ANALYSIS PREDICTION BANKRUPTCY BUSINESS BY USING THE METHOD ALTMAN Z-SCORE AND METHODS SPRINGATE (STUDY IN PT HOLCIM INDONESIA TBK.)

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Abstract---Bankruptcy is a condition where a company has financial difficulties that make business failures and harm many parties. Bankruptcy itself becomes a threat to companies that do not realize early on the existence of business bankruptcy. Therefore, it is necessary to predict bankruptcy early on. There are several ways to predict bankruptcy by analyzing financial ratios with Altman Z-Score and Springate Methods.

This study aims to determine the company's financial performance by using the ratio of financial analysis and prediction analysis of bankruptcy method Altman Z-Score and Springate Method. This study uses secondary data obtained from the financial statements of PT Holcim Indonesia Tbk period 2010 to 2014. To know the financial performance of the company there are 5 ratios used consisting of liquidity, solvency, activity, profitability and market ratios. Then to predict bankruptcy by the Altman Z-score method and the Springate method. Altman Z-Score method consists of Working Capital to Total Assets, Retained Earning to Total Assets, Earning Before Interest and Tax to Total Assets, Market Value of Equity to Book Value of Debt, Sales to Total Aseets. Springate method consist of 4 ratio namely Working Capital to Total Assets, Earning Before Interest and Tax to Total Assets, Earning Before Tax to Current Liabilities, Sales to Total Aseets. The results showed the company's financial performance with ratio analysis from the period 2010 to 2014 showed the company in good condition because there is no negative result even though every year the results fluctuate. The results of bankruptcy analysis by the method of Altman Z-Score in the period 2010 to 2013 are categorized not bankrupt and in 2014 categorized the company is in the area of gray or hesitant. The results of bankruptcy analysis by Springate method in the period 2010 to 2012 companies are categorized not bankrupt and in the period 2013 to 2014 companies are categorized bankrupt.

Keywords---Bankruptcy, Altman Z-Score, Springate

I. Background

The cement industry is one of the large scale industries in Indonesia. The macroeconomic side, the cement industry in Indonesia is an industry that still has positive prospects in the future. Based on data of ASI (Indonesian Cement

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Association) in 2014 domestic cement demand does not decrease if seen from consumption every region in Indonesia. In general, the increase occurred in almost all areas such as, in Sumatra 2.6%, Java 3.9%, Kalimantan 1.7%, Sulawesi 6.9%, Maluku-Papua 1.5%. The decline occurred only in Bali-Nustra at 0.7%.

Table 1. Table of cement consumption growth in Indonesia 2013-2014

Region	January - October		% Growth
	2013	**2014**	
Sumatera	9,916,191	10,170,610	*2.6*
Jawa	26,493,234	27,520,613	*3.9*
Kalimantan	3,576,278	3,638,289	*1.7*
Sulawesi	3,405,356	3,640,441	*6.9*
Bali Nustra	2,792,435	2,773,736	*(0.7)*
Maluku Papua	993,366	1,008,500	*1.5*
T o t a l	**47,176,859**	**48,752,188**	*3.3*

The increasing growth of cement consumption in Indonesia is proportional to the number of cement companies spread across the Indonesian territories. From the data of ASI, there are 9 cement companies that have production capacity that can fulfill domestic demand of cement consumption. However, the growth of cement demand each year has not increased significantly. For example, in 2013 in January-October and 2014 in the same month only increased 3.3%.

The market share of the cement industry in Indonesia in 2012 is still controlled by Semen Gresik Group with market share of 39.74%. In the second position PT Indocement Tunggal Prakarsa Tbk has a market share of around 33%, PT Holcim Indonesia Tbk has a market share of 15 , 69% and other cement producers such as Bosowa and Lafarge controlled 11.53% market share.

Competition among cement companies is increasing, therefore every company is required to improve its company's performance in order to win the competition. The financial condition of a company is one factor that can affect the survival of a company, this can be seen from the financial statements. The financial statements are the end result of a recording process which is a summary of financial transactions that occurred during the relevant fiscal year (Kamaludin, 2011: 34). The financial statements published by the company make one source of information about the company's financial position, the performance and changes in its financial position, which is very useful for supporting the right decision-making.

In order for the information obtained to be more useful in making decisions, financial data should be converted into useful information in economic decision making. This is done by analyzing the financial statements. The model that is often used in conducting such analysis is in the form of financial ratios. Financial statement analysis is also useful in assessing corporate bankruptcy, assessing the fairness of stock prices, and assessing the fairness of the financial statements presented.

In some cases go-public companies that went bankrupt, namely Eastmen Kodak Company is a pioneer company of the world of photography. Kodak was still very popular in the 1980s, to financial difficulties in 1983 and the company announced profits that plummeted by 73%. In 2012, it eventually went bankrupt because it was unable to compete with competing companies who could better understand consumers who needed all-digital products (http://www.gadget.gopego.com, accessed on January 14, 2015, 15:05 WIB). PT Batavia Air (Batavia Air) was an airline

company in Indonesia operating in 2002. Batavia Air was declared bankrupt by Central Jakarta Commercial Court on January 31, 2013 due to Batavia Air being sued for bankruptcy by International Lease Finance Corporation (ILFC) . The cause of Batavia Air was sued for not being able to repay the debt due until December 13, 2012 which amounted to USD 4.68 million to ILFC (http://www.merdeka.com, accessed January 15, 2015, 16:10 WIB).

It also does not rule out other go-public companies, such as PT Holcim Indonesia Tbk service providers and cement-based building materials whose business activities take place in two countries, Indonesia and Malaysia. Sales and profit data achieved by PT Holcim Indonesia Tbk as follows:

Table 2. Net Sales and Net Profit Table PT Holcim Indonesia Tbk.

Year	Net Sales (Trillion)	Net Income (Billion)
2010	5,96	830
2011	7,52	1064
2012	9,01	1351
2013	9,68	952
2014	10,5	669

Source: Annual Report PT Holcim Indonesia Tbk. (Researcher's Review, 2015)

The data shows net sales for five years continues to increase but the increase in profit is only three years ie 2010 to 2012 while in 2013 and 2014 has decreased.

Predictions about financial difficulties or bankruptcy analysis are important analyzes. Bankruptcy analysis is important with consideration of bankruptcy of a go-public company will harm many parties. These parties include, among others, investors who invest in the form of shares or bonds, creditors due to Termination of Employment (PHK) and company management.

This bankruptcy analysis is done to obtain early warning of bankruptcy (early signs of bankruptcy). The earlier signs of bankruptcy are found, the better for the management, because it can make improvements from the beginning (Hanafi, 2003: 263) in Peter and Joseph (2011).

Frequent bankruptcy analysis used Altman's Z-Score analysis (1968). The bankruptcy analysis is known for its accuracy in determining bankruptcy predictions (R. Agus Sartono, 2008: 115). Bankruptcy analysis is done to predict a company as an assessment and consideration of a company's condition.

A similar study was conducted by Gordon L.V. Springate (1978) in predicting the potential (indication) bankruptcy of the company. Gordon L.V. Springate has finally found four ratios that can be used in predicting bankruptcy. The four ratios are combined in a formula formulated by Gordon L.V. Springate and later known as the Springate Method (Hernanta, 2013: 4).

Based on this background, the authors are interested to examine the "Bankruptcy Analysis of Business by Using Altman Z-Score Method and Springate Method (Study on PT Holcim Indonesia Tbk.)"

A.   **Problem Formulation**
The formulation of the problem in this research are:
1. What is the financial performance of PT Holcim Indonesia Tbk in the period 2010 to 2014 using financial ratio analysis?

2. How is the result of bankruptcy analysis of PT Holcim Indonesia Tbk from 2010 to 2014 using altman z-score method?

3. How is the result of bankruptcy analysis of PT Holcim Indonesia Tbk in period 2010 to 2014 by using springate method?

B. Research Objectives

This study aims to know, analyze and review:

1. Financial performance of PT Holcim Indonesia Tbk in period 2010 to 2014 by using financial ratio analysis.

2. Prediction of bankruptcy of PT Holcim Indonesia Tbk in period 2010 to 2014 by using altman z-score method.

3. Prediction of bankruptcy of PT Holcim Indonesia Tbk in period of 2010 until 2014 by using springate method.

C. Relevant studies Theory

1. Definition of Bankruptcy

Bankrupt is defined as an insolvent company that goes bankrupt in accordance with the law that goes bankruptcy is a juridical procedure to liquidate officially the activities of companies undertaken under the courts. Government involvement is needed to guarantee the payment of obligations to external parties and return shareholders' capital (for limited liability companies). A company goes bankrupt, if the total amount of liabilities exceeds the total total assets, so that the company's own wealth is negative. The state of bankruptcy can be achieved by: voluntary reasons or chosen by the company itself that filed a petition to the district court for the company to go bankrupt. It is interesting that the creditor (creditor) submits a request to the district court for the company to be bankrupt first (Ardiyos in Hanunu, 2013: 13).

According to Martin. et al (1995) in Irma Thisca Indriyati (2010: 11-12), bankruptcy as a failure in several senses:

a. Economic failure (economic failure), failure in the economic sense usually means the company cannot cover its own cost. This means the profit level is less than the cost of capital or more.

b. Financial failure (financial failure), financial failure can be interpreted as insolvency that distinguishes between basic cash flow and base.

Insolvency on the basis of the flow there are two forms, namely:

a. Technical insolvency (technical bankruptcy), the company fails if the company can not meet the requirements at maturity. Insolvency is important if you do not want to meet the payment.

b. Insolvency in the sense of bankruptcy, in this sense bankruptcy in size because the expected net worth is less than the obligation.

2. Financial Ratio Analysis

Financial ratio analysis is the ratio of the numbers in the financial statements or between financial statements. After making comparisons can be concluded the financial position of a company for a certain period. In the end we can assess the performance of management in that period (Kashmir, 2010: 93; Hussain et al., 2019).

According to James C. Van Horne in Kasmir (2010: 93), the financial ratio is an index that links the two accounting numbers and is obtained by dividing one number by another. Financial ratios are used to evaluate the company's financial condition and performance. From the results of this financial ratio will be seen the health condition of the company concerned.

According to Kamaludin (2011: 40) that financial ratios are designed to help evaluate financial statements or help identify some of the company's financial strengths and weaknesses.

according to Kamaludin (2011) The types of financial ratios consist of: 1). Liquidity Ratio, Liquidity Ratio is the ratio used to measure the company's ability to meet short-term obligations; 2). The solvency ratio is to answer the question of how the company finances its assets; 3). The activity ratio shows how far management can accumulate sufficient sales of the assets used; 4). Profitability ratios show an overview of the effectiveness of management in generating profits; 5). The market ratio shows a group of ratios related to the firm's stock price compared to the firm's earnings, the book value of perlembar and the market value compared with the book value.

3. Altman Z-score analysis

The study of the prediction of corporate failure was done by Edward I. Altman called multiple discriminant analysis. In his analysis, Altman uses several ratios that can illustrate the degree of bankruptcy. the list of ratios used can be seen in table 2.1 below:

Tabel 3. Ratio in z-score

Z-Score	Z'-Score	Z''-Score
1. *Working Capital / Total Asset*	1. *Working Capital / Total Asset*	1. *Working Capital / Total Asset*
2. *Retained Earning / Total Asset*	2. *Retained Earning / Total Asset*	2. *Retained Earning / Total Asset*
3. *EBIT / Total Asset*	3. *EBIT / Total Asset*	3. *EBIT / Total Asset*
4. *Market Value of Equity / Book Value of Debt*	4. *Book Value of Equity / Book Value of Debt*	4. *Book Value of Equity / Book Value of Debt*
5. *Sales / Total Asset*	5. *Sales / Total Asset*	
1. Manufaktur	1. *Private (non public)*	1. Jasa
2. Publik		2. *Public & Private*

Source: Prihadi (2008: 144)

The Z-score formula can only be used for public and manufacturing companies because at the moment. Altman takes samples from public manufacturing companies. Due to the limited use of Z-scores that can only be used for public and manufacturing companies, Altman developed two variants of Z-score, Z'score and Z "-score.Z'-score is intended for non-public corporations by way of re-forming the ratio used, ie removing the value of the equity market and replacing it with the book value of equity. While Z "-score is aimed at service companies, in this last model the ratio of sales to total assets is eliminated with industry expectations, in terms of firm size related to assets or sales can be eliminated. Below is the table formulation Altman Z-score, Z'-score and Z "-score, namely:

Tabel 4. Tabel Formula Altman Z-score, Z'-score dan Z''-score

$$Z = 1{,}2\,x_1 + 1{,}4\,x_2 + 3{,}3\,x_3 + 0{,}6\,x_4 + 1{,}0\,x_5$$

Dimana:

x_1 = *Working Capital / Total Assets*

x_2 = *Retained Earning / Total Assets*

x_3 = *Earning Before Interest Tax / Total Assets*

x_4 = *Market Value of Equity / Book Value of Debt*

x_5 = Sales / Total Assets

Bankruptcy criteria

< 1,81 = Predicted to be bankrupt

> 2,99 = Predicted not bankrupt

1,81 - 2,99 = Gray or hesitant area

Z' = $0,717 x_1 + 0,847 x_2 + 3,107 x_3 + 0,420 x_4 + 0,998 x_5$

Whereas:

x_1 = Working Capital / Total Asset

x_2 = Retained Earning / Total Assets

x_3 = Earning Before Interest Tax / Total Assets

x_4 = Book Value of Equity / Book Value of Debt

x_5 = Sales / Total Assets

Bankruptcy criteria:

> 2,90 = Predicted to be bankrupt

< 1,23 = Predicted to no bankrupt

1,23 - 2,90 = Gray or hesitant area

Z" = $6,56 x_1 + 3,26 x_2 + 6,72 x_3 + 1,05 x_4$

whereas:

x_1 = Working Capital / Total Asset

x_2 = Retained Earning / Total Assets

x_3 = Earning Before Interest Tax / Total Assets

x_4 = Book Value of Equity / Book Value of Debt

Bankruptcy criteria:

> 2,60 = Gray or hesitant area

< 1,1 = Predicted to no bankrupt

1,1 - 2,60 = Gray or hesitant area

Source: Prihadi (2008: 180)

4. Springate Model Analysis

This model was developed in 1978 by Gorgon L.V. Springate. Following Altman's developed procedures, Springate used step-wise multiple discriminate analysis to select four of the 19 popular financial ratios so as to distinguish companies in bankruptcy zones or safe zones. The four ratios are WCTA, EBITDA, EBTCI, and STA (Harnanta, 2013: 51). The Springate method formulates as follows:

S = 1.03A + 3.07B + 0.66C + 0.4D

Whereas :

A = Working Capital to Total Assets Ratio

B = Net Profit before Interest and Taxes to Total Assets Ratio

C = Net Profit beforeTaxes to Current Liabilities

D = Sales to Total Assets

5. Previous Research

The following researchers describe briefly the results of previous research that closely related or even have similar themes with this research, namely:

Sinta Kartikawati (2009) entitled "Z-Score Analysis in measuring Financial Performance to predict Bankruptcy in seven Manufacturing Companies in Jakarta Stock Exchange." The results of analysis from seven Manufacturing Companies listed on the BEI that there are only 2 companies that are on healthy condition that is PT Gudang Garam Tbk & PT Kimia Farma Tbk, and 4 companies under gray area and 1 bank in bankrupt condition ie PT Mayora Indah Tbk.

Yoseph (2011) entitled "Analysis of Bankruptcy with Altman Z-Score Method, Springate and Zmijewski on Pt. Indofood Sukses Makmur Tbk Period 2005 - 2009. "The results of this study is the financial performance of PT. Indofood Sukses Makmur Tbk in 2005, 2006 and 2009 both. Poor performance in 2007 and 2008. Analysis of Altman Z-Score in 2005 - 2009 is called potentially bankrupt. The analysis of Springate bankruptcy in 2005, 2006, and 2009 is called not potentially bankrupt, in 2007 and 2008 potentially bankrupt. Zmijewski bankruptcy analysis of 2005 - 2009 is called not potentially bankrupt.

Harnanta (2013) under the title "Prediction Analysis of Corporate Bankruptcy Using Altman Z-score and Springate Methods on Telecommunication Companies Listed in Indonesia Stock Exchange (BEI) Period 2008-2011." Based on the test results using Altman method only PT Telkom Tbk was declared healthy in 2008-2011, PT Indosat Tbk and PT Bakrie Tbk in 2008 were in gray area and in 2009-2011 were in the bankruptcy area and for PT XL Axiata Tbk in 2008 are categorized bankrupt and in 2009-2011 are in gray area. While testing by Springate method result PT Telecom Tbk is in healthy position, in the period 2009 PT XL Axiata otherwise healthy

D.   Research Methods

1.   Types of Research

This research is descriptive research, that is by collecting, classifying, analyzing, and interpreting data obtained from company / institution so as to give description with actual situation (Arikunto, 2010: 234). According to Sugiyono (2010: 11), "Descriptive research is a study conducted to determine the value of independent variables, either one or more variables (independent) without making comparisons, or connect with other variables".

2.   Data Types and Data Sources

By means of obtaining it, this study uses secondary data types. Secondary data in this research is balance report and earnings report annual Report PT. Holcim Indonesia Tbk for four years from 2010 to 2014 taken from PT Holcim Indonesia Tbk website

3.   Data Collection Techniques

In this research data collection techniques used is the method of documentation by recording and tracing data on the website of PT. Holcim Indonesia Tbk. And the data contained in Indonesia Stock Exchange in the form of balance sheet financial statements and profit and loss of PT. Holcim Indonesia Tbk. year 2010-2014.

F. Analysis

1. Application of Altman Z-score Method

Here are the results of the prediction of bankruptcy at PT. Holcim Indonesia Tbk using Altman Z-score method:

Table 5. Altman Z-Score Calculation and Criteria for Bankruptcy Period 2010-2014

year	1,2X1	1,4X2	3,3X3	0,6X4	1,0X5	Z-Score	Criteria
2010	0,11	0,07	0,36	3,28	0,56	4,38	No bankrupt
2011	0,08	0,14	0,46	2,62	0,68	3,99	No bankrupt
2012	0,06	0,21	0,50	4,78	0,73	6,28	No bankrupt
2013	-0,10	0,18	0,30	2,10	0,64	3,13	No bankrupt
2014	-0,11	0,14	0,20	1,42	0,60	2,25	gray

Source: PT Holcim Indonesia Tbk. (Researcher's Review, 2015)

2. **Application of Springate Methods**

Here are the predicted results of bankruptcy PT. Holcim Indonesia Tbk using Springate method:

Table 6. Calculation of Springate Method and Criteria for Bankruptcy Period 2010-2014

Tahun	1,03A	3,07B	0,66C	0,4D	Z	Criteria
2010	0,09	0,34	0,56	0,23	1,22	No bankrupt
2011	0,07	0,43	0,60	0,28	1,38	No bankrupt
2012	0,05	0,46	0,79	0,30	1,60	No bankrupt
2013	-0,08	0,28	0,27	0,26	0,72	No bankrupt
2014	-0,09	0,18	0,17	0,24	0,51	No bankrupt

Source: PT Holcim Indonesia Tbk. (Researcher's Review, 2015)

G. Discussion

1. Discussion on the results of Financial Ratio Calculation

In 2010 samapai to 2012 shows the value of Net Working Capital / Total Assets Ratio positive although there is a decrease while in 2013 and 2014 have a negative ratio this shows the value of net working capital is negative meaning that current assets smaller than current debt.

Retained Earnings to Total Assets or retained earnings compared to the number of company assets in 2010 to 2012 has increased significantly but in 2013 and 2014 decreased sharply. This shows that retained earnings decrease compared with the number of company assets.

Net Profit before Interest and Taxes / Total Assets Ratio or profit before tax compared to total assets in 2010 to 2012 increased while in 2013 and 2014 decreased, it shows that profit before tax and interest has decreased in the last two years.

Market Value of Equity to Book Value of debt in the market compared to the total book value of debt in 2010 to 2012 increased while in 2013 and 2014 decreased. This shows the price per share in the stock decreased or the amount of debt increased.

Sales / Total Assets or the comparison between the number of sales with the amount of property that has fluctuated and in the last two years has decreased significantly.

2. **Discussion of Altman Z-score Method Analysis**

Altman Z-score calculation above is obtained in 2010 with a value of Z-Score 4.38 which dikriteriakan not go bankrupt because the Z-score in 2010 was above 2.99. In 2011 the value of Z-score has decreased to 3.99 but the Z-score is still criticized not bankrupt because the value is above 2.99. In 2012 the value of Z-score increased to 6.28 and dikriteriakan not bankrupt because it is definitely worth being far above 2.99. In 2013 the value of Z-score decreased to 3.13 and dikriteriakan in a position not bankrupt because the value is still above 2.99. However, in 2014 the value of Z-score decreased to 2.25, which means that the value of Z-score is between 1.81 to 2.99 and dikriteriakan companies in gray area or gray where the company in a position near bankruptcy.

3. Discussion of Springate Method Analysis

the calculation of springate method then obtained in 2010 with a value of Z that is 1.22 which dikriteriakan companies do not go bankrupt because the value is above 0.82. In 2011 the value of Z is 1.38 which dikriteriakan companies do not go bankrupt because the value is above 0.82. In 2012 the value of Z increased to 1.60 which dikriteriakan companies do not go bankrupt because the value is also above 0.82. In 2013 and 2014 the value of Z decreased to 0.72 and 0.51 which the company predicted to go bankrupt because its value is less than 0.82.

H. CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions

The conclusions of this study are as follows:

1. The calculation of financial ratios shows that the five ratios have the same tendency that in 2010 to 2012 increased but in 2013 and 2014 experienced a significant decrease.

2. The results of the calculation of Altman Z-score method analysis can explain the state of PT Holcim Indonesia Tbk in the period 2010, 2011, 2012 and 2013 Z-score calculation is on prediction of companies not bankrupt because the Z-score is above 2.99. While in the period 2014 Z-score value of 2.25 is on the prediction of the gray area or gray area because the Z-score is between 1.81 to 2.99.

3. The results of the calculation of springate methods in 2010, 2011 and 2012 predicted the company does not go bankrupt In 2013 and 2014 the value of Z decreased to 0.72 and 0.51 which dikriteriakan companies predicted bankruptcy because the value is less than 0.82.

2. Suggestions

Assessment of bankruptcy analysis with the Altman Z-score method in the period 2010 to 2013 which is not bankrupt is the company must maintain the condition and continue to improve the performance of the company and the period 2014 which is in the gray area the company should lower its short-term liabilities because it is not comparable with the increase in assets smoothly company. The calculation of bankruptcy analysis by Springate method in the period 2010 to 2012 which in a condition not bankrupt should company can defend it. In the period 2013 and 2014 the company predicted bankrupt this should be a material evaluation company to improve the performance of the company and the company should be able to do debt management well.

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