Predictive Analysis of Fraudulent Financial Statement Risk Potential Through the Fraud Score Model

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Keywords:	Abstract
	This quantitative research project aimed to assess fraud risk in the financial statements of mining sector companies listed on the Indonesia Stock Exchange between 2018 and 2020. The study focused on measuring and predicting the likelihood of fraudulent financial reporting during this period using specific independent variables. Accrual quality was evaluated using RSST (Relative Signed Surprises of Total Accruals) as a proxy. Additionally, financial performance indicators, such as changes in accounts receivable, inventory, cash sales, and income, were analyzed to understand the financial health of the selected firms. The dependent variable was the prediction of fraudulent financial statements. Through statistical analysis and data modeling, the study aimed to identify patterns and trends that could indicate potential fraudulent reporting in the sampled mining companies' financial statements. A targeted sampling method was used, selecting 22 mining companies with available financial data from 2018 to 2020, categorized into two groups: 14 affiliated with big four KAP (Kantor Akuntan Publik) and 8 with non-big four KAP. Data analysis methods included descriptive statistics and lap cubes tests, helping summarize and compare the two groups in terms of their ability to mitigate the risk of fraudulent financial statements. The research findings revealed that companies associated with big four KAP firms were more effective at reducing fraud in their financial statements compared to non-big four counterparts. This underscores the importance of robust financial oversight and audit practices in the mining sector for maintaining investor confidence and market stability. Continuous research and monitoring of financial reporting practices are vital for transparency within the Indonesian Stock Exchange.

1. INTRODUCTION

Reported finance serves as a crucial tool for providing information to management, company owners, investors, and stakeholders. Stakeholders rely on accurate financial reports to make informed decisions related to investments, credit, and business strategies. Access to precise financial information simplifies decision-making processes. In the realm of company management, the analysis of financial data plays a pivotal role in decision-making. It assists in crucial determinations such as expanding the business, investing in new assets, and product development. Understanding the financial impact of various alternatives through financial information is invaluable for management.

Therefore, the content of financial reports must be suitable for both management and internal investors. These reports provide insights into the company's profits and serve as

a basis for measuring management's performance and future investment decisions (Zulfikar, 2017). Standardization is essential to ensure reliability and accuracy in financial reporting, preventing any material misrepresentations (Ulfah et al., 2017). In practice, adhering to accounting standards ensures that financial reports offer an accurate, relevant, and reliable portrayal of the company's financial performance and position.

However, it's important to note that financial reporting in a company is susceptible to various forms of fraud motivated by the pursuit of financial gain. This motivation can lead to fraudulent practices, which involve the manipulation or presentation of inaccurate financial information with the objective of altering perceptions of the company's financial performance. This phenomenon often runs counter to ethical business principles and accounting standards. Fraud in financial

reporting has detrimental consequences, including eroding trust among stakeholders, legal risks, reputational damage, and potential financial losses. To mitigate these risks, strict regulations, diligent supervision, and a strong ethical foundation in business are vital components in preventing fraudulent activities in financial reporting..

Irianto & Novianti (2019) define fraud as an intentional act or something done due to negligence, driven by individual or group interests, which results in losses for others. The Association of Certified Fraud Examiners (ACFE) categorizes fraud into three groups: financial reporting fraud, asset fraud, and corruption. Financial reporting fraud is the most common form of fraud committed by companies when they intentionally or negligently misrepresent financial information, quantities, or disclosures, thereby deceiving financial report users (Yusroniyah, 2017).

The need for further research on financial reporting fraud is crucial due to the potential magnitude of losses resulting from such incidents. In 2019, the total loss due to fraud in Indonesia amounted to IDR 873.43 billion, with an average loss per case exceeding IDR 7 billion and a damage rate of 38.5%. Financial reporting fraud alone ranked third, resulting in losses of IDR 242.26 billion (ACFE, 2020). Indonesia was ranked 96th out of 180 countries surveyed in the 2021 Corruption Perception Index (CPI) measurement. The CPI is based on assessments from experts and business leaders evaluating corruption in the public sector.

Indonesia received a score of 38/100, indicating a relatively high level of corruption (Transparency International, 2021). According to ACFE data (2020), the mining sector experienced the largest losses, amounting to US$475,000. PT. Garuda was also found to have violated OJK Regulation No. 29/POJK.04/2016 regarding the Annual Report of Issuers or Public Companies. Based on the 2018 financial report, the company reported a clean profit of US$809.85 or IDR 11.33 billion, but later revealed a loss of US$114.08 million or IDR 1.6 trillion. As a result, IDX issued a Warning Letter III, imposed a fine of IDR 250 million, and ordered the company to rectify and improve its financial reporting.

This case clearly demonstrates that Garuda Indonesia engaged in fraudulent accounting practices by considering receivables as income (Ministry of Finance, 2018). Numerous cases of accounting fraud have been reported in Indonesia, underscoring the significance of addressing fraudulent financial reporting as a prevalent issue in recent years. The extent of fraudulent activities also affects other sectors. To minimize fraud in financial reporting and create a fraud-free environment, companies engage the services of public accountants to audit their financial reports. The role of public accountants is crucial in minimizing the occurrence of fraud, as they are responsible for ensuring that the client's financial reports are accurate, reliable, and compliant with applicable accounting standards. The quality of audit reports varies and is often associated with the size of the audit firm, whether it is a big four or non-big four firm.

A company with a weak or inadequate internal audit department is more likely to face a higher risk of financial reporting fraud. Conversely, companies with a strong and capable internal audit department are better equipped to operate efficiently and minimize the likelihood of financial reporting fraud. Large Public Accounting Firms (KAPs) typically have auditors who are more independent, professional, and experienced, making it easier for them to learn and implement effective management methods. However, the size of a KAP can have a negative impact on a company's income (Dewi, 2017).

In contrast, Luhgiatno (2010) did not find a significant correlation between KAP size and management profits. KAPs in various countries may be affiliated with the big four accounting firms through network partnerships or collaborative projects. This affiliation offers advantages such as access to global resources, training, technological

support, and a strong reputation. Companies affiliated with the big four often conduct audits more efficiently, thanks to their perceived ability to complete audits on a more flexible timetable. Big four auditors tend to provide higher-quality audit results due to their extensive experience, larger client portfolios, and effective time management (Cristansy, 2018).

The Fraud Score Model or F-Score involves determining the mean and standard deviation values applied across different countries or industries. This model includes three key variables related to financial reporting: the quality of stated accruals using RSST, accounts receivable, and the performance stated in financial reports, including changes in financial reporting, inventory accounts, cash sales, EBIT, and the final component, market incentives represented by actual company issues. According to Skousen (2009), financial reporting fraud carries a certain level of risk. This is evident in companies in the mining sector that fall into two groups: those using KAP services from the big four and those using KAP services from other firms. The level of fraud risk in financial reporting is reduced by the F-Score, which combines variables related to performance quality and financial performance.

This study provides valuable insights into financial reporting fraud using the F-Score as a tool to detect the potential risk of fraud in financial reports. Despite its effectiveness, the F-Score model is still underutilized as a fraud detection tool. As noted by Wahyuningtias (2016), the F-Score method is relatively straightforward for detecting financial reporting fraud, making it a critical consideration for investors and stakeholders. Annisya et al. (2016) emphasize the need for further in-depth research on the F-Score method due to its limited use. This study aims to predict the potential risk of financial reporting fraud in the mining sector and explore the significant differences in fraud risk

prevention between companies using big four KAPs and non-big four KAPs.

2. LITERATURE REVIEW
2.1 Theory Agency (Agency Theory)

An agreement exists between the owner of capital (the principal) and management (the agent), giving rise to an agency relationship (J. Prof, 2021). The emergence of management profit is explained through agency theory. As the agent, the manager is morally responsible for optimizing the profits of the owners (the principals) and, in turn, receives compensation in accordance with the contractual agreement. In this context, there are two interests that are not always synchronous within the company, as each party strives to achieve or maintain their desired level of prosperity. Managers, in their role as company leaders, often possess a deeper understanding of the company's internal affairs and future prospects when compared to the owners (shareholders).

2.2 Fraudulent Financial Reporting

Fraudulent financial reporting involves the deliberate misrepresentation, concealment (omission), or manipulation of financial numbers or disclosures with the intent to deceive financial statement users (Ulfa, 2017). Detecting fraud often relies on the F-score method, which is an evaluation technique for assessing the risk of fraudulent financial reporting with the highest level of accuracy (Filiz Ak et al., 2013). The F-score is determined by using dummy variables, assigning a code of 1 to companies that indicate fraudulent financial reporting with an F-score greater than 1.00. The fraud score model (F-score) is calculated by combining accrual quality with financial performance (Arsandi and Verawaty, 2017).

2.3 F-Score Model

The F-score is one valuable tool for detecting fraud in financial reports. It comprises two essential components: Accrual Quality and Financial Performance. In this research, the F-score model is utilized to assess

the level of risk associated with fraudulent financial reporting within a company. Companies can be predicted to engage in fraudulent financial reporting if the Fraud Score Model, after calculation, exceeds 1. However, a company cannot be predicted to engage in fraudulent financial reporting if the Fraud Score Model value is less than 1 (Harahap, 2017).

2.4 Financial Performance

Financial performance is a set of performance variable gauges finance companies at various dimensions and study is manager make a misstatement that has the effect of being intentional for cover badness performance company that .

a) Change in receivable . Manipulation from amount account receivables is one method simple things done by managers For raise amount sales .

b) Change in inventory . Rate of change supply something company can in a way drastic affect gross margins

c) Change in cash sales . With measure change only on sales cash , and not including sale credit and sales based accrual other, variables This can help in evaluate is happen a decrease in sales that does not according to management accrual .

d) Change in earnings. Study has show that manager tend more choose For show growth positive on earnings (Burgstahler and Dichev , 1997).
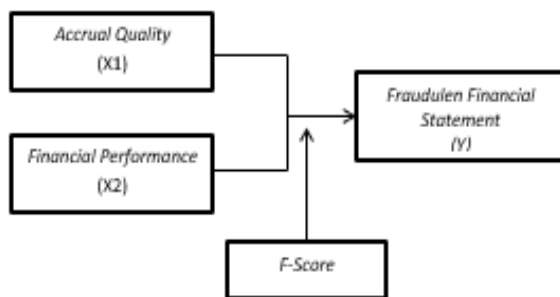
Gambar 2.2 Kerangka penelitian

H1: Risk level happen fraudulent financial statements at companies that use them non-big four Public Accounting Firm (KAP) services more big compared to with big four Public Accounting Firm (KAP) services .

H2: Risk level happen fraudulent financial statements to companies that use them non-big four Public Accounting Firm (KAP) services more small compared to with companies that use it big four Public Accounting Firm (KAP) services .

3. RESEARCH METHODS

This study employs a quantitative approach and descriptive analysis, conducted at the Indonesian Stock Exchange's Investment Gallery within Muhammadiyah University, Makassar. It relies on secondary data, annual financial reports from mining firms on the Indonesia Stock Exchange between 2018 and 2020. Quantitative analysis utilizes OLAP Cubes, a multidimensional data processing technology, for structured data analysis.

OLAP Cubes enable a comprehensive examination of financial data, revealing patterns and potential fraudulent financial reporting in the mining sector companies. The choice of OLAP Cubes underlines the research's commitment to rigorous analysis. Conducted at the BEI Investment Gallery in Muhammadiyah University, Makassar, the study ensures access to vital resources for a robust analysis of fraudulent financial reporting risk among Indonesia Stock Exchange-listed mining companies.

4. RESULTS AND DISCUSSION
2.1 Research result

In this study, the population under consideration comprises mining companies listed on the IDX from 2018 to 2020. The sampling method used is purposive sampling, resulting in a sample of 22 companies, with 14 falling into the category of Affiliated Companies with big four accounting firms and 8 companies associated with non-big four accounting firms.

The research data utilized covers the financial reports for a three-year period, totaling 66 sets of company data for analysis. The F-Score values are derived from the data, primarily involving discretionary accruals and performance indicators such as changes in

INVOICE
JURNAL ILMU AKUNTANSI
p-ISSN: 2714-6359 e-ISSN: 2714-6340

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Universitas Muhammadiyah Makassar

accounts receivable, inventory, cash sales, and income. These data are then processed using various statistical techniques, including descriptive statistics, the calculation of standard deviations, and mean values. The findings from this analysis will help determine the level of fraud risk in financial reports within the mining sector.

a. Normality test Kolmogorov-Smirnov

Method used to test a the data sample comes from a normal distribution or not. This test measures the extent to which the data approaches a normal distribution .

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		66
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	78.41923406
Most Extreme Differences	Absolute	.061
	Positive	.061
	Negative	-.050
Test Statistic		.061
Asymp. Sig. (2-tailed)		.200[c,d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

Asymp . Sig (2-tailed) means significance >0.05, so it can be said that the information from each research variable is statistically normal and can be used as research information.

b. Multicollinearity Test

Statistical tests used _ in analysis regression For identify exists problem multicollinearity between variables independent used _ in the regression model . Multicollinearity happen when there is strong correlation _ between two or more variable independent in the regression model . So that can bother interpretation results regression and create estimation coefficient become No stable .

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	x1	.929	1.076
	x2	.929	1.076

a. Dependent Variable: y

The calculation results are that tolerance value =0.929 (value absolute more than 0.7 normally considered strong) then This can become indication exists multicollinearity . At a VIF value = 1.076 (a high VIF value is above 10 or 5 depending on the literature used) so No there is exists multicollinearity .

c. Autocorrelation Test

Method used For identify is There is pattern correlation between residual values from the regression model with himself Alone or with previous residual values . Then happen when mutual residual values correlated , which can bother assumption residual independence in analysis regression .
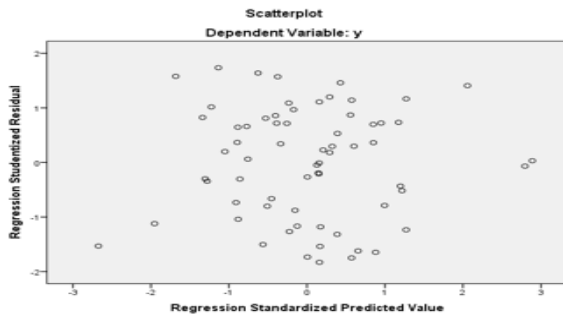
Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	1.000[a]	1.000	1.000	.34252	1.859

a. Predictors: (Constant), x2, x1
b. Dependent Variable: y

Durbin-Watson score = 1.859 and his score based on N=66, K=2, dL=1.23949, and dU=1.42888. Then the value of 4-dU (4- 1, 42888) = 2.57112. Durbin-Watson values range between 0 and 4. Values close to 2 indicate that there is no autocorrelation. Values below 2 indicate positive autocorrelation, while values above 2 indicate negative autocorrelation. So those data show exists autocorrelation negative .

d. Heteroscedasticity Test

In identifying is variability (dispersion) of the residuals in a regression model different in a manner significant in various level mark prediction (value-level independent) and occurs when residual variability does constant throughout value-level independent , which can bother assumption homoscedasticity (constant residual variability) in analysis regression .

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p-ISSN: 2714-6359 e-ISSN: 2714-6340

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Scatterplot
Dependent Variable: y

As can be seen in the picture , the scatterplot results show a pattern that leads to a wide shape on the plot, this can indicate the presence of heteroscedasticity .

Group Statistics

	Perusahaan	N	Mean	Std. Deviation	Std. Error Mean
fraudulent financial statement	KAP big four	42	4.3029	10.29010	1.58780
	KAP non big four	24	35.8542	131.55734	26.85403

Table show for KAP big four there are 42 counts sample whereas non big four consists over 24 samples . Then the mean big four KAP companies = 4.3029 and non big four = 35.8542. whereas standard very different deviations Far between 10.29010 and 131.55734.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
fraudulent financial statement	Equal variances assumed	6.799	.011	-1.555	64	.125	-31.55131	20.29019
	Equal variances not assumed			-1.173	23.161	.253	-31.55131	26.90093

Based on table above , you can see each value significance (2-tailed) >0.05. So no seen significance difference between the two groups company .

e. Hypothesis Testing

On hypothesis testing following can use Olap Cubes For detect level risk happening fraudulent financial statements per group company .

Statistic Deskriptif Kelompok Perusahaan Pengguna *KAP Big four*

OLAP Cubes

OLAP Cubes

perusahaan: Total

	Sum	N	Mean	Std. Deviation	% of Total Sum	% of Total N
f_score	181.28	42	4.3162	10.28438	100.0%	100.0%

The mean value obtained = 4.3162 with standard deviation 10.28438. matter This based on report data 3 year finance final For period accountancy with 14 companies that use KAP big four .

Statistic Deskriptif Kelompok Perusahaan Pengguna *KAP Non Big Four*

OLAP Cubes

OLAP Cubes

perusahaan: Total

	Sum	N	Mean	Std. Deviation	% of Total Sum	% of Total N
f_score	860.50	24	35.8542	131.55734	100.0%	100.0%

In table show mean = 35.8542 and standard results deviation =131.55734. Descriptive statistics results the state company non big four own mark standard more deviation _ tall compared to with big four companies .

2.2 Research Discussion

The first hypothesis proposed in this research concerns the level of risk associated with fraudulent financial statements in mining companies. Based on the results of the descriptive statistical test using the F-Score approach and the cubes traffic test, it was found that the mean value for big four companies is 4.3162, with a standard deviation of 10.28438. On the other hand, for non-big four companies, the Olap test results show a mean value of 35.8542, with a standard deviation amounting to 131.55734.

From these results, it can be concluded that H1 is supported, suggesting that there is a significant difference in standard deviation between companies using non-big four KAP services and those using big four KAP services. This indicates a higher trend of risk associated with fraudulent financial statements in companies using non-big four KAPs. This finding aligns with research suggesting that

auditors with a good reputation, such as the big four KAPs, tend to provide higher quality and more efficient audit work, offering both qualitative and quantitative human resources (C. Felicya, 2020).

Both hypotheses presented in this study aim to assess the significant difference between companies utilizing KAP Big Four services and those using non-big four KAP services. The Independent Sample T-Test results indicate a significance level of sig. (2-tailed) of 0.125 when equal variances are assumed, and 0.253 when equal variances are not assumed. In both cases, the significance is greater than 0.05. Therefore, the conclusion is that H2 is not supported, as there is no significant difference observed between the two groups of companies. This research underscores the role of auditors in limiting the potential for fraudulent practices.

Deviations from default F-Score values serve as warning signs or early indicators of potential financial reporting fraud. These indicators are crucial for internal investors when deciding to invest capital in a company, as making informed economic decisions requires careful consideration of the possibility of fraud risk in financial reports. This research highlights that fraudulent financial statements, while considered a lesser form of fraud in practice, can have significant and far-reaching negative impacts. Such fraud poses risks to various parties and can damage a company's reputation in the eyes of society..

5. CLOSING

5.1 Conclusion

The empirical data obtained from this research indicates that affiliated companies with KAP Non Big Four have a higher risk trend of fraudulent financial statements compared to companies that do not use KAP Big Four. However, a significant difference between companies using KAP Big Four services and those using KAP Non Big Four services was not observed. Therefore, it can be concluded that companies employing the services of big four KAPs are better positioned to minimize the occurrence of fraud in their financial reports compared to companies using non-big four KAPs, especially within the mining sector.

5.2 Suggestion

It is hoped that this research will serve as a foundation for future researchers, enabling them to conduct studies with longer accounting periods, extending beyond the three-year final observation. Additionally, future research could consider using different research subjects, such as banking companies or other corporate sectors, to further broaden the scope of inquiry.

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