

## **Analysis of Fraud Hexagon Theory on Potential Fraudulent Financial Reporting Using the Beneish M-Score Model**

**Adiibah Daffa' Dhiya 'Ulhaq<sup>1</sup>, Lalu Muhammad Syahril Majidi<sup>2</sup>**

*<sup>1,2</sup>Universitas Nahdlatul Ulama Surabaya*

**\*Email: adiibahdaffa13@gmail.com**

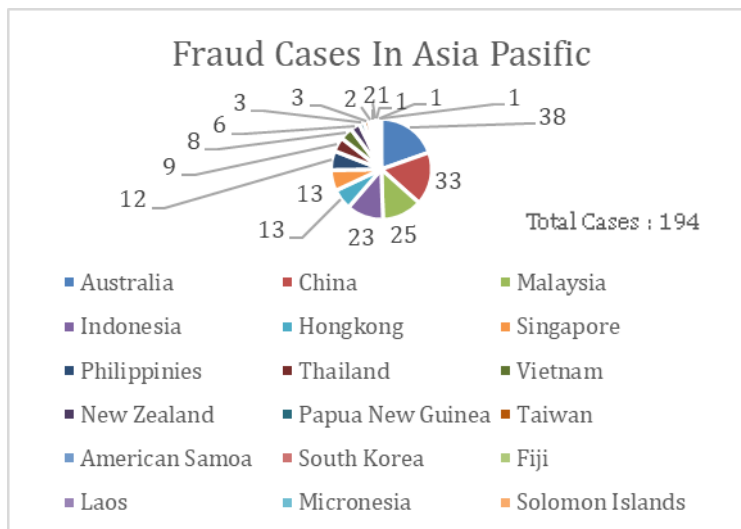
### **ABSTRACT**

This study aims to analyze the effect of the Fraud Hexagon on the potential for Fraudulent Financial Reporting. There are eleven variables used, namely, financial stability, external pressure, financial target, director change, CEO's education, audit fee, ineffective monitoring, change in head of internal audit, nature of industry, frequent number of CEO's picture, and CEO duality. Fraudulent Financial Reporting is measured using the Beneish M-Score Model. The sample in this study were BUMN companies listed on the Indonesia Stock Exchange (IDX) in 2018-2022 with the number of samples used being 28 companies. Data analysis in this study used multiple linear regression analysis. The results of this study indicate that financial stability, financial targets, and director change have a positive and significant effect on the potential for Fraudulent Financial Reporting. While external pressure, CEO's education, audit fee, ineffective monitoring, change in head of internal audit, nature of industry, frequent number of CEO's picture, and CEO duality have no influence on Fraudulent Financial Reporting.

**Keywords:** fraud hexagon, fraudulent financial reporting, beneish m-score model

### **INTRODUCTION**

Financial statements are the result of a process of accounting recording activities obtained from financial transactions during the period of the relevant financial year. This financial report is prepared by the accounting department to be accountable to management and to the company. According to the Statement of Financial Accounting Standards (PSAK) No. 1 of 2022, the purpose of financial reporting is to provide information about the financial position, financial performance, and cash flow of an entity that is useful for most reporting users in making economic decisions. The importance of financial reporting for a company, management sometimes hides the real situation in financial reporting so that its performance results appear positive, even in poor performance (Agustina & Pratomo, 2019). These conditions encourage some companies to commit fraud by manipulating financial statements. Manipulation of financial statements by management is called fraudulent financial reporting. This behavior is deliberate behavior to falsify financial statements with the aim of deceiving related parties.



**Source:** Occupational Fraud 2022: A Report to the Nations, Data Processed

**Figure 1:** Graph of Fraud Cases in Asia Pacific

The occurrence of undetected fraud can have a negative impact on users of financial statements. Based on the “Asia-Pacific Occupational Fraud 2022: A Report to the Nations” report released by the Association of Certified Fraud Examiners (ACFE), Indonesia ranks 4th in terms of the number of fraud cases in 2022, with 23 recorded cases. Of the 23 cases of fraud in Indonesia, it turns out that those who commit financial reporting fraud also occur in companies with BUMN status. The existence of this fraud phenomenon can be explained by several fraud theories, one of which is the fraud hexagon theory by Vousinas (2019). The variables in the fraud hexagon theory can be closely related to the potential for fraudulent financial statements.

In the fraud hexagon theory, there are 6 variables as mentioned above, one of which is the stimulus variable which is reviewed using financial stability and found to be the cause of fraud. This can be seen from Siregar's research (2023), which states that one of the elements of the fraud hexagon, namely the stimulus from financial stability, has a significant positive effect on financial statement fraud, which indicates that this element plays a role in fraudulent activities. The findings of previous researchers (Siregar, 2023) have differences with research conducted by Agusputri & Sofie (2019), which revealed that financial stability has no effect on fraudulent financial reporting. Managers tend not to immediately manipulate financial statements to improve company prospects when financial conditions are unstable or declining. Such actions may worsen the company's financial situation in the future.

The potential for financial statement fraud can be measured using the Beneish M-Score model popularized by (Beneish et al., 1999). The detection tool in the Beneish M-Score involves eight ratios consisting of Days Sales In Receivables Index (DSRI), Gross Margin Index (GMI), Asset Quality Index (AQI), Sales Growth Index (SGI), Depreciation Index (DEPI), Sales General and Administrative Index (SGA), Leverage Index (LVGI), and Total Accrual To Total Assets Index (TATA). This financial ratio aims to get a certain score to identify the possibility of fraud in the preparation of financial statements.

Based on the phenomena and previous research described above, this research is interesting to do, this is because there is a research gap from various variables that can motivate this research. This study will examine the effect of fraud hexagon variables proxied

by 11 indicators including financial stability, ineffective monitoring, external pressure, financial target, nature of industry, director change, change in head of internal audit, audit fee, frequent number of CEO's picture, CEO duality and CEO's education on fraudulent financial reporting. This encourages researchers to conduct research on "Analysis of Fraud Hexagon Theory on Potential Fraudulent Financial Reporting Using the Beneish M-Score Model (Case Study of BUMN Companies on the IDX 2018-2022)".

## **LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT**

### **1. Financial Stability on potential fraudulent financial reporting**

Based on agency theory, financial stability can affect financial statement fraud. Agency theory explains that managers can feel pressured to manipulate financial statements when the company's financial stability is threatened, because the principal wants the company's finances to remain stable. Pressure to maintain financial stability can encourage managers to take dishonest actions related to financial reporting. This statement is supported by previous research conducted by Siregar & Murwaningsari (2022) which shows that financial stability has a significant effect on fraudulent financial reporting. This statement is in line with research conducted by Rianggi (2023) which states that the stimulus categorized as financial stability has a significant and positive effect on fraudulent financial reporting.

It can be concluded that the stimulus of financial stability can put pressure and raise the possibility of the occurrence of fraud to hide the financial condition of an entity by keeping the company's assets in good condition. Based on the explanation above, the the following hypothesis is formulated:

H<sub>1</sub> Financial Stability has a positive effect on potential fraudulent financial reporting

### **2. External Pressure on potential fraudulent financial reporting**

Based on agency theory, external pressure is a condition where company managers are under pressure to obtain financial resources or capital from external parties, such as investors, banks, or markets. External pressure can influence managers to take inappropriate or unethical actions, such as fraud in financial reporting. Based on agency theory, external pressure shows that it has a positive effect on financial statement fraud. This shows that external pressure can increase the risk of fraudulent financial statements. This statement is supported by previous research conducted by Imtikhani (2021) which shows that external pressure has a significant positive effect on fraudulent financial reporting. This statement is in line with research conducted by Oktavia et al., (2022) which states that external pressure has an influence on fraud detection in financial reporting.

It can be concluded that differences in interests cause management to feel pressure to meet the expectations of company owners, including to obtain sources of funds and financing from external parties. This pressure encourages management to make various efforts to meet the expectations of external parties by showing optimal performance, even if this involves manipulating financial statements. Based on the explanation above, the following hypothesis is formulated:

H<sub>2</sub> External Pressure has a positive effect on the potential for fraudulent financial reporting

### **3. Financial Target on potential fraudulent financial reporting**

Based on the agency theory, financial targets can be an excessive pressure on management or operational employees to achieve financial targets that have been set by related parties in the form of company profits. Financial targets are targets in the form of profit on business set by the board of directors or management. SAS No.99 states that financial targets arise due to excessive pressure to achieve predetermined financial targets felt by parties who have a large responsibility for corporate governance towards company management. This statement is supported by previous research conducted by Maryadi et al., (2020) which shows that financial targets have a significant effect on financial reporting fraud. Because the lower the ROA level, the higher the possibility of fraudulent financial reporting. This statement is in line with research conducted by Agusputri & Sofie (2019) which shows that the pressure element proxied through the financial target variable has a positive effect on fraudulent financial reporting.

It can be concluded that the lower the Return on Assets (ROA), the higher the probability of fraudulent financial reporting. This is because a low ROA indicates that the company is having difficulty generating profits from its assets, so company managers may be more ambitious to achieve the set financial targets. Poor company performance due to low ROA can influence manager behavior to take unethical actions. to take unethical actions to achieve targets, thereby increasing the possibility of fraudulent financial reporting. Based on the explanation above, the following hypothesis is formulated:

H<sub>3</sub> Financial Target has a positive effect on potential fraudulent financial reporting

### **4. Director Change on potential fraudulent financial reporting**

Director change in the context of agency theory can be seen through the variety of pressures faced by management, including pressures related to changes in the board of directors. A change of directors can affect the initial performance of new directors, which can negatively affect the company's performance as they need time to adapt. This is a factor to consider in agency analysis, especially in the context of board turnover. This statement is supported by previous research conducted by Triyanto (2019) which shows that director change has a positive and significant effect on fraud in financial statements. This statement is in line with research conducted by Sasongko & Wijyantika (2019) which states that director change has a positive effect on fraudulent financial reporting.

It can be concluded that changing directors can have complex implications. While changes in the board of directors can help improve the performance of the previous directors by introducing higher competencies, it can also cause a stress period that allows opportunities for fraud. In addition, a change of directors may indicate certain political interests and reduce effectiveness in performance because it requires adaptation time to the culture of the new directors. Based on the explanation above, the following hypothesis is formulated:

H<sub>4</sub> Director Change has a positive effect on the potential fraudulent financial reporting

### **5. CEO's Education on potential fraudulent financial reporting**

The relationship between CEO education and firm performance is based on the agency theory that CEO-specific education can have a positive effect on IPO performance in high uncertainty environments. Moreover, continuous learning and training at the executive level is important for business leaders and executives to gain a competitive advantage and

prepare for the future. This statement is supported by previous research conducted by Lestari & Henny (2019) which shows that CEO's Education has a positive and significant effect on financial statement fraud. This statement is in line with research conducted by Precilia et al., (2022) which states that CEO's Education is able to influence financial statement fraud.

It can be concluded that a person's education plays a role in shaping moral and ethical character, which can influence behavior. A CEO who has a high educational background and is competent in his field, he will be better able to identify weaknesses in standards and manipulate financial statements using his knowledge and skills. Based on the explanation above, the following hypothesis is formulated:

H<sub>5</sub> CEO's Education has a positive effect on the potential for fraudulent financial reporting.

#### **6. Audit Fee on potential fraudulent financial reporting**

Based on the theory of financial behavior, the amount of audit fees can affect fraud in financial statements. Audit fee is a service fee received by the auditor from the client to audit the company's financial statements. The amount of the audit fee can affect the quality of the audit performed by the auditor. Auditors who receive low audit fees may experience time constraints in conducting audits, which in turn can have a negative impact on the quality of the audit results submitted.

This statement is supported by previous research conducted by Aviantara (2021) which shows that audit fees have a positive effect on financial statement fraud. It can be concluded that the relationship between the amount of audit fees and fraud in financial statements can be understood through the complexity of the factors that influence the determination of audit fees and the responsibilities and risks inherent in auditors in carrying out their duties. Based on the explanation above, the following hypothesis is formulated:

H<sub>6</sub> Audit fees have a positive effect on the potential for fraudulent financial reporting.

#### **7. Ineffective Monitoring on potential fraudulent financial reporting**

Based on agency theory, ineffective monitoring refers to a condition where the company does not have an effective supervisory unit to monitor company performance. According to this theory, ineffective monitoring can increase the risk of fraudulent financial statements due to the weakening of the company's supervisory system and audit committee. Several studies have shown that ineffective monitoring has a positive effect on fraudulent financial statements. This statement is supported by previous research conducted by Agusputri & Sofie (2019) which states that ineffective monitoring has a positive effect on fraudulent financial reporting. This statement is in line with research conducted by Lestari & Henny (2019) ineffective monitoring has a significant effect on the detection of fraudulent financial statements.

It can be concluded that with ineffective supervision, management feels that their performance is not being monitored so that they look for ways to commit fraud. Thus, the higher the ineffectiveness of supervision, the weaker the internal control over management performance will be so that the possibility of fraudulent financial statements will be higher. Based on the explanation above, the following hypothesis is formulated:

H<sub>7</sub> Ineffective Monitoring has a positive effect on the potential for fraudulent financial reporting

#### **8. Change in Head of Internal Audit on potential fraudulent financial reporting**

Based on agency theory, changing the head of internal audit may impact the performance and effectiveness of the internal audit function. A new head of internal audit may bring new ideas and effective, sustainable changes to the internal audit organization. However, if the head of internal audit is not performing up to the expectations of management or the audit committee, they may need to be replaced or rotated regularly. This statement is supported by previous research conducted by Ferica et al., (2019) which states that the change of chief internal auditor has a significant effect on financial statement fraud. This statement is in line with research conducted by Yendrawati & Hernanda (2022) which states that the change of chief internal auditor has a positive and significant effect on the potential for financial statement fraud.

It can be concluded that too frequent changes in the chief internal auditor in a company can affect the internal audit that will be carried out by the internal control system (SPI). Opportunities for fraud can be open when companies have weak internal controls, inadequate management supervision, and unclear procedures. In situations like this, fraudsters may feel that their actions will not be easily detected. The more frequent the change in the chief internal auditor, the greater the potential for fraud in the financial statements. Based on the explanation above, the following hypothesis is formulated:

H<sub>8</sub> Change in Head of Internal Audit has a positive effect on the potential for fraudulent financial reporting.

#### **9. Nature of Industry on potential fraudulent financial reporting**

Based on agency theory, industry interests can be viewed in terms of market structure, management decisions, and the relationship between the two. This theory facilitates the analysis of industry characteristics, such as concurrency, market construction, and performance. Industries are based on economic principles, including transaction theory, managerial, and firm behavior. Thus, agency theory brings a systematic and dynamic view of industry functions and characteristics. This statement is supported by previous research conducted by Sari & Nugroho (2020) which shows that the nature of industry affects financial statement fraud. This statement is in line with research conducted by Riinggi & Novita (2023) which shows that the nature of industry has a positive and significant effect on the occurrence of fraudulent financial statements.

It can be concluded that a significant change in the value of trade receivables from the previous year can indicate the potential for fraud in the financial statements and indicates that the increase in the entity's receivables indicates poor cash turnover. The large number of receivables owned by the entity can reduce the amount of cash used for operations and encourage management to manipulate financial statements. Based on the explanation above, the following hypothesis is formulated:

H<sub>9</sub> Nature of Industry has a positive effect on the potential for fraudulent financial reporting

#### **10. Frequent Number CEO's Picture on potential fraudulent financial reporting**



Based on behavioral finance theory, the number of CEO photos that appear frequently can predict fraudulent financial reporting. The number of CEO photos displayed in the company's annual report may reflect the level of arrogance or superiority that the CEO has. This arrogance can be indicated by the CEO's desire to show everyone the status and position he has in the company. Several studies have shown that the number of CEO photos can influence fraudulent behavior in financial reporting. This statement is supported by previous research conducted by Oktavia et al., (2022) which states that the frequent number of CEO's pictures has a positive and significant effect on fraudulent financial reporting. This statement is in line with research conducted by Elviani et al., (2020) which states that the frequent number of CEO's picture affects fraud in financial reporting.

It can be concluded that the number of CEO photos displayed in a report can show the level of CEO arrogance in the company. This can be caused by the fact that a high level of arrogance can trigger fraud in financial reporting. CEOs who feel superior and have full control over the company may feel that internal controls do not apply to them because of their high status and position. This can allow the CEO to easily commit fraud in financial reporting. Based on the explanation above, the following hypothesis is formulated:

H<sub>10</sub> Frequent Number of CEO's Picture has a positive effect on the potential for fraudulent financial reporting.

#### **11. CEO Duality on potential fraudulent financial reporting**

In the context of Agency Theory, CEO Duality refers to a situation where one individual gathers two important positions in the company, namely as Chief Executive Officer and Chairman of the Board. From an Agency Theory perspective, CEO Duality leads to weaker "insider control", as such a powerful position in the hands of one person may promote self-interest more than investor interest. This statement is supported by previous research conducted by Situngkir & Triyanto (2020) which states that CEO Duality has a positive effect on fraudulent financial reporting. This statement is in line with research conducted by Kusumosari & Solikhah (2021) which states that CEO Duality has an effect on fraud in financial reporting.

It can be concluded that the dual position held by the CEO will result in dominance in the company. This dominance will encourage the CEO to prioritize his personal interests. This can have an impact on reducing supervision in the company, so that it can be utilized by certain parties to commit fraudulent acts and cause problems between agents and principals. Based on the explanation above, the following hypothesis is formulated:

H<sub>11</sub> CEO Duality has a positive effect on the potential for fraudulent financial reporting.

## METHODS

1. Financial Stability  $ACHANGE = \frac{Total\ Asset\ (t) - Total\ Asset\ (t-1)}{Total\ Asset\ (t)}$
2. External Pressure  $LEV = \frac{Total\ Debt}{Total\ Asset}$
3. Financial Target  $ROA = \frac{Net\ Profit}{Total\ Asset}$
4. Director Change using dummy variables, code 1 if there is a change of director and code 0 otherwise (Siregar, 2023).
5. CEO's Education using dummy variables, code 1 if the CEO has a master's background or above and code 0 otherwise (Angelita & Hasnawati, 2023).
6. Audit Fee using dummy variables, code 1 if the fee is expensive, code 0 if the fee is cheap (Salsabila, 2022).
7. Ineffective Monitoring  $BDOU = \frac{Number\ of\ Independent\ Commissioners}{Total\ Board\ of\ Commissioners}$
8. CHead Internal Audit using dummy variables, code 1 if the company changes the chief internal auditor during the five years of observation, code 0 otherwise (Yendrawati & Hernanda, 2022).
9. Nature of Industry  $NIO = \frac{Receivables(t)}{Sales\ (t)} - \frac{Receivables(t-1)}{Sales\ (t-1)}$
10. Freq CEO Pic the number of CEO pictures in the company's annual report (Siregar, 2023).
11. CEO Duality using dummy variables, code 1 if there is CEO duality and code 0 otherwise (Imtikhani, 2021).
12. Beneish M-Score
  - a. DSRI  $DSRI = \frac{Accounts\ Receivable(t):Sales\ (t)}{Accounts\ Receivable\ (t-1):Sales\ (t-1)}$
  - b. GMI  $GMI = \frac{Gross\ Profit\ (t):Sales\ (t)}{Gross\ Profit\ (t-1):Sales\ (t-1)}$
  - c. AQI  $AQI = \frac{Total\ Asset\ (t)}{1 - Current\ Asset\ (t) + Fixed\ Asset\ (t)}$
  - d. SGI  $SGI = \frac{Sales\ (t)}{Sales\ (t-1)}$
  - e. DEPI  $DEPI = \frac{Depreciation(t-1) + Fixed\ Asset\ (t-1)}{Depreciation(t)}$
  - f. SGAI  $SGAI = \frac{Depreciation(t) + Fixed\ Asset\ (t)}{Selling\ and\ Administrative\ Expenses\ (t)}$
  - g. LVGI  $LVGI = \frac{Selling\ and\ Administrative\ Expenses\ (t)}{Sales\ (t)}$
  - h. TATA  $TATA = \frac{Selling\ and\ Administrative\ Expenses\ (t-1)}{Sales\ (t-1)}$
  - g. LVGI  $LVGI = \frac{Total\ Liability(t)}{Total\ Asset\ (t)}$
  - h. TATA  $TATA = \frac{Total\ Liability\ (t-1)}{Total\ Asset\ (t-1)}$
  - h. TATA  $TATA = \frac{EAT(t) - Cash\ Flow\ Operating\ Activities\ (t)}{Total\ Asset\ (t)}$



**RESULTS**

**Descriptive Statistical Test Result**

**Table 1.** Descriptive Statistics

Variables	Indicators	N	Min	Max	Mean	Std. Dev
Stimulus	X1_FS	140	-0,029	0,130	0,01203	0,019238
	X2_EP	140	0,000	0,020	0,00714	0,003424
	X3_FT	140	-0,208	0,259	0,02882	0,041227
Capability	X4_DC	140	0,000	1,000	0,3571	0,48088
	X5_CEO EDU	140	0,000	1,000	0,6143	0,48851
Collusion	X6_AF	140	0,000	1,000	0,7571	0,43035
Opportunity	X7_IM	140	0,333	0,800	0,51168	0,105996
	X8_CHIA	140	0,000	1,000	0,3571	0,48088
Rationalization	X9_NI	140	-0,931	0,000	-0,71835	0,091662
Ego	X10_FreqCEOPic	140	1,000	1,000	1,0000	0,00000
	X11_CEODUAL	140	0,000	1,000	0,1214	0,32780
FFR	Y_M-Score	140	0,167	0,356	0,1784	0,01585

**Source:** SPSS 26 Output, Data Processed

Based on the results of descriptive statistics in table 1, it can be seen that the amount of research data is 140 data which includes variables such as financial stability, external pressure, financial target, director change, CEO's education, audit fee, ineffective monitoring, change in head of internal audit, nature of industry, frequent number of CEO's picture, CEO duality and Fraudulent Financial Reporting (M-Score), it can be concluded that (1) Financial Stability has an average value of 0,01203, with a standard deviation of 0,019238. Meanwhile, the minimum and maximum values are -0,029 and 0,130. (2) External Pressure has an average value of 0,00714, with a standard deviation of 0,003424. As for the minimum and maximum values of 0,000 and 0,020. (3) Financial Target has an average value of 0,02882, with a standard deviation of 0,041227. As for the minimum and maximum values of -0,208 and 0,259. (4) Director Change has an average value of 0,3571, with a standard deviation of 0,48088. Meanwhile, the minimum and maximum values are 0,000 and 1,000. (5) CEO's Education has an average value of 0,6143, with a standard deviation of 0,48851. As for the minimum and maximum values of 0,000 and 1,000. (6) Audit Fee has an average value of 0,7571, with a standard deviation of 0,43035. As for the minimum and maximum values of 0,000 and 1,000. (7) Ineffective Monitoring has an average value of 0,51168, with a standard deviation of 0,105996. Meanwhile, the minimum and maximum values are 0,333 and 0,800. (8) Change in Head of Internal Audit has an average value of 0,3571, while the standard deviation is 0,48088. As for the minimum and maximum values of 0,000 and 1,000. (9) Nature of Industry has an average value of -0,71835, with a standard deviation of 0,091662. As for the minimum and maximum values of -0,931 and 0,000. (10) Frequent Number CEO's Picture has an average value of 1,0000, while for a standard deviation of 0,00000. As for the minimum

and maximum values of 1,000 and 1,000. (11) CEO Duality has an average value of 0,1214, while for a standard deviation of 0,32780. As for the minimum and maximum values of 0,000 and 1,000. (12) Fraudulent Financial Reporting (M-Score) has an average value of 0,1784, while for a standard deviation of 0,01585. As for the minimum and maximum values of 0,167 and 0,356.

**Classical Assumption Test Results**

**Table 2.** Normality Test

No	Indicator	Unstandardized Residual
1	N	140
2	Mean	0,000
3	Std. Deviation	0,014
4	Absolute Differences	0,266
5	Positive Differences	0,266
6	Negative Differences	-0,249
7	Kolmogrov-Smirnov z	0,266
8	Asymp. Sig. (2-tailed)	0,200

**Source:** SPSS 26 Output, Data Processed

Based on the data listed in table 2, it can be interpreted that the data in this study are normal. This can be seen from the Asymp Sig value. (2-tailed) of 0,200 which exceeds the significance value of 0,05. Thus the test results show that the regression model in the study fulfills the assumption of normality.

**Table 3.** Multicollinearity Test

Variable	Collinearity Statistic		Description
	Tolerance	VIF	
Financial Stability	0,823	1,214	Multicollinearity Free
External Pressure	0,796	1,256	Multicollinearity Free
Financial Target	0,840	1,190	Multicollinearity Free
Director Change	0,975	1,026	Multicollinearity Free
CEO's Education	0,954	1,048	Multicollinearity Free
Audit Fee	0,918	1,089	Multicollinearity Free
Ineffective Monitoring	0,783	1,277	Multicollinearity Free
Change in Head of Internal Audit	0,954	1,049	Multicollinearity Free
Nature of Industry	0,960	1,041	Multicollinearity Free
Frequent Number CEO's Picture	0,941	1,063	Multicollinearity Free
CEO Duality	0,918	1,089	Multicollinearity Free

**Source:** SPSS 26 Output, Data Processed

Based on table 3 shows that all variables have a tolerance value of the independent variables of more than 0,10 each and a VIF value of less than 10,0. So that the variables of Financial Stability, External Pressure, Financial Target, Director Change, CEO's Education, Audit Fee, Ineffective Monitoring, Change in Head of Internal Audit, Nature of Industry, Frequent Number of CEO's Picture and CEO Duality do not have symptoms of multicollinearity between independent variables because there is no VIF value > 10,0 and tolerance value < 0,10 so it can be concluded that the multicollinearity test is passed and further testing can be done.

**Table 4. Glesjer Test**

No	Variable	Signification
1	Financial Stability	0,879
2	External Pressure	0,661
3	Financial Target	0,078
4	Director Change	0,220
5	CEO's Education	0,449
6	Audit Fee	0,543
7	Ineffective Monitoring	0,830
8	Change in Head of Internal Audit	0,292
9	Nature of Industry	0,783
10	Frequent Number CEO's Picture	0,640
11	CEO Duality	0,870

**Source:** SPSS 26 Output, Data Processed

Based on Table 4, the test results using the Glesjer test show that all independent variables have a significant value above 0,05 so it can be concluded that there is no heteroscedasticity in the research sample.

**Table 5. Durbin Watson Test**

N	K	DW	dU	4-dU	Description
140	11	2,061	1,8955	2,1045	Autocorrelation Free

**Source:** SPSS 26 Output, Data Processed

Based on table 5, the DW value is known to be 2,061. This value indicates that there is no autocorrelation because the DW value lies in the dU value of 1,8955 and the 4-dU value of 2,1045 or with the provisions of  $dU (1,8955) < DW (2,061) < 4-dU (2,1045)$  so it can be concluded that the Durbin Watson regression model in this study is free from autocorrelation.

### Linear Analysis

**Table 6. Linear Regression Test**

Variable	Unstandardized Coefficient		Standardized Coefficient
	B	Std. Error	Beta
Constant	0,003	0,011	
Financial Stability	0,003	0,024	0,014
External Pressure	0,370	0,318	0,100
Financial Target	0,125	0,026	-0,407
Director Change	0,004	0,002	-0,158
CEO's Education	-0,001	0,002	-0,036
Audit Fee	0,002	0,002	0,053
Ineffective Monitoring	0,005	0,010	0,039
Change in Head of Internal Audit	-0,003	0,002	-0,125
Nature of Industry	-0,005	0,011	-0,038
Frequent Number CEO's Picture	0,000	0,005	0,003
CEO Duality	-0,002	0,003	-0,055

**Source:** SPSS 26 Output, Data Processed

Based on the results of Linear Regression Test in table 6, then the multiple linear regression equation can be described, as follows (1) The constant value has a positive value of 0,003, this means that there is a unidirectional influence between the independent variable and the dependent variable. (2) Financial Stability shows a positive value (unidirectional) between the Financial Stability variable and fraudulent financial reporting of 0,003. (3) External Pressure shows a positive value (unidirectional) between the External Pressure variable and fraudulent financial reporting of 0,370. (4) Financial Target shows a positive value (unidirectional) of 0,125 between the Financial Target variable and fraudulent financial reporting. (5) Director Change shows a positive value (unidirectional) of 0,004 between the Director Change variable and fraudulent financial reporting. (6) CEO's Education shows a negative value (opposite direction) of -0,001 between the CEO's Education variable and fraudulent financial reporting. (7) Audit Fee shows a positive value (unidirectional) between the Audit Fee variable and fraudulent financial reporting of 0,002 between the Audit Fee variable and fraudulent financial reporting. (8) Ineffective Monitoring shows a positive value (unidirectional) between the Ineffective Monitoring variable and fraudulent financial reporting of 0,005 between the Ineffective Monitoring variable and fraudulent financial reporting. (9) Change in Head of Internal Audit shows a negative value (opposite direction) of -0,003 between the Change in Head of Internal Audit variable and fraudulent financial reporting. (10) Nature of Industry shows a negative value (opposite direction) of -0,005 between the Nature of Industry variable and fraudulent financial reporting. (11) Frequent Number CEO's Picture shows a positive value (in the same direction) between the Frequent Number CEO's Picture variable and fraudulent financial reporting of 0,000 between the Frequent Number CEO's Picture variable and fraudulent financial reporting. (12) CEO Duality shows a negative value (opposite direction) of -0,002 between the variables of CEO Duality and fraudulent financial reporting.

**Table 7.** Individual Parameter Test (t-test)

Variable	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
(Constant)	0,003	0,011	0,014	0,273	0,786
Financial Stability	0,003	0,024	0,100	0,138	0,049
External Pressure	0,370	0,318	-0,407	1,161	0,248
Financial Target	0,125	0,026	-0,158	-4,853	0,000
Director Change	0,004	0,002	-0,036	-2,028	0,045
CEO's Education	-0,001	0,002	0,053	-0,458	0,648
Audit Fee	0,002	0,002	0,039	0,658	0,512
Ineffective Monitoring	0,005	0,010	-0,125	0,449	0,654
Change in Head of Internal Audit	-0,003	0,002	-0,038	-1,593	0,114
Nature of Industry	-0,005	0,011	0,003	-0,484	0,629
Frequent Number CEO's Picture	0,000	0,005	-0,055	0,043	0,966
CEO Duality	-0,002	0,003	0,014	-0,686	0,494

**Source:** SPSS 26 Output, Data Processed

Based on the results of Linear Regression Test in table 7, it show that:

1. The Financial Stability variable shows a positive beta value of 0,003 and a significant value of 0,049 or less than 0,05. This means that Financial Stability has a positive and significant effect on fraudulent financial reporting. Then  $H_1$  is accepted.
2. The External Pressure variable shows a positive beta value of 0,370 and a significant value of 0,248 or more than 0,05. This means that External Pressure has no effect on fraudulent financial reporting. Then  $H_2$  is rejected.
3. The Financial Target variable shows a positive beta value of 0,125 and a significant value of 0,000 or less than 0,05. This means that Financial Target has a positive and significant effect on fraudulent financial reporting. Then  $H_3$  is accepted.
4. The Director Change variable shows a positive beta value of 0,004 and a significant value of 0,045 or less than 0,05. This means that Financial Stability has a positive and significant effect on fraudulent financial reporting. Then  $H_4$  is accepted.
5. The CEO's Education variable shows a negative beta value of -0,001 and a significant value of 0,648 or more than 0,05. This means that CEO's Education has no effect on fraudulent financial reporting. Then  $H_5$  is rejected.
6. The Audit Fee variable shows a positive beta value of 0,002 and a significant value of 0,512 or more than 0,05. This means that audit fees have no effect on fraudulent financial reporting. Then  $H_6$  is rejected.
7. The Ineffective Monitoring variable shows a positive beta value of 0,005 and a significant value of 0,654 or more than 0,05. This means that Ineffective Monitoring has no effect on fraudulent financial reporting. Then  $H_7$  is rejected.
8. The Change in Head of Internal Audit variable shows a negative beta value of -0,003 and a significant value of 0,114 or more than 0,05. This means that Change in Head of Internal Audit has no effect on fraudulent financial reporting. Then  $H_8$  is rejected.
9. The Nature of Industry variable shows a negative beta value of -0,005 and a significant value of 0,629 or more than 0,05. This means that Nature of Industry has no effect on fraudulent financial reporting. Then  $H_9$  is rejected.
10. The Frequent Number CEO's Picture variable shows a positive beta value of 0,000 and a significant value of 0,966 or more than 0,05. This means that Frequent Number CEO's Picture has no effect on fraudulent financial reporting. Then  $H_{10}$  is rejected.
11. The CEO Duality variable shows a negative beta value of -0,002 and a significant value of 0,494 or more than 0,05. This means that CEO Duality has no effect on fraudulent financial reporting. Then  $H_{11}$  is rejected.

**Table 8.** Simultaneous Significance Test

<b>Model</b>	<b>df</b>	<b>F</b>	<b>Sig.</b>	<b>Description</b>
1	11	3,794	0,000	Significant Effect

**Source:** SPSS 26 Output, Data Processed

Based on the results of Linear Regression Test in table 8, it shows a value of 0,000 or less than 0,05, it can be concluded that the variables Financial Stability, External Pressure, Financial Target, Director Change, CEO's Education, Audit Fee, Ineffective Monitoring, Change in Head of Internal Audit, Nature of Industry, Frequent Number of CEO's Picture, CEO Duality together affect fraudulent financial reporting.

**Table 9.** Coefficient of Determination Test

Model	R	R Square	Adjusted R Square	Std. Error Of the Estimate
1	0,496	0,246	0,181	0,01434

Source: SPSS 26 Output, Data Processed

Based on the results of Linear Regression Test in table 9, the coefficient of determination (R square) is 0,246 or equal to 24,6%. It can be concluded that this study is able to explain the factors that influence fraudulent financial reporting by 24,6% and the remaining 75,4% is influenced by other variables outside this study.

## DISCUSSION

### 1. The Effect of Financial Stability on Fraudulent Financial Reporting

The results of hypothesis testing show that Financial Stability has a positive influence on the potential for fraudulent financial reporting. Thus  $H_1$  is accepted because it is in line with the proposed hypothesis. These results support agency theory which states that if there is a conflict of interest between the agent (management) and the principal (owner). Agents tend to manipulate financial statements in order to achieve the financial targets expected by the principal. Higher Financial Stability can be an indicator of the financial pressure felt by management to maintain a stable company image. This pressure can encourage management to manipulate financial statements. The results of this study are in line with Siregar (2023), Angelita & Hasnawati (2023), Rianggi & Novita (2023) which state that financial stability has a significant effect on financial statement fraud.

### 2. The Effect of External Pressure on Fraudulent Financial Reporting

The results of hypothesis testing show that External Pressure has no influence on the potential for fraudulent financial reporting. Thus  $H_2$  is rejected because it is not in line with the proposed hypothesis. This is in line with the research of Yulianti et al., (2019), Agusputri & Sofie, (2019), Putra & Lestanti, (2023) which states that external pressure has no effect on fraudulent financial reporting.

### 3. The Effect of Financial Target on Fraudulent Financial Reporting

The results of hypothesis testing show that Financial Target has a positive influence on the potential for fraudulent financial reporting. Thus  $H_3$  is accepted because it is in line with the proposed hypothesis. In the context of agency theory, increasing Financial Target can put additional pressure on management to achieve the set financial targets. This pressure can encourage management to manipulate or commit fraud in financial reporting in order to meet the expectations of shareholders and maintain the company's reputation. In addition, changes in the Beneish M-Score value also reflect changes in the company's financial and operational conditions. This is in line with the research of Agustin et al. (2022), Agusputri & Sofie (2019), Maryadi et al. (2020) which states that Financial Target has a significant effect in detecting fraudulent financial statements.

### 4. The Effect of Director Change on Fraudulent Financial Reporting

The results of hypothesis testing show that Director Change has a positive influence on the potential for fraudulent financial reporting. Thus  $H_4$  is accepted because it is in line with the proposed hypothesis. The results showed that director changes have a significant



positive effect on the potential for fraudulent financial reporting in state-owned companies. This can be explained using the grand agency theory, where the relationship between principals (shareholders) and agents (management) is often characterized by conflicts of interest. Changes in directors can be an indication of dissatisfaction from the principal towards the agent's performance, which in turn increases pressure on the new management to achieve ambitious financial targets. The results of this study are in line with Preicilia et al. (2022), Triyanto (2019), Sasongko & Wijyantika (2019) which state that director change has a significant effect on the prediction of fraudulent financial reporting.

#### **5. The Effect of CEO's Education on Fraudulent Financial Reporting**

The results of hypothesis testing show that CEO's Education has no influence on the potential for fraudulent financial reporting. Thus  $H_5$  is rejected because it is not in line with the proposed hypothesis. In the context of agency theory, there is a potential conflict of interest between agents and principals, which can cause agents to take actions that are unfavorable to the principal, including fraudulent financial reporting. However, in this study, the CEO's education level was not found to have a significant effect on the potential for fraudulent financial reporting. This is in line with the research of Angelita & Hasnawati (2023), (Lestari & Henny, 2019) which states that CEO's Education has no significant effect on financial statement fraud.

#### **6. The Effect of Audit Fee on Fraudulent Financial Reporting**

The results of hypothesis testing show that audit fees have no influence on the potential for fraudulent financial reporting. Thus  $H_6$  is rejected because it is not in line with the proposed hypothesis. Behavioral finance theory states that financial decisions are influenced by psychological, social, and emotional factors. This shows that companies tend not to use the amount of audit fees as a measure to reduce or increase the potential for fraud. Other factors more related to managerial behavior and organizational structure may be more influential. This is in line with Astrawan & Achmad's research (2023) which states that audit fees have no significant effect on fraudulent financial reporting.

#### **7. The Effect of Ineffective Monitoring on Fraudulent Financial Reporting**

The results of hypothesis testing show that Ineffective Monitoring has no influence on the potential for fraudulent financial reporting. Thus  $H_7$  is rejected because it is not in line with the proposed hypothesis. Agency theory explains the relationship between owners and managers where conflicts of interest can occur due to differences in goals between the two parties. In this context, it means that ineffective monitoring does not necessarily increase the risk of fraudulent financial reporting because managers in manipulating financial statements are not caused by a lack of supervision. This is in line with Siregar's research (2023) which states that Ineffective Monitoring has no influence on the potential for fraudulent financial reporting.

#### **8. The Effect of Change in Head of Internal Audit on Fraudulent Financial Reporting**

The results of hypothesis testing show that Change in Head of Internal Audit has no influence on the potential for fraudulent financial reporting. Thus  $H_8$  is rejected because it is not in line with the proposed hypothesis. According to agency theory, there is an inherent conflict of interest between management (agent) and shareholders (principal). Agents tend to have better information about the condition of the company than the principals, which can lead to information asymmetry and potential fraud. Changes in the head of internal audit may not improve oversight and reduce information asymmetry.

However, the results of this study indicate that these changes are not significant enough to affect the potential for fraudulent financial reporting. This is in line with Aprilia's research (2017) which states that Change in Head of Internal Audit has no influence on the potential for fraudulent financial reporting.

#### **9. The Effect of Nature of Industry on Fraudulent Financial Reporting**

The results of hypothesis testing show that Nature of Industry has no influence on the potential for fraudulent financial reporting. Thus  $H_9$  is rejected because it is not in line with the proposed hypothesis. Agency theory explains that there is a conflict of interest between management (agent) and the owner (principal) of the company. Agents tend to have better information about the condition of the company than the principals, so agents can act against the interests of the principals. Certain industry characteristics can exacerbate agency conflicts and increase the opportunity for fraud in financial reporting. This is in line with the research of Agustin et al. (2022), Fajri et al. (2023), Setyono et al. (2023) which states that Nature of Industry has no significant effect in detecting fraudulent financial statements.

#### **10. The Effect of Frequent Number of CEO's Picture on Fraudulent Financial Reporting**

The results of hypothesis testing show that Frequent Number of CEO's Picture has no influence on the potential for fraudulent financial reporting. Thus  $H_{10}$  is rejected because it is not in line with the proposed hypothesis. Using behavioral finance theory, this result can be interpreted that the visual behavior of the CEO in the annual report does not have a significant psychological or behavioral impact on potential fraud. Companies may be more influenced by external pressures and financial targets than visual factors such as the number of CEO pictures. This is in line with the research of Setyono et al., (2023), Hernanda (2022), Siregar (2023) which states that Frequent Number CEO's Picture has no influence on the potential for fraudulent financial reporting.

#### **11. The Effect of CEO Duality on Fraudulent Financial Reporting**

The results of hypothesis testing show that CEO Duality has no influence on the potential for fraudulent financial reporting. Thus  $H_{11}$  is rejected because it is not in line with the proposed hypothesis. Based on agency theory, CEO Duality will increase the risk of financial fraud because the consolidation of power in one individual can reduce transparency and accountability. However, these findings suggest that there are other factors that may be more dominant in this context, such as significant external pressures. This is in line with the research of Precilia et al., (2022), Agustin et al., (2022), Dewi & Anisykurlillah (2021) which states that CEO Duality has no influence on the potential for fraudulent financial reporting.

### **CONCLUSION**

In this study, the variables of Financial Stability, Financial Target and Director Change have a significant positive effect on Fraudulent Financial Reporting. While the variables External Pressure, CEO's Education, Audit Fee, Ineffective Monitoring, Change in Head of Internal Audit, Nature of Industry, Frequent Number of CEO's Picture and CEO Duality have no effect on Fraudulent Financial Reporting. As for suggestions for further research, conduct research on other sectors on the Indonesia Stock Exchange in order to obtain more diverse research results, add or update several other proxies related to fraud hexagon analysis, explore more deeply the mechanism for detecting fraudulent financial reporting. The scope

of this study only includes state-owned companies on the Indonesia Stock Exchange (IDX) for the period 2018-2022. The independent variables in this study were only able to explain the effect on fraudulent financial reporting by 24.6%.

## REFERENCES

- Agusputri, H., & Sofie, S. (2019). Faktor - Faktor Yang Berpengaruh Terhadap Fraudulent Financial Reporting Dengan Menggunakan Analisis Fraud Pentagon. *Jurnal Informasi, Perpajakan, Akuntansi, Dan Keuangan Publik*, 14(2), 105–124. <https://doi.org/10.25105/jipak.v14i2.5049>
- Agustina, R. D., & Pratomo, D. (2019). Pengaruh Fraud Pentagon Dalam Mendeteksi Kecurangan Pelaporan Keuangan (Studi pada Perusahaan Sektor Pertambangan yang Terdaftar di Bursa Efek Indonesia Periode 2013-2017). *Jurnal Ilmiah MEA (Manajemen, Ekonomi, & Akuntansi)*.
- Angelita, M., & Hasnawati. (2023). Pengaruh Fraud Hexagon Terhadap Financial Statement Fraud. *Jurnal Ekonomi Trisakti*, 3(2), 2449–2458. <https://doi.org/10.25105/jet.v3i2.17236>
- Aprilia. (2017). Analisis Pengaruh Fraud Pentagon Terhadap Kecurangan Laporan Keuangan Menggunakan Beneish Model Pada Perusahaan Yang Menerapkan Asean Corporate Governance Scorecard. In *Akuntansi Riset* (Vol. 9, Issue 1).
- Astrawan, M. I., & Achmad, T. (2023). *Pengaruh Efektivitas Auditor Spesialisasi Industri, Fee Audit, Dan Komite Audit Terhadap Pendeteksian Kecurangan Pelaporan Keuangan (Studi Kasus pada Perusahaan Perbankan yang Terdaftar di BEI Tahun 2019-2021)*.
- Aviantara, R. (2021). The Association Between Fraud Hexagon and Government's Fraudulent Financial Report. *Asia Pacific Fraud Journal*, 6(1), 26. <https://doi.org/10.21532/apfjournal.v6i1.192>
- Beneish, M. D., Bernard, V., Ciesielski, J., Deangelo, L., Fridson, M., Harvey, C., Hsieh, D., Lee, C., Press, E., Whaley, B., & Zmijewski, M. (1999). *The Detection of Earnings Manipulation Comments Welcome*.
- Dewi, K., & Anisykurlillah, I. (2021). Analysis of the Effect of Fraud Pentagon Factors on Fraudulent Financial Statement with Audit Committee as Moderating Variable. *Accounting Analysis Journal*, 10(1), 39–46. <https://doi.org/10.15294/aaaj.v10i1.44520>
- Elviani, D., Ali, S., & Kurniawan, R. (2020). Pengaruh Kecurangan Laporan Keuangan terhadap Nilai Perusahaan: Ditinjau dari Perspektif Fraud Pentagon (Kasus di Indonesia). *Jurnal Ilmiah Universitas Batanghari Jambi*, 20(1), 121. <https://doi.org/10.33087/jiubj.v20i1.828>
- Fajri, M. A. N., Berliana Febrianti, G., & Rahmayani, S. (2023). Pengaruh Fraud Hexagon terhadap Kecurangan Laporan Keuangan pada Perusahaan Properti dan Real estate yang Terdaftar di Bursa Efek Indonesia Tahun 2018-2021. *Jurnal Ilmiah Multidisiplin*, 2(2).
- Ferica, Aprilio, H., Sinaga, N., Budi Santoso, I., Iqbal Febriyanto, M., Pradana, K., Nur Febryandi, M., & Umar, H. (2019). *Analisis Pengaruh Fraud Pentagon terhadap Kecurangan Laporan Keuangan Menggunakan Beneish Model (Studi Empiris pada Perusahaan Pertambangan yang terdaftar Dalam BEI Periode 2015-2017)*.

- Hernanda, S. A. (2022). *Pengaruh Fraud Hexagon Terhadap Potensi Kecurangan Laporan Keuangan Menggunakan Beneish M Score Model (Studi Empiris pada Perusahaan Infrastruktur yang Listing di BEI 2018 – 2020)*.
- Imtikhani, L. (2021). Determinan Fraudulent Financial Statement Melalui Perspektif Fraud Hexagon Theory Pada Perusahaan Pertambangan. In *Jurnal Akuntansi Bisnis* (Vol. 19, Issue 1).
- Kusumosari, L., & Solikhah, B. (2021). *Analisis Kecurangan Laporan Keuangan Melalui Fraud Hexagon Theory*.
- Lestari, M. I., & Henny, D. (2019). Pengaruh Fraud Pentagon Terhadap Fraudulent Financial Statements Pada Perusahaan Perbankan Yang Terdaftar Di Bursa Efek Indonesia Tahun 2015-2017. *Jurnal Akuntansi Trisakti*, 6(1), 141–156. <https://doi.org/10.25105/jat.v6i1.5274>
- Occupational Fraud 2022: A Report to the Nations*. (2022).
- Oktavia, S., Bahari, A., & Kartika, R. (2022). Pengaruh Elemen Fraud Hexagon Theory Terhadap Fraud Laporan Keuangan. *Jurnal Akuntansi Dan Ekonomika*, 12(2), 275–284. <https://doi.org/10.37859/jae.v12i2.4207>
- Preicilia, C., Wahyudi, I., & Preicilia, A. (2022). Analisa kecurangan laporan keuangan dengan perspektif teori Fraud Hexagon. *Jurnal Ilmiah Akuntansi Dan Keuangan*, 5(3). <https://journal.ikopin.ac.id/index.php/fairvalue>
- Putra, O. A., & Lestanti, H. S. (2023). Pengaruh Fraud Hexagon Model Terhadap Kecurangan Laporan Keuangan. *JURA: Jurnal Riset Akuntansi*, 1(4), 24–44. <https://doi.org/10.54066/jura-itb.v1i4.836>
- Rianggi, F., & Novita. (2023). Fraud Hexagon Dan Fraudulent Financial Statement Dengan Pendekatan Beneish M-Score Model Fraud Hexagon And Fraudulent Financial Statement Using The Beneish M-Score Model Approach. In *Jurnal Akuntansi Universitas Jember* (Vol. 21, Issue 2).
- Salsabila, H. (2022). *Pengaruh Fraud Hexagon Terhadap Potensi Kecurangan Laporan Keuangan Menggunakan Beneish M-Score Model (Studi Empiris pada Perusahaan Infrastruktur yang Listing di BEI 2018 – 2020)*.
- Sari, S. P., & Nugroho, N. K. (2020). *Financial Statements Fraud dengan Pendekatan Vousinas Fraud Hexagon Model: Tinjauan pada Perusahaan Terbuka di Indonesia* 26.
- Sasongko, N., & Wijyantika, S. F. (2019). *Faktor Resiko Fraud Terhadap Pelaksanaan Fraudulent Financial Reporting (Berdasarkan Pendekatan Crown'S Fraud Pentagon Theory)*.
- Setyono, D., Hariyanto, E., Wahyuni, S., & Pratama, B. C. (2023). Penggunaan Fraud Hexagon dalam Mendeteksi Kecurangan Laporan Keuangan. *Owner*, 7(2), 1036–1048. <https://doi.org/10.33395/owner.v7i2.1325>
- Siregar, A. (2023). *Fraudulent Financial Reporting: Analisis Pengaruh Elemen Fraud Hexagon Pada Perusahaan Farmasi*.
- Siregar, A., & Murwaningsari, E. (2022). Pengaruh Dimensi Fraud Hexagon Terhadap Financial Statement Fraud. In *Jurnal Kajian Akuntansi* (Vol. 6, Issue 2). <http://jurnal.ugj.ac.id/index.php/jka>
- Situngkir, N. C., & Triyanto, D. N. (2020). Detecting Fraudulent Financial Reporting Using Fraud Score Model and Fraud Pentagon Theory : Empirical Study of Companies Listed in the

- LQ 45 Index. *The Indonesian Journal of Accounting Research*, 23(03).  
<https://doi.org/10.33312/ijar.486>
- Triyanto, D. N. (2019). Fraudulence Financial Statements Analysis using Pentagon Fraud Approach. *Journal of Accounting Auditing and Business*, 2(2), 26.  
<https://doi.org/10.24198/jaab.v2i2.22641>
- Vousinas, G. L. (2019). *Advancing Theory of Fraud: The S.C.O.R.E. Model*.
- Yendrawati, R., & Amajida Hernanda, S. (2022). *Fraud Hexagon : Pendeteksian Potensi Kecurangan Laporan Keuangan Menggunakan Beneish M-Score Model*. 2(5), 73.
- Yulianti, Pratami, S. R., Widowati, Y. S., & Prapti, L. (2019). Influence Of Fraud Pentagon Toward Fraudulent Financial Reporting In Indonesia An Empirical Study On Financial Sector Listed In Indonesian Stock Exchange. *International Journal Of Scientific & Technology Research*, 8, 8. [www.ijstr.org](http://www.ijstr.org)