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Comparative Analysis of the Effects of Fraud Pentagon Theory on Financial Statement Fraud

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ABSTRACT

This study aims to analyze and compare the effects of fraud pentagon theory on financial statement fraud at companies in the banking and food & beverage subsectors registered on the Indonesia Stock Exchange throughout the 2022-2024 period. The urgency of this research lies in the distinct operational and regulatory characteristics of both subsectors in managing fraud risk. The independent variables analyzed encompass pressure (financial targets and external pressure), opportunity (by nature of industry and effective monitoring), rationalization (change in auditor), capability (changes in directors), and arrogance (frequency of CEO photos), while the dependent variable is financial statement fraud. The sample was selected using purposive sampling, resulting in 111 observations from the banking subsector and 108 observations from the non-cyclical consumer sector. Data analysis was conducted using logistic regression. The results show that in the banking subsector, financial targets, external pressure, and frequency of CEO photos have a effect. Meanwhile, in the food & beverage subsector, nature of industry and change in auditor have a effect, while the other independent variables have no effect on financial statement fraud in either subsector. The implications of this study provide insights for regulators in formulating industry specific, risk based supervisory policies.

Keywords: *Banking Subsector; Food and Beverage Subsector; Financial Statement Fraud; Fraud Pentagon Theory;*

INTRODUCTION

Financial statements provide an overview of a company's financial condition over a specific period and act as a vital source of information for stakeholders inside and outside the organization when making economic and managerial decisions. In the current business environment, companies across all sectors compete to enhance performance and advance their growth to gain widespread public recognition and present favorable financial statements. Enterprises employ multiple approaches to sustain their operations amidst market competition, such as improving the quality of goods or services, developing human resources, innovating in line with contemporary developments, and bolstering competitiveness. However, many entities resort to improper methods, such as engaging in financial statement fraud. According to the Association of Certified Fraud Examiners (ACFE) Occupational Fraud 2024: A Report to the Nations report noted 1.921 fraud cases from January 2022 until September 2023, with financial statement fraud accounting for 5% of the total and incurring a median loss of $766,000. Sectorally, the banking and financial services industry ranked first (305 cases), followed by the manufacturing sector (175 cases). These findings highlight the continued significance of fraud as an issue across industries and provide broader context for examining potential financial statement fraud in the present study. Theoretically, this phenomenon can be explained through Agency Theory introduced by Jensen and Meckling (1976),

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which highlights how the principal (shareholders) and the agent (management) interact in corporate governance. In this relationship, an information asymmetry and conflicting interests often exist between both parties, driving management to commit fraud to achieve performance targets, thereby incurring agency costs. Agency theory provides an argumentative foundation that a high level of information asymmetry and weak monitoring mechanisms can heighten the likelihood of fraud. Fraud pentagon theory can be employed to examine the factors associated with financial statement fraud. The Fraud Pentagon represents a conceptual model that explains the underlying drivers of fraudulent behavior. Proposed by Crowe Horwath (2011), this theory incorporates the component of arrogance into the factors influencing fraud occurrence. Consequently, the Fraud Pentagon Theory encompasses five principal components: pressure, opportunity, rationalization, competence, and arrogance.

Numerous studies have examined the relationship between Fraud Pentagon dimensions and financial statement fraud. A study by Burlacu et al. (2025) demonstrated that financial performance and financial stability significantly affect financial statement fraud. Conversely, external pressure, external auditor quality, nature of industry, change in auditor, changes in directors, and the frequency of CEO photos show no significant impact. In a separate study, Sawaka et al. (2020) revealed that pressure negatively affects fraud occurrence, whereas opportunity and rationalization exhibit a positive relationship. Meanwhile, competence and arrogance were shown to no significant relationship with financial statement fraud. Adding to this empirical body, Yanti et al. (2021) observed that financial targets, nature of industry, external auditor quality, and number of CEO photos fail to significantly influence fraud risk, whereas change in auditor and changes in directors carry a statistically significant effect. Previous research yields inconsistent results. The inconsistencies in previous findings may be attributed to differences in the research objects and observation periods. Studies examining different types of companies or industry sectors may produce different results because firms operate under different business characteristics, levels of pressure, and opportunities for financial statement manipulation. In addition, differences in observation periods may expose companies to different economic and business conditions, which can affect the relationship between Fraud Pentagon elements and financial statement fraud. Therefore, the inconsistent findings may indicate that the relationship between Fraud Pentagon elements and financial statement fraud is context-dependent across different companies and periods. These discrepancies underscore the importance of conducting further studies regarding the fraud pentagon theory to obtain more consistent results. Furthermore, previous studies generally examine only a single industry subsector, providing limited evidence on whether its explanatory role is consistent across subsectors with different characteristics. A cross-subsector comparison is therefore relevant because the banking and food & beverage subsectors have different operational and regulatory characteristics. The banking subsector manages public funds and financial assets under relatively strict regulatory supervision, which may create different forms of external pressure and monitoring mechanisms. In contrast, the food & beverage subsector involves real-sector activities, including the production of essential consumer goods and the management of physical assets, which may expose firms to different operational pressures and opportunities. Therefore, comparing these subsectors is relevant for examining whether the relationship between Fraud Pentagon dimensions and financial statement fraud differs across different business contexts. Based on these conditions, this study is conducted to address this research gap by performing a comparative analysis across two distinct corporate subsectors is the banking and the food & beverage subsectors. The selection of these two subsectors as comparison objects is grounded in the 2024 ACFE Report to the Nations issued by the Association of Certified Fraud Examiners, which reports the banking and financial sector and manufacturing sectors as ranking first and second experiencing the largest

number of reported fraud cases, However, the industry classifications used by the ACFE are not directly equivalent to the sector classifications used by the Indonesia Stock Exchange (IDX). Therefore, the ACFE statistics are used as a general basis for demonstrating the importance of fraud as a cross-industry issue, while the selection of the banking and food & beverage subsectors is based on their distinct business and regulatory characteristics and their relevance to the cross-subsector comparison. Therefore, this study analyzes and compare the effects of the Fraud Pentagon elements on the potential occurrence of financial statement fraud across both subsectors during the 2022–2024 observation period.

Hypotheses Development

The Influence of Pressure on Financial Statement Fraud

Pressure acts as a catalyst motivating individual or group to execute deception and attempt to conceal such fraudulent acts. From the perspective of agency theory, which explains the relationship between principals and agents, management is delegated authority to oversee corporate operations and is accountable for achieving target outcomes. However, under conditions of information asymmetry, managers encounter heightened pressure to meet corporate financial targets and satisfy external demands. Within this study, the pressure dimension is operationalized through financial targets and external pressure. The findings by Oktaviani et al. (2022) indicate that the pressure element influences the occurrence of financial statement fraud. Similarly, research by Hidayah et al. (2020) reveals that pressure, proxied by financial targets, positively associated with financial statement fraud risk, whereas external pressure exhibits an inverse effect on financial statement fraud. Based on the theoretical explanation and prior empirical findings, the hypotheses are proposed as follows:

H1a: Financial Targets affect financial statement fraud in the banking subsector
H1b: Financial Targets affect financial statement fraud in the food & beverage subsector
H1c: External Pressure affects financial statement fraud in the banking subsector
H1d: External Pressure affects financial statement fraud in the food & beverage subsector

The Influence of Opportunity on Financial Statement Fraud

Opportunity serves as a pivotal dimension of the fraud pentagon theory, driving individuals or collectives toward fraudulent behavior. The study measures, opportunity is operationalized through effective monitoring and the nature of industry. Distinct nature of industry can generate conditions conducive to financial reporting manipulation. Moreover, regarding effective monitoring, organizations that maintain robust internal oversight mechanisms are better equipped to reduce the likelihood of financial statement fraud committed by management. According by Icih & Andini (2021) revealed that the opportunity element, proxied by nature of industry, exhibits an inverse relationship with financial statement fraud. Conversely, in contrast Tinambunan et al. (2022) identified a significant impact of effective monitoring regarding financial statement fraud. Meanwhile, empirical findings from Sawaka et al. (2020) empirically proved that opportunity increases fraud incidents. Driven by these arguments, the proposed hypotheses are as follows:

H2a: Nature of Industry affects financial statement fraud in the banking subsector
H2b: Nature of Industry affects financial statement fraud in the food & beverage subsector
H2c: Effective Monitoring affects financial statement fraud in the banking subsector
H2d: Effective Monitoring affects financial statement fraud in the food & beverage subsector

The Influence of Rationalization on Financial Statement Fraud

Rationalization is the way a person views fraudulent acts as acceptable. Although aware of the ethical violation, perpetrators often rationalize their conduct as normal or acceptable practice. Within this research, change of auditor serves as the proxy rationalization. Change in auditor within a company can be interpreted as an means to mitigate or obscure audit trails and fraud indicators identified by former auditors. Empirical research by Maharani Shinta (2017) demonstrated that change in auditor positively affect the financial statement fraud occurrence. Similarly, a study by Hastuti et al. (2023) revealed that a change in auditor likewise contributes to financial statement misconduct. Based on these premises, the hypotheses are presented as follows:
H3a: Rationalization affects financial statement fraud in the banking subsector
H3b: Rationalization affects financial statement fraud in the food & beverage subsector

The influence of Capability on Financial Statement Fraud

Capability denotes the intrinsic ability or skills possessed by an individual or group within an organization, which can potentially be leveraged to commit fraudulent acts for personal or collective gain. Within this study, capability is examined through changes in directors. A shift in top management structure represents a critical factor that may trigger the commission of financial statement fraud. These changes are often accompanied by management's efforts to enhance organizational performance that was previously deemed sub-optimal, including through corporate restructuring or the appointment of new directors who are perceived to possess superior competence compared to their predecessors. Findings by Yanti et al. (2019) revealed that the capability element, measured by a change in directors, substantially impacts financial statement fraud. Furthermore, research conducted by Hidayah et al. (2020) also revealed financial statement fraud is positively influenced by changes of directors. Based on these arguments, the hypotheses are formulated as follows:
H4a: Capability affects financial statement fraud in the banking subsector
H4b: Capability affects financial statement fraud in the food & beverage subsector

The influence of Arrogance on Financial Statement Fraud

Arrogance reflects a disposition marked by superiority and entitlement, leading individuals to perceive themselves as above company policies and internal controls. As an indicator of arrogance, this study utilizes the frequency of CEO photos featured within the annual report. A higher number of CEO displays is considered to reflect a greater degree of CEO superiority and arrogance. This is consistent findings from prior empirical research, such as Rukmana (2018), which showed the arrogance element proxied by frequency of CEO photos positively drives. Additionally, Yanti et al. (2019) revealed that arrogance significantly impacts financial statement fraud practices. Based on these arguments, the hypotheses are formulated as follows:
H5a: Arrogance affects financial statement fraud in the banking subsector
H5b: Arrogance affects financial statement fraud in the food & beverage subsector

Comparative Analysis of Fraud Pentagon Theory Dimensions on Financial Statement Fraud Across the Banking and Food & Beverage Subsectors

The comparative analysis intends to evaluate the the associations between Fraud Pentagon dimensions and financial statement fraud across subsectors, specifically contrasting the banking subsector

and the food & beverage subsector. Rooted in agency theory, information asymmetry separating shareholders and management serves as the root cause of financial statement fraud. However, these conditions may vary across subsectors due to differences in operational characteristics, regulatory environments, and governance structures. The banking subsector operates in the financial services industry under relatively strict regulatory supervision and manages public funds and financial assets. In contrast, the food & beverage subsector involves real-sector activities, including the production of essential consumer goods and the management of physical assets. These differences may result in different levels of pressure, opportunities, and managerial incentives, which may in turn influence the effects of Fraud Pentagon dimensions on potential financial statement fraud. These cross-subsectoral differences generate variations in the explanatory power of fraud pentagon theory elements regarding financial statement fraud. Driven by these considerations, the hypotheses are presented as follows:

H6: The associations between Fraud Pentagon dimensions and financial statement fraud risk differ between the banking and food and beverage subsectors

Conceptual Framework

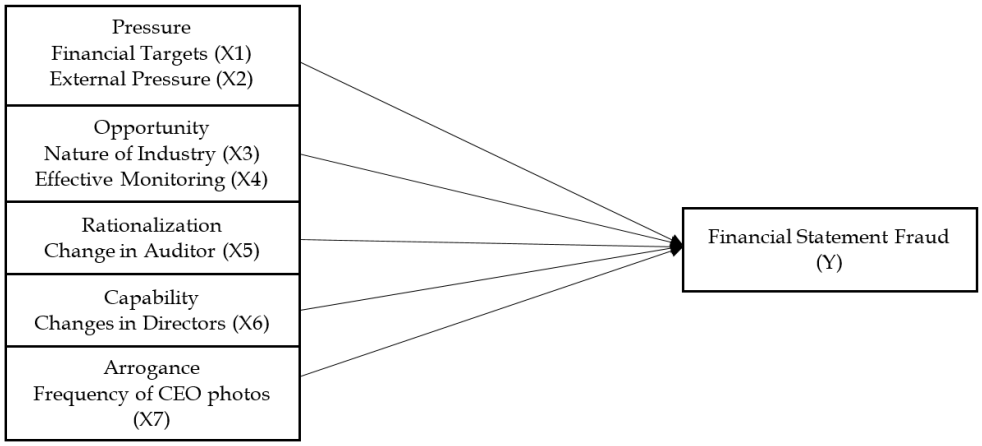

Figure 1. Conceptual Framework

METHODS, DATA, AND ANALYSIS

This study employs quantitative data, which are expressed numerically and derived from the calculation of each variable's measurement indicators (Chandrarin, 2024). Additionally, this study uses panel data (pooled data), combining time-series and cross-sectional observations are utilized. The data source consists of secondary data obtained from other parties or institutions that have already processed and published the information. Specifically, the secondary data used in this research comprise corporate annual reports and financial statements.

Information gathering relied on secondary data extraction utilizing a documentary approach. The dataset compiles annual reports and financial reports published by enterprises companies operating in the banking and food & beverage subsectors. The data were retrieved from the Indonesia Stock Exchange website is www.idx.com as well as the respective company's websites.

Data analysis was carried out using SPSS, with logistic regression serving as the main analytical approach. The analytical procedure encompasses descriptive statistical analysis, logistic regression modeling, hypothesis testing, and comparative analysis.

Variable Measurement

Dependent Variable

In this research, The dependent variable represents the potential indication of financial statement misstatement risk, operationalized using the Dechow F-Score. The F-Score is used as an indicator of the likelihood of material accounting misstatement based on two components: accrual quality and financial performance. The mathematical formulation is defined below:

F-Score = Accrual Quality + Financial Performance

The F-Score consists of two main components: RSST accruals and financial performance. Specifically, the RSST accruals component evaluates an enterprise's accrual quality standardized by mean total assets. This dimension rests on the premise that corporate accounting misstatements predominantly stem from deliberate adjustments within accrual accounts, including receivables, inventory, fixed assets, and liabilities. The formula is:

$$\textbf{RSST Accrual} = \frac{\Delta \textbf{WC} + \Delta \textbf{NCO} + \Delta \textbf{FIN}}{\textbf{Average Total Assets}}$$

WC (*Working Capital*)	=	Current Assets – Current Liability
NCO (*Non Current Operating Accrual*)	=	(Total Assets – Current Assents – Investments) – (Total Liability – Current Liability – Long Term Debt)
FIN (*Financial Accrual*)	=	Total Investment – Total Liability
Average Total Assets	=	(Beginning Total Assets + End Total Assets)/2

Financial performance evaluation serves to detect shifts in corporate operations commonly linked to fraudulent activities. When corporate indicators such as fluctuations in receivables, inventory, cash sales, and earnings exhibit unusual or abnormal patterns, they may serve as potential indicators of financial statement misstatement or fraud risk. The formula is:

Financial Performance = Change in Receivables + Change in Inventories + Change in Cash Sales + Change in Earnings

$$\textbf{Change in Receivables} = \frac{\Delta \textbf{Receivables}}{\textbf{Average Total Assets}}$$

$$\textbf{Change in Inventories} = \frac{\Delta \textbf{Inventories}}{\textbf{Average Total Assets}}$$

$$\textbf{Change in Cash Sales} = \frac{\Delta \textbf{Sales}}{\textbf{Sales}(t)} - \frac{\Delta \textbf{Receivables}}{\textbf{Receivables}(t)}$$

$$\textbf{Change in Earnings} = \frac{\textbf{Earnings}\ (t)}{\textbf{Average Total Assets}(t)} - \frac{\textbf{Earnings}\ (t-1)}{\textbf{Average Total Assets}(t-1)}$$

This variable is operationalized as a dummy variable, where a value of 1 is assigned to companies with an F-Score greater than 1, indicating a higher likelihood of financial statement misstatement, while a value of 0 is assigned to companies with an F-Score of 1 or below. The cutoff of 1 follows Dechow et al. (2011), where an F-Score greater than 1 indicates a greater likelihood of material accounting misstatement. Thus, the F-Score represents a potential indication of financial statement misstatement rather than confirmed fraud.

Independent Variables

Explanatory factors in this empirical investigation are grounded in the fraud pentagon theoretical framework, encompassing five core elements: pressure, opportunity, rationalization, competence, and arrogance. Each dimension is measured using a corresponding proxy variable.

Table 1. Operational Independent Variables

Variable	Measurement
Financial Targets	ROA = Earnings after Tax/Total Asset X 100%
External Pressure	DER = Total Liabilities/Total Equity X 100%
Nature of Industry	Receivable= $Receivables_t/Sales_t$ – $Receivables_{t-1}/Sales_{t-1}$
Effective Monitoring	BDOUT = Total Independent Commissioners/ Total Board of Commissioners X 100%
Change in Auditor	The variable is operationalized as a dummy variable where companies experiencing a change in auditor are coded as 1, while those with no change are coded as 0.
Changes in Directors	The variable is operationalized as a dummy variable, where companies experiencing a changes in directors are coded as 1, while those with no change are coded as 0.
Frequency of CEO Photos	Total CEO photos disclosed in the annual report

Source: Processed by the author (2026)

The population encompasses public firms within the banking and food & beverage sectors traded on the Indonesia Stock Exchange throughout the 2022–2024 period. To select representative observations, a purposive sampling approach was employed, whereby subject selection follows pre established inclusion criteria set by the investigator (Chandrarin, 2024)

Table 2. Sample Selection for the Banking Subsector

No	Description	Total
1	Companies in the banking subsector listed on the Indonesia Stock Exchange	48
2	Companies in the banking subsector that did not issue audited financial statements and annual reports covering the 2022–2024 period	(11)
3	Total sample companies meeting the criteria	37
	Observation period	3 years
	Total research observations for the 2022-2024 period	111

Source: Processed by the author (2026)

Table 3. Sample Selection for the Food & Beverage Subsector

No	Description	Total
1	Companies in the Food & beverage subsector listed on the Indonesia Stock Exchange	52
2	Companies in the Food & beverage subsector did not issue audited financial statements and annual reports covering the 2022–2024 period	(16)
3	Total sample companies meeting the criteria	36
	Observation period	3 years
	Total research observations for the 2022-2024 period	108

Source: Processed by the author (2026)

RESULT AND DISCUSSION

Descriptive Statistics Analysis

The first step was to conduct descriptive statistics. The metrics evaluated include the mean values and standard deviation. The outcomes for both sectors are presented below:

Table 4: Descriptive Statistics of Banking Subsector

	N	Minimum	Maximum	Mean	Std. Deviation
Financial Targets	111	-0.04	0.08	0.0121	0.01545
External Pressure	111	0.08	13.56	4.6345	2.82457
Nature of Industry	111	-3.94	5.07	-0.0185	1.20938
Effective Monitoring	111	0.33	1.00	0.5920	0.12231
Change in Auditor	111	0	1	0.23	0.425
Changes in Directors	111	0	1	0.58	0.496
Frequency of CEO Photos	111	1	33	11.24	6.422
F-Score	111	0	1	0.07	0.260
Valid N (listwise)	111				

Source: Processed from SPSS output (2026)

Drawing from the descriptive statistics analysis of 111 observational data points, the F-Score mean 0.07 (SD = 0.260). This indicates that 7% of the corporate data exhibited signs of financial statement fraud, while the remaining 93% showed no evidence of reporting misconduct. Furthermore, financial targets registered a mean score of 0.0121 (SD = 0.01545), indicating that on average, the companies generated a return on total assets of 1.21% with varying degrees of earning capability. External pressure yielded a mean of 4.6345 (SD = 2.82457), reflecting a relatively stable debt to equity ratio across companies and showing no significant differences. Nature of industry recorded an average of -0.0185 (SD = 1.20938), indicating diverse negative fluctuations in the proportion of receivables to sales resulting from varying levels of receivables management effectiveness. Meanwhile, effective monitoring yielded a mean 0.5920 (SD = 0.12231), demonstrating that companies, on average maintain a homogenous independent commissioner proportion of 59.20%. Change in auditor averages of 0.23 (SD = 0.425), indicating that 23% of the corporate data points underwent an auditor change, while the remaining 77% did not, reflecting relatively high data variance. Change of directors registered a mean of 0.58 (SD = 0.496), implying that 58% of the corporate observations executed board member changes, compared to 42% that maintained their existing directorships. Lastly, the frequency of CEO photos recorded a mean of 11.24 (SD = 6.422), demonstrating that companies displayed an average of 11 CEO photos in their annual reports, with relatively small data variance.

Table 5. Descriptive Statistics of Food & Beverage Subsector

	N	Minimum	Maximum	Mean	Std. Deviation
Financial Targets	108	-0.49	0.33	0.0530	0.11779
External Pressure	108	-23.62	7.38	0.6419	2.66371
Nature of Industry	108	-0.42	1.29	0.0258	0.17650
Effective Monitoring	108	0.20	0.67	0.4136	0.08912
Change in Auditor	108	0	1	0.18	0.383
Changes in Directors	108	0	1	0.41	0.494
Frequency of CEO Photos	108	1	24	3.80	2.988
F-Score	108	0	1	0.09	0.291
Valid N (listwise)	108				

Source: Processed from SPSS output (2026)

Based on 108 observational data points, descriptive statistical outcomes show that the F-Score mean 0.09 (SD = 0.291). This indicates that 9% of the companies observations exhibited signs of financial statement fraud, while the remaining 91% exhibited no fraud indicators, reflecting a relatively high level dispersion of data. Financial targets recorded averaged 0.0530 (SD = 0.11779), demonstrating that the sample companies generated an average return on total assets of 5.30%, with considerable data variance. Furthermore, external pressure posted mean score of 0.6419 (SD = 2.66371), revealing that firms on average utilized debt amounting to 64.19% relative to their total equity. The high variance in this metric is attributable to negative equity occurrences in specific issuers, such as PT Estika Tata Tiara, Tbk (2022) and PT Sentra Food Indonesia, Tbk (2024). Nature of industry recorded an average of 0.0258 (SD = 0.17650), reflecting diverse fluctuations in the proportion of receivables to sales resulting from varying levels of receivables management effectiveness. Meanwhile, effective monitoring the metric averaged of 0.4136 (SD = 0.08912), demonstrating that companies on average maintain a homogenous independent commissioner proportion of 41.36%. Change in auditor recorded a mean value of 0.18 (SD = 0.383), indicating that on average, 18% of the companies data points underwent an auditor change, while the remaining 82% did not, reflecting a relatively high level of data variance. Changes of directors registered mean of 0.41 (SD = 0.494), demonstrating that 41% of the corporate observations executed board member changes, compared to 59% that retained their directorships, with a relatively balanced data distribution. Lastly, the frequency of CEO photos yielded a mean of 3.80 (SD = 2.988), signifying that companies displayed an average of 4 CEO photos in their annual reports, with relatively small data variance.

Logistic Regression Analysis

Binary logistic regression was performed to evaluate how explanatory factors affect the response outcome The analytical steps involved in this method are outlined below:

Goodness-of-Fit Test of the Logistic Regression Model

The Hosmer & Lemeshow test was employed to evaluate the overall model fit. Where probability > 0.05, H0 is retained. Conversely, whereas probability < 0.05, results in the rejection of H0.

Table 6. Hosmer & Lemeshow Test

Banking Subsector			
Step	Chi-square	df	Sig.
1	3.180	8	0.923
Food & Beverage Subsector			
Step	Chi-square	df	Sig.
1	10.800	8	0.213

Source: Processed from SPSS output (2026)

For the banking subsector, the the Hosmer-Lemeshow evaluation yielded a Chi-square statistic of 3.180 with a p-value of 0.923 > 0.05, leading to the retention of H0 and rejection of H1. Confirms that predicted estimates align with actual observations without meaningful discrepancy between the model's predicted values and the observed data. Consequently, the model is deemed fit and satisfies the requirement for data adequacy. Similarly, for the food & beverage subsektor, the analysis generated a Chi-square value of 10.800 with a p-value of 0.213 > 0.05, confirming the acceptance of H0 and rejection of H1. This demonstrates that the model provides an acceptable fit, with no significant discrepancy between

the model's predicted values and the observed data. Consequently, the model is deemed fit and satisfies the requirement for data adequacy.

Overall Model Fit Assessment

The next step, to determine overall model fit, the initial -2 Log Likelihood score from Block Number = 0 excluding independent variables is compared with the final -2 Log Likelihood value at Block Number = 1 including independent variables. A reduction in the -2LL across these stages confirms that including independent variables improves the overall fit of the model.

Table 7. -2 log likelihood block 0

Sector	Iteration	-2 log likelihood	Coefficients Constant
Banking Subsector	Step 0 1	64.236	-1.712
	2	57.871	-2.336
	3	57.493	-2.536
	4	57.490	-2.555
	5	57.490	-2.555
Food & Beverage Subsector	Step 0 1	71.253	-1.630
	2	66.800	-2.150
	3	66.635	-2.276
	4	66.635	-2.282
	5	66.635	-2.282

Source: Processed from SPSS output (2026)

Table 8. -2 log likelihood block 1

		Banking Subsector		Food & Beverage Subsector	
Iteration		-2 log likelihood	Constant	-2 log likelihood	Constant
Step 1		56.343	-1.098	61.450	-1.807
	2	41.441	-0.951	43.349	-3.432
	3	35.124	-0.060	34.165	-5.121
	4	32.508	1.153	31.331	-5.661
	5	31.863	1.868	30.737	-5.520
	6	31.809	2.044	30.697	-5.444
	7	31.809	2.057	30.697	-5.442
	8	31.809	2.057	30.697	-5.442
	9	31.809	2.057		

Source: Processed from SPSS output (2026)

Empirical evaluation indicates a decline in the -2 Log Likelihood metric for the banking subsector dropped from 57.490 to 31.809, while the food & beverage subsector decreased from 66.635 to 30.697. These significant reductions in -2LL across both subsectors confirm that adding the independent variables substantially boosts the model's better fit to the data, confirming that the specified logit model adequately examining the associations between the independent variables on financial statement fraud.

Multicollinearity Test

Multicollinearity diagnostic is performed to verify that predictor variables in the empirical model do not exhibit strong intercorrelations.. The decision criteria dictate that a tolerance value

exceeding 0.10 and a VIF below 10, model estimation is considered unbothered by multicollinearity. Conversely, should the tolerance under 0.10 and the VIF exceed 10 indicates the presence of multicollinearity issues.

Table 9. Multicollinearity Test

Banking			
Variables	**Tolerance**	**VIF**	**Conclusion**
Financial Targets	0.879	1.138	No multicollinearity was detected
External Pressure	0.878	1.138	
Nature of Industry	0.858	1.166	
Effective Monitoring	0.896	1.116	
Change in Auditor	0.807	1.240	
Changes in Directors	0.928	1.078	
Frequency of CEO Photos	0.909	1.100	
Food & Beverage			
Variables	**Tolerance**	**VIF**	**Conclusion**
Financial Targets	0.870	1.150	No multicollinearity was detected
External Pressure	0.879	1.137	
Nature of Industry	0.929	1.077	
Effective Monitoring	0.968	1.033	
Change in Auditor	0.942	1.062	
Changes in Directors	0.963	1.038	
Frequency of CEO Photos	0.954	1.048	

Source: Processed from SPSS output (2026)

According to the collinearity diagnostics present in table 9, both the banking and food & beverage subsectors exhibit no multicollinearity, as all independent variables exceed tolerance > 0.10 and VIF < 10. These models are verified as fit and reliable for logistic regression analysis.

Classification Matrix

Classification matrix was utilized to demonstrate the predictive accuracy of the regression model in correctly categorizing data into their respective groups.

Table 10. Classification Matrix

Sector	**Observed**	**Predicted**		
		F-Score		
		No Fraud	**Fraud**	**Percentage Correct**
Banking	No Fraud	102	1	99.0
	Fraud	6	2	25.0
	Overall Percentage			93.7
Food & Beverage	No Fraud	98	0	100.0
	Fraud	3	7	70.0
	Overall Percentage			97.2

Source: Processed from SPSS output (2026)

The logistic regression model for the banking subsector demonstrated an overall predictive accuracy of 93.7%. Specifically, out of 103 observations classified as non fraudulent, the model correctly predicted 102 cases while misclassifying 1 observation as fraudulent, yielding an accuracy rate of 99% for this category. Conversely, among the 8 observations with indications of financial statement fraud, the

model accurately predicted 2 cases while incorrectly classifying 6 cases as non-fraudulent, resulting in a 25% classification accuracy for the fraud category. Meanwhile, the logistic regression model for the food & beverage subsector exhibited an overall predictive accuracy of 97.2%. The prediction results indicate that all 98 non fraudulent observations were correctly classified by the model, achieving a 100% accuracy rate for this group. Furthermore, out of 10 fraudulent observations, the model correctly identified 7 cases while misclassifying 3 as non fraudulent, reflecting a 70% prediction accuracy for the fraud category.

Coefficient of Determination

The Nagelkerke R^2 is a pseudo-R^2 measure used to assess the relative explanatory performance of a logistic regression model, with values ranging from 0 to 1.

Table 11. Coefficient of Determination

Banking Subsector			
Step	-2 log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	31.809	0.207	0.511
Food & Beverage Subsector			
Step	-2 log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	30.697	0.283	0.615

Source: Processed from SPSS output (2026)

According to the table above, the Nagelkerke R^2 for the banking subsector is 0.511, while the value for the food & beverage subsector is 0.615. These values indicate the relative explanatory performance of the logistic regression models in explaining the likelihood of potential financial statement fraud. The higher Nagelkerke R^2 value in the food & beverage subsector indicates relatively greater explanatory performance compared with the banking subsector. However, these values should not be interpreted as the exact percentages of variance in the dependent variable explained by the independent variables because Nagelkerke R^2 is a pseudo-R^2 measure in logistic regression.

Hypothesis Testing (Wald Test)

Hypothesis testing relied on the Wald statistic to examine the effect of each independent variable on the dependent variable. The decision rule was based on significance level, if the significance < 0.05 and 0.10, H1 is supported, were interpreted as a significant influence. Conversely, if the significance > 0.05 and 0.10, H1 is not supported, were considered no statistically significant effect on the dependent variable.

Table 12. Hypothesis Testing for the Banking Subsector

	β	S.E.	Wald	df	Sig
Financial Targets	-49.390	26.866	3.380	1	0.066
External Pressure	-0.801	0.321	6.226	1	0.013
Nature of Industry	-0.264	0.379	0.484	1	0.487
Effective Monitoring	-0.359	4.788	0.006	1	0.940
Change in Auditor	0.929	1.305	0.507	1	0.476
Changes in Directors	1.135	1.076	1.113	1	0.291
Frequency of CEO Photos	-0.338	0.174	3.781	1	0.052
Constant	2.057	3.409	0.364	1	0.546

Source: Processed from SPSS output (2026)

Table 13. Hypothesis Testing for the Food & Beverage Subsector

	β	S.E.	Wald	df	Sig
Financial Targets	-2.529	4.901	0.266	1	0.606
External Pressure	-0.074	0.151	0.243	1	0.622
Nature of Industry	-33.834	11.584	8.530	1	0.003
Effective Monitoring	1.176	6.460	0.033	1	0.856
Change in Auditor	2.159	1.174	3.381	1	0.066
Changes in Directors	0.959	1.166	0.677	1	0.411
Frequency of CEO Photos	0.173	0.179	0.927	1	0.336
Constant	-5.442	3.052	3.178	1	0.075

Source: Processed from SPSS output (2026)

Logistic Regression Equation for the Banking Subsector

Ln (F/1 – F) = 2.057 – 49.390X1 – 0.801X2 – 0.264X3 – 0.359X4 + 0.929X5 + 1.135X6 - 0.338X7 + e

The hypothesis testing results for the banking subsector reveal that the financial targets negatively and significantly influence financial statement fraud (0.066 < 0.10) with a β coefficient of -49.390. The results provide empirical support for the hypothesis. Likewise, external pressure displays a significant negative association with fraud occurrence (0.013 < 0.05) with a β coefficient of -0.801. Therefore, supporting the hypothesized relationship, confirming that greater external pressure lowers the probability of financial statement fraud. Furthermore, the nature of industry does not significantly affect because its p-value of 0.487 > 0.05 and 0.10 significance levels. Thus, the corresponding hypothesis is not supported. Similarly, effective monitoring fails to show a significant relationship, as evidenced by a p-value of 0.940 > 0.05 and 0.10, resulting in the rejection of the hypothesis. No statistically significant association is observed for change in auditor, with a p-value of 0.476 > 0.05 and 0.10. indicating that change in auditor does not significantly affect financial statement fraud. Changes of directors is likewise to be statistically insignificant of 0.291 > 0.05 and 0.10. Thus, the hypothesis is rejected, suggesting that changes in directors are not associated with the occurrence of financial statement fraud. Frequency of CEO photos yields a (0.052 < 0.10) and a β coefficient of -0.338, indicating a negative direction. These findings support the proposed hypothesis, suggesting that the Frequency of CEO photos have a negative effect on financial statement fraud.

Logistic Regression Equation for the Food & Beverage Subsector

Ln (F/1 – F) = -5.442 – 2.529X1 – 0.074X2 – 33.834X3 + 1.176X4 + 2.159X5 + 0.959 X6 + 0.173X7 + e

The hypothesis testing results for the food & beverage subsector indicate that financial targets variable is not significantly associated with financial statement fraud, as indicated by a p-value of 0.606 > 0.05 and 0.10 significance thresholds. Accordingly, the proposed hypothesis is not supported. In contrast, external pressure does not demonstrate a significant relationship with financial statement fraud because its level of significance of 0.622 > 0.05 and 0.10 is above the acceptable significance levels. Therefore, the corresponding hypothesis is rejected. Among all explanatory variables, nature of industry is the only variable that exhibits a statistically significant negative association with financial statement fraud (0.003 < 0.05) and a β coefficient of -33.834, supporting the hypothesis that the nature of industry reduces the

likelihood of financial statement fraud. Effective monitoring does not emerge as a significantly associated with financial statement fraud, as reflected by a p-value of 0.856 > 0.05 and 0.10. Hence, the hypothesis proposing its influence on financial statement fraud is not supported. Change in auditor exhibits a significant positive relationship (0.066 < 0.10) with a β coefficient of 2.159, indicating that a change in auditor increases the probability of financial statement fraud. Therefore, the hypothesis is accepted. The regression estimates indicate that changes of directors did not significantly influence financial statement fraud because its significance value of 0.411 > 0.05 and 0.10. Thus, the proposed hypothesis is rejected. The frequency of CEO photos yields a significance value of 0.336 > 0.05 and 0.10. Therefore, the hypothesis is rejected, meaning that frequency of CEO photos fails to demonstrate a significant effect.

The regression result table for both companies subsectors shows that, within the banking subsector, financial targets, external pressure, and frequency of CEO photos are significantly associated with financial statement fraud. Meanwhile, in the food & beverage subsector, only nature of industry and change in auditor are significantly associated with financial statement fraud. These findings suggest that the influence of the Fraud Pentagon elements differs across the two subsectors, thereby supporting the proposed comparative hypothesis.

From the Result in Banking Sub-sector, the Analysis Revealed:

The hypothesis testing conducted on the banking subsector shows that financial targets significantly influence financial statement fraud. This finding is consistent with previous studies by Hidayah et al. (2020) and Oktaviani et al. (2022), but differs from the research by Pratami et al. (2019), Evana et al. (2019), and Tinambunan et al. (2022). The estimated regression coefficient for financial targets is negative, suggesting that an increase in ROA is linked to with a lower probability of financial statement fraud. In other words, companies with stronger financial performance are less likely to be involved in fraudulent financial reporting. Through the lens of agency theory, despite pressure from shareholders, in the banking subsector such pressure does not always serve as a driver for management to perpetrate fraud, because the performance of the banking subsector is not only evaluated by profitability levels but is also influenced by other factors, such as high levels of regulation that limit management's space to manipulate financial statements.

The analysis also demonstrates that external pressure is identified as a significantly associated with financial statement fraud. This aligns with Hidayah et al. (2020) and Putra & Suprasto (2021), but differs from the research by Arfianto & Alexander (2023) and Burlacu et al. (2025). Based on fraud pentagon theory, management has a relationship with creditors where creditors exert pressure on management to repay company debt on time. The negative direction indicates that the higher the external pressure, reduces a lower likelihood of financial statement fraud. These factors are interconnected, as using debt for operations increases creditor monitoring, thereby reducing opportunities for financial statement fraud. Additionally, in the banking sub-sector, funding relies heavily on third-party funds such as savings, time deposits, and current accounts, thus, a high DER reflects a normal operational condition rather than financial pressure.

The findings indicate that nature of industry is not significantly associated with financial statement fraud. The aligns with Inayah et al. (2024) and Sari & Lestari (2020), but differ from the studies by Yanti et al. (2021) and Icih & Andini (2021). The insignificance of nature of industry does not mean that changes in receivables relative to sales serve as an opportunity driving management to manipulate financial statement data. Instead, it can be attributed to financing and credit distribution being core activities that

are managed prudently and subject to strict regulation, which ultimately prevents management from having opportunities to commit financial statement fraud.

Effective monitoring reveal does not significantly on financial statement fraud. This aligns with Arfianto & Alexander (2023) and Achmad et al. (2022), but differs from Tinambunan et al. (2022) and Putra & Suprasto (2021). This indicates that supervision in the banking subsector extends beyond independent commissioners to internal audit units, audit committees, external auditors, and the OJK. Thus, effective monitoring is not the only factor in preventing and explain variations in financial statement fraud.

Change in auditor is not significantly associated with financial statement fraud. This aligns with by Putri & Setiyorini (2024) and Sari & Lestari (2020), but differs from the studies by Sawaka et al. (2020) and Fadhilah et al. (2022). This means that auditor changes occur as a result of management changes in accordance with banking subsector corporate policies and professional considerations based on company needs, rather than as an indicator to cover up fraud detected by previous auditors.

Changes of directors have no effect on financial statement fraud. This finding supports the results with Oktaviani et al. (2022) as well as Icih & Andini (2021). However, it differs from the studies by Arfianto & Alexander (2023) and Evana et al. (2019). This result show changes in directors are not carried out as an effort to conceal acts of financial statement fraud, but rather due to leadership regeneration, adjustments to company needs, and replacements aimed at enhancing corporate performance.

Frequency of CEO photos is negatively associated with financial statement fraud. This aligns with Yanti et al. (2021), but contrasts with Pratami et al. (2019) and Rukmana (2018). The negative regression coefficient, indicating that the more frequently the CEO's picture is displayed in their annual report, the smaller the likelihood of financial statement fraud occurring. In the banking subsector, the appearance of the CEO's photo primarily reflect corporate communication, transparency, and management's commitment to maintaining stakeholder confidence. Therefore, arrogance does not encourage fraudulent financial reporting in this sector.

From the Result in Food & Beverage Subector, the Analysis Revealed:

Financial targets does not effect on financial statement fraud. This present findings Fadhilah et al. (2022) and Yanti et al. (2021), but differs from Prayonggie et al. (2022) and Faradiza (2016). Based on agency theory, even when management faces pressure, not all companies regard such pressure as a driver to commit financial statement fraud, preferring instead to enhance operational performance rather than manipulate reporting data. Furthermore, regulations in the food & beverage subsector requiring Good Corporate Governance implementation, IDX monitored information transparency, and compliance with financial accounting standards serve as barriers to financial statement fraud.

External pressure is not identified as a significantly associated with financial statement fraud. This supports Sari & Lestari (2020) and Ghandur et al. (2019), but differs from Achmad et al. (2022) and Rukmana (2018). The analysis indicates that a company's DER level cannot explain the tendency for food & beverage subsector firms to commit fraud. Although a company has high debt relative to equity, management avoids fraudulent practices to protect its reputation and future trust. Furthermore, high leverage does not necessarily signify financial distress, but may reflect a corporate strategy to drive growth.

Nature of industry exhibits a significant negative association with financial statement fraud. This aligns with Icih & Andini (2021) and Faradiza (2016), but differs from the study by Maharani (2017). This influence demonstrates that nature of industry is able to explain the occurrence of fraud, because

managing receivables and sales activities represents a critical part of these companies operations, rendering changes in these accounts more indicative of potential management fraud. Additionally, the negative direction implies that companies manage their receivables effectively, thereby improving financial reporting quality and ensuring that changes in the receivables to sales ratio do not reflect opportunities for financial statement manipulation.

Efective monitoring is no found to significantly influence financial statement fraud. This aligns with Hidayah et al. (2020) and Pratami et al. (2019), but contrasts with Putra & Suprasto (2021) and Ningsih & Syarief (2021). This indicates that the presence of independent commissioners for oversight does not necessarily prevent fraud opportunities. Instead, oversight effectiveness can be influenced by supervision quality and corporate operational characteristics which focus heavily on production and sales activities, unlike those in the banking subsector. Change in auditor has an effect on financial statement fraud. This study is in line with research by Sawaka et al. (2020) and Fadhilah et al. (2022), but differs from studies by Putri & Setiyorini (2024) and Sari & Lestari (2020). The presence of a positive effect indicates that companies replacing their auditors are more likely to commit financial statement fraud. In line with fraud pentagon theory, change in auditor are motivated by management's efforts to conceal fraudulent practices discovered by previous auditors.

Changes of directors have no effect on financial statement fraud. This aligns with Oktaviani et al. (2022) as well as Icih & Andini (2021). However, it differs from the studies by Arfianto & Alexander (2023) and Evana et al. (2019). The results show that changes in directors are not carried out as an effort to conceal acts of financial statement fraud, but rather as a strict corporate governance mechanism in compliance with applicable requirements, thereby maintaining the operation of the company's internal controls and supervisory systems.

Frequency of CEO photos have no effect on financial statement fraud. This aligns with Pratami et al. (2019) and Rukmana (2018), but differs from the study by Yanti et al. (2021). In the food & beverage subsector, the appearance of the CEO's photos in annual reports demonstrates the company's communication and proactive functions toward stakeholders, as well as a means of introducing corporate leadership. Therefore, arrogance in this study is not a reason for committing financial statement fraud.

CONCLUSION, AND SUGGESTIONS

The study demonstrates that the factors associated with financial statement fraud vary across the banking and food & beverage subsectors. In the banking subsector, financial targets, external pressure, and the frequency of CEO photos are identified as significantly associated with financial statement fraud. By contrast, nature of industry, effective monitoring, auditor change, and director change do not show statistically significant effects. In the food & beverage subsector confirm that only nature of industry and change in auditor are identified as significant determinants, whereas financial targets, external pressure, effective monitoring, director change, and the frequency of CEO photos are not significantly associated with financial statement fraud.

The limitations lie in its use of samples restricted to the banking and food & beverage sub-sectors, thereby failing to fully represent the entire sectors. Furthermore, the observation period spans only three years, from 2022 to 2024, which may not completely capture long-term company conditions. A measurement limitation arises from the use of single-item proxies for certain Fraud Pentagon dimensions. For example, arrogance is represented only by the frequency of CEO photos, which may not fully capture the broader construct of managerial arrogance. Another limitation is the class imbalance in the F-Score

variable, where observations indicating financial statement fraud are fewer than non-fraud observations. This imbalance may affect classification accuracy, particularly in identifying the minority fraud class.

Recommendations for future research stem from the current scarcity of comparative studies on fraud pentagon theory, highlighting the need for further cross sectoral comparative analysis. Future research is expected to utilize alternative measurements for the dependent variable, such as Discretionary Accruals, Restatements, and the Beneish M-Score. Additionally, subsequent studies could incorporate other independent variables, such as CEO duality and financial stability.

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