

# Can Financial Ratios Detect Fraudulent Financial Reporting?

Enggar Diah Puspa Arum\*, Ilham Wahyudi, Widya Sari Wendry

Accounting Department, Universitas Jambi, Jambi, Indonesia

{enggar\_diah@unja.ac.id}

**Abstract.** This research was conducted to examine whether financial ratios can detect fraudulent financial reporting. The financial ratios analyzed are Days' Sales Outstanding Growth, Cash Flow from Operating Divided by Net Income, and Accounts Receivable Divided by Sales. The target population in this study was State-Owned Enterprises (BUMN) in Indonesia, particularly the Cluster of Insurance Services Industry and Pension Funds. The research data were analyzed by multiple linear regression method using eviews program. The results showed that the ratio of Days' Sales Outstanding Growth and the ratio of Accounts Receivable Divided by Sales had an effect on Fraudulent Financial Reporting. Meanwhile, the ratio of Cash Flow from Operating Divided by Net Income had no effect on Fraudulent Financial Reporting. This study proved that financial ratios can detect fraudulent financial reporting.

Keywords: Financial Reporting; Ratio; Cash Flow

## 1 Introduction

The fraud phenomenon is still a matter that needs to be addressed and investigated. Based on the survey of the Association of Certified Fraud Examiners (ACFE) Indonesia Chapter [1], there were 239 cases of fraud with a total loss of Rp. 873.430 million. According to the survey results, the financial statement fraud case caused a loss of Rp 242,260,000,000. The organization that is most disadvantaged by fraud is the government. While the institutions that are most harmed by fraud are State-Owned Enterprises (BUMN) and the industries that are most harmed by fraud are the financial and banking industries.

The results of the Indonesian fraud survey are in line with the reality conditions that occur in the Indonesia financial industry SOEs, particularly the insurance industry and pension funds. Based on the findings of the Indonesia Supreme Audit Agency (BPK RI), PT Asuransi Jiwasraya (Persero) caused state losses due to investments that were not properly analyzed and were placed in stocks and mutual funds which amounted to Rp. 16.8 trillion. Based on Jiwasraya's 2019 financial report, premium income decreased significantly from Rp. 10.55 trillion (2018) to only Rp. 3.09 trillion (2019). Likewise, the amount of equity that experienced a greater decline than the previous year, from minus IDR 30.26 trillion in 2018 to minus IDR 34.57 trillion in 2019 [2]. Other state losses caused by fraud were also carried out by PT. Asabri (Persero). The amount of state losses based on the explanation from the Attorney General's Office reached Rp. 23.7 trillion [3].

Financial information is needed by interested parties to make financial decisions. Ratio analysis derived from financial information helps provide an overview of the financial

condition of an entity. Thus, financial ratio analysis can also be used to detect indications of fraud in the financial statements. Several studies have been conducted to detect indications of fraudulent financial reporting using the Beneish M-Score [4]; [5]; [6]; [7], F Score [8]; [9]; [10]; [11], and Z Score [4]; [12]; [13].

Research that examines indications of fraudulent financial reporting using financial ratios is expected to give a signal when interested parties analyze the entity's financial performance. This will make it easier to identify indications of fraud in the financial statements. Schilit and Perler [14] recommend several financial ratios that can be used to detect indications of fraudulent financial reporting, which is called the financial shenanigans technique. Several studies examining financial ratios to detect fraud in financial statements have been carried out by Goel [14], Mohammed et al. [15] and Sakti et al. [8]. In contrast to studies examining fraud theory, the use of financial shenanigans techniques in analyzing indications of fraudulent financial reporting is still rarely studied.

One of the financial shenanigan techniques proposed by Schilit et al. [16] is the detection of earnings manipulation, which is the most frequent action taken by the management of an entity to manipulate sales and profits in one step. Several financial ratios used to detect earnings manipulation as an indication of fraud in financial statements are Days' Sales Outstanding Growth (DSOG), Cash Flow from Operating Divided by Net Income (CFFONI), and Accounts Receivable Divided by Sales (ARSAL).

When management is under pressure to get a lot of profit, management tries to collect receivables faster than it should. The speed of collection of receivables depends on how policies are taken by management or it can also depend on how long the debtor will pay the receivables. Therefore, the management strives for the collection of receivables to be faster than it should be [8]. The unreasonable speed of receivable collection period is an indication of profit manipulation. One way to measure it is by paying attention to the billing period. If the rate of collection for each period or quarter is getting faster, it indicates that management is collecting receivables faster than it should. These conditions can be an indication of red flag financial shenanigans. By looking at the billing period growth ratio which measured by Days' Sales Outstanding Growth (DSOG), investors can find out whether there are problems or not in the company's financial statements [16]. Based on these arguments, the first hypothesis formulated in this study was:

H<sub>1</sub>: Days' Sales Outstanding Growth has an effect on Fraudulent Financial Reporting.

Investors tend to choose a company with a stable profit in investing. This pressure causes management to take various ways to keep the company's profits in a stable condition. Schilit et al. [16] argues that manipulation of net income will leave an imprint on cash flows from operations. The manipulation of net income will create a gap between cash flow from operations and net income, thus indicating that the company has committed fraud. By using the ratio of cash flow from operations divided by net income, investors can indicate the presence of red flag financial shenanigans. Goel [14] has proven that cash flow from operating divided by net income (CFFONI) has a significant effect on indications of fraudulent financial reporting (FFR). Based on these arguments, the second hypothesis in this study was:

H<sub>2</sub>: Cash Flow from Operating Divided by Net Income (CFFONI) has an effect on Fraudulent Financial Reporting (FFR).

Bad loans reflect uncertainty in the collection of receivables, this condition is highly undesirable by investors and can be a pressure for management to commit fraud. When long-term receivables that should be billed for more than one period are billed prematurely, this

will cause problems where receipts from receivables are faster than sales, and it can be a red flag financial shenanigan [16]. Dalnial et al. [17]; [18] and Kanapickiene & Grundiene [19] have found evidence that the ratio of receivables divided by sales has a significant effect on indications of financial statement fraud. Based on these arguments, the third hypothesis in this study was:

H<sub>3</sub>: Accounts Receivable Divided by Sales (ARSAL) has an effect on Fraudulent Financial Reporting (FFR).

## 2 Methodology

The population in this study is the Cluster of State-Owned Enterprises in the Insurance Services and Pension Funds Industry, which consists of 8 (eight) companies with a 5 (five) year observation period. Considering the small population size, all members of the population are selected as samples. Therefore, the sample selection technique used in this study was total sampling. The data analysis method used in this research is multiple regression analysis, because it can be used as a predictive model of a dependent variable from several independent variables. Multiple linear regression model can be categorized as a good model if the model meets the assumption of data normality and free from classical statistical assumptions, both multicollinearity and autocorrelation.

Hypothesis testing in this study was carried out by: 1) F Statistical Test, which was conducted to determine the significance of the effect of the independent variable on the dependent variable; 2) The Coefficient of Determination Test ( $R^2$ ) was carried out to see the magnitude of the variation of the independent variable simultaneously in influencing the dependent variable; and 3) t-statistical test, which is used to see the significance of the effect of each independent variable partially on the dependent variable. The research model is described as follows:

## 3 Result and Discussion

Based on a predetermined population, this study should consist of 40 observational data. However, the data on the financial statements of PT. Asuransi Jiwasraya (Persero) for 2017 and 2018 were not available, so the research data was incomplete. The unpublished financial report of PT. Asuransi Jiwasraya (Persero) for 2017 and 2018 is closely related to the adverse opinion obtained for the 2017 financial statements, and the large losses reported in 2018. Thus, the data that can be collected in this study is only obtained from 7 companies with an observation period of 5 years, so the number of research data that can be analyzed was 35.

The dependent variable in this study is Fraudulent Financial Reporting (FFR) as measured by the F-Score. While the independent variables consist of the ratio of Days' Sales Outstanding Growth (DSOG), the ratio of Cash Flow from Operations divided by Net Income (CFFONI), and the Ratio of Receivables to Sales (ARSAL).

According to the results of descriptive statistics, the average of FFR was 0.10, while the minimum and maximum values were -1.19 and 2.55, respectively. Meanwhile for the ratio of DSOG, the average was 0.36, the minimum and maximum values were -0.75 and 3.90, respectively. For the ratio of CFFONI, the average was 0.67, the minimum was -1.48 and the

maximum was 4.87. Furthermore, for the ratio of ARSAL, the average was 0.77, the minimum and maximum were 0.06 and 2.26, respectively.

An F-Score value  $> 1$  indicates the risk of fraud is above the normal limit, while an F-Score value  $< 1$  indicates a low or normal risk of fraud [20]. The research data showed that PT. Asabri (Persero) for 3 consecutive years had an F-Score  $> 1$ . Based on the F-Score value from the research data, PT. Asabri (Persero) was indicated to have fraud risk from misstatement of financial statements. This evidence strengthens the phenomenon of state loss cases which are indicated to have originated from fraudulent financial statements by PT. Asabri (Persero). Thus, the F-Score can be used to detect fraud in financial statements.

Before using the regression equation to perform the analysis, a classical assumption test was performed to determine whether the data were normally distributed, free from autocorrelation, and multicollinearity in the obtained regression. Detection of normality was tested using Jarque Bera. By using eviews, the output value of Jarque Bera is 3.882856 with a p-value of 0.143499 which is greater than 0.05, so it can be determined that the data is normally distributed.

Data free from autocorrelation is an indication that there is no correlation caused by residuals in one observation with other observations in the regression model. Furthermore, to find out whether the data is free from autocorrelation, the Durbin Watson (DW) test is used. The calculated DW value is compared with the DU and DL values in the Durbin Watson table. If the value of  $DW > DU$  and the value  $(4-DW) > DU$  or simplified to  $(4-DW) > DU < DW$ , then there is no autocorrelation problem, either positive or negative autocorrelation. Based on the output eviews, the DW value is 2.339700. Meanwhile, based on the DW table, the values of  $DL = 1.2833$  and  $DU = 1.6528$  are obtained. Thus,  $(4 - 2.339700) = 1.6603 > 1.6528 < 2.339700$ , which means that the data is free from autocorrelation.

To find out whether it is free from multicollinearity, it can be seen from the VIF value. The limit value for two variables categorized as having high collinearity can be seen through the VIF (Variance Inflation Factors) value. If the VIF value for the independent variable is greater than 10, then one of the highly correlated variables must be derived from the regression model.

**Table 1.** Multikolinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
DSOG	1.000000	0.200318	0.066821
CFFONI	0.200318	1.000000	-0.281498
ARSAL	0.066821	-0.281498	1.000000

The calculation results in table 1 show that the centered VIF value is less than 10 so it can be concluded that the data is free from multicollinearity.

The output evaluation results for the fixed effect model are shown in table 2, which shows the R2 value of 0.769583, which is greater than 0.5, which means that the independent variable is very strong in explaining the dependent variable. Furthermore, Prob(F-statistic) shows a value of 0.000330, smaller than 0.05, which means that the simultaneous effect of the independent variable on the dependent variable is proven to be statistically significant.

**Table 2.** Results of Fixed Effect Model

Cross-section fixed (dummy variables)			
R-squared	0.769583	Mean dependent var	0.280000
Adjusted R-squared	0.654374	S.D. dependent var	0.823502
S.E. of regression	0.484136	Akaike info criterion	1.659553
Sum squared resid	4.218986	Schwarz criterion	2.135340
Log likelihood	-13.23374	Hannan-Quinn criter.	1.805006
F-statistic	6.679906	Durbin-Watson stat	2.339700
Prob(F-statistic)	0.000330		

### 3.1. Hypothesis Testing

Based on statistical testing using multiple regression analysis with the eviews program, there is evidence that DSOG has a negative and significant effect on FFR. This can be seen from the significance level of 0.0249 which is greater than 0.05 in table 3. It shows that the lower the billing period growth ratio, the higher the tendency for fraudulent financial reporting. Thus, the DSOG ratio can be indicate fraudulent financial reporting, this result in line with Schilit et al. [16]. But not in line with Sakti et al. [8]; Carpenter et al. [21]; and Gorczynska [22].

**Table 3.** The Effect of DSOG, CFFONI, and ARSAL on FFR

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.118345	0.264875	4.222156	0.0005
DSOG	-0.246662	0.100802	-2.446998	0.0249
CFFONI	0.004761	0.083561	0.056976	0.9552
ARSAL	-0.954428	0.319930	-2.983236	0.0080

Table 3 also show that CFFONI has no effect on FFR. This can be seen at the significance level of 0.9552 which is greater than 0.05. Too conspicuous figures of operating cash flow and net income in financial statements could be the reason why management being very carefully to manipulate it. So, it will be too easy to detect fraudulent financial statements using the CFFONI ratio. The results in line with Sakti et al. [8] and Gaol & Indriani [23], but not in line with Grove & Basilico [24] and Goel [14].

According to the output eviews in table 3, the ARSAL ratio has a negative and significant effect on FFR. This is indicated by the significance level of 0.0080 which is smaller than 0.05. Indications of fraud can be seen from the collection of receivables faster than sales. Receivables that are collected prematurely are a reflection of the pressure that the company's management exerts to manipulate earnings. The results of this study are in line with Dalnial et al. [17]; [18]; and Kanapickienė & Grundienė [19], but not in line with Sakti et al. [8].

## 4 Conclusion

Based on the results of study, it can be concluded that the lower the daily sales growth, the higher the possibility of fraud in the financial statements. The ratio of operating cash flow divided by net income cannot detect fraudulent financial reporting. The faster the receivables than sales, the higher the possibility of fraudulent financial reporting. Thus, the fraud detection model in financial statements using the financial shenanigans ratio can be identified from the Days' Sales Outstanding Growth (DSOG) ratio and the Accounts Receivable Divided by Sales (ARSAL) ratio. Furthermore, it is recommended for others to conduct an analysis using financial shenanigans ratios to detect the possibility of fraudulent financial reporting. Further researchers are expected to develop a model by analyze other variables in the financial shenanigan technique, such as the ratio of faster revenue growth from receivables, the ratio of increasing or decreasing liabilities, and faster operating profit growth ratios from sales.

## References

- [1] ACFE, "Survei Fraud Indonesia 2019," ACFE Indonesia Chapter, Jakarta, 2020.
- [2] S. Sidik, "CNBC Indonesia," CNBC Indonesia, 22 September 2020. [Online]. Available: <https://www.cnbcindonesia.com>. [Accessed 12 Februari 2021].
- [3] E. Simanjuntak, "Kompas.com," Kompas, 3 Februari 2021. [Online]. Available: <https://money.kompas.com>. [Accessed 15 Februari 2021].
- [4] G. Kukreja, S. Gupta, A. Sarea and S. Kumaraswamy, "Beneish M-score and Altman Z-score as a catalyst for corporate fraud detection," *Journal of Investment Compliance*, vol. 21, no. 4, pp. 231-241, 2020.
- [5] F. Alfian and N. Triani, "Fraudulent Financial Reporting Detection Using Beneish M-Score Model in Public Companies In 2012-2016.," *Asia Pacific Fraud Journal*, vol. 4, no. 1, pp. 27 - 42, 2019.
- [6] S. Repousis, "Using Beneish model to detect corporate financial statement fraud in Greece," *Journal of Financial Crime*, vol. 23, no. 4, p. 1063-1073, 2016.
- [7] Tarjo and N. Herawati, "Application of Beneish M-Score Models and Data Mining to Detect Financial Fraud," *Procedia - Social and Behavioral Sciences*, no. 211, pp. 924-930, 2015.
- [8] E. Sakti, Tarjo, Prasetyono and M. Riskiyadi, "Detection of Fraud Indications in Financial Statements Using Financial Shenanigans," *Asia Pacific Fraud Journal*, vol. 5, no. 2, pp. 277-287, 2020.
- [9] E. D. P. Arum and I. Wahyudi, "Fraudulent Financial Reporting Detection in Banking Sector: Evidence from Indonesia," *International Journal of Psychosocial Rehabilitation*, no. Conference Special Issue, pp. 199-211, 2020.
- [10] J. Hugo, "Efektivitas Model Beneish M-Score Dan Model F-Score Dalam Mendeteksi Kecurangan Laporan Keuangan," *Jurnal Muara Ilmu Ekonomi dan Bisnis*, vol. 3, no. 1, pp. 165-175, 2019.
- [11] P. M. Dechow, W. Ge, C. R. Larson and R. G. Sloan, "Predicting Material Accounting Misstatements," *Contemporary Accounting Research*, vol. 28, no. 1, pp. 17-82, 2011.
- [12] J. MacCarthy, "Using Altman Z-score and Beneish M-score Models to Detect Financial Fraud and Corporate Failure: A Case Study of Enron Corporation," *International Journal of Finance and Accounting*, vol. 6, no. 6, pp. 159-166, 2017.

- [13] K. Mavengere, "Predicting corporate bankruptcy and earnings manipulation using the Altman Z-score and Beneish M score. The case of a manufacturing firm in Zimbabwe," *International Journal of Management Sciences and Business Research*, vol. 4, no. 10, pp. 8-14, 2015.
- [14] S. Goel, "Decoding Gimmicks of Financial Shenanigans in Telecom Sector in India," *Journal of Accounting and Management Information Systems*, vol. 12, no. 1, pp. 118-131, 2013.
- [15] R. Mohammed, L. G. A. Salih and S. Inguva, "Evaluating Financial Evidences and Early Detection of Financial Shenanigans, A study on the United Arab Emirates," no. April, pp. 1-10, 2015.
- [16] H. M. Schilit, J. Perler and Y. Engelhart, *Financial Shenanigans, Fourth Edition: How to Detect Accounting Gimmicks and Fraud in Financial Reports*, New York: McGraw-Hill Education, 2018.
- [17] H. Dalnial, A. Kamaluddin, Z. M. Sanusi and K. S. Khairuddin, "Accountability in Financial Reporting: Detecting Fraudulent Firms," *Procedia - Social and Behavioral Sciences*, vol. 145, pp. 61-69, 2014.
- [18] H. Dalnial, A. Kamaluddin, Z. M. Sanusi and K. S. Khairuddin, "Detecting Fraudulent Financial Reporting through Financial Statement Analysis," *Journal of Advanced Management Science*, vol. 2, no. 1, pp. 17-22, 2014.
- [19] R. Kanapickienė and Ž. Grundienė, "The Model of Fraud Detection in Financial Statements by Using of Financial Ratios," *Procedia - Social and Behavioral Sciences*, vol. 213, pp. 321-327, 2015.
- [20] P. M. Dechow, W. Ge, C. R. Larson and R. G. Sloan, "Predicting Material Accounting Misstatements," *Contemporary Accounting Research*, vol. 28, no. 1, pp. 17-82, 2011.
- [21] T. D. Carpenter, C. Durtschi and L. M. Gaynor, "The Incremental Benefits of a Forensic Accounting Course on Skepticism and Fraud-related Judgments," *Issues in Accounting Education*, vol. 26, no. 1, pp. 1-21, 2011.
- [22] M. Górczyska, "Accounts Receivable Turnover Ratio. The Purpose of Analysis in Terms of Credit Policy Management," *Financial management of firms and financial institutions*, pp. 1-7, 2011.
- [23] R. L. Gaol and L. R. R. Indriani, "Pengaruh Rasio Arus Kas Terhadap Prediksi Kondisi Financial Distress pada Perusahaan Jasa Sektor Keuangan yang Terdaftar di Bursa Efek Indonesia," *JRAK*, vol. 5, no. 1, pp. 87-110, 2019.
- [24] H. Grove and E. Basilico, "Major Financial Reporting Frauds of the 21st Century: Corporate and Risk Lessons Learned," *Journal of Forensic and Investigative Accounting*, vol. 3, no. 2, pp. 191-226, 2011.