

Financial Distress Analysis with Altman Z Score Method and Value of SOEs Listed on BEI

Flourien Nurul Ch, Lies Zulfiati

Department of Accounting

Sekolah Tinggi Ilmu Ekonomi Indonesia Jakarta

Jakarta, Indonesia

flonurul@gmail.com

Abstract—This study aims to examine and find out how the method of Altman Z-Score developed in 1984 is able to predict the level of health in state-owned enterprises go public listed in Indonesia Stock Exchange, as well as to know and test the influence of health level on the value of related companies. This study uses secondary data in the form of Financial Statements of State-Owned Enterprises Listed on BEI in 2014-2016. The population in this study are the State-Owned public companies (20 companies) listed on the Indonesia Stock Exchange in 2014-2016. While the number of samples obtained as many as 15 companies With a 3-year observation period starting from 2014 to 2016, consisting of pharmacy, energy, metal, construction, metal, bank, mining, cement, transportation, and telecommunication company. The analysis in this research using linear regression analysis. After the data was collected, the data were analyzed using SPSS program to test the Z-Score value significantly influence the partial value of the company with the t test. The result of this research shows that Altman Z-Score method applied in this research succeeded in classifying the sample of companies listed in Indonesia Stock Exchange in the category of Distress Zone, Gray Zone, Safe Zone. Other results also show that the Z-Score variable has no effect on Company Value.

Keywords—SOEs; company health and z-score

I. INTRODUCTION

The Government of Indonesia established SOEs with two main objectives, which are economic goals and social objectives. In an economic purpose, SOEs are meant to manage strategic business sectors in order not to be controlled by certain parties. Business fields concerning the livelihood of the public, such as electricity, oil and gas companies, as mandated in *pasal 33 UUD 1945* [1]. With the existence of SOEs is expected to increase the welfare of the community, especially the people around the location of SOEs. The purpose of SOEs that are social, among others, can be achieved through job creation as well as efforts to raise the local economy. Employment creation is achieved through the recruitment of manpower by SOEs. Efforts to generate the local economy can be achieved by involving the community as partners in supporting the smoothness of the business process. This is in line with the government's policy to empower small, medium and cooperative businesses located in the vicinity of SOEs.

However, in the 50 years since SOEs were formed, state-owned enterprises in general have not shown an encouraging performance. The resulting profit is still very low. Meanwhile, the Government of Indonesia is still struggling to pay off foreign loans caused by the 1997 economic crisis. And one of the efforts taken by the government to increase its income is by privatizing SOEs.

Until the first half of 2017, there are 24 State Owned Enterprises (SOEs) that suffered losses. However, the figure is less than the same period last year, as many as 27 SOEs, only one state-owned company to suffer losses, namely PT Merpati Nusantara Airlines which is no longer in operation [2].

The value of the Company reflects the assets owned by the company. Company value can be judged from its stable stock price and increase in the long term. High stock prices make the Company Value also high. The higher the Company's Value indicates shareholder wealth., stock prices in the capital market are formed based on an agreement between the demand and supply of investors, so the stock price is a fair price that can be used as a proxy of Company Value [3].

Bankruptcy as a failure that occurs in a company. can be defined as follows [4]:

- Economic failure (Economic Distressed)

Failure in the economy means that the company loses money or the company's income is unable to cover its own costs, this means that the profit level is less than the capital cost or the present value of the company's cash flow is less than the obligation. Failure occurs when the actual cash flow from the company is far below the expected cash flow

- Financial Distressed

Understanding financial distressed has the meaning of financial difficulties both in the sense of funds in the sense of cash or in terms of working capital. As an asset liability management plays a role in regulating to avoid financial distressed. Bankruptcy will quickly occur in companies in countries that are experiencing economic difficulties, because economic difficulties will trigger the faster bankruptcy of companies that may have been sick and become sick and bankrupt.

There are several researchers who make the Financial Distress and the value of the company as the object of research, A Significant Study of the Altman Z-score model. There are a large number of ratios put forward by various authors. Altman developed a z-score model using the ratio as the foundation. With the help of Z-Score model, Altman can predict financial efficiency or bankruptcy up to 2-3 years before [5]. This study explains in detail the study conducted by Altman to predict business bankruptcy. Altman makes regular changes to achieve a perfect equation that can predict bankruptcy.

As has been mentioned in the background of the above problems and for this research to be more focused then the identification of the main problem of this research are:

- 1 What is the condition of Financial Distress at a state-owned company listed on BEI?
- 2 Is there any influence of Financial Distress on the value of state-owned companies listed on the BEI?

II. METHOD

A. Altman Z-Score

The Z-score analysis was developed by prof. Edward Altman with the intent to predict the financial health of a company and the possibility of experiencing a bankruptcy. Therefore this analysis is used as a measure of the financial risk level of a company.

The Altman Z-Score model is one multivariate analysis model that serves to predict corporate bankruptcy with a level of accuracy and accuracy that is relatively reliable. This model has an accuracy of 95% if using data 1 year before bankruptcy condition. Z-Score is a predetermined score of the standard count of financial ratios that indicates the probable level of corporate bankruptcy. The Z-Score formula for predicting bankruptcy from Altman is a multivariate formula used to measure the financial health of a company [6,7]. Altman discovers three types of financial ratios that can be combined to see the difference between a bankrupt and a non-bankrupt company. Based on the discriminant analysis using the Altman model based on the ratio of five variables, namely [8]:

- X_1 = Working Capital to Total Assets (Working Capital / Total Assets)
- X_2 = Retained Earnings to Total Assets (Retained Earnings / Total Assets)
- X_3 = Earnings Before Interest and Taxes (EBIT) to Total Assets (Revenue before taxes and interest charges. Total assets)
- X_4 = Market Value of Equity to Book Value of Total Liabilities (Market Value of Equity / Total Value of Debt)
- X_5 = Sales to Total Assets (Sales / Total Assets)

In 1983-1984 the prediction model of bankruptcy was developed again by Altman for several countries, from the research found the value of Z, which is sought with the

following discriminant equation for companies that have gone public namely:

$$Z = 1.2 X_1 + 1.4 X_2 + 3.3 X_3 + 0.6 X_4 + 1.0 X_5$$

With the following assessment criteria:

- $Z\text{-Score} > 2.99$ is categorized as a very healthy company so no financial difficulties.
- $1.81 < Z\text{-Score} < 2.99$ is in a gray area so it is categorized as a company that has financial difficulties, but the possibility of rescue and possibly bankruptcy is the same depending on the decision of the company's management policy as a decision maker.
- $Z\text{-Score} < 1.81$ is categorized as a company that has a very large financial difficulties and high risk so that the possibility of bankruptcy is very large.

B. Company Value

Corporate Value can be described as market value. The reason is because Company Value can give prosperity or profit to shareholder if company price increase. Company value is commonly indicated by Price to Book Value (PBV). A high Pricing to Book Value will make the market believe in future prospects. This is also the desire of the owners of the company, because high corporate value indicates high shareholder prosperity [9]. Market value differs from book value. If the book value is the price recorded on the value of the company's stock, then the market value is the stock price that occurs in a particular stock market formed by the demand and supply of shares by the market participants. The market value of this company is the value given to the stock to management and company as the organization continues to grow. Corporate value reflects the company's profitability in the future and also reflects current profitability.

Based on the market value concept approach or Price to Book Value, the stock price can be known to be above or below the book value. Basically, buying shares means buying the prospect of the company. High PBV will make investors confident about the prospects of the company in the future. Therefore the presence of PBV ratio is very important for investors and potential investors to set investment decisions.

C. Population and Sample Research

The population in this study are the State-Owned public companies (20 companies) listed on the Indonesia Stock Exchange in 2014-2016. While the number of samples obtained as many as 15 companies With a 3-year observation period starting from 2014 to 2016, consisting of pharmacy, energy, metal, construction, metal, bank, mining, cement, transportation, and telecommunication company.

The independent variable of this research is the condition of the company which will be proxied by z score, while the dependent variable is the company value which will be measured by Price to book Value (PBV).

TABLE I. OPERATING VARIABLE

Variable	Altman Ratio Component Z-Score	Indicator
Financial Distress Analysis with Altman Z-Score Method (X)	Working Capital to Total Assets (WCTA)	WCTA = Working Capital / Total Asset
	Retained Earning to Total Assets (RETA)	RETA = Retained earning / Total Asset
	Earning Before Interest and Taxes (EBIT) to Total Assets (EBITA)	EBITTA= income before tax n interest / Total Asset
	Market Value of Equity to Book Value of Total Liabilities (MVoE)	MVoE = Equity Market Value / Total Debt
	Sales to Total Assets (STA)	STA = Sales / Total Asset
Company Value (Y)		PBV = Share Price / Book Value Per Share

D. Hypothesis

It has been mentioned before that the Altman Z-Score Method can show a company's ability through financial performance quality. Investors will react positively to companies that have good company performance, whereas investors can assess negatively on companies that have unsatisfactory financial performance. So it can be concluded that if the results of the analysis of the company have the potential to go bankrupt, it will affect the value of the company in the future. Negative net working capital is likely to face problems in closing short-term liabilities because there is not enough current assets to cover liabilities so that the value of the company will decrease. It can be interpreted that the Altman z-score method analysis in predicting the bankruptcy of a company plays a role in the value of the company on the IDX.

Data will be processed by using SPSS program. While the hypothesis of this research are:

Ho : The condition of the company does not affect the value of the company

Ha : The condition of the company does affect the value of the company

III. RESULT AND DISCUSSION

The bankruptcy analysis variable with the Altman Z Score method is calculated using financial ratios, namely Working Capital to Total Assets, Retained Earning to Total Assets, Earning Before Interest and Taxes (EBIT) to Total Assets, Market Value of Equity to Book Value of Total Liabilities, and Sales to Total Assets. In Table 2 shows the condition of

the bankruptcy of 15 state-owned companies that have been sampled during the 2014-2016 period

TABLE II. CORPORATE BANKRUPT PREDICTIONS RESULT

No.	Company	2014	2015	2016
1	PT. Indofarma, Tbk	0.8574	1.5307	1.5854
2	PT. Kimia Farma, Tbk	1.9121	2.8990	1.4137
3	PT. Perusahaan Gas Negara, Tbk	2.1855	1.9018	1.3719
4	PT. Krakatau Steel, Tbk	1.4744	3.1501	1.7955
5	PT. Adhi Karya, Tbk	1.5350	1.2720	1.0723
6	PT. Pembangunan Perumahan, Tbk	1.4606	1.6118	1.1938
7	PT. Waskita Karya, Tbk	0.7402	1.4349	1.1956
8	PT. Bank Negara Indonesia, Tbk	1.9259	1.1829	1.5421
9	PT. Aneka Tambang, Tbk	1.1490	1.0129	0.6555
10	PT. Bukit Asam, Tbk	2.5629	2.3185	2.9497
11	PT. Timah, Tbk	2.1597	2.1036	2.3873
12	PT. Semen Baturaja, Tbk	0.8366	1.5020	2.6885
13	PT. Semen Indonesia, Tbk d.h PT. Semen Gresik, Tbk	3.2930	2.5815	1.7737
14	PT. Garuda Indonesia, Tbk	1.7919	1.7381	1.4202
15	PT. Telekomunikasi Indonesia, Tbk	2.3226	2.3382	2.3952

Based on the table 3 it can be seen the percentage of bankruptcy of state-owned public companies in the study period for 3 years, 2014-2016 with a total sample of 45, consisting of 15 companies. Companies that are estimated to have a bankruptcy (distress zone) of 60% are categorized as companies that have financial difficulties are very large and high risk so that the possibility of bankruptcy is very large. Then the company in the gray zone of 33,33% is categorized as a company that has financial difficulties, but the possibility of rescue and possibly bankrupt as much depends on the decision of the company's management policy as a decision maker. While companies are estimated to not bankrupt (safe zone) of 6,67% are categorized as a very healthy company so that no financial difficulties.

TABLE III. RESUME OF BANKRUPT PREDICTIONS RESULT

	Category		
	Distress Zone	Gray Zone	Safe Zone
Z-Score	< 1,81	1,81 - 2,99	> 2,99
Company	27	15	3
Percentage	60 %	33,33 %	6,67 %

By looking from the results of K-S test in table 4 it can be seen that the value of Test Statistic is 0.094 significantly on Asymp.Sig. (2-tailed) is 0.200. Value on Asymp.Sig. (2-tailed) shows above a significant value that can be concluded that the data is normally distributed and the regression model is feasible to use. Because the data used no one deviated too far from the overall data sampled research.

TABLE IV. TABLE OF DATA NORMALITY

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		,45
Normal Parameters ^{a,b}	Mean	,0000000
	Std. Deviation	3,85473471
Most Extreme Differences	Absolute	,248
	Positive	,221
	Negative	-,248
Test Statistic		,248
Asymp. Sig. (2-tailed)		,200 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

Next is the regression result and the hypothesis test results:

TABLE V. REGRESSION MODEL

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2,423	1,701		1,425	,162
X	,124	,896	,021	,139	,890

a. Dependent Variable: Y

Table of regression coefficient above can produce a simple linear regression equation in this study as follows:

$$\text{Company Value} = 2,423 + 0,124 \text{ Z-Score}$$

Simple linear regression equation above, it can be explained that:

- Constant of 2.423 means that if the free variable (Z-Score) is considered constant (value 0), then the value of the company will amounted to 2.423.
- The value coefficient Z-Score value of 0.124 states that every addition of 1 value of Z-Score then the value of the company increased by 0.124.

From the output of Table 6, the value of coefficient of determination (r^2) is 0.268, this means that the percentage of influence of the Z-Score variable on the value of state-owned enterprises that go public period 2014-2016 listed on the BEI is 26.8%. While the rest (100% - 26.8% = 73.2%) is explained by other causes beyond the model that are not included in the research model, such as the condition of company management, company HR, corporate efficiency, and corporate finance.

TABLE VI. COEFFICIENT OF DETERMINATION RESULTS

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,518 ^a	,268	,250	23.38873

a. Predictors: (Constant), X

b. Dependent Variable: Y

Based on table 7 can be seen the results of t test. Values for altman Z-Score of 0.139 with a significance level of 0.890. From the results, it is known that the significance value of Z-

Score variables is greater than the significant level $\alpha = 0.05$ which means that partially Z-Score has no significant effect on firm value. Thus the hypothesis of this study that states the Z-Score significant effect on firm value in public SOEs companies in 2014-2016 can be rejected.

TABLE VII. SIGNIFICANCY OF INDUSTRY

No.	Industry	Sig.	Description
1	Pharmacy	0,871	No Significant Impact
2	Energy	0,430	No Significant Impact
3	Metal	0,145	No Significant Impact
4	Construction	0,848	No Significant Impact
5	Bank	0,347	No Significant Impact
6	Mining	0,044	Significant Impact
7	Cement	0,049	Significant Impact
8	Transport	0,609	No Significant Impact
9	Telecommunication	0,223	No Significant Impact

In addition to seeing the results in general, researchers also try to see the effect of the company's condition through altman z score method against the value of companies based on industry groups. The results show that only companies in the mining and cement industries provide significant effect on firm value.

Looking at the above results, it can be seen that the state-owned financial condition is actually not very good in general, seen more than 50% are in a state heading in bankruptcy, but this does not make investors to comply with SOEs as an investment tool, it can be seen from the value of the company stay positive. In addition, based on the results of research proved empirically that there is no relationship between the financial condition of SOEs with the value of the company. This indicates that investors have confidence that although the financial condition of SOEs is not good, it remains a profitable investment destination because of government support as the main shareholder of SOEs.

IV. CONCLUSION

Based on the results of the above research that more than 50% state of state enterprises that go public, in the distress zone that shows that the actual state of the state-owned enterprises is not very good. Nevertheless the results of research show that the financial condition of SOE companies have no effect on the value of the company which means investors still provide a positive reaction, reflected from the good corporate value. This is because investors are confident that state-owned companies will not experience bankrupt conditions, in addition they are convinced that the government as the largest shareholder of state-owned companies will fully support if the company is experiencing financial difficulties.

REFERENCE

- [1] Republik Indonesia. Undang-Undang Republik Indonesia Nomor 8 Tahun 1995 Tentang Pelaporan Keuangan Perusahaan. Bandung: Neneng Susanti. 2010.
- [2] C.J. Kim, and Z. Ali, "Efficient management of state-owned: challenges and opportunities", Policy Workshop for Efficient Management of State-Owned Enterprises, vol.4, 2017.

- [3] A.E. Cretu and R.J. Brodie, "The influence of brand image and company reputation where manufacturers market to small firms: A customer value perspective", *Industrial Marketing Management*, vol. 36 (2). pp. 230-240, 2007.
- [4] J. A. Ohlson, "Financial ratios and the probabilistic prediction of bankruptcy", *Journal of Accounting Research*, vol. 18 (1). pp. 109-131, 1980.
- [5] S.A. Siddiqui, "Business bankruptcy prediction models: a significant study of the Almant Z-score model" *Asian Journal of Management Research* Vol.3 No.1. Kurnool, India: Rayalaseema University. 2012.
- [6] E.K. Laitinendan and S. Arto. "Distressed firm and bankruptcy prediction in an international context: a review and empirical analysis of Altman's Z-Score Model", *Journal of Finance & Economics* Volume 1, Issue 3. Finlandia: University of Vaasa. 2013.
- [7] M.S. Karamzadeh., "Application and comparison of Altman Z-Score and Ohlson Models to predict bankruptcy of companies", *Research Journal of Applied Sciences, Engineering and Technology*, Vol.5 (6). Malaysia: Multimedia University. 2013.
- [8] S. Goswami, B. Chandra, and V. Chouhan, "Predicting financial stability of select BSE companies revisiting Altman Z score", *International Letters of Social and Humanistic Sciences*, vol. 26. pp 92-105, 2014.
- [9] J.C.V. Horne, and J. M. Wachowicz Jr., *Fundamentals of Financial Management*, (2nd ed.). Jakarta: Salemba Empat. 2013.