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Detecting Fraudulent Financial Statement Using the Fraud Hexagon Model and ESG Disclosure as a Moderator

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Abstract : *The purpose of this study is to investigate the connection between the probability of financial statement fraud and the components of the Fraud Hexagon: pressure, opportunity, rationalization, capability, arrogance, and collusion. Additionally, we examine how Environmental, Social, and Governance (ESG) Disclosure functions as a moderator. Banks listed on the Indonesia Stock Exchange (IDX) between 2021 and 2024 are the subject of this study. We make use of secondary data gathered from business sustainability and annual reports. Purposive sampling was used to choose the bank sample depending on the completeness of the data. We use the Partial Least Squares (PLS) method of Structural Equation Modeling (SEM), which works well for evaluating models with complex variables, for the analysis. The results of this study are expected to provide insights into how each element of the Fraud Hexagon contributes to financial statement fraud and how ESG Disclosure can mitigate these risks.*

Keywords: *Banking Sector; ESG Disclosure; Financial Reporting Fraud; Fraud Hexagon Theory; SEM-PLS*

1. INTRODUCTION

According to PSAK No. 1 (Revised 2009), financial statements serve to present important data regarding a company's financial condition, performance, cash flow, and equity. This information is crucial for report users in making financial decisions (Indonesian Institute of Accountants, 2016). To achieve this objective, reports must be free from misstatements, whether intentional or unintentional, to prevent fraud that could undermine investor confidence and lead to significant losses (Julianto et al., 2021).

For example, CORE economist Yusuf Rendy Manilet once warned that BCA's credit restructuring to anticipate liquidity risk could negatively impact the bank's revenue (Soepriyanto et al., 2022). This situation suggests that pressure on financial performance can encourage report manipulation, in line with research findings emphasizing the critical role of financial stability in preventing fraud (Maria et al., 2022; Handayani et al., 2023).

There are three primary types of fraud, per the Association of Certified Fraud Examiners' biennial study (ACFE, 2022). Asset misappropriation was the most prevalent kind of fraud, making up 86% of cases and resulting in an average loss of $100,000. 50% of instances involved corruption, with an average loss of $150,000. Financial statement fraud, on the other hand, was the most expensive, with a median loss of $593,000. This was despite being the least common (9% of cases). This kind of fraud entails purposefully omitting or making significant mistakes in financial statements.

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Figure 1. Percentage of Fraud in 2022.

Source: ACFE, (2022)

According to the ACFE (2022) report, the banking and financial services industry tops list, with 351 recorded cases. This figure accounts for 22.30% of total fraud cases, making it the sector with the highest fraud incidence among all industries surveyed.

Table 1. Number of Cases Industry of Victim Organizations.

No	**Industry**	**Presenting the Case**
1.	Banking and financial services	23,30%
2.	Government and public administration	12,57%
3.	Manufacturing	12,33%
4.	Health core	8,27%
5.	Energy	6,16%
6.	Retail	5,78%
7.	Insurance	5,60%
8.	Technology	5,34%
9.	Transportation and warehousing	5,20%
10.	Construction	4,95%
11.	Education	4,38%
12.	Information	3,82%
13.	Food service and hospitality	3,30%
	TOTAL	100,00%

Source: ACFE, (2022)

This study aims to identify the main drivers of financial statement fraud, given its significant financial impact, particularly in the banking sector. By analyzing banks listed on the Indonesia Stock Exchange (IDX) during the 2021-2024 period, this study specifically investigates how the six elements of the Fraud Hexagon Theory influence fraud. Furthermore, this study introduces a new perspective by examining the role of ESG Disclosure as a variable influencing this relationship. The goal is to understand whether ESG transparency can mitigate or amplify the effects of the Fraud Hexagon factors on fraud potential. This study is expected to provide strategic guidance in fraud prevention efforts by increasing corporate transparency and accountability.

2. LITERATURE REVIEW

Fraud Hexagon Theory

Vousinas introduced the Fraud Hexagon Theory in 2019 as a framework for identifying potential fraud. This theory proposes six factors that trigger fraudulent acts. First is stimulus, namely the pressure of hidden financial needs that drives individuals to commit fraud (Ghaisani et al., 2022). Next is capability, referring to a person's expertise that creates an opportunity to commit fraud (Elkotby, 2022). Third is opportunity, namely the existence of gaps that trigger the intention to commit fraud (Sukmadilaga et al., 2022). Fourth, rationalization, which is an attempt to justify oneself so that fraudulent acts feel normal (Achmad et al., 2023). Fifth is ego, namely a lack of moral awareness that causes fraud to be considered commonplace for personal gain (Lubur & Hambali, 2023). Finally, collusion, namely cooperation between individuals within a company to conceal fraudulent acts (Apsari & Suhartini, 2021).

ESG Disclosure

Companies are not only financially responsible but also accountable for the impact of environmental damage on their surroundings. A company's survival depends not only on improved performance but also on the attention of all stakeholders, including the environment (Triyani et al., 2020). Corporate social responsibility (CSR) is a form of accountability to internal and external stakeholders for the effectiveness of the company's sustainability.

Companies today apply ESG (Environmental, Social, and Governance) principles in accordance with the government's objective of implementing sustainability to enhance economic welfare. The ESG effects of sustainability on business or firm investment decisions are referred to as ESG. Investors utilize these three CSR facets to assess a company's sustainability performance more thoroughly. ESG equities enhance cost of capital, volatility, stock liquidity, and financial performance (Ratajczak & Mikołajewicz, 2021).

The Influence of Hexagon Fraud Theory in Detecting Financial Report Fraud

According to the Fraud Hexagon theory, several factors can positively influence the occurrence of financial statement fraud. First, pressure, as measured by Return on Assets (ROA), can create pressure on management to achieve profit targets, thus triggering financial statement fraud (Fuad et al., 2020). Second, capability increases in individuals with high positions and long tenure, giving them a deep understanding of the company and facilitating financial statement manipulation (Yanti & Riharjo, 2021). Third, opportunity arises from subjective assessments of uncollectible receivables, which provides managers with the opportunity to commit misstatements (Yanti & Riharjo, 2021; Ramdany et al., 2020). Fourth, rationalization occurs when there is a change in auditor, where companies can justify fraudulent actions during the transition process (Setyono et al., 2023). Fifth, CEO arrogance, or narcissism, which is perceived as superior and above the law can be measured by the number of CEO photos in annual reports, and this has been shown to have a positive effect on the detection of financial reporting fraud (Haqq & Budiwitjaksono, 2020). Finally, collusion can be driven by collaboration with government projects, which is a reason for companies to collude to improve their financial reports and allow them to participate in the project (Sari & Nugroho, 2020).

H1a: Pressure has a positive impact on the likelihood of financial statement fraud.
H1b: Capability has a positive impact on the likelihood of financial statement fraud.
H1c: Opportunity has a positive impact on the likelihood of financial statement fraud.
H1d: Rationalization has a positive impact on the likelihood of financial statement fraud.
H1e: Arrogance has a positive impact on the likelihood of financial statement fraud.
H1f: Collusion has a positive impact on the likelihood of financial statement fraud.

Moderation of ESG Disclosure on the Relationship Between Hexagon Fraud Theory in Detecting Financial Statement Fraud Methods

Environmental, Social, and Governance (ESG) principles address stakeholder demands for accountability and transparency. Sustainability reports disclose a company's economic, environmental, social, and governance impacts, enabling companies to implement ESG principles as part of their objectives (Ratajczak & Mikołajewicz, 2021). Disclosure of this non-financial information is considered a crucial indicator of corporate performance, with strong support from the Indonesian government, including Finance Minister Sri Mulyani and the Ministry of State-Owned Enterprises, which are promoting ESG implementation for economic recovery (Alareeni & Hamdan, 2020; Winarto, 2022). Therefore, ESG disclosure acts as a moderating variable that can influence the relationship between Fraud Hexagon factors and financial statement fraud. Enhanced transparency through ESG implementation is expected to mitigate fraud risks arising from pressure, capability, opportunity, rationalization, arrogance, and collusion, thereby creating a stronger oversight mechanism.

H2a: ESG disclosure moderated pressure in detecting fraudulent financial statement.
H2b: ESG disclosure moderated opportunity in detecting fraudulent financial statement.
H2c: ESG disclosure moderated rationalization in detecting fraudulent financial statement.
H2d: ESG disclosure moderated capability in detecting fraudulent financial statement.

H2e: ESG disclosure moderated ego in detecting fraudulent financial statement.

H2f: ESG disclosure moderated collusion in detecting fraudulent financial statement.

Theoretical Framework of Thought

The theoretical framework is presented in Figure 2.

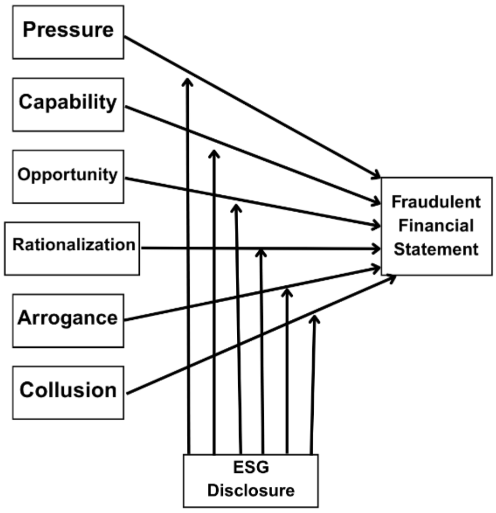

Figure 2. Theoretical Framework of Thought.

Source: Processed Data, 2025

3. METHODS

Research Design and Methodology

The purpose of this study is to investigate the causal relationship between the risk of financial statement fraud and the six components of the Fraud Hexagon. Additionally, this study investigates how Environmental, Social, and Governance (ESG) Disclosure functions as a moderating factor.

Research Focus and Data

Using data from banks listed on the Indonesia Stock Exchange (IDX) for the years 2021–2024, this study focuses on the banking industry in Indonesia. Secondary data from yearly financial reports and business sustainability reports was used. Using a purposive sampling technique, the bank sample was chosen from among those that offered comprehensive data.

Data Analysis

The Structural Equation Modeling (SEM) method using the Partial Least Squares (PLS) approach, which is ideal for testing complex models, was employed in this work to analyze the data. Validity and reliability tests were performed on the research instrument prior to testing the hypotheses. As demonstrated by sufficient cross-loading values, the Fornell-Larcker criterion, and an AVE value more than 0.5, validity testing guarantees that each variable measure what it should. Following validation, Cronbach's Alpha and Composite Reliability values are checked to make sure the instrument is reliable. Lastly, path analysis is used to assess the association between variables; if the p-value is less than 0.05, the hypothesis is deemed statistically justified.

4. RESULT AND DISCUSSION

R Square

Table 2. R Square.

	R Square	R Square Adjusted
Fraudulent Financial Statement (Y)	0.989	0.988

The model in use has very excellent predictive potential, as indicated by the R-squared value of 0.989. In particular, 98.9% of the variation in financial statement fraud was explained by the independent factors examined collectively. This indicates that the components in the model could only account for 1.1% of the variation.

In the meantime, the model's strong predictive accuracy for financial statement fraud was confirmed by its Adjusted R-squared value of 0.988, which took into consideration the number of variables included. To sum up, this PLS-SEM model fits the available study data and is quite dependable.

F Square

Table 3. F Square.

	Fraudulent Financial Statement (Y)
X1 Pressure (ROA)	0.113
X2 Opportunity (Allowance/AR)	4.584
X3 Rationalization (Auditor Change)	48.811
X4 Capability (CEO Duality)	15.376
X5 Arrogance (CEO Photos)	17.375
X6 Collusion (Gov Project)	2.244

Based on the results of the F-squared test, each independent variable shows a varying contribution to financial statement fraud. The Pressure variable, measured by ROA, has the smallest influence (0.113). In contrast, the Opportunity, Collusion, Capability, and Arrogance variables show a very large influence. However, the Rationalization variable, proxied by auditor switching, is the most dominant determinant with a value of 48.811. These findings theoretically provide strong evidence that aspects such as behavioral justification

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(rationalization) and leadership traits (arrogance and capability) have a much more significant role in encouraging financial statement fraud practices than financial pressure alone.

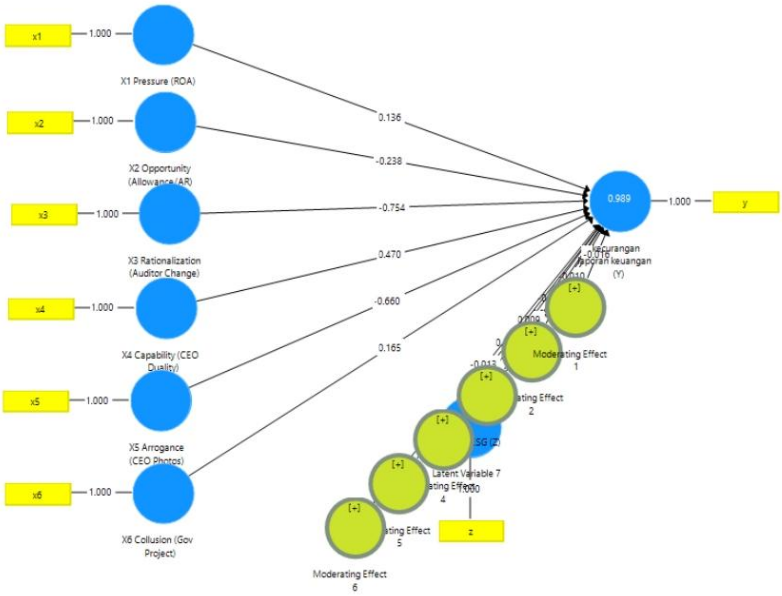

Figure 3. Path Coefficient.

Source: Processed Data, 2025

Hypothesis Testing

Table 4. Hypothesis Testing.

	T Statistics (|O/STDEV|)	P Values
Moderating Effect 1 -> Fraudulent Financial Statement (Y)	0.715	0.475
Moderating Effect 2 -> Fraudulent Financial Statement (Y)	1.189	0.235
Moderating Effect 3 -> Fraudulent Financial Statement (Y)	9.570	0.000
Moderating Effect 4 -> Fraudulent Financial Statement (Y)	1.111	0.267
Moderating Effect 5 -> Fraudulent Financial Statement (Y)	1.613	0.107
Moderating Effect 6 -> Fraudulent Financial Statement (Y)	2.120	0.034
X1 Pressure (ROA) -> Fraudulent Financial Statement (Y)	2.004	0.046
X2 Opportunity (Allowance/AR) -> Fraudulent Financial Statement (Y)	8.031	0.000
X3 Rationalization (Auditor Change) -> Fraudulent Financial Statement (Y)	22.764	0.000
X4 Capability (CEO Duality) -> Fraudulent Financial Statement (Y)	16.246	0.000
X5 Arrogance (CEO Photos) -> Fraudulent Financial Statement (Y)	18.724	0.000
X6 Collusion (Gov Project) -> Fraudulent Financial Statement (Y)	7.816	0.000

Moderation Effect Test Results

a. Moderation Effects 1 and 2: These two effects did not show a significant effect (p-value > 0.05). This means that moderating variables 1 and 2 do not play a significant role in changing or influencing the relationship between the independent variables and financial statement fraud. Their effects can be considered neutral.
b. Moderation Effect 3: This effect proved highly significant (p-value = 0.000). These results indicate that moderating variable 3 significantly influences the relationship between the main variables and financial statement fraud. The presence of this variable can alter the strength of the relationship, either strengthening or weakening its influence.
c. Moderation Effects 4 and 5: These two effects were also not significant. Although moderating effect 5 had a p-value approaching the significance limit (0.107), it was still considered statistically insignificant enough to change the relationship between the variables.
d. Moderation Effect 6: This moderating effect was significant (p-value = 0.034). This indicates that moderating variable 6 plays a significant role as an effective moderator, meaning it can alter the relationship between the independent variables and financial statement fraud.

Independent Variable Test Results

a) Pressure (X1): Proxied by ROA, this variable is significant (p-value = 0.046). This confirms that financial pressure, as measured by company profitability, has a significant influence on financial statement fraud practices. The higher the pressure, the greater the likelihood of fraud.
b) Opportunity (X2): Proxied by Allowance/AR, this variable is highly significant (p-value = 0.000). This finding indicates that the greater the opportunity for a company to manipulate accounts, such as allowances for doubtful accounts, the higher the risk of financial statement fraud.
c) Rationalization (X3): Proxied by auditor change, this variable is highly significant (p-value = 0.000). These results support the argument that auditor change can serve as an excuse or rationalization for management to commit fraud. This is an important indicator in detecting fraud.
d) Capability (X4): Proxied by CEO Duality, this variable is highly significant (p-value = 0.000). The concentration of power in one person (a CEO holding multiple positions) significantly increases that individual's ability to manipulate financial statements, thereby increasing the risk of fraud.

e) Arrogance (X5): Proxied by the frequency of CEO photos, this variable is significant (p-value = 0.000). The results indicate that managerial arrogance is strongly associated with fraud. The higher the level of arrogance, the greater the likelihood of abuse of authority.

f) Collusion (X6): Proxied by involvement in government projects, this variable is also significant (p-value = 0.000). Involvement in government projects creates incentives and opportunities for collusion, which ultimately increases the potential for financial statement fraud.

5. CONCLUSION

The results of this study reinforce the theory that the elements of the Fraud Hexagon Theory are significant strengthen of financial statement fraud in the Indonesian banking sector. Specifically, factors related to individual behaviour and characteristics such as Rationalization, Arrogance, and Capability play a crucial role in triggering fraud. However, the role of ESG Disclosure as a prevention mechanism is not always consistent. This study found that transparency resulting from ESG disclosure is only effective in moderating some of the fraud triggers, but not all of the factors identified by the Fraud Hexagon. These findings provide new insights that, although important, ESG transparency may not be the sole solution to prevent all forms of fraud that stem from various motivations and opportunities. Based on these results, it is recommended that fraud prevention strategies should not only focus on non-financial disclosures, but also on closer scrutiny of behavioural and structural factors within companies, such as auditor turnover, power concentration, and leadership characteristics.

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