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Predicting Audit Quality Based on Factors in the Fraud Hexagon

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Abstract.
Background. An audit of financial statements is needed to ensure accountability and transparency, especially in public companies. One of the actions that undermines transparency in a report is the deliberate manipulation of financial statements by management.
Aim. This study aims to analyse and predict audit quality based on factors in the Fraud Hexagon. The results are expected to make a theoretical contribution to the development of agency theory-based audit literature and a practical contribution to strengthening the role of auditors in fraud prevention and disclosure.
Methods. A causal-comparative type of research, which utilised a quantitative approach, was used in this study. Using a logistic regression model, this study aims to evaluate how the components of the Fraud Hexagon impact audit quality. The population in this study is all non-financial BUMN operating in Indonesia. The sample selection was carried out using a purposive sampling technique based on specific criteria set by the researcher. This study uses secondary data on annual and financial reports of BUMN companies listed on the Indonesia Stock Exchange for 2015 to 2022.
Result. The factors in the fraud hexagon used in the model simultaneously significantly affect audit quality. Based on the logistic regression model used, the probability of high audit quality under certain conditions is 18.96%.
Conclusion. Based on the test results obtained that: (1) The factors in hexagon fraud used in the model simultaneously have a significant effect on audit quality (2) Based on the classification results, the logistic regression model has an accuracy rate of 68.5%, which means that out of 184 observations, 126 observations were successfully classified correctly by the model (3) Factors in hexagon fraud can explain variations in the dependent variable, namely audit quality, by 24.5%. (4) Based on the logistic regression model used, it is obtained that the probability of high audit quality under certain conditions is 18.96%.
Implementation. This study's results can be mapped using logistic regression to identify the main factors in the Fraud Hexagon that significantly affect audit quality.

Keywords: audit quality, fraud, BUMN, hexagon theory, logistic regression

INTRODUCTION

An audit of financial statements is needed to ensure accountability and transparency. This happens because financial statements are the basis for decision-making by shareholders, especially in public companies. One action that undermines transparency in a report is the deliberate manipulation of financial statements by management, for example, by embellishing

financial figures (window dressing). These actions are included in the category of fraudulent financial reporting, which is a form of fraud in corporate financial reporting.

The ACFE survey results below show that financial statement fraud, although less common than other types of fraud, such as asset misappropriation, causes the most economic loss, with a median loss of $593,000. This finding emphasises the critical role of audit in detecting and preventing financial statement manipulation.

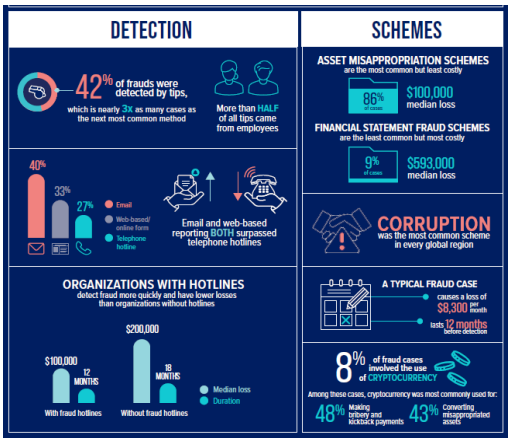

Figure 1 Fraud Schemes

A high quality audit is a key indicator of auditor professionalism in ensuring that financial statements are free from material misstatement or fraud. Thus, audit quality reflects the auditor's ability to provide accurate and reliable information to stakeholders. (Pham et al., 2017). Audit quality reflects how external auditors can detect material misstatements and other irregularities in the financial statements. The finding of significant violations or fraud is an essential indicator of audit quality because it depends on auditors' competence, knowledge, and professionalism in carrying out their duties. Audit quality is becoming increasingly important to pay attention to, especially after the emergence of various financial scandals involving the role of auditors, which raises public concerns about the effectiveness of the auditor's supervisory function. (Syahrudin, 2022).

Audit quality is a crucial aspect in ensuring the integrity of the financial information the entity presents. A quality audit provides confidence in the fairness of financial statements and plays a role in detecting and preventing fraud. However, various fraud cases that escape the audit process indicate weaknesses in implementing audits, especially in identifying fraud risk indicators early. (Syahrudin, 2024).

Fraud cases also occur in state-owned companies, not only in private companies. Based on the results of a survey conducted by ACFE Indonesia in 2019, it is known that fraud is most

detrimental to government institutions, namely 48.5%. Furthermore, fraud was also found in State-Owned Enterprises (BUMN) institutions at 31.8%, and private companies at 15.1%. This finding shows that the government sector is most vulnerable to fraud, followed by SOEs. This illustrates the need to strengthen a more effective supervision and audit system, especially in the public sector (ACFE Indonesia Chapter, 2020).

One of the phenomena that reflects the weakness of fraud detection in the audit process is the alleged corruption at PT Timah Tbk. The case involved allegations of misuse of mining licences and illegal collaboration between internal and external parties, resulting in state losses estimated at more than Rp271 trillion. Despite the company's periodic audits, this scandal demonstrates the auditor's failure to detect systematic collusion and manipulation. This phenomenon reinforces the importance of evaluating auditors' approach and competence in identifying fraud risk factors (cnbcindonesia.com).

From the perspective of agency theory, conflicts of interest between management (agents) and company owners (principals) create the potential to manipulate financial statements in favour of management's interests. Conflicts of interest in companies often occur when management, as agents, and shareholders, as principals, have different objectives, especially to maximise personal wealth. (Jensen & Meckling, 1976). This difference in objectives leads to agency problems, where management actions are not always in line with the interests of company owners. One of the main causes of agency problems is information asymmetry, which is an imbalance of information between management, which has direct access to company operations, and shareholders, who depend on financial reports as the main source of information. To minimise the risks posed by information asymmetry and ensure that the financial statements presented by management can be trusted, the role of an independent third party, namely the external auditor, is needed. The external auditor acts as a liaison between agents and principals by providing an objective opinion on the fairness of the presentation of financial statements. The audit is a monitoring mechanism to reduce information asymmetry between the two parties. However, if the audit is unable to reveal the actual economic reality, then the supervisory function does not run optimally. (Lubis et al., 2024)

In addition, there is also an expectation gap, which is the gap between public expectations of auditors' roles and responsibilities and the reality of audit practices that are limited to certain procedures and standards. (Porter, 1993). The auditor profession is expected to have high integrity and competence, because public trust in financial statements depends on the quality and accountability of the audit results provided (Rahmawati et al., 2021). The public often

expects auditors to be able to detect all forms of fraud, whereas in practice this depends heavily on the auditor's professionalism, scepticism, and knowledge of fraud risk. (Porter, 1993).

One approach that can help auditors understand the complexity of fraud causes is the Hexagon Fraud model by Vousinas (2019) Which is a development of the Fraud Triangle and Fraud Diamond. This model includes six more comprehensive factors that cause fraud: pressure, opportunity, rationalisation, capability, arrogance, and collusion. This model provides a relevant conceptual framework in identifying high-risk areas for auditors. (Pawitri et al., 2024).

Some empirical studies on audit quality that are referenced to this research are research by Riadi et al., (2025), Lubis et al., (2024), Yousefi Nejad et al., (2024), Yulianti et al., (2024), Manurung et al., (2018), Man et al., (2022), Alsmairat et al., (2019). However, empirical studies that examine the effect of all components of the Fraud Hexagon on audit quality are still limited, especially in the Indonesian context. Auditors' understanding of these six factors is believed to increase audit effectiveness and narrow the expectation gap between auditors and users of financial statements.

Based on this background, this study aims to analyse and predict audit quality based on factors in the Fraud Hexagon. The results are expected to make a theoretical contribution to the development of agency theory-based audit literature and a practical contribution to strengthening the role of auditors in fraud prevention and disclosure.

Based on the background that has been described, the problem identification in this study is as follows: (1) There are still fraudulent financial reporting practices even though an external auditor has carried out an audit. (2) The audit quality produced by external auditors has not been able to fully assure that the financial statements are free from material misstatement and elements of fraud. (3) The risk of fraud that occurs in the audit entity has not been fully considered in the audit process, especially regarding the six elements in the Fraud Hexagon (pressure, opportunity, rationalisation, ability, arrogance, and collusion). (4) The auditor's role as an independent party in reducing conflicts of interest between management and shareholders due to information asymmetry is not optimal. (5) The lack of empirical studies that examine the effect of the elements of the Fraud Hexagon on audit quality with a statistical approach such as logistic regression.

METHODS

This study used a causal-comparative type of research that utilised a quantitative approach. Using a logistic regression model, this study aims to evaluate how the components of the Fraud Hexagon impact audit quality. The population in this study was all non-financial State-Owned Enterprises (BUMN) operating in Indonesia. The sample selection was carried out using a purposive sampling technique, which is a sampling technique based on specific criteria set by the researcher. Based on these criteria, 23 BUMN were obtained from 27 non-financial BUMN that met the requirements to be used as research samples. This study uses secondary data from the annual and financial reports of BUMN companies listed on the Indonesian Stock Exchange from 2015 to 2022.

A variable is anything that can be measured and observed and has a variety of values. The value of a variable can change depending on time, conditions, and the subject being observed. This change can occur either in the same object or individual at different times, or between different objects or individuals simultaneously. (Sekaran & Bougie, 2017)Variable operations are definitions based on a variable's observable characteristics, which can be measured to obtain research data. (Sugiyono, 2022). The following are the operational variables used in this study:

Table 1 Operational Variable

Variabel	Indicators	Scale
Stimulus (X1)	Financial Target is proxied by the value of ROA; the higher the ROA value, the higher the pressure received by management.	Rasio
Capability (X2)	CEO Change, if there is a change = 1 if not = 0	Dummy
Opportunity (X3)	Effective monitoring is proxied by the ratio of the number of independent commissioners to the number of company commissioners.	Rasio
Rasionalisasi (X4)	KAP Changes, if there is a change of KAP = 1, if not = 0	Dummy
Ego (X5)	Number of CEO photos published in the company's annual report	Rasio
Collution (X6)	Proxied by company value as measured by PBV	Rasio
Kualitas Audit (Y)	If audited by KAP affiliated with the big four, KAP = 1, non-big Four = 0	Dummy

The analytical technique used to test the hypothesis in this study is binomial logistic regression with a significance level of 5% ($\alpha = 0.05$). This method is used because the dependent variable is dichotomous, which consists of two categories (audit by KAP affiliated with KAP Bigfour =1 and non-Bigfour = 0). Unlike linear regression, logistic regression does

not require the normality assumption on the independent variables. This is because the independent variables in logistic regression can be a mixture of continuous (metric) and categorical (non-metric) variables (Ghozali, 2021). SPSS version 26 software was chosen by the researcher in processing the data of this study. Thus, this analysis is suitable for modelling the relationship between the variables in the Hexagon Fraud theoretical framework and the probability of a high-quality audit. The logistic regression model used is:

$$\text{Ln}\left(\frac{p}{1-p}\right) = \alpha + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 + \beta 6X6$$

DISCUSSION

Descriptive Statistical Analysis

Descriptive statistical analysis in this study was carried out with the help of IBM SPSS version 26 software, which was used to obtain information about the minimum, maximum, average (mean), and standard deviation values of each research variable, following the results of the analysis:

Table 2 Descriptive Analysis

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
STIMULUS	184	-27.9300	27.7100	2.245120	5.0443248
CAPABILITY	184	0	1	.34	.476
Opportunity	184	.1667	1.0000	.465419	.1436147
KAP CHANGES	184	0	1	.22	.414
Dualisme Pimpinan	184	0	1	.21	.406
COLLUTION	184	.2000	41.2800	3.084457	6.6196538
Kualitas Audit	184	0	1	.51	.501
Valid N (listwise)	184				

Logistic Regression Analysis

Following the purpose of this study, namely to predict audit quality based on factors in the Fraud Hexagon, this study will analyse directly using binary logistic regression. The test results obtained from logistic regression analysis are as follows:

Table 3 Output Case Processing Summary

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	184	100.0
	Missing Cases	0	.0
	Total	184	100.0
Unselected Cases		0	.0
Total		184	100.0

a. If weight is in effect, see classification table for the total number of cases.

Based on the Case Processing Summary output, all cases analysed in this study amounted to 184 samples, and all were observed completely. This indicates that no missing values are in the analysis process so that all data can be used optimally in the logistic regression model.

Based on the results of the Omnibus Tests of Model Coefficients test table below, a significance value of 0.001 is obtained. Because this value is smaller than the 5% significance level (0.05), the independent variables used in the model simultaneously have a significant effect on the dependent variable, or at least one independent variable significantly affects audit quality.

Table 4 Output Omnibus Tests of Model Coefficients

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	26.194	1	.000
	Block	26.194	1	.000
	Model	26.194	1	.000
Step 2	Step	11.168	1	.001
	Block	37.362	2	.000
	Model	37.362	2	.000

Based on the classification results, the logistic regression model has an accuracy rate of 68.5%, meaning that out of 184 observations, 126 were correctly classified by the model. The number of correctly classified observations can be seen in the main diagonal of the classification table, which shows the match between the predicted and actual values.

Table 5 Output Classification Table

Classification Table[a]

			Predicted		
			Kualitas Audit (Y)		
	Observed		0	1	Percentage Correct
Step 1	Kualitas Audit (Y)	0	65	25	72.2
		1	38	56	59.6
	Overall Percentage				65.8
Step 2	Kualitas Audit (Y)	0	63	27	70.0
		1	31	63	67.0
	Overall Percentage				68.5

a. The cut value is .500

Table 6 Output model summary

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	228.797[a]	.133	.177
2	217.629[a]	.184	.245

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Based on the table of analysis results above, after including six independent variables into the model, there is a change in the -2 Log Likelihood value of 217.629, which indicates an increase in model fit. The Cox & Snell version's R-square value of 0.184 (18.4%) and the Nagelkerke version of 0.245 (24.5%) indicate that the six independent variables can explain the variation in the dependent variable, audit quality, by 24.5%. However, it is important to note that the interpretation of the pseudo R-square value in logistic regression is approximate, and cannot be interpreted directly like the coefficient of determination in ordinary linear regression.

Table 7 Analisis Regresi Logistik

Variables in the Equation

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	STIMULUS (X1)	.237	.061	15.272	1	.000	1.267	1.125	1.426
	Constant	-.419	.187	5.027	1	.025	.658		
Step 2[b]	STIMULUS (X1)	.243	.062	15.260	1	.000	1.275	1.129	1.441
	KAP CHANGES (X4)	-1.317	.415	10.083	1	.001	.268	.119	.604
	Constant	-.145	.204	.504	1	.478	.865		

a. Variable(s) entered on step 1: STIMULUS (X1).

b. Variable(s) entered on step 2: KAP CHANGES (X4).

From the table above, the binary logistic equation formula is obtained as follows:

$$\text{Ln}\left(\frac{p}{1-p}\right) = 0.243\text{X1} - 1.317\text{X4} - 0.145$$

Where: p = P (Affiliation with KAP Bigfour = 1)

High audit quality in this study can be predicted by stimulus variables (X1) and KAP Changers (X4). For example, if the value of X1 = 0.040, X4 = 1 then:

$$\text{Ln}\left(\frac{p}{1-p}\right) = 0.243(0.040) - 1.317(1) - 0.145$$

$$\text{Ln}\left(\frac{p}{1-p}\right) = -1.45228$$

$$\left(\frac{p}{1-p}\right) = \text{e} - 1.45228 \approx 0.234$$

$$\text{P} = \left(\frac{0.234}{1.234}\right) \approx \mathbf{0.1896}$$

So the probability value $\text{P} \approx 0.1896$ or about 18.96%. The logistic regression model used results in the probability of high audit quality under certain conditions being equal to 18.96%**.**

CONCLUSION

Based on the test results obtained that: (1) The factors in hexagon fraud used in the model simultaneously have a significant effect on audit quality (2) Based on the classification results, the logistic regression model has an accuracy rate of 68.5%, which means that out of 184 observations, 126 observations were successfully classified correctly by the model (3) Factors in hexagon fraud are able to explain variations in the dependent variable, namely audit quality, by 24.5%. (4) Based on the logistic regression model used, it is obtained that the probability of high audit quality under certain conditions is 18.96%.

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