

Implementation of the Beneish M-Score Model to Detect Fraudulent Financial Statements and Its Impact on Firm Value

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ABSTRACT

This study aims to detect fraudulent financial statements using the Beneish M-Score Model and to obtain empirical evidence related to fraudulent financial statements regarding the firm value. The population in this study was the manufacturing companies listed in BEI in the period 2016-2018. The sample selection in this study used the purposive sampling technique, which involved 171. The method of data analysis used regression analysis. This study showed that in 2016-2018, 31% of manufacturing companies in Indonesia were detected to make fraudulent financial statements, and 69% were not found to do so. The results also showed that fraudulent financial statements were proven to negatively and significantly affect the firm's value. This study can be used as a reference for the users of financial reports in making a decision and for the managers of companies not to do any financial reports fraud as it can negatively affect the firm value.

Keywords: Beneish M-Score, fraudulent financial statements, firm value.

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1. INTRODUCTION

Financial reporting aims to provide information containing the financial position, performance, and changes in the financial position of a company that is useful in making economic decisions for users of financial statements (Indonesian Institute of Accountants, 2017). Decisions from the results of existing financial statements are investment decisions, granting credit, or other important decisions. Companies tend to present sound financial statements, so they get positive feedback from the users. On the other hand, it should be remembered that financial statements must be presented accurately and relevantly to avoid fraudulent financial statements that will harm users of financial statements in making a decision. According to the Association of Certified Fraud Examiners (ACFE, 2016), the most significant percentage of fraud in Indonesia comes from 77% corruption, 19% misuse of assets, and 4% financial statement fraud. In 2020, based on the Corruption Perceptions Index (CPI) issued by Transparency International (TI), Indonesia is ranked 102nd out of 180 countries, 5th in Southeast Asia. Indonesia's position is due to the increasing number of corruption cases disclosed by Indonesia Corruption Watch (Gamayuni et.al, 2023). The results of ACFE's research (2018), which was conducted on 2,690 cases of fraud from 125 countries in the world, show that fraudulent financial statements are the most harmful acts of fraud. West and Bhattacharya (2016) reveal that fraud in financial statements can cause problems that have broad consequences in various aspects, because it can reduce trust and disrupt the economic stability of each individual and even a company. Setyaki et.al (2022)

state that their study highlights the importance of being honest in the academic and professional activities.

Cases of fraudulent financial statements occurred in Indonesia and abroad. Companies involved in cases related to overseas accounting fraud include Xerox, Waste Management, WorldCom, and Enron Corporation. Enron Corporation committed fraud by inflating profits and hiding debt, which caused enormous losses for investors, employees, and retirees. The most significant impact of the Enron case was the collapse of one of the Big Five Accounting Firms in the world, Arthur Andersen. The financial statement fraud case has decreased the world's public trust in the independence and professionalism of public accountants (Handoyo, 2016). Scandals of fraudulent financial statements in Indonesia are also rampant, one of which was carried out by PT Kimia Farma Tbk. Indications of fraudulent financial statements begin with the discovery of misstatements in the financial statements that result in an overstatement of net income. The PT Kimia Farma management manipulated the sales account by double recording sales. The case resulted in the board of Kimia Farm directors being sentenced to a fine of one billion rupiahs (Apriani & Nuzula, 2019).

The losses of various cases of fraudulent financial statements are enormous and need serious attention by detecting fraudulent financial statements. Fraud detection can be done using a financial statement fraud detection method. Beneish (1999) reveals that the manipulation of financial statements can be indicated by an extraordinary increase in receivables, a decrease in assets, a decrease in gross profit, and an increase in accruals. These indications are then measured using eight financial ratio indices to detect the occurrence of manipulation, known as the Beneish Ratio Index. Then the Beneish Ratio Index results are formulated into a model known as the Beneish M-Score.

The results of research on the application of the Beneish M-Score model in Indonesia are still varied. Efita's research (2013) shows that 4.48% of manufacturing companies are classified as manipulators, 65.67% as non-manipulators, and 29.85% as gray companies. Annisa's research (2017) results show that no companies are classified as manipulators, nine companies are classified as non-manipulators, and seven companies are classified as gray companies. Hani's research (2018) concludes that financial statement fraud in companies listed on the Jakarta Islamic Index is higher than that of non-Jakarta Islamic Index companies. The research results by Christy and Stephanus (2018) show that banking companies classified as manipulators in 2014 were 57.1%, in 2015 11.9%, and in 2016 7.14%. The percentage of banking companies as non-manipulators in 2014 was 4.76%, in 2015 was 38.1% and in 2016 was 47.6%. The percentage of banking companies classified as gray companies in 2014 was 38.1%, in 2015 50%, and in 2016 45.2%. Apriani & Nazula (2019) reveals that in 2017 37.88% of manufacturing companies were classified as manipulators, 57.58% as non-manipulators, and 4.55% as gray companies. In 2016, 9.52% of consumption companies were classified as manipulators, 90.48% were non-manipulators, and no companies were classified as gray companies. Meanwhile, in 2017, 9.52% of companies were classified as manipulators, 80.95% as non-manipulators, and 9.52% as gray companies (Kurnianingsih and Siregar, 2019).

Based on the results of these various studies, the authors are interested in conducting a study on the detection of financial statement fraud using the Beneish M-Score model because the Beneish M-Score model is rarely used. In previous studies, research only reached the stage of detecting fraud in financial statements. In this study, the authors carried out a renewal, testing the effect of fraud detection results in financial statements on firm value. In addition, this study also added two control variables: company size and company age. The sample used in this study were manufacturing companies listed on the Indonesia Stock Exchange from 2016-2018. The sample was obtained using a purposive

sampling method, and the data obtained were analyzed using the regression method. The author chose manufacturing companies because of the increasing percentage of fraudulent financial statements detected from manufacturing companies in Indonesia based on several previous studies. Efitasari (2013) shows that 4.48% of manufacturing companies were classified as manipulators in 2011. Apriani & Nuzula (2019) shows that 37.88% of manufacturing companies were classified as manipulators in 2017. The following reason is that manufacturing companies have long stages in their business processes, so the gap to committing fraud is more significant than in other sectors.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Agency Theory

Agency theory explains the working relationship in a company. In agency theory, there are two parties as the main actors: the principal and the agent. The principal is the investor, the party that gives the agent the authority to manage the company. Meanwhile, the agent is the manager, the party authorized by the principal to optimally run the company (Jensen & Meckling, 1976).

An investor and manager contract states the agency relationship between principal and agent. The agreed contract shows a potential conflict of interest, which is difficult and hinders a company in achieving positive performance to generate good value for the company and investors because investors have a primary interest in obtaining a high rate of return on investment. However, on the other hand, the manager, as the party who manages the company, has an interest in prospering his life (Scott, 2015). Therefore, managers will make various efforts so that their performance gets a good impression for the welfare of investors. Efforts by company managers are to manipulate financial statements included in one of the fraudulent acts.

2.2. Fraud

Fraud is an act containing an element of intent. It is carried out in a structured manner for the benefit of individuals and groups to obtain an advantage resulting in losses for other parties. Christy and Stephanus (2018) reveal that fraud is one of the criminal fraud crimes that intends to provide financial benefits to fraudsters who are carried out intentionally for specific purposes, such as deceiving or giving a false picture to other parties by parties inside and outside the organization. According to Handoyo (2016), fraud is a generic term that includes a variety of human ingenuity in terms of planning something to gain more advantage than other parties in an incorrect way or with false information.

2.3 Financial Reports Fraud

Financial statement fraud is an illegal act by company management to deceive interested parties in financial statements by changing or hiding material information to achieve personal interests of certain parties (Tuanakotta, 2013). According to Nugraheni and Triatmoko (2017), financial statement fraud is a deliberate act by management engineering the value of financial statements to deceive users of financial statements.

2.4 Beneish M-Score Model

Beneish M-Score Model is a statistical model using financial ratios to detect fraudulent financial statements of a company. The model was created by a professor from Indiana University named Messod D. Beneish. According to Beneish (1999), the manipulation of financial statements can be indicated by an extraordinary increase in receivables, a decrease in assets, a decrease in gross profit, and an increase in accruals. Beneish (1999) developed

a financial ratio to detect fraud in a company's financial statements, formulated in the Beneish M-Score. Eight financial ratios used by Beneish to detect fraudulent financial statements are as follows: a). *Days Sales in Receivables Index* (DSRI), b). *Gross Margin Index* (GMI), c). *Asset Quality Index* (AQI), d). *Sales Growth Index* (SGI), e). *Depreciation Index* (DEPI), f). *Sales General and Administrative Expenses Index* (SGAI), g). *Leverage Index* (LVGI), h). *Total Accruals to Total Assets Index* (TATA)

2.5. The value of the company

According to Rahayu & Bida (2018), firm value is a specific condition that has been achieved by a company reflected in the stock market price. Firm value is investors' view of the company, which is often associated with stock prices, so the higher the stock price, the higher the firm value (Laksitaputri, 2012). In general, managers expect high firm value because it indicates high shareholder welfare and can increase market confidence, not only in the company's current performance but also in its estimated future performance.

2.6. Hypothesis Development

Fraud in financial statements occurring in publicly traded companies is closely related to agency theory. The theory explains the working relationship between principals and agents in a company. The principal is the investor, the party that gives the agent the authority to manage the company. In contrast, the agent is the manager, the party authorized by the principal to optimally run the company (Jensen & Meckling, 1976). The working relationship between investors and managers can create a conflict of interest, which makes it difficult and hinders a company in achieving positive performance to generate good value for the company and investors. It is because managers tend to make various efforts so that their performance looks promising to investors. The efforts tend to manipulate financial statements included in one of the fraudulent acts.

Rukmana (2018) reveals that the firm value after fraud or cheating will face an unavoidable shock, indicating that fraud negatively impacts firm value. Financial statement fraud harms firm value; the higher the level of financial statement fraud, the lower the firm value (Fernandes & Ferreira (2007) and Rukmana (2018). Based on this description, the authors formulate the following hypothesis:

H1: *Fraudulent financial statements negatively affect firm value.*

2.7. Research Model

This study uses three variables: the dependent variable, independent variable, and control variable. The dependent variable in this study is a firm value, the independent variable is financial statement fraud, and the control variables are company size and age. The following is the research model in this study:

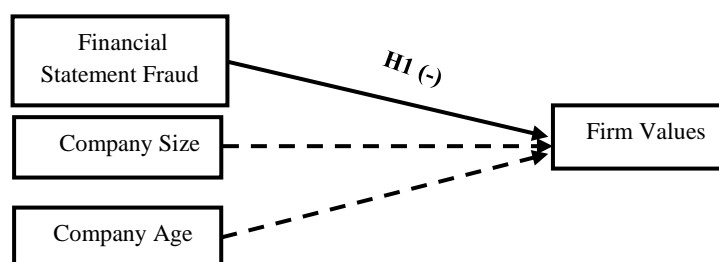


Figure 1: Research Model

3. RESEARCH METHOD

3.1. Population and Sample

In this study, the population is manufacturing companies listed on the Indonesia Stock Exchange from 2016-2018. Determination of the sample was carried out using a purposive sampling technique, where the sample was selected by the author using the following criteria: a). Manufacturing companies were listed on the Indonesia Stock Exchange during 2016-2018. b). The company was not delisted from the Indonesia Stock Exchange during 2016-2018. c). The company's annual financial reports can be accessed from the Indonesia Stock Exchange website or the company's website for 2016-2018. d). The company presents annual financial statements denominated in Rupiah. e). The company did not experience a loss during 2016-2018. f). The company's annual financial reports present data related to the required variables.

3.2. Research Variables and Variable Measurement

In this study, the dependent variable is firm value, a specific condition that has been achieved by a company reflected in the stock market price (Rahayu & Bida, 2018). The firm value variable was measured using Price to Book Value (PBV). Systematically PBV is formulated as follows:

$$PBV = \frac{\text{Market Price per Shares}}{\text{Book Value per shares}}$$

The market price per share used is the market price per share after the financial statement publication period.

In this study, the independent variable is financial statement fraud, which was measured using the Beneish M-Score of 8 financial ratio indexes.

Table 1: Financial Ratio Index to Measure Beneish M-Score

Financial Ratio	Formula
Days Sales in Receivables Index (DSRI)	$DSRI = \frac{\frac{\text{Receivables}_{(t)}}{\text{Sales}_{(t)}}}{\frac{\text{Receivables}_{(t-1)}}{\text{Sales}_{(t-1)}}}$
Gross Margin Index (GMI)	$GMI = \frac{\frac{\text{Gross Profit}_{(t-1)}}{\text{Sales}_{(t-1)}}}{\frac{\text{Gross Profit}_{(t)}}{\text{Sales}_{(t)}}}$
Asset Quality Index (AQI)	$AQI = \frac{1 - \frac{\text{Current Assets}_{(t)} + \text{Fixed Assets}_{(t)}}{\text{Total Assets}_{(t)}}}{1 - \frac{\text{Current Assets}_{(t-1)} + \text{Fixed Assets}_{(t-1)}}{\text{Total Assets}_{(t-1)}}}$
Sales Growth Index (SGI)	$SGI = \frac{\text{Sales}_{(t)}}{\text{Sales}_{(t-1)}}$
Depreciation Index (DEPI)	$DEPI = \frac{\frac{\text{Depreciation}_{(t-1)}}{\text{Depreciation}_{(t-1)} + \text{Fixed Assets}_{(t-1)}}}{\frac{\text{Depreciation}_{(t)}}{\text{Depreciation}_{(t)} + \text{Fixed Assets}_{(t)}}}$

<i>Sales General and Administrative Expenses Index (SGAI)</i>	$SGAI = \frac{\frac{\text{Sales and general expenses}_{(t)}}{\text{Sales}_{(t)}}}{\frac{\text{Sales and General Expenses}_{(t-1)}}{\text{Sales}_{(t-1)}}}$
<i>Leverage Index (LVGI)</i>	$LVGI = \frac{\frac{\text{Total Liabilities}_{(t)}}{\text{Total Assets}_{(t)}}}{\frac{\text{Total Liabilities}_{(t-1)}}{\text{Total Assets}_{(t-1)}}}$
<i>Total Accruals to Total Assets Index (TATA)</i>	$TATA = \frac{\text{Income from Continuing operation}_{(t)} - \text{Operating Cash Flows}_{(t)}}{\text{Total Assets}_{(t)}}$

Furthermore, the calculation results of the eight ratio index are put in a mathematical model to obtain the M-Score Beneish value:

$$MSORE = -4.84 + 0.920*DSRI + 0.528*GMI + 0.404*AQI + 0.892*SGI + 0.115*DEPI - 0.172*SGAI - 0.327*LVGI + 4.697*TATA$$

If the company's score shows MSCORE > -2.22, the company is detected as committing fraud. Then it is given a code of 1. However, if the company's score shows MSCORE < -2.22, it is not detected as fraud, then it is coded 0.

This study uses two control variables: company size and company age. Company size is a description of the size of a company. In this study, the size of the company is formulated as follows:

$$\text{Size} = \text{Ln}(\text{Total Assets})$$

The company's age shows how long a company can maintain its existence and continue to compete. In this study, the age of the company is formulated as follows:

$$\text{AGE} = \text{Research Year} - \text{Company Founded}$$

3.3. Data analysis method

This study uses secondary data types in the form of financial statements of manufacturing companies listed on the Indonesia Stock Exchange in 2016-2018 obtained from the website www.idx.co.id. Furthermore, the data obtained were carried out by descriptive statistical analysis. Then the classical assumption test consisted of normality, multicollinearity, autocorrelation, and heteroscedasticity tests. After passing the classical assumption test, the hypothesis was tested using multiple linear regression.

4. RESULTS AND DISCUSSION

4.1. Research Sample

The population in this study is 144 manufacturing companies listed on the Indonesia Stock Exchange from 2016-2018. The sample was determined using a purposive sampling technique, the sample was selected by the author using specific criteria. After going through the sample selection stage, the researchers obtained 57 companies that meet these criteria. Thus, the total sample in this study was 171 (57 companies × 3 years).

4.2. Descriptive Statistical Analysis

Descriptive statistical analysis was conducted to provide an overview of the study's variables. The following are the results of descriptive statistical analysis:

Table 2: Descriptive Statistical Analysis Results

	N	Minimum	Maximum	Mean	Std.Deviation
PBV	171	-0.66	81.01	3.59	9.616
MSCORE	171	0	1	0.31	0.464
SIZE	171	25.22	33.47	28.74	1.648
AGE	171	2	89	39	16.537
Valid N (listwise)	171				

4.3. Classical assumption test

The regression model in this study has passed the classical assumption test. The normality test results showed that the Kolmogorov-Smirnov Z was 0.840 with Asymp. Sig. (2-tailed) of 0.48. It concludes that the residual of the data has a normal distribution. The regression model equation does not contain multicollinearity problems, which means no correlation between the independent variables. The results of Durbin Watson test indicate that the DW value is 2.005, between the values of du and $4 - du$ or $1.7856 < 2.005 < 2.2144$, which means that the regression model in this study does not contain autocorrelation problems. The heteroscedasticity test used the Spearman Rank correlation test. The result of Spearman Rank test show that the value of sig. (2-tailed) > 0.05 , so there is no heteroscedasticity symptom.

4.4. Multiple Linear Regression Analysis

Multiple linear regression analysis determines the independent variable's effect on the dependent variable. The following is the result of multiple linear regression:

Table 3: Multiple Linear Regression Analysis Results

Model	Unstandardized		Standardized	t	Sig.
	Coefficients				
	B	Std. Error	Beta		
(Constant)	-37.674	11.534		-3.267	0.001
MSCORE	-2.858	1.400	-0.135	-2.042	0.043
SIZE	2.513	0.925	0.181	2.715	0.007
AGE	0.275	0.040	0.458	6.964	0.000

Based on Table 3, the regression equation can be arranged as follows:

$$PBV = -37.674 - 2.858 \text{ MSCORE} + 2.513 \text{ SIZE} + 0.275 \text{ AGE} + e$$

4.5. Coefficient of Determination Test (R^2)

The coefficient of determination (R^2) test determines the magnitude of the effect of the entire independent variable on the dependent variable. The test show that the Adjusted R Square value is 0.281, meaning that 28.1% of variations in changes in firm value are influenced by variations in financial statement fraud, company size, and company age, while other variables outside this research model influence the remaining 71.9%.

4.6. Model Feasibility Test

The F test basically serves to test the feasibility of the regression model. From the F test obtains a significance value of 0.000, which is smaller than the significance level of 0.05 or ($0.000 < 0.05$). Thus, the regression model used in this study is fit or feasible.

4.7. Hypothesis Testing and Discussion

Research on the implementation of the Beneish M-Score Model shows the results presented in Table 4:

Table 4 : Financial Statement Fraud Detection Results

MSCORE	Frequency	Percentage (%)
Not Committing Fraud	118	69
Committing Fraud	53	31
Total	171	100

The results of fraud detection using the Beneish M-Score Model shows that in 2016-2018, 69% of manufacturing companies in Indonesia did not commit financial statement fraud, and 31% of companies detected as having the potential to commit on financial statement fraud. It illustrates that the high percentage of manufacturing companies in Indonesia that detected having the potential to commit fraud on financial statements. Therefore, users of financial statements, such as investors and creditors, need to be careful, especially against companies detected as fraudulent financial statements, to avoid losses.

Fraud in financial statements is in line with agency theory. Agency theory explains a company's working relationship between principals and agents (Jensen & Meckling, 1976). The agency relationship between the principal and the agent has the potential for a conflict of interest, causing company managers to make various efforts so that the company's performance looks good in front of the investors, one of which is by committing fraud on the financial statements. The results of this research are in line with the results of previous research, which concluded that the percentage of companies that were detected not manipulating their financial reports was lower than the percentage of companies that did. This can be seen from the results of Efita's (2013) research which shows that 4.48% of manufacturing companies are classified as manipulators, 65.67% are classified as non-manipulators, and 29.85% are classified as gray companies. Likewise, the results of Annisa's (2017) research show that there are no companies classified as manipulators, nine companies are classified as non-manipulators, and seven companies are classified as gray companies.

Hypothesis testing was conducted to test the effect of the independent variable on the dependent variable. The following table shows the results of hypothesis testing:

Table 5: Hypothesis Testing Results

Variable	Prediction Direction	B	Sig.	Conclusion
MSCORE	Negative	-2.858	0.043	H1 is supported

Table 5 shows that the regression coefficient of the MSCORE variable is -2.858 and has a significance value of 0.043, which is smaller than the 0.05 level of significance or ($0.043 < 0.05$). It shows that H1 is supported, which means that financial statement fraud partially has a negative and significant effect on firm value.

This study proves that financial statement fraud negatively and significantly affects firm value. The higher the level of fraudulent financial statements by the company, the lower the value of the company. The decline in the company's value can be caused by concerns and loss of confidence from investors in the quality of information on financial statements issued by the company. The loss of investor trust in the company can reduce the market's response to stock prices. The decline in stock prices decreases the firm value because the firm value that has gone public is reflected in the company's stock price.

These study results are in line with research by Fernandes Ferreira (2007) and Rukmana (2018), which show that financial statement fraud negatively affects firm value. Therefore, companies should avoid fraudulent actions in financial statements because they cause broad consequences. West & Bhattacharya (2016) state that fraud in financial statements can cause problems that have vast consequences in various aspects because it can reduce trust and disrupt economic stability for every individual or entity.

The results of this study show that the users of financial reports in making a decision must be more careful if there is the potential for financial report fraud. Meanwhile, the managers of companies not to do any financial reports fraud as it can negatively affect the firm value.

5. CONCLUSION

5.1. Conclusion

The results of data analysis and hypothesis testing concludes: 1) 31% of manufacturing companies in Indonesia were detected as having the potential to commit financial statement fraud and 69% of companies did not have potential to commit fraudulent financial statements in 2016-2018 based on calculations using the Beneish M-Score. 2) The variable of financial statement fraud negatively and significantly affect firm value.

5.2. Research Implication

Financial statement users can use the Beneish M-Score to detect the potential of fraud in financial statements as a consideration in decision making. In addition, companies need to consider when there is a potential for fraudulent financial statements, because fraudulent financial statements negatively impact firm value.

5.3. Suggestion

The following are some suggestions proposed by the author for further research: 1) Future research is expected to use research samples from other sectors, such as banking because banking is a sector prone to fraudulent financial statements. 2) Future research is expected to add other models for detecting financial statement fraud, such as using the F-Score model, so that the effectiveness of the two models can be compared. 3) Further research is also expected to add control variables that are considered to have an influence on firm value, such as leverage.

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