

**AN ANALYSIS OF THE BANKRUPTCY POTENCY OF THE  
COMPANY WITH ALTMAN Z-SCORE, SPRINGATE, ZMIJEWSKI,  
AND GROVER MODEL  
(CASE STUDY ON PT. SMARTFRENTELECOM, Tbk.)**

**Anissa Agustina Rahmadini\***

**Abstract:** Rapid technological development requires every business in telecommunications services must be able to develop its products. In 2014 was a difficult year for telecommunications companies that provide services CDMA network, it is because the network is started is not used again even some companies have turned off the product PT. Smartfren Telecom, Tbk. is a telecommunications company that delivers services CDMA network, but is the only company that does not turn the product off its CDMA network services. If we look at the financial situation of the company has always suffered losses of 2010 to 2014.

The purpose of this study was to determine the financial condition of PT. Smartfren Telecom, Tbk. from the 2010 to 2014 and compared by using the model Altman Z-Score, Springate, Zmijewski, and Grover thus unknown whether the company has the potential to bankrupt or not.

The results showed that the financial condition.PT. Smartfren Telecom, Tbk. Telecom, Tbk. from the years 2010-2014 experienced a serious problem because it could potentially bankrupt company. In 2012 the company declared Zmijewski models potentially bankrupt, but overall when compared to results using the Z-Score Altman, Springate, Smijewski and Grover can be stated that all models predicting the bankruptcy of PT. Smartfren Telecom, Tbk.

**Keyword:** *Altman Z-Score, Springate, Zmijewski, Grover, Bancruptcy*

---

\* Universitas Widyatama Bandung email: [anissa.rahmadini@widyatama.ac.id](mailto:anissa.rahmadini@widyatama.ac.id)

## INTRODUCTION

The times were followed by the development of technological and economic changes led to the business world is also changing. The development of technology is progressing very rapidly one of which is a network technology provided by the mobile operator. Currently various mobile operators compete to provide the best content and services to customers in the continuity of their business. Companies that provide GSM services today may feel safe but not for companies that provide services CDMA network. Began in 2014 and the company that provides services CDMA networks one by one began to close their CDMA network, it becomes a problem for business continuity as they should be able to survive to face the competition otherwise they will be bankrupt company.

PT. Smartfren, Tbk. is a company that is not going to close the CDMA network services it is reinforced by the statement given by the head of Smartphones Smartfren, Sukaca Purwokardjono in Hong Kong on Tuesday evening (07/10/2014) local time "4G is a cutting edge technology that promises and awaited all segments that require high-speed internet services. Going forward, although we've opened the 4G LTE service, we are not going to close the CDMA service. "With that statement means PT. Smartfren Telecom, Tbk. Have prepared a variety of new services that will support its performance so as to face the competition. Table 1 below presents the number of subscribers of the two largest private companies that provide CDMA network services:

Table 1  
Customer Data CDMA

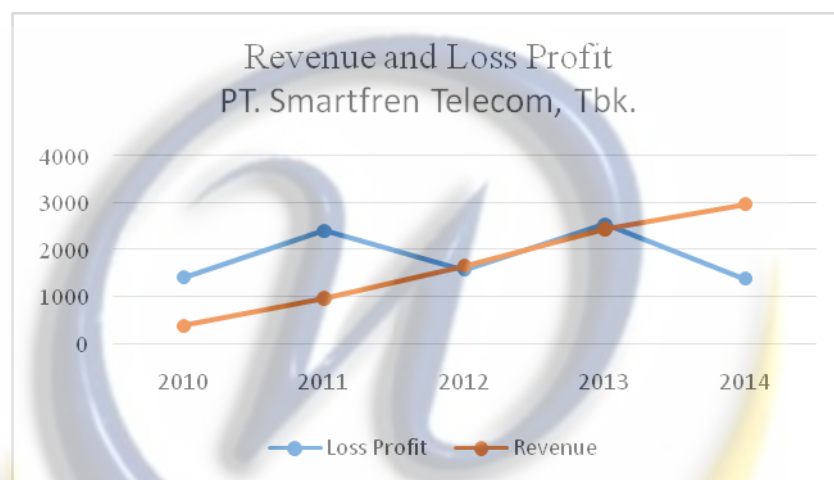
Perusahaan	Jumlah Pelanggan (dalam juta)				
	2010	2011	2012	2013	2014
PT. Smartfren Telecom, Tbk.	4,6	7,6	11	11,3	11,9
PT. Bakrie Telecom, Tbk.	13,02	14,63	11,66	12,04	11,64

*Source: Annual Report*

The ability of the company to face the competition is determined by the performance of their own therefore the company should be able to provide services or new products for the

continuation of his business. In the face of competition PT.PT. Smartfren Telecom, Tbk. Telecom, Tbk. continues to innovate by opening 4G LTE services, in collaboration with mobile phone vendors to bring smartphones based on CDMA technology in Indonesia. Smartfren efforts to build an ecosystem CDMA sweet fruit. Smartfren managed to become the second largest importer of smart phones in Indonesia in the third quarter of 2013, according to the research firm IDC. (Source: *tekno.kompas.com*)

Figure 1  
Revenue and Loss Profit



Source : *Financial Report*

Over the last five years, namely from the 2010-2014 income PT. Smartfren Telecom, Tbk. continue to increase, but the company suffered losses every year, the biggest losses occurred in the year 2013 in the amount of Rp. 2.53 Trillion. This loss is caused by the increasing burden borne by the company in carrying out its operations. Losses incurred by the company is an indication of financial distress. Gitman (2006: 785) states that "A firm may fail Because its returns are negative or low". Financial distress experienced by the company can cause the company can no longer generate profits, while the objective of the establishment of a company in general is to make profits, increase sales, maximize shareholder value, and improving the welfare of shareholders (Brigham and Houston, 2009).

Based on the data that has been described, the author intends to find out whether PT. Smartfren Telecom, Tbk. capable of undergoing business process by analyzing the bankruptcy of the company by using a model of Altman, Springate, Zmijewski and Grover. Therefore, the authors of this study entitled "**AN ANALYSIS OF THE BANKRUPTCY POTENCY OF THE COMPANY WITH ALTMAN Z-SCORE, SPRINGATE, ZMIJEWSKI, AND GROVER MODEL (CASE STUDY ON PT. SMARTFREN TELECOM, TBK.)**"

## **RESEARCH PURPOSES**

Based on the background described above, the purpose of this study are:

1. To know the financial condition. PT. Smartfren Telecom, Tbk. Telecom, Tbk. by using a model of the Altman Z-Score, Springate, Zmijewski and Grover in 2010-2014
2. To determine the ratio of Z-Score calculation results using the model of the Altman Z-Score, Springate, Zmijewski and Grover in 2010-2014

## **LITERATURE REVIEW AND THEORETICAL**

### **1. Literature Review**

- a. Hayes, etc (2010) : all but two of the bankruptcies (94 percent) would have been accurately predicted. Despite some criticism of the model's efficacy, two firms were misclassified yet later revealed potential financial distress.
- b. Venkataramana, etc (2012): The result reveals that liquidity, working capital turnover efficiency and solvency position of the selected cement companies are not satisfactory. In this study the Z-Score analysis results shows that KCP Ltd and Kesoram Industries Ltd have poor financial performance and Dalmia Bharat Ltd is at the edge of bankruptcy.

- c. Robot (2013) : Results and conclusions are bankruptcy analysis using the Altman Z-score model of PT. Gudang Garam Tbk. for the period 2008-2011 is in a position of the healthy company. While in 2012 the company touched the position of grey area and the Springate models classified the company not potentially bankrupt. Based on the analysis results by using the Altman Z-score and Springate models, it can be seen that the liquidity and inefficient management extremely affect to financial performance of the company.
- d. Prihantini and Ratnasari (2013) : Kesimpulan hasil pengujian penelitian ini menunjukkan perbedaan signifikan antara model Grover dengan model Altman Z-Score, model Grover dengan model Springate, serta model Grover dengan model Zmijewski serta tingkat akurasi tertinggi yang diraih model Grover kemudian disusul oleh model Springate, model Zmijewski, dan terakhir model Altman Z-score.
- e. Purnajaya and Merkusiwati (2014) : Potensi kebangkrutan dari ketiga model dikomparasikan dengan uji Kruskal-Wallis dengan tingkat signifikansi 0,005 dan diperoleh hasil tingkat signifikansi sebesar 0,001 dimana berarti terdapat perbedaan potensi kebangkrutan industri kosmetik yang terdaftar di BEI dengan metode Z-Score Altman, Springate dan Zmijewski.
- f. Wang and Campbell (2010) : All three models were found to have significant predictive ability. The reestimated model has higher prediction accuracy for predicting nonfailed firms, but Altman's model has higher prediction accuracy for predicting failed firms. The revised Z-score model has a higher prediction accuracy compared with both the reestimated model and Altman's original model. This study indicates that the Z-score model is a helpful tool in predicting failure of a publicly listed firm in China.

g. Kokyung and Khairani (2013) : The results showed that the method of Altman Z-score and Springate able to predict the potential bankruptcy of the PT.Bakrie Telecom Tbk in 2009 -2012, where the Altman Z-score method and Springate detect that there has been a significant decline in performance on PT.Bakrie Telecom Tbk. There are differences between the results predicted bankruptcy Altman Z-score method and Springate because of differences in the use of financial ratios and bankruptcy criteria between the Altman Z-score and Springate.

## **2. Theoretical**

### **a. Bankruptcy**

In the business world the most feared by the business is bankruptcy. Bankruptcy merupakan condition where the company is no longer able to pay its obligations, resulting in prolonged loss to the company.

According to Lily and Trisnady Saragih (2005) "issuer or public company fails or is unable to avoid the failure to pay its obligations to the lenders that are not affiliated, then the issuer or public company shall submit a report on the loan, including principal and interest amount, loan term, lender name, loan use and reason for the failure or inability to avoid failure to Bapepam and Stock Exchange where securities issuers or public companies as soon as possible, no later than the end of the second day since the issuer or public company experience a failure or inability to know to avoid failure in the intent "

### **b. Models Analysis of Bankruptcy**

#### **1) Altman Z-Score**

Bankruptcy prediction model was first performed by Edward I Altman in 1968 as a result of his research. Altman Z-Score models have undergone several revisions, in this study Altman Z-Score models used is the third model. According to Altman in Risco (2013)

Altman Z-Score third model (nonmanufacture firm / service sector) with the following formula:

$$Z = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$$

Where :

$$X_1 = \frac{\text{Working Capital}}{\text{Total Assets}}$$

$$X_2 = \frac{\text{Retained Earnings}}{\text{Total Assets}}$$

$$X_3 = \frac{\text{Earning Before Interest and Tax}}{\text{Total Assets}}$$

$$X_4 = \frac{\text{Market Value of Equity}}{\text{Book Value of Total Debts}}$$

Cut Off Value :

$Z \geq 2,60$  : Safe Zone / Nonbankruptcy

$1,10 \leq Z \leq 2,60$  : Gray Zone

$Z \leq 1,10$  : Distress Zone / Bankruptcy

## 2) Springate Model

Model Springate discovered by Gordon L.V. Springate in 1978 as a development of the model in predicting bankruptcy Altman. According Rudianto in Norita (2015) Springate Score is a model for predicting the survival of a company by combining several financial ratios to give different weights among these ratios. The formula of this model are as follows:

$$Z = 1,03 X_1 + 3,07 X_2 + 0,66 X_3 + 0,40 X_4$$

Where:

$$X_1 = \frac{\text{Working Capital}}{\text{Total Asset}}$$

$$X_2 = \frac{\text{Earning Before Interest and Tax}}{\text{Total Assets}}$$

$$X_3 = \frac{\text{EBT}}{\text{Current Liability}}$$

$$X_4 = \frac{\text{Sales}}{\text{Total Assets}}$$

After getting the value of Z in the next springate models we compare Z value with the value of the criteria on the model Springate wherein if  $Z \geq 0,862$  potentially tidak then firms go bankrupt but if tilapia  $Z \leq 0,862$  potentially bankrupt the company.

### 3) Zmijewski

According Rudianto in Norita (2015) Zmijewski using ratio analysis that measures performance, leverage, and liquidity of the company. This model emphasizes on the amount of debt as a component of the most influential event of bankruptcy. Zmijewski Score for various types of company are as follows:

$$Z = -4,3 - 4,5 X_1 + 5,7 X_2 - 0,004 X_3$$

Dimana:

$$X_1 = \frac{\text{Net Profit}}{\text{Total Assets}}$$

$$X_2 = \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

$$X_3 = \frac{\text{Current Assets}}{\text{Current Liability}}$$

After finding the value of the Z-Score model with Zmijewski then performed a comparison based on the model Zmijewski cut off. If the value Z is positive or  $Z \geq 0$  then the company predicted bankruptcies and vice versa if the negative Z or  $Z \leq 0$  then the company predicted potentially bankrupt.

#### 4) Grover

In 1968 Jeffrey S. Grover conduct research using the samples in the study Altman. Results of research conducted on 70 companies showed that 35 companies into bankruptcy and 35 other companies are not bankrupt in the year 1982-1996. Based on these studies Grover in Prihantini and Ratnasari (2013) resulted in the following functions:

$$Z = 1,650X_1 + 3,404X_3 - 0,016ROA + 0,057$$

Dimana :

$$X_1 = \frac{\text{Working Capital}}{\text{Total Asset}}$$

$$X_3 = \frac{\text{Earning Before Interest and Tax}}{\text{Total Assets}}$$

$$ROA = \frac{\text{Net Income}}{\text{Total Assets}}$$

On Grover Model category company was bankrupt with a score of less than or equal to -0.02 ( $Z \leq -0.02$ ). While the value for the companies that fall within state bankruptcy is greater than or equal to 0.01 ( $Z \geq 0.01$ ).

#### RESEARCH METHODS

This research was conducted on telecommunications services company that provides services CDMA network but still held on for not closing the network like other telecommunications companies. The object of research is the annual financial statements of PT. Smartfren Telecom, Tbk. in 2010-2014, conducted the study began in 2010 because before 2009 the company still have the Mobile 8 making it impossible to use the financial statements under the year 2010 on the company.

## DATA ANALYSIS TECHNIQUE

Data analysis techniques to perform calculations on each financial ratio for each bankruptcy prediction model used in the study. After doing further calculations we compare the results of potential bankruptcy for each model used.

## RESULTS AND DISCUSSION

### 1. Altman Z-Score

Cut-off grades used in the analysis of Altman Z-Score is if the score is more than 2.6, the company has the potential to not bankrupt but if the Z-Score of less than 1.10, the company is in distress zone or potential bankruptcy. Based on table 4 on the calculation of Altman Z-Score at PT. Smart Fren Telecom, Tbk. the period 2010-2014 are as follows:

Table 2  
Calculation results of the Altman Z-Score Model

Tahun	6.56X1	3.26X2	6.72X3	1.054X4	Z-Score	Potensi Kebangkrutan
2010	-0.363	-0.187	-0.152	-0.222	-0.570	Bangkrut
2011	0.893	-0.521	-0.555	-0.662	-4.037	Bangkrut
2012	-0.194	-0.181	-0.112	-0.102	-3.384	Bangkrut
2013	0.193	0.099	0.165	0.075	-4.218	Bangkrut
2014	0.084	0.078	0.115	0.153	-4.085	Bangkrut

Value of Z-Score of the 2010-2014 fluctuated but were below the value of 1.10 which means that the company is in distress zone. In 2011 the value of the Z-Score decreased quite high at 85% of it was due to a decrease in revenue of 38.6% from 2010 to 2011.

### 2. Springate

Based on the model Springate potential bankruptcy occurs if the value of  $Z \leq 0,862$  and if  $Z \geq 0,862$  then potentially bankrupt firms. Here are the results of model calculations Springate:

Table 3  
Calculation results of the Springate Model

Tahun	1,03 X1	3,07X2	0,66X3	0,40X4	Springate Score	Potensi Kebangkrutan
2010	-0.363	-0.194	-0.657	0.084	-1.369	Bangkrut
2011	-0.187	-0.181	-0.855	0.078	-1.281	Bangkrut
2012	-0.152	-0.112	-0.598	0.115	-0.848	Bangkrut
2013	-0.222	-0.102	-0.489	0.153	-0.802	Bangkrut
2014	-0.253	-0.055	-0.215	0.166	-0.504	Bangkrut

Source : Data Analysis

From Table 3 above it can be seen that from 2010-2014 Springate Score  $\leq 0,862$  this indicates that PT. SmartFren, Tbk. the potential bankruptcy, but if observed from the 2010-2014 results springate scores have continued to rise this is because sales continued to increase from 2010-2014.

### 3. Zmijewski

Here is the result of the calculation using the model Zmijewski:

Table 4  
Calculation results of the Zmijewski Model

Tahun	-4.3	4,5X1	5,7X2	0,004X3	Zmijewski Score	Potensi Kebangkrutan
2010	-4.3	-0.313	1.027	0.215	2.958	Bangkrut
2011	-4.3	-0.195	0.734	0.256	0.762	Bangkrut
2012	-4.3	-0.109	0.652	0.281	-0.092	Tidak Bangkrut
2013	-4.3	-0.160	0.808	0.364	1.022	Bangkrut
2014	-4.3	-0.078	0.777	0.310	0.477	Bangkrut

Source : Data Analysis

By using a model wherein potential bankruptcy Zmijewski experienced if the value  $Z \geq 0$  and potential do not go bankrupt if the value  $Z \leq 0$ , then in 2012 the company predicted that it is not bankrupt due to decreasing losses experienced by the company.

### 4. Grover

Grover Model categorizes companies into insolvency with a score of less than or equal to  $-0.02$  ( $Z \leq -0.02$ ). While the value for the companies that fall within state bankruptcy

is greater than or equal to 0.01 ( $Z \geq 0.01$ ). Here are the results of the calculation of the Z-Score model with Grover:

Table 5  
Calculation results of the Grover Model

Tahun	1,65X1	3,404X3	0,016ROA	0,057	Grover Score	Potensi Kebangkrutan
2010	-0.363	-0.194	0.084	0,057	-1.203	Distress Zone
2011	-0.187	-0.181	0.078	0,057	-0.869	Distress Zone
2012	-0.152	-0.112	0.115	0,057	-0.576	Distress Zone
2013	-0.222	-0.102	0.153	0,057	-0.658	Distress Zone
2014	-0.253	-0.055	0.166	0,057	-0.549	Distress Zone

Source : Data Analysis

Based on Table 5 it can be seen that by using a model of Grover Z value of less than -0.02 in 2010-2014 this indicates that by using the model of Grover PT. Smart Fren, Tbk. predicted bankruptcy.

### 5. Comparison of Potential Bankruptcy Altman model, Springate, Zmijewski, and Grover

Based on the calculations have been done, the following comparison of the results of the Z-Score by using a model of Altman, Springate, Zmijewski, and Grover:

Table 6  
Comparison Of Altman, Springate, Zmijewski, dan Grover Model

Tahun	Altman Z-Score	Springate	Zmijewski	Grover
2010	Bangkrut	Bangkrut	Bangkrut	Bangkrut
2011	Bangkrut	Bangkrut	Bangkrut	Bangkrut
2012	Bangkrut	Bangkrut	Tidak Bangkrut	Bangkrut
2013	Bangkrut	Bangkrut	Bangkrut	Bangkrut
2014	Bangkrut	Bangkrut	Bangkrut	Bangkrut

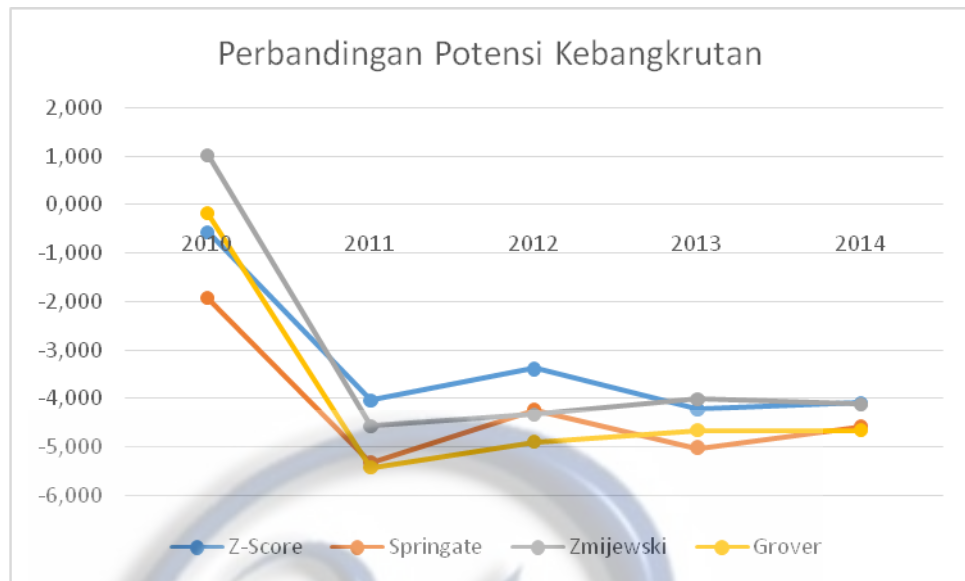
Figure 2

Comparison

chart of

Potential

Bankruptcy



Source : Data Analysis

From Table 6 it can be seen that by using a model of Altman, Grover predicted Springate and potentially bankrupt company from 2010-2014, while using models Zmijewski in 2012 PT. Smartfren predicted not bankrupt, but in 2010, 2011, 2013 and 2014 is predicted to experience bankruptcy.

## CONCLUSION

1. The financial position of PT. Smartfren Telecom, Tbk. from the years 2010-2014 are in a condition that could potentially bankrupt this is evidenced by the results of calculations and analysis using a model of the Altman Z-Score, Springate and Grover.
2. The financial position of PT. Smartfren Telecom, Tbk. using models Zmijewski in 2010, 2011, 2013, and 2014 could potentially bankrupt in 2012 but potentially not bankrupt.

3. Comparison of the results of the calculation and the four models there is a difference only in model Zmijewski in 2012, in addition to the predicted results of the four models have the same result.

## **SUGGESTION**

1. Should PT. Smartfren, Tbk. continues to innovate on the product so that it can increase its profit, this can be seen on the model Zmijewski when income increases, the company has the potential to not go bankrupt.
2. For further research should use other models and to extend the period of the study which is expected to get better results.
3. For investors should choose a company that is growing well so did not experience fear in investing its own funds.

## **REFERENCE**

- Altman, Edward I. 1968. *Discriminant Analysis and the Prediction of Corporate Bankruptcy*. The Journal of Finance, Vol. 23, No. 4. (Sep., 1968), pp 589-609.
- Brigham, Eugene dan Joel F. Houston. 2009. *Fundamentals of Financial Management (Dasar-Dasar Manajemen Keuangan Edisi Ke sepuluh)*. Jakarta: Salemba Empat.
- Ondang, Risco. 2013. *Analisis Financial Distress Dengan Menggunakan Metode Altman Z-Score Untuk Memprediksi Kebangkrutan Pada Perusahaan (Studi Pada Perusahaan Telekomunikasi Yang Terdaftar Di Bursa Efek Indonesia Periode 2008-2012)*. Bandung : Universitas Telkom.
- Hayes, K. Suzane. 2010. "A Study of the Efficacy of Altman's Z To Predict Bankruptcy of Specialty Retail Firms Doing Business in Contemporary Times". *Economics & Business Journal : Inquiries & Perspectives*. Vol. 3 No. 1. Pg. 130-134.
- Ida and Sandy Santoso. 2011. *Analisis Kebangkrutan Dengan Menggunakan Metode Springate*. Bandung : Universitas Maranatha.
- Kokyung and Siti Khairani. 2013. *Analisis Penggunaan Altman Z-score dan Springate untuk Mengetahui Potensi Kebangkrutan pada PT.Bakrie Telecom Tbk*. Palembang : STIE MDP.

Mastuti, Firda., etc. 2013. *Altman Z-Score Sebagai Salah Satu Metode Dalam Menganalisis Estimasi Kebangkrutan Perusahaan (Studi Pada Perusahaan Plastik Dan Kemasan Yang Terdaftar (Listing) Di Bursa Efek Indonesia Periode Tahun 2010 Sampai Dengan 2012)*. Malang : Universitas Brawijaya.

Nurchayanti, Wahyu. 2015. *Studi Komparatif Model Z-Score Altman, Springate Dan Zmijewski Dalam Mengindikasikan Kebangkrutan Perusahaan Yang Terdaftar Di BEI*. Padang : Universitas Negeri Padang.

Norita. 2015. *Analisis Potensi Kebangkrutan Perusahaan Vendor Telekomunikasi Berdasarkan Rasio Keuangan Bermasalah Dengan Metode Altman, Springate Dan Zmijewski (Studi Pada Nokia Corporation)*. Bandung : Universitas Telkom.

Prihantini, Ni Made Evi Dwi dan Maria M. Ratna Sari. 2013. *Prediksi Kebangkrutan Dengan Model Grover, Altman Z-Score, Springate Dan Zmijewski Pada Perusahaan Food And Beverage Di Bursa Efek Indonesia*. Bali : Jurnal Akuntansi Universitas Udayana.

Robot, Selmy. 2013. *The Application Of Bankruptcy Prediction Analysis Using Altman Z-Score And Springate Methods At Pt. Gudang Garam Tbk*. Manado : Universitas Samratulangi. Vol. 1 pg. 630-636

Sandin, Ariel R and Marcela Porporato. 2007. *Corporate bankruptcy prediction models applied to emerging economies*. International Journal of Commerce and Management Vol. 17 No. 4 pg. 295-311.

Syafitri, Lili and Trisnadi Wijaya. 2014. *Analisis Komparatif Dalam Memprediksi Kebangkrutan Pada Pt. Indofood Sukses Makmur Tbk*. Palembang : STIE MDP.

Venkataramana, N., etc. 2012. *Financial Performance And Predicting The Risk Of Bankruptcy: A Case Of Selected Cement Companies In India*. International Journal Of Public Administration And Management Research (IJPAMR), Vol. 1 pg. 40-56.

Wang, Ying and Michael Campbell. 2010. *Business Failure Prediction for Publicly Listed Companies in China*. *Journal of Business and Management*. Vol. 16, No. 1, pg. 75.