

Application of Benford Law and Beneish M Score at PT Pertamina Indonesia

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Abstract:

This study aims to see how the application of laws and Berneish Benford models in the analysis of corporate financial statements. The author uses data PT Pertamina's financial statements for the fiscal year ending in 2010-2015. From the results of that is done there is that the model Benford law and Berneish score biased in use as tools in predicting bankruptcy within the company.

Key words: Benford law, Berneish, financial analysis, PT Pertamina.

BACKGROUND

Seeing the flashbacks on October 21, 1986 on a newspaper page New York Times, writing about Enron company survived and managed to hit as well as to repurchase shares in the number of large blocks at a premium price. On the other side of the disaster was sweeping the Peruvian government, are in the process of nationalization of gas pipeline Enron and added the situation with Enron who suffered losses from trading activities of oil or rather leading to speculation that the oil company is destined to go bankrupt. According to Mark Palmer Vice President Corporate Communications Enron Corp., "In the

years 1986-1987 Enron corp are in a very difficult situation and almost declared bankruptcy in 1988. With the establishment of new companies in 1985 to create Enron Corporation, which is a combination of Houston Gas and Inter North Inc. With the establishment of the new company by Kenneth Lay, Enron Corp. suffered losses reached \$ 15 million, so that Jacobs and Leucadia National Corporation accumulated 15% more shares of Enron Corp. that time.

Thus, indirectly, the financial dilemma at Enron Corp. began to appear. On the external side, there is good information in the financial report on stock exchanges can be made in analysis tools. Some models are much in use, such an objective analysis relating Altman Z Score. In this study the authors tried to use another analyzer that is considered able to provide advice and additional information from the Enron case with the case of one of the oil companies in Indonesia such as PT Pertamina. In completing this case study examples, the author uses financial analysis tools are very simple Benford's Law and Beneish M Score.

LITERATURE FRAUDULENT COMPANY

In Suntherland Edwin (1949), Cressey (1972), Wells, (2007) Coburn, (2006); Sitorus and Scott, 2009; Brody (2010) explains that a fraud in the financial statements can be regarded as a pervasive business risk business activities, and risk of loss are deeply embedded in the company's business. Many companies are less once respond to events as mentioned, when I have a lot of analysis model was developed to respond to it. Several strategies have been widely present fraud detection, although some of the literature is based on a study done in the earliest as well. So the literary works and current issues related to fraud detection in the financial statements of Suntherland inspired research.

Afterwards proceed by other well-known names such as Altman, Beneish and others. In a study done by the Suntherland coined the term 'white collar crimes' described in the company means that individuals who committed crimes in corporations, and individuals acting in the capacity of the company where he works. But now the term has become more frequent in the hearing with the financial or economic crimes. The emergence of the theory of the association that has been proposed by Suntherland work related to the perpetrator or a dishonest employees, which in turn will infect the corporation indirectly. Their behavior indirectly in terms verbalizations situation that allows the actors to adjust conception of the case, in which the perpetrators generally are as a person in trust with the conception they hold themselves, and in general the perpetrators are the users of funds entrusted or property in a analytical discourse. If interpreted fraud in a more general sense means an action or activity that is done intentionally, that is in essence to benefit personally and can damage another individual, whereas corporate fraud can be described as an activity or action undertaken by the corporation with involves the deliberate dishonesty, to deceive stakeholders, shareholders, and usually result in financial rewards to those who do.

MOTIVATION RESEARCH

According to the authors know and understand exactly on the information contained in the financial statements is a very important asset for an interest in it. Although in Zahra, Priem and Rasheed (2005) describes how the parties are clearly committed fraud in financial reporting, and can effect significant information to stakeholders and shareholders. From the authors were motivated to carry out the study using simple tools of analysis of the financial statements that Benford's Law and Berneish M Score. So that could provide an explanation for

the two characteristics that can provide evidence on the relevance of the objectives of this study. The first characteristic is based on the model studies on the proposal by Glover, Prawitt, Schultz & Zimbelman, (2003), Asare & Wright (2004), Wilks & Zimbelman, (2004a), Wilks & Zimbelman, (2004b), Carpenter, (2007), Green & Choi, (1997), Kaminski, Wetzel & Guan, (2004), Beneish, (1999) and Durtschi, Hillison & Pacini, (2004), which in their study on the methodology used to gain insight in the possibilities the occurrence of a fraud in the financial statements that are presented.

The second characteristic is based to a study done by (Beasley, 1996), Dechow, Sloan and Sweeney, (1996), Beneish, (1999), Harris & Bromiley (2007), Skousen & Wright (2008), Jones, Krishnan & Melendrez, (2008), Brazel, Jones & Zimbelman, (2009), Armstrong, Jagolinzer & Larcker, (2010) and Hribar, Kravet & Wilson, (2010) which explains that the analyzer's financial statements is one type of information used in making and take a decision. If we see that the research method used was the deciding factor in the type of information used. So the authors justify the study models of Cressey, (1973) which uses the analyzer as a mechanism to see if fraud and error in financial reporting information that is given. Each tool certainly has its benefits and advantages. But this can not be separated from the deliberations and decisions that will be taken to achieve maximum results. For this reason, the author aims to contribute to the research, particularly with regard to decision aids generally applicable based on the model of financial analysis.

BUILDING FRAMEWORK HYPOTHESES

In the analysis has been widely developed various models as a tool to support an information, one Benford's Law and Beneish M Score. However, some arguments to assume that the analysis model used by the authors in this study, can benefit and expand

research on information that ultimately can reduce the error information to be conveyed. Based on the writer's argument, so in this study the authors construct a hypothesis as follows:

H0: In this study, the authors establish the hypothesis accept H0, if the figures obtained from the analysis of models of Benford's Law can support the results of the analysis information generated numbers in the model Beneish M Score.

DATA AND METHODS

Data and Time Research

The data used by the authors in this study, using financial statement data PT Pertamina for the period year ended 2010-2015. Data in the can by the author by means of downloading on the website of PT Pertamina Indonesia. Data once in the can, first in though to make it as a method of analysis with Benford's Law and Berneish M Score. The study was done by the author at the time of the month from October 2016.

Research methods

In this study the authors used two financial statements analysis tools are:

1. Benford Law

Stages or steps to the data analysis performed by the authors is as follows:

1. Analyze "Benford Analysis" by way of the Tools menu to open the tool.
2. Create a Table in a way Click the Browse button to see the project on the computer and select the table you want in the analysis.
3. When finished select the column name from the drop-down menu. After that the data contained in the column will be analyzed to determine the distribution of first digits.

4. Model the analysis following the model of Myagkov, et, al. (2009).

2. Beneish M-Score Model

Is Professor Bene-ish-Messod that make the equation resembles the Altman Z score, but the equation model is expected to be able to detect the occurrence of earnings manipulation in the financial statements.

M-score calculation (8-variable model):

$$M = -4.84 + 0.92*DSRI + 0.528*GMI + 0.404*AQI + 0.892*SGI + 0.115*DEPI - 0.172*SGAI + 4.679*TATA - 0.327*LVGI \quad (1)$$

The following variables are employed:

1. DSRI - Days' sales in receivable index in the t and t-1 period.
2. GMI - Gross margin index as the ratio of gross margin and sales in the t and 3.t-1.
3. AQI - Asset quality index.
4. SGI - Sales growth index.
5. DEPI - Depreciation index.
6. SGAI - Sales and general and administrative expenses index.
7. LVGI - Leverage index of total debts to total assets in the t and t-1.
8. TATA - Total accruals to total assets in the t-period.

In Beneish (2001) explains that the value of the M-score of less than -2.22 indicated that the company does not manipulate its financial statements if the M-score greater than -2.22 This gives a signal that in the financial statements of companies going manipulation.

Table 1 Beneish M-Score Model for years 1 and 2

Options for 1st - 2nd year	M-Score	Result
Option A	-0.83	High risk in 1st year
Option C	-2.26	Low risk in 1st year

Sumber: Berneish M-Score (2001)

Table 1 shows the number of Beneish M-Score of -0.83 that is higher than -2.2, which is defined by the model for risk assessment. M-Score for A options and one year (accounting period) so that a positive detection of high risk of manipulation of financial statements. Beneish reported a lower risk of manipulation of financial statements. M-score of -2.26 is less than the threshold value of -2.2. M-Score detect positive creative accounting method (window dressing and fraud) that distorts the true and fair view of accounting in the choice of case studies.

RESULT AND DISCUSSION

Here are the results in the research of PT Pertamina's financial statements for the year ended in 2010-2015 with analysis model Benford models.

Table 2 Results of the analysis of the first digit of the financial untuklaporan PT Pertamina 2010-2015

2015 Diff	2014 Diff	2013 Diff	2012 Diff	2011 Diff	2010 Diff
3.23%	4.49%	-7.37%	1.73%	-1.10%	-1.10%
1.79%	1.04%	4.42%	-1.19%	0.72%	0.72%
-5.03%	-0.63%	-5.71%	-3.54%	2.51%	2.51%
-0.74%	-2.91%	5.56%	6.73%	-6.36%	-6.36%
2.53%	-4.53%	0.56%	-3.44%	-6.25%	-6.25%
-5.20%	0.08%	-1.61%	0.77%	8.31%	8.31%
-1.62%	2.38%	-1.01%	-0.13%	2.23%	2.23%
1.16%	-3.12%	-3.12%	-1.83%	-1.48%	-1.48%
2.89%	2.20%	7.29%	-0.10%	0.42%	0.42%

Sources in if the author

And following the results of the analysis of financial statements of PT Pertamina for the year ending in the year 2010-2014 with Benesih m score models.

Table 2 Results Beneish m score for the financial statements of PT Pertamina 2010-2014

	2014	2013	2012	2011	2010
M-score					
5 variable model	-1.76	-2.95	-3.17	-2.99	2.24
8 variable model	-1.25	-2.40	-2.61	-2.55	3.06

Sumber di olah oleh penulis

Seen in table 2 above analysis results of legal Benford showed good results, away from the numbers specified for the threshold error in the financial statements.

CONCLUSION

In conclusion, risk models and financial fraud were used in this analysis demonstrate the potential to develop the monitoring of effective risk management and corporate governance more powerful to improve the relationship between management, financial reporting, and the stability of the economic system in crisis and post-crisis shows that reports PT Pertamina finance seems to be in the same financial position or slightly stronger. Because of Benford analysis and Beneish m score to the same conclusion, are in a good position.

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