement fraud likelihood in Indonesian SOEs, with each percentage point increase in ROA. This result aligns with institutional pressure theory and confirms that SOE performance targets create unique fraud dynamics. Unlike private firms where targets emerge from competitive market forces, SOE targets often reflect political objectives and social mandates disconnected from economic realities. When government shareholders impose aggressive ROA requirements to demonstrate SOE effectiveness or justify continued state ownership, management faces intense pressure to meet these politically-salient benchmarks through any means necessary, including financial manipulation.

The significance of financial targets in SOE fraud surpasses findings in private sector studies, suggesting that political accountability amplifies fraud stimulus beyond traditional agency theory predictions. SOE underperformance carries broader implications than shareholder dissatisfaction—it threatens government legitimacy and may trigger political interventions such as management replacement or privatization. This creates asymmetric consequences where executives risk severe political retaliation for missing targets but receive limited upside for honest performance, incentivizing short-term manipulation over long-term value creation.

These findings corroborate Pasaribu and Ekowati (2023) and Febriani et al. (2023) who documented positive financial target-fraud relationships in Indonesian contexts. However, our results contradict Handoko and Tandean (2021) and Akbar et al. (2022) who found null effects, possibly due to their focus on banking sectors with different regulatory oversight or shorter observation periods that failed to capture fraud patterns.

CEO Education and Fraud Capability

Based on the table 3, Contrary to hypothesis, CEO education showed no significant relationship with fraud probability, **leading to rejection of H2**. This unexpected finding suggests that fraud capability in SOEs is not primarily determined by executives' formal educational credentials, challenging conventional upper echelon theory predictions.

Several theoretical explanations emerge for this null finding. First, SOE fraud may require more institutional and political knowledge than technical accounting expertise. Successful financial manipulation in state-owned contexts necessitates understanding bureaucratic processes, regulatory relationships, and political networks—tacit knowledge unrelated to formal education. Second, CEO appointments in Indonesian SOEs often prioritize political loyalty over technical competence, potentially decoupling educational credentials from actual capability. Third, fraud in SOEs may be more institutionalized and collective rather than individually driven, reducing the importance of any single executive's characteristics. This finding carries important theoretical implications by suggesting that fraud capability constructs developed in private sector contexts may not transfer to state ownership environments. Rather than individual competencies, SOE fraud capability may reflect organizational factors such as control system maturity, board effectiveness, and government oversight intensity areas requiring future research attention. Our results align with Wicaksono and Suryandari (2021) and Fouziah et al. (2022) who found non-significant capability effects, but contradict Sihombing and Panggulu (2022) and Sukmadilaga et al. (2022) who reported positive relationships. The divergence may reflect different capability operationalizations or sectoral heterogeneity in how educational background influences fraud execution.

Market Performance and Collusion

Based on the table 3, Market performance (PBV ratio) demonstrated no significant relationship with fraud probability, **leading to rejection of H3**. This finding suggests that collusive behaviors in SOEs are not primarily driven by market valuation pressures as hypothesized.This null result challenges institutional isomorphism theory predictions and indicates that SOE fraud dynamics differ fundamentally from private firms where market performance strongly influences management behavior. Several

explanations are plausible. First, SOEs may be less sensitive to market valuations due to implicit government guarantees that shield them from bankruptcy regardless of performance. Second, SOE stakeholders may prioritize social objectives (employment, regional development) over financial returns, reducing market-driven collusion incentives. Third, limited analyst coverage and government-dominated ownership structures may render market valuations less informative signals in SOE contexts.

The non-significance of market performance suggests that collusion in SOEs, when it occurs, may be motivated by factors beyond market legitimacy concerns perhaps bureaucratic advancement opportunities, political favor-trading, or corruption networks independent of financial reporting. This points to a need for fraud theory refinement that distinguishes market-driven collusion (relevant in private firms) from politically-motivated collusion (relevant in SOEs). Our findings contradict Jannah et al. (2021) and Sumbari et al. (2023) who found collusion effects on fraud, but align with Febriani et al. (2023) who reported null relationships. The inconsistency may reflect measurement challenges, as PBV ratio captures market perception but may not adequately proxy the complex collusive networks characteristic of SOE governance.

Nature of Industry and Fraud Opportunity

Based table 3, Nature of industry (receivables-to-sales ratio changes) demonstrated a highly significant negative relationship with fraud probability, **providing strong support for H4's** general premise that industry characteristics influence SOE fraud. The negative coefficient requires careful theoretical interpretation, as it suggests that firms with declining receivables-to-sales ratios exhibit higher fraud probability. This counterintuitive finding may reflect sophisticated fraud mechanisms where companies accelerate revenue recognition to improve apparent collection efficiency, then manipulate other accounts to balance financial statements. Alternatively, certain SOE industries (infrastructure, utilities) may have unique revenue patterns where declining receivables signal contract completion and create windows for comprehensive financial manipulation. This result strongly supports opportunity theory by confirming that industry-specific accounting characteristics create systematic fraud vulnerabilities in SOEs. Industries with complex revenue recognition standards, long-term contract accounting, and significant estimation requirements (common in Indonesian SOE sectors like construction and infrastructure) provide greater manipulation flexibility. Moreover, regulatory capture where SOEs influence their own oversight through government relationships may weaken industry-specific controls.

The magnitude of the coefficient indicates that industry characteristics exert the strongest influence on SOE fraud among all hexagon elements, suggesting that structural opportunities dominate individual motivations or capabilities. This finding has important practical implications: fraud prevention in SOEs

should prioritize strengthening industry-specific accounting standards and revenue recognition controls rather than focusing exclusively on individual incentive management. Our results partially align with Khamainy et al. (2022) and Nurardi and Wijayanti (2021) who found opportunity effects on fraud, though the negative coefficient direction warrants further investigation across different SOE industry contexts. The findings contradict Adhania et al. (2024) and Akbar et al. (2022) who reported non-significant relationships, possibly due to their broader samples mixing industries with heterogeneous accounting characteristics.

Auditor Changes and Fraud Rationalization

Based on table 3, Auditor changes showed no significant relationship with fraud probability, **leading to rejection of H5**. This null finding suggests that rationalization mechanisms in SOEs operate differently from private firms where auditor changes frequently signal opinion shopping and fraud facilitation. Several institutional explanations emerge. First, SOE auditor selection often involves government procurement processes rather than management discretion alone, limiting executives' ability to "shop for opinions" through auditor changes. Second, Indonesia's regulatory environment may mandate periodic auditor rotation independent of fraud motivations, creating benign auditor changes that dilute any fraud relationship. Third, SOE fraud rationalization may occur at broader institutional levels through mission-based justifications ("serving national interest") rather than through individual auditor-management dynamics.

This finding challenges cognitive dissonance theory's applicability to SOE contexts and suggests that rationalization constructs require institutional adaptation. SOE executives may not need auditor changes to rationalize fraud because their organizational mission provides inherent justification for prioritizing political and social objectives over accounting accuracy. This "mission-based rationalization" operates independently of external auditor relationships. Our results align with Handoko and Tandean (2021) and Febriani et al. (2023) who found non-significant rationalization effects, but contradict Setyono et al. (2023) who reported positive relationships. The divergence may reflect temporal variations in regulatory enforcement or sectoral differences in auditor change motivations.

Managerial Ownership and Ego-Driven Fraud

Based on table 3, Managerial ownership demonstrated a significant negative relationship with fraud probability, **providing support for H6's** general premise that ownership structures influence SOE fraud though the direction contradicts theoretical predictions. This unexpected negative coefficient suggests that higher managerial ownership actually reduces fraud likelihood in Indonesian SOEs. Several theoretical mechanisms may explain this paradoxical finding. First, the accountability paradox: SOE managers with

equity stakes face greater scrutiny from government oversight bodies and anti-corruption agencies compared to managers without ownership. Any detected fraud would trigger severe political consequences and potential criminal prosecution, creating powerful deterrents. Second, long-term reputation concerns: Ownership creates long-term wealth ties to organizational performance, making managers more cautious about reputation-damaging fraud that could destroy their equity value. Third, vulnerability to political retaliation: SOE managers with significant ownership stakes may be more vulnerable to political targeting if caught in fraudulent activities, as their financial interests make them visible symbols of state asset management. This finding challenges psychological ownership theory and power-distance cultural explanations that predicted positive ego-fraud relationships. Rather than fostering hubris and perceived invulnerability, managerial ownership in SOEs appears to create binding commitment mechanisms that align management interests with honest reporting. The negative relationship suggests that ownership serves as an accountability mechanism rather than ego-inflating device in state-owned contexts.

These results have important governance implications: policies promoting modest managerial ownership in SOEs may reduce fraud risk by creating personal accountability without the excessive risk-taking associated with high ownership concentration in private firms. However, the low average managerial ownership in our sample (0.01%) limits the practical significance of this finding. Our results align with Fouziah et al. (2022) regarding ego's significance but contradict the predicted direction. Sihombing and Panggulu (2022) found non-significant effects, possibly due to different samples or time periods. The negative relationship warrants replication in other emerging market SOE contexts to establish generalizability.

Conclusion

This study examined how fraud hexagon elements influence financial statement fraud in Indonesian SOEs, yielding four major conclusions:(1) Financial target pressure significantly increases fraud probability in SOEs, with effect sizes exceeding private sector benchmarks. Political accountability dynamics amplify fraud stimulus beyond traditional agency theory predictions, confirming that government-mandated performance targets create unique fraud risks in state-owned contexts. (2) Nature of industry (opportunity) exerts the strongest influence on SOE fraud among all hexagon elements. Industry-specific accounting characteristics—particularly revenue recognition complexity create systematic fraud vulnerabilities that dominate individual motivations or capabilities. This finding underscores the structural determinants of SOE fraud. (3) Managerial ownership reduces rather than increases fraud probability, contradicting ego theory predictions. Ownership creates accountability mechanisms in SOE contexts that bind managers to

honest reporting through enhanced government scrutiny and reputational concerns. (4) Three fraud hexagon elements (capability, collusion, rationalization) show no significant effects in SOE contexts, suggesting that individual characteristics, market pressures, and auditor relationships matter less in state ownership environments where fraud is institutionally determined

This research makes three theoretical contributions, Institutional Fraud Framework Development: We propose extending fraud theory through institutional lenses that recognize how organizational form (state ownership) fundamentally alters fraud dynamics. The fraud hexagon operates differently across institutional contexts, requiring theoretical refinement beyond universal application. Agency Theory Refinement: Conventional agency theory inadequately explains SOE fraud because it assumes unitary principal-agent relationships. SOEs involve multiple principals (government, citizens, shareholders) with conflicting objectives, creating agency relationships where fraud may serve some principals while harming others. This complexity demands multi-principal agency frameworks. Context-Specific Fraud Theory: The differential effects of hexagon elements across SOEs versus private firms demonstrate the need for context-specific fraud theories rather than universal models. Future research should develop institutional taxonomies that classify organizations by fraud-relevant characteristics (ownership structure, regulatory environment, stakeholder complexity) and develop tailored theoretical predictions.

Four limitations constrain interpretation, (1) The R^2 of 52.73% indicates that 47.27% of SOE fraud variation remains unexplained by the fraud hexagon model. Omitted variables such as political connections, organizational culture, board characteristics, and audit committee effectiveness may provide additional explanatory power. (2) The sample comprises only Indonesian SOEs listed on the Indonesia Stock Exchange during 2017-2022, limiting generalizability to other emerging markets with different institutional environments. Cultural factors, regulatory frameworks, and governance traditions vary substantially across countries. (3) The F-score model measures fraud probability rather than actual detected fraud, potentially introducing measurement error. Future research should triangulate using multiple fraud indicators including restatements, regulatory sanctions, and forensic audit findings. (4) the fraud hexagon elements are measured using proxy variables that may not fully capture theoretical constructs. For example, CEO education proxies capability, but actual technical

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