

Financial Statement Ratio Analysis to Predict Bankruptcy on Company Registered in BEI - Jakarta

Andi Silvan^{a,*}

^a*Sekolah Tinggi Ilmu Ekonomi Manajemen Bisnis Indonesia*

Abstract

This study takes the topic of predicting corporate bankruptcies. This research uses traditional methods Altman Z-Score and Zmijewski. The purpose of this study was to obtain in-depth information about predicting bankruptcy of companies that are not necessarily directly to bankruptcy, but there is financial distress. Based on the results of research conducted on the four non-industrial manufacturing company listed on the Indonesia Stock Exchange (BEI). Obtaining the value z-score represents the average company are in good condition, which means no financial distress. Acquisition value of x-score has a value of less than 0 (zero) which means that the company is in good condition and is predicted not experiencing financial difficulties. This study led to the conclusion that the Altman Z-Score and Zmijewski method can be used to predict corporate bankruptcy.

Keywords: financial ratios, bankruptcy, company

1. INTRODUCTION

Competition in the business and corporate world today is rapidly increasing the impact of increased competition competitive business. These circumstances will inevitably have to be faced by the company. The main objective of the company is a going concern (going concern) and the achievement of maximum profit.

The manufacturing company is a corporation operating machinery, equipment, and labor in a process to convert raw materials into finished goods that have a sale value. In operation, manufacturing companies get revenue from the manufacture of raw materials into finished goods. Manufacturing firm activity is managing the raw materials or raw materials so that the finished product and then sell it to consumers. Various challenges faced by the company such as the development of information and technology rapidly, and other factors that require the company to always be sensitive to change and to be careful in making decisions which must be by company objectives.

Therefore, so that the company can survive or even grow and thrive, companies need to examine and analyze the financial condition of the company. To know the exact financial condition would require an analysis of the media that presents reports

on the financial condition of the company. The media in the form of the company's financial reports published periodically, annual, semiannual, quarterly, monthly, weekly and daily.

The financial statements can provide information about the position of assets (assets), liabilities (liabilities), and Equity (Capital) who can assist interested parties in assessing the condition, strengths, and weaknesses of the company. One important aspect of the analysis of the financial statements of any company is its usefulness for predicting survival.

Based on the financial statements will be calculated several financial ratios commonly used as a prediction of bankruptcy. The results of the analysis of the financial statements will help in interpreting various relationships and trends that can provide the basis for consideration on future predictions the company does survive or not. Companies that become the object of this study is the cigarette industry manufacturing companies listed in Indonesia Stock Exchange.

The purpose of this research is (1) to analyze and predict bankruptcy using Altman Z-Score in four cigarette industry manufacturing companies listed on the Stock Exchange in 2015-2018; (2) to analyze and predict bankruptcy using Zmijewski models in four (4) cigarette industry manufacturing companies listed on the Stock Exchange in 2015-2018; (3) to analyze the bankruptcy prediction comparison between models of the Altman Z-Score model Zmijewski on these firms.

The results of the analysis in this study can be useful for the readers of both theory and practice applied in the business world. Also, It can be a reference for further research and devel-

* Author in correspondence,

Email address: andi_silvan@yahoo.com (Andi Silvan)

opment as experience in applying financial insight and analysis of financial statements.

2. LITERATURE REVIEW

Empirical studies (previous research) by [Purwanti and Wibowo \(2018\)](#) analyze the financial ratios to predict the cigarette company bankruptcy (cigarettes sub-sector studies listed on the Indonesia Stock Exchange 2010-2015).

Results of Altman Z-score analysis concerning the financial statements, the results obtained from the years 2010-2015 show where PT Gudang Garam Tbk. with a predicted position of the company is healthy even though the results declined from the year 2010-2013 but PT Gudang Garam Tbk. able to improve financial performance in 2014-2015. Meanwhile, PT HM. Samporna from 2010-2015 years predicted the company's position is healthy and tends to move vertically or rose significantly. Unlike the PT Bentoel Internasional Investama Tbk that from the year 2010-2015 dropped significantly and the results predicted in the year 2010-2012 the company's position was healthy, but for the years 2013-2015 is predicted to experience bankruptcy.

2.1. Understanding Financial Statements

Financial Report (Financial Statement) reports that shows the company's financial condition at this time or in a given period ([Kasmir, 2018](#)). Meanwhile, according to [Munawir \(2014\)](#), the Financial Statements are the result of the accounting process that can be used as a tool for communication between financial data or activities of a company with the parties concerned with the data or activities of the company.

2.2. Purpose of Financial Statements

According to [Kasmir \(2018\)](#), the objective of financial statements is: (1) Provide information about the type and amount of assets (property) owned by the company at this time. (2) Provide information about the type and amount of liabilities and capital of the company at this time. (3) Provide information about the type and amount of income earned in a given period. (4) Provide information about the number of fees and expenses incurred types of companies in a given period. (5) Provide information about the changes that occur to the assets, passive and capital. (6) Provide information about the company's management performance during the period. (7) Provide information about the notes to the financial statements (8) Other financial information.

2.3. Financial Statement Analysis

Statement analysis is an analysis of the financial condition of an enterprise involving balance sheet and income statement. Balance (balance sheet) describes the amount of wealth (assets), liabilities (debts) and the capital of the company-specific period. Analysis of the financial statements according to [Hara-hap \(2015\)](#) is an attempt to find a relationship between the various posts that exist in the financial statements. The financial statements present the figures would be better to have more

strategic significance and interpretation when analyzed first. Interpretation (analyzes) of financial reporting is to connect the figures contained in the financial statements, including the results of the analysis with the business decision to be taken, from this relationship to assess the company concerned, so that it can be deduced for decision making.

2.4. Understanding Financial Ratios

According to [Fahmi \(2015\)](#), financial ratios are relationship is a number with several others where Agnes Sawir, adding this comparison provides the relative picture of the financial condition and corporate presentations. Financial ratios or financial ratio is very important to analyze the financial condition of the company. In the long-term financial ratios and serve as a reference used to analyze the condition of a company's performance. The ratios can be distinguished: Balance sheet ratios (balance sheet ratio), the ratio for which data derived from existing items in the balance sheet. Ratios of income (income statement) ratio, ie the ratio of data derived from the profit and loss. Ratios between reports (inter statement ratio), is a combination of items included in the balance sheet and profit and loss.

2.5. Type of Financial Ratios

According to [Kasmir \(2018\)](#), the type of financial ratios and its descriptions are as follows:

2.5.1. Liquidity ratio

A ratio describes the company's ability to meet obligations (debt) short-term. The types of liquidity ratios: a) Current Ratio (Current Ratio). b) Very Current Ratio (Quick Ratio). c) Ratio Cash (Cash Ratio). d) Turnover Ratio Cash (Cash Turnover Ratio). e) Inventory Ratio to Net Working Capital.

2.5.2. Solvency ratios (Leverage)

It is a ratio to measure the extent of assets (assets) financed by debt. The types of solvency ratios: a) Debt to Asset Ratio, b) Debt to Equity Ratio, c) Long Term Debt to Equity Ratio, d) Times Interest Earned. e) Fixed Charge Coverage.

2.5.3. Activity ratio

It is a ratio to measure the efficiency of the company's resources. The types of activity ratios: a) Turnover Receivables (Receivable Turn over). b) Day Average Billing Accounts Receivable (Days of Receivable). c) Turnover preparations (Inventory turn over). d) Day Average Billing preparations (Days of Inventory). e) Turnover Working Capital (Working Capital Turn over). f) Turnover of Fixed Assets (Fixed Assets Turn over). g) Asset Turnover (Total Assets Turn over).

2.5.4. Profitability ratios

Is the ratio of assessing the ability of the company to seek profit in a particular period. The types of profitability ratios: a) Profit Margin (Profit Margin on Sales). b) Return on Investment (ROI). c) Return on Equity (ROE). d) Earnings Per Share.

2.5.5. Growth ratio

This ratio describes the company's ability to maintain its economic position in the middle of the growth of the economy and the business sector.

2.5.6. Valuation ratios

The ratio that measures the ability of management to create value business in that market at the expense of investment.

2.6. Understanding Bankruptcy

Is the financial difficulties so severe that the company is not able to run the company's operations well if the company is having problems in liquidity it is possible the company began to enter a period of financial difficulties (financial distress), and if these conditions are not quickly addressed it could lead to bankruptcy (bankruptcy)? (Fahmi, 2015).

2.7. Bankruptcy Prediction Model

2.7.1. Altman Z-Score Model

Altman creates new formulas and new four ratios that can be used to predict bankruptcy on all companies (Harahap, 2011). The equation obtained for all companies either go public or not to go public are as follows:

$$Z = 1,2X_1 + 1,4X_2 + 3,3X_3 + 0,6X_4 + 1,0X_5$$

Where: Z : Overall Index, 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, (Earnings Before Net of Interest Expense / Total Assets) X_4 : Market Value of Equity to Book Value of Total Liabilities, (Stock Exchange Stock Market Price / Value Total Debt) X_5 : Sales to Total Assets (Sales / Total Assets).

With the following criteria:

1. Z-Score > 2.99 is classified as a very healthy company that is not experiencing financial difficulties.
2. 1.10 < Z-Score < 2.99 are in the gray area that is categorized as a company having financial difficulties, but the possibility was saved and the possibility of bankruptcy as much depends on the discretion of the management company's decision as decision-makers.
3. Z-Score < 1.81 is categorized as a company having huge financial difficulties and high risk and the possibility of the collapse of very large.

The description of each of these variables are as follows:

- (a) Working capital to total assets (working capital to total assets), used to measure the liquidity of the company's assets relative to total capitalization, or to measure the company's ability to meet short-term obligations. Indicators that can be used to detect problems at the level of liquidity of the company are internal indicators such as insufficiency of cash, trade payables swell, and some other indicators.

- (b) Retained earnings to total assets (retained earnings to total assets), used to measure the cumulative profitability. This ratio measures the accumulated profits during the company operates. Age company influences this ratio because the longer the company operates allows accelerating the accumulation of retained earnings. This can cause a company that is still relatively young in general will show the results of a low ratio, except that a very large profit in its early years.
- (c) Income before taxes and interest to total assets (earnings before interest and taxes to total assets) Used to measure the productivity of the assets of the company. The ratio measures the company's ability to generate profits from assets used. This ratio is the largest contributor to that model. Some of the indicators that we can use in detecting problems on the ability of the company's profitability include trade receivables increased, the continued loss-several quarters, increased inventory, sales declined, and the delay in collection of accounts receivable results.
- (d) The market value of equity to book value of the debt (market value of equity to book value of total debt) Used to measure how much assets a company can go down in value before the amount of debt is greater than its assets, and the company became insolvent. Capital in question is the combined market value of ordinary and preference shares capital, while debt includes current liabilities and long term debt.

2.7.2. Zmijewski Model

Zmijewski used formula as follows:

$$X = -4.3 - 4,5X_1 + 5,7X_2 - 0,004X_3$$

Where: X_1 = (Profit After Tax / Total Assets) x 100% X_2 = (Total Debt / Total Assets) x 100% X_3 = (Current Assets / Debt Current) x 100% The cut-off used in this model is 0 (zero). Wherein if the result of the X-score is positive, then the company is said to be unhealthy. Meanwhile, if the result of the X-score is negative, then the company is said to be healthy.

2.8. Factors that Encourage Bankruptcy

At present the company runs the risk of liquidation, several factors support the bankruptcy include: 1) Debt companies that are at the extreme position of leverages, meaning loans that are already in position endanger the company itself. 2) Simultaneously maturing debt is so large, both debt banking, leasing, trade payables and other forms of other bills. 3) Companies doing the wrong policy, therefore, contributes to the loss of short-term and long term. 4) Own company assets can not be sufficient to stabilize the financial condition of the company, had too many assets are sold. 5) Sales and profit results in the can decrease the systematic and volatile. Should have good growing conditions is "constant growth" means sales and profits the company experienced steady growth. 6) Companies often do a policy-ending hole, meaning that the company resolves the liquidity problems by using a fund of funds to pay the debt.

3. RESEARCH METHODS

3.1. Types of research

This research is a case study with quantitative data sourced from the company's financial statements. Subjects of this study using secondary data, i.e. financial statement data (in 2015-2018), while the object of this study is four (4) companies listed in Jakarta Stock Exchange Indonesia.

3.2. Time, Place Research and Research Subjects

This study was conducted from September to November 2019.

3.3. Targets and Goals

Targets and goals to be achieved in this research are to obtain results of the analysis of financial statements in assessing the company's bankruptcy.

3.4. Procedures, Instruments and Data Analysis Techniques

According to Sugiyono (2014), data collection can use primary sources and secondary sources. The primary source is a data source that directly provides data to data collectors, and the secondary source is a source that does not directly provide data to data collectors, for example through others or documents. Data collection techniques used are documentation, namely to seek financial statement data. The data analysis technique is used Altman Z-Score Model and Model Zmijewski.

4. RESULTS AND DISCUSSION

4.1. Summary Processed results of Altman Z-Score Model

From Tabel 3 can be extracted that in 2015 acquisition of a Z-score is 0.701, in theory Altman z-score value $z\text{-score} > 1.20$ is categorized as a company will experience financial distress. The acquisition in 2016 Z-score is 3.367, in theory Altman z-score value $z\text{-score} > 2.99$ is classified as a very healthy company that will not run into financial difficulties. In 2017 acquisition of a Z-score is 2,879 according to the theory Altman z-score value $z\text{-score} > 1.20$ are categorized as companies that are in the gray area. Acquisition in 2018 Z-score is 4,121 according to the theory Altman z-score value $z\text{-score} > 2.99$ is classified as a very healthy company that will not run into financial difficulties.

4.2. Summary Processed results Zmijewski Model

Zmijewski method calculation results in PT Bentoel International Investama year 2015-2018 are (see Table 7):

- 2015 acquisition of the X-score is 3,390 according to the theory Zmijewski if the value of x-score exceeds 0 then categorized as a company is experiencing financial difficulties or financial distress.
- 2016 acquisition of the X-score is -2.079, in theory, if it is negative then Zmijewski categorized as a healthy company that is not experiencing financial difficulties.

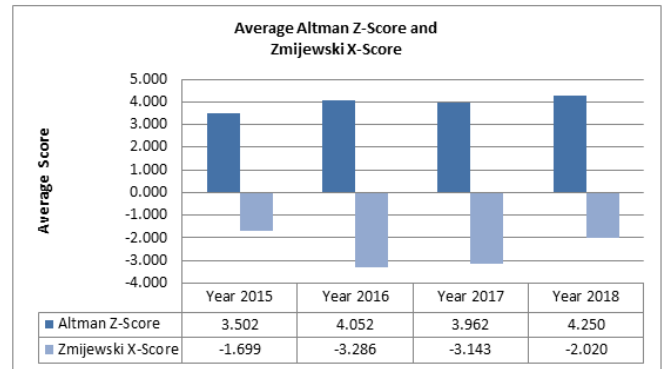


Figure 1: Average of Altman Z-Score and Zmijewski Score

- 2016 acquisition of the X-score was -2.066 in theory worth negative, therefore Zmijewski if categorized as a healthy company that is not experiencing financial difficulties.
- 2015 acquisition of the X-score is 3.297, in theory, Zmijewski if the value of x-score exceeds 0, therefore categorized as unhealthy companies that are experiencing financial difficulties.

From the results of the comparison chart (see Figure 1), there is a difference between the average yield of the Z-Score and X-Score on companies listed on the Stock Exchange. In the Z-Score results in the year 2016 there was an increase but a decrease in the last two years. While the results of X-Score decline in 2016 and 2017, in 2018 there was an increase. But both the model results show that the average value of the Z-Score and X-Score indicates that the value is still within a healthy corporate category criteria.

Based on the Table 1, bankruptcy prediction analysis of test results that Altman z-score can predict 4 companies listed on the Stock Exchange from 2015 to 2018. Of the four companies that studied one company, PT Bentoel International Investama in 2015 scored z-score is under 1.81 describes the financial condition of financial distress in the sense that the company is expected to experience financial difficulties or bankruptcy if not promptly corrected. Thus the hypothesis H_0 accepted and H_1 rejected.

The table is based on the analysis of test results for bankruptcy prediction that the method can predict Zmijewski 4 companies listed on the Stock Exchange from 2015 to 2018. Of the four companies investigated, there is one company that the X-score exceeds 0, describing the financial condition of companies experiencing financial distress in terms of PT Bentoel International Investama experiencing financial difficulties in 2015 and 2018. Thus the hypothesis H_0 is rejected and H_1 is accepted.

The comparison Altman Z-Score and Zmijewski is one company out of four companies surveyed are in the category of financial distress or experiencing financial difficulties so that the risk of bankruptcy.

5. CONCLUSION

Several factors are causing the predictive potential bankruptcy of the company, namely: the characteristics of the economic

Table 1: PT Handaya Mandala Sampoerna Processed Results of Altman Z-Score method

Year	Altman Z-Score Model	Z-Score	Prediction
2015	1.2 (0.665) +1.4 (0.275)+3.3 (0.370)+0.6 (3,495) +1.0 (2,343)	6.844	Will not
2016	1.2 (0.640) +1.4 (0.297)+3.3 (0.401)+0.6 (2.512) +1.0 (2.246)	6.26	Experience
2017	1.2 (0.642) +1.4 (0.292)+3.3 (0.392)+0.6 (2.317) +1.0 (2.297)	6.160	Financial
2018	1.2 (0.623) +1.4 (0.295)+3.3 (0.385)+0.6 (1,869) +1.0 (2,290)	5.846	Difficulties

Table 2: PT Gudang Garam Processed results of Altman Z-Score method

Year	Altman Z-Score Model	Z-Score	Prediction
2015	1.2 (0.292) +1.4 (0.581)+3.3 (0.158)+0.6 (0,038) +1.0 (1,108)	2.818	Only
2016	1.2 (0.322) +1.4 (0.611)+3.3 (0.161) +0.6 (0.042)+1.0 (1,212)	3.010	2015
2017	1.2 (0.317) +1.4 (0.617)+3.3 (0.168)+0.6 (0,040) +1.0 (1,248)	3.072	Potency
2018	1.2 (0.337) +1.4 (0.639)+3.3 (0.161)+0.6 (0,042) +1.0 (1,385)	3.242	insolvent

Table 3: PT Bentoel International Investama Processed results of Altman Z-Score method

Year	Altman Z-Score Model	Z-Score	Prediction
2015	1.2 (0.327)+1.4 (-0.292)+3.3 (-0.191)+0.6 (0,035) +1.0 (1,327)	0.701	Potentially dissolvent in 2015 and 2017
2016	1.2 (0.377)+1.4 (-0.430)+3.3 (-0.054)+0.6 (3.779) +1.0 (1.427)	3.367	
2017	1.2 (0.307)+1.4 (-0.448)+3.3 (-0.046)+0.6 (2.951) +1.0 (1.438)	2.789	
2018	1.2 (0.729)+1.4 (-1.406)+3.3 (-0.206)+0.6 (2.338) +1.0 (4.493)	4.121	

Table 4: PT Wisnilak Inti Makmur Processed results of Altman Z-Score method

Year	Altman Z-Score Model	Z-Score	Prediction
2015	1.2 (0,482) 1.4 (0.319)+3.3 (0.145)+0.6 (1,287) +1.0 (1,370)	3.646	Will not
2016	1.2 (0.520)+1.4 (0.352)+3.3 (0.109)+0.6 (1.417) +1.0 (1.245)	3.572	Experience
2017	1.2 (0.571) 1.4 (0.377)+3.3 (0,050)+0.6 (2,074) +1.0 (1,205)	3.827	Financial
2018	1.2 (0.588) 1.4 (0.390)+3.3 (0.057)+0.6 (2.0532) +1.0 (1,119)	3.792	Difficulties

Table 5: PT Handaya Mandala Sampoerna Processed results Zmijewski Model

Year	Zmijewski Model	Result	Prediction
2015	(-4.3) -4.5 (0.273) + 5.7 (0.158) -0.004 (6.567)	-4.654	No
2016	(-4.3) -4.5 (0.300) + 5.7 (0.151) - 0.004 (5.234)	-4,810	Experience
2017	(-4.3) -4.5 (0.294) + 5.7 (0.209) - 0.004 (5.836)	-4.452	Financial
2018	(-4.3) -4.5 (0.291) + 5.7 (1.89) - 0.004 (4.302)	-4,549	Difficulties

Table 6: PT Gudang Garam Processed results Zmijewski Model

Year	Zmijewski Model	Result	Prediction
2015	(-4.3) -4.5 (0.102) + 5.7 (0.402) -0.004 (1.770)	-2.476	No
2016	(-4.3) -4.5 (0.106) + 5.7 (0.344) - 0.004 (1.938)	-2.825	Experience
2017	(-4.3) -4.5 (0.116) + 5.7 (0.368) - 0.004 (2.003)	-2.733	Financial
2018	(-4.3) -4.5 (0.113) + 5.7 (0.318) - 0.004 (2.058)	-3.001	Difficulties

Table 7: PT Bentoel International Investama Processed results Zmijewski Model

Year	Model Zmikewski	Result	Prediction
2015	(-4.3) -4.5 (-0.129) + 5.7 (1.249) -0.004 (2.203)	3,390	Financial distress
2016	(-4.3) -4.5 (-0.155) + 5.7 (0.269) - 0.004 (2.402)	-2.08	
2017	(-4.3) -4.5 (0.034) + 5.7 (0.366) - 0.004 (2.045)	-2.07	
2018	(-4.3) -4.5 (-0.125) + 5.7 (1,235) - 0,004 (1,590)	3.297	

Table 8: PT Wismilak Inti Makmur Processed results Zmijewski Model

Year	Model Zmikewski	Result	Prediction
2015	(-4.3) -4.5 (-0.098) + 5.7 (0.297) -0.004 (2.894)	-3.06	No
2016	(-4.3) -4.5 (0,0079+ 5.7 (0.217) - 0.004 (3.394)	-3.43	experience
2017	(-4.3) -4.5 (0.033) + 5.7 (0.202) - 0.004 (5.529)	-3.32	difficulty
2018	(-4.3) -4.5 (0.041) + 5.7 (0.120) - 0.004 (5.919)	-3.83	finance

Table 9: Summary Calculation method of Altman Z-Score and Zmijewski

Company	Methods / Year							
	Altman Z-Score				Zmijewski			
	2015	2016	2017	2018	2015	2016	2017	2018
PT HM Sampoerna	6.844	6.26	6,160	5.846	-4.654	-4.81	-4.452	-4.549
PT Gudang Garam	2.818	3,010	3,072	3,242	-2.476	-2.825	-2.733	-3.001
PT Bentoel	0.701	3.367	2.798	4,121	3,390	-2.079	-2.066	3.297
PT Wismilak	3.646	3.572	3.827	3,792	-3.057	-3.43	-3.32	-3.825

system, internal factors and external factors. In a company such factors will affect each other and will have an impact on the survival of the company, in this study the authors focus on the internal factors that suggested that the businessman perform evaluation and analysis on internal factors and other factors that also affect the performance of the company, so can cause financial hardship that would be an impact on the company's bankruptcy.

After observing the results of both analyzes bankruptcy prediction model is a model Zmijewski and Altman model that factors significantly affect the performance of the company is working capital, retained earnings, net income, and total liabilities of the company, it is recommended that manufacturers give special attention to these posts either by utilizing working capital as well as possible, or even conduct a review of the debt agreement burden some. In addition to the performance in terms of finance, it is advisable manufacturing companies also consider matters relating to the field of non-financial issues such as increasing the resources owned by the company both human resources and technological resources, in addition to manufacturing companies need to conduct environmental analysis relating to competitor development, considering that a lot of manufacturing companies that offer competitive products. So

that the company analyzed bankruptcy prediction early on can help companies avoid therefore Financial Distress can make improvements.

The results of this study are expected to be used as reference material as an additional reference for the next researcher, and the object of study more than one company indicated that bankruptcy can be compared to its peers.

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